

**Table B: Alphabetical List of Dangerous Goods**

The names of the substances and articles are listed in alphabetical order. Arabic numbers or prefixes such as o-, m-, p-, n-, sec-, tert-, N-, alpha-, beta-, omega-, cis- and trans- are ignored for the purposes of alphabetical listing. However, prefixes Bis- and Iso- are counted as the first part of a name.

**Column "NHM-Code" (Nomenclature Harmonisée Marchandises – Harmonized Goods List)**

This column contains the NHM Code of the goods in accordance with the harmonized goods list (UIC leaflet 221<sup>1</sup>). The NHM codes consist of eight figures. The codes shown in this Table are limited to six figures, as prescribed in the CIM consignment note. As dangerous goods are assigned to NHM codes in accordance with principles which do not reflect the classification principles of RID, it is not possible in all cases to assign a single NHM code to each RID substance description. This is especially true of collective entries and n.o.s. entries. In these cases, the correct NHM code can only be found if the chemical or technical description of the goods is known. If the correct NHM code can only be given in part, the missing figures are replaced with plus signs ("+"). In cases where there is more than one NHM code to be considered, two relevant NHM codes are shown, the most relevant code being indicated first.

The Secretariat of OTIF has assigned the NHM codes with the greatest care. However, it cannot be guaranteed that the content and technical details are entirely free from errors.

The information in this column is not legally binding.

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<sup>1</sup> The NHM codes can be consulted on the UIC website under [www.uic.org/nhm](http://www.uic.org/nhm).

Name and description	UN No.	Note	NHM Code
Accumulators, electric: see	2794		8507++
Accumulators, electric: see	2795		8507++
Accumulators, electric: see	2800		8507++
Accumulators, electric: see	3028		8507++
Accumulators, electric: see	3292		8507++
ACETAL	1088		291100
ACETALDEHYDE	1089		291212
ACETALDEHYDE AMMONIA	1841		292211
ACETALDEHYDE OXIME	2332		292800
ACETIC ACID, GLACIAL	2789		291521
ACETIC ACID SOLUTION, more than 10% but not more than 80% acid, by mass	2790		291521
ACETIC ACID SOLUTION, more than 80% acid, by mass	2789		291521
ACETIC ANHYDRIDE	1715		291524
Acetoin: see	2621		291440
ACETONE	1090		291411
ACETONE CYANOHYDRIN, STABILIZED	1541		292690
ACETONE OILS	1091		380700
ACETONITRILE	1648		292690
ACETYL BROMIDE	1716		291590
ACETYL CHLORIDE	1717		291590
ACETYLENE, DISSOLVED	1001		290129
ACETYLENE, SOLVENT FREE	3374		290129
Acetylene tetrabromide: see	2504		290339
Acetylene tetrachloride: see	1702		290319
ACETYL IODIDE	1898		291590
ACETYL METHYL CARBINOL	2621		291440
Acid butyl phosphate: see	1718		291990
Acid mixture, hydrofluoric and sulphuric: see	1786		281119
Acid mixture, nitrating acid: see	1796		280800
Acid mixture, spent, nitrating acid: see	1826		280800
			382569
Acraldehyde, inhibited: see	1092		291219
ACRIDINE	2713		293399
ACROLEIN DIMER, STABILIZED	2607		293299
ACROLEIN, STABILIZED	1092		291219
ACRYLAMIDE SOLUTION	3426		292419
ACRYLAMIDE, SOLID	2074		292419
ACRYLIC ACID, STABILIZED	2218		291611
ACRYLONITRILE, STABILIZED	1093		292610
Actinolite: see	2212		252490
Activated carbon: see	1362		380210
Activated charcoal: see	1362		380210
ADHESIVES containing flammable liquid	1133		350699
ADIPONITRILE	2205		292690
ADSORBED GAS, N.O.S.	3511		++++++
ADSORBED GAS, FLAMMABLE, N.O.S.	3510		++++++
ADSORBED GAS, OXIDIZING, N.O.S.	3513		++++++
ADSORBED GAS, TOXIC, N.O.S.	3512		++++++
ADSORBED GAS, TOXIC, CORROSIVE, N.O.S.	3516		++++++
ADSORBED GAS, TOXIC, FLAMMABLE, N.O.S.	3514		++++++
ADSORBED GAS, TOXIC, FLAMMABLE, CORROSIVE, N.O.S.	3517		++++++
ADSORBED GAS, TOXIC, OXIDIZING, N.O.S.	3515		++++++
ADSORBED GAS, TOXIC, OXIDIZING, CORROSIVE, N.O.S.	3518		++++++
AEROSOLS	1950		++++++
AGENT, BLASTING, TYPE B	0331		360200
AGENT, BLASTING, TYPE E	0332		360200
Air bag inflators, see	0503		870895
Air bag inflators, see	3268		870895
Air bag modules, see	0503		870895
Air bag modules, see	3268		870895
AIR, COMPRESSED	1002		285300
AIRCRAFT HYDRAULIC POWER UNIT FUEL TANK (containing a mixture of anhydrous hydrazine and methylhydrazine) (M86 fuel)	3165		880330
AIR, REFRIGERATED LIQUID	1003		285300
ALCOHOLATES SOLUTION, N.O.S., in alcohol	3274		290519
ALCOHOLIC BEVERAGES	3065		2208++
ALCOHOLS, FLAMMABLE, TOXIC, N.O.S.	1986		2905++
ALCOHOLS, N.O.S.	1987		2905++
ALDEHYDES, FLAMMABLE, TOXIC, N.O.S.	1988		2912++
ALDEHYDES, N.O.S.	1989		2912++
ALDOL	2839		291249
ALKALI METAL ALCOHOLATES, SELF-HEATING, CORROSIVE, N.O.S.	3206		290519
ALKALI METAL ALLOY, LIQUID, N.O.S.	1421		280519
ALKALI METAL AMALGAM, LIQUID	1389		285300
ALKALI METAL AMALGAM, SOLID	3401		285300

Name and description	UN No.	Note	NHM Code
ALKALI METAL AMIDES	1390		285300
ALKALI METAL DISPERSION	1391		280519
ALKALI METAL DISPERSION, FLAMMABLE	3482		280519
ALKALINE EARTH METAL ALCOHOLATES, N.O.S.	3205		290519
ALKALINE EARTH METAL ALLOY, N.O.S.	1393		280519
ALKALINE EARTH METAL AMALGAM, LIQUID	1392		285300
ALKALINE EARTH METAL AMALGAM, SOLID	3402		285300
ALKALINE EARTH METAL DISPERSION	1391		280519
ALKALINE EARTH METAL DISPERSION, FLAMMABLE	3482		280519
ALKALOID SALTS, LIQUID, N.O.S.	3140		2939++
ALKALOID SALTS, SOLID, N.O.S.	1544		2939++
ALKALOIDS, LIQUID, N.O.S.	3140		2939++
ALKALOIDS, SOLID, N.O.S.	1544		2939++
ALKYLPHENOLS, LIQUID, N.O.S. (including C <sub>2</sub> -C <sub>12</sub> homologues)	3145		290719
ALKYLPHENOLS, SOLID, N.O.S. (including C <sub>2</sub> -C <sub>12</sub> homologues)	2430		290719
ALKYLSULPHONIC ACIDS, LIQUID with more than 5% free sulphuric acid	2584		290410
ALKYLSULPHONIC ACIDS, LIQUID with not more than 5% free sulphuric acid	2586		290410
ALKYLSULPHONIC ACIDS, SOLID with more than 5% free sulphuric acid	2583		290410
ALKYLSULPHONIC ACIDS, SOLID with not more than 5% free sulphuric acid	2585		290410
ALKYLSULPHURIC ACIDS	2571		290410
ALLYL ACETATE	2333		291539
ALLYL ALCOHOL	1098		290529
ALLYLAMINE	2334		292119
ALLYL BROMIDE	1099		290339
ALLYL CHLORIDE	1100		290329
ALLYL CHLOROFORMATE	1722		291590
ALLYL ETHYL ETHER	2335		290919
ALLYL FORMATE	2336		291513
ALLYL GLYCIDYL ETHER	2219		291090
ALLYL IODIDE	1723		290339
ALLYL ISOTHIOCYANATE, STABILIZED	1545		293090
ALLYLTRICHLOROSILANE, STABILIZED	1724		293100
ALUMINIUM BOROHYDRIDE	2870		285000
ALUMINIUM BOROHYDRIDE IN DEVICES	2870		285000
ALUMINIUM BROMIDE, ANHYDROUS	1725		282759
ALUMINIUM BROMIDE SOLUTION	2580		282759
ALUMINIUM CARBIDE	1394		284990
ALUMINIUM CHLORIDE, ANHYDROUS	1726		282732
ALUMINIUM CHLORIDE SOLUTION	2581		282732
ALUMINIUM FERROSILICON POWDER	1395		760120
ALUMINIUM HYDRIDE	2463		285000
ALUMINIUM NITRATE	1438		283429
ALUMINIUM PHOSPHIDE	1397		284800
ALUMINIUM PHOSPHIDE PESTICIDE	3048		284800
ALUMINIUM POWDER, COATED	1309		760310
ALUMINIUM POWDER, UNCOATED	1396		760310
ALUMINIUM REMELTING BY-PRODUCTS	3170		262040
ALUMINIUM RESINATE	2715		380620
ALUMINIUM SILICON POWDER, UNCOATED	1398		285000
ALUMINIUM SMELTING BY-PRODUCTS	3170		262040
AMINES, FLAMMABLE, CORROSIVE, N.O.S.	2733		2921++
AMINES, LIQUID, CORROSIVE, FLAMMABLE, N.O.S.	2734		2921++
AMINES, LIQUID, CORROSIVE, N.O.S.	2735		2921++
AMINES, SOLID, CORROSIVE, N.O.S.	3259		2921++
2-AMINO-4-CHLOROPHENOL	2673		292229
2-AMINO-5-DIETHYLAMINOPENTANE	2946		292129
2-AMINO-4,6-DINITROPHENOL, WETTED with not less than 20% water, by mass	3317		292229
2-(2-AMINOETHOXY)ETHANOL	3055		292250
N-AMINOETHYLPIPERAZINE	2815		293399
AMINOPHENOLS (o-, m-, p-)	2512		292229
AMINOPYRIDINES (o-, m-, p-)	2671		293339
AMMONIA, ANHYDROUS	1005		281410
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	2672		281420
AMMONIA SOLUTION, relative density less than 0.880 at 15 °C in water, with more than 35% but not more than 50% ammonia	2073		281420
AMMONIA SOLUTION, relative density less than 0.880 at 15 °C in water, with more than 50% ammonia	3318		281420
AMMONIUM ARSENATE	1546		284290
Ammonium bifluoride solid: see	1727		282619
Ammonium bifluoride solution: see	2817		282619
Ammonium bisulphate: see	2506		283329
AMMONIUM DICHROMATE	1439		284150
AMMONIUM DINITRO-o-CRESOLATE, SOLID	1843		290899
AMMONIUM DINITRO-o-CRESOLATE SOLUTION	3424		290899
AMMONIUM FLUORIDE	2505		282619

Name and description	UN No.	Note	NHM Code
AMMONIUM FLUOROSILICATE	2854		282690
AMMONIUM HYDROGENDIFLUORIDE, SOLID	1727		282619
AMMONIUM HYDROGENDIFLUORIDE SOLUTION	2817		282619
AMMONIUM HYDROGEN SULPHATE	2506		283329
AMMONIUM METAVANADATE	2859		284190
AMMONIUM NITRATE BASED FERTILIZER	2067		310520
Ammonium nitrate based fertilizer, uniform mixtures of the nitrogen/phosphate, nitrogen/potash or nitrogen/phosphate/potash type, containing not more than 70% ammonium nitrate and not more than 0.4% total combustible/organic material calculated as carbon or with not more than 45% ammonium nitrate and unrestricted combustible material	2071	Exempt	310520
AMMONIUM NITRATE EMULSION, intermediate for blasting explosives	3375		360200
AMMONIUM NITRATE GEL, intermediate for blasting explosives	3375		360200
AMMONIUM NITRATE, LIQUID, hot concentrated solution, in a concentration of more than 80% but not more than 93%	2426		310230
AMMONIUM NITRATE SUSPENSION, intermediate for blasting explosives	3375		360200
AMMONIUM NITRATE	0222		310230
AMMONIUM NITRATE with not more than 0.2% combustible substances, including any organic substance calculated as carbon, to the exclusion of any other added substance	1942		310230
AMMONIUM PERCHLORATE	0402		282990
AMMONIUM PERCHLORATE	1442		282990
AMMONIUM PERSULPHATE	1444		283340
AMMONIUM PICRATE dry or wetted with less than 10% water, by mass	0004		290899
AMMONIUM PICRATE, WETTED with not less than 10% water, by mass	1310		290899
AMMONIUM POLYSULPHIDE SOLUTION	2818		283090
AMMONIUM POLYVANADATE	2861		284190
AMMONIUM SULPHIDE SOLUTION	2683		283090
AMMUNITION, ILLUMINATING with or without burster, expelling charge or propelling charge	0171		930690
AMMUNITION, ILLUMINATING with or without burster, expelling charge or propelling charge	0254		930690
AMMUNITION, ILLUMINATING with or without burster, expelling charge or propelling charge	0297		930690
AMMUNITION, INCENDIARY, liquid or gel, with burster, expelling charge or propelling charge	0247		930690
AMMUNITION, INCENDIARY with or without burster, expelling charge or propelling charge	0009		930690
AMMUNITION, INCENDIARY with or without burster, expelling charge or propelling charge	0010		930690
AMMUNITION, INCENDIARY with or without burster, expelling charge or propelling charge	0300		930690
AMMUNITION, INCENDIARY, WHITE PHOSPHORUS with burster, expelling charge or propelling charge	0243		930690
AMMUNITION, INCENDIARY, WHITE PHOSPHORUS with burster, expelling charge or propelling charge	0244		930690
AMMUNITION, PRACTICE	0362		930690
AMMUNITION, PRACTICE	0488		930690
AMMUNITION, PROOF	0363		930690
AMMUNITION, SMOKE with or without burster, expelling charge or propelling charge	0015		930690
AMMUNITION, SMOKE with or without burster, expelling charge or propelling charge	0016		930690
AMMUNITION, SMOKE with or without burster, expelling charge or propelling charge	0303		930690
AMMUNITION, SMOKE, WHITE PHOSPHORUS with burster, expelling charge or propelling charge	0245		930690
AMMUNITION, SMOKE, WHITE PHOSPHORUS with burster, expelling charge or propelling charge	0246		930690
AMMUNITION, TEAR-PRODUCING, NON-EXPLOSIVE without burster or expelling charge, non-fuzed	2017		930690
AMMUNITION, TEAR-PRODUCING with burster, expelling charge or propelling charge	0018		930690
AMMUNITION, TEAR-PRODUCING with burster, expelling charge or propelling charge	0019		930690
AMMUNITION, TEAR-PRODUCING with burster, expelling charge or propelling charge	0301		930690
AMMUNITION, TOXIC with burster, expelling charge or propelling charge	0020	Prohibited	
AMMUNITION, TOXIC with burster, expelling charge or propelling charge	0021	Prohibited	
AMMUNITION, TOXIC, NON-EXPLOSIVE without burster or expelling charge, non-fuzed	2016		930690
Amosite: see	2212		252490
AMYL ACETATES	1104		291539
AMYL ACID PHOSPHATE	2819		291990
AMYLAMINE	1106		292119
AMYL BUTYRATES	2620		291590
AMYL CHLORIDE	1107		290319
n-AMYLENE	1108		290129
AMYL FORMATES	1109		291513
AMYL MERCAPTAN	1111		293090
n-AMYL METHYL KETONE	1110		291419
AMYL NITRATE	1112		292090
AMYL NITRITE	1113		292090
AMYLTRICHLOROSILANE	1728		293100
ANILINE	1547		292141
ANILINE HYDROCHLORIDE	1548		292141
ANISIDINES	2431		292229
ANISOLE	2222		290930
ANISOYL CHLORIDE	1729		291899
Anthophyllite: see	2212		252490
ANTIMONY COMPOUND, INORGANIC, LIQUID, N.O.S.	3141		28+++
ANTIMONY COMPOUND, INORGANIC, SOLID, N.O.S.	1549		28+++
Antimony hydride: see	2676		285000
ANTIMONY LACTATE	1550		291811
ANTIMONY PENTACHLORIDE, LIQUID	1730		282739
ANTIMONY PENTACHLORIDE SOLUTION	1731		282739

Name and description	UN No.	Note	NHM Code
ANTIMONY PENTAFLUORIDE	1732		282619
ANTIMONY POTASSIUM TARTRATE	1551		291813
ANTIMONY POWDER	2871		811010
ANTIMONY TRICHLORIDE	1733		282739
ARGON, COMPRESSED	1006		280421
ARGON, REFRIGERATED LIQUID	1951		280421
Arsenates, n.o.s.: see	1556		284290
Arsenates, n.o.s.: see	1557		284290
ARSENIC	1558		280480
ARSENIC ACID, LIQUID	1553		281119
ARSENIC ACID, SOLID	1554		281119
ARSENICAL DUST	1562		280480
ARSENICAL PESTICIDE, LIQUID, FLAMMABLE, TOXIC, flash-point less than 23 °C	2760		3808++
ARSENICAL PESTICIDE, LIQUID, TOXIC	2994		3808++
ARSENICAL PESTICIDE, LIQUID, TOXIC, FLAMMABLE, flash-point not less than 23 °C	2993		3808++
ARSENICAL PESTICIDE, SOLID, TOXIC	2759		3808++
ARSENIC BROMIDE	1555		281290
ARSENIC COMPOUND, LIQUID, N.O.S., inorganic	1556		28++++
ARSENIC COMPOUND, SOLID, N.O.S., inorganic	1557		28++++
ARSENIC PENTOXIDE	1559		282590
Arsenic sulphides, n.o.s.: see	1556		281390
Arsenic sulphides, n.o.s.: see	1557		281390
ARSENIC TRICHLORIDE	1560		281210
ARSENIC TRIOXIDE	1561		282590
Arsenites, n.o.s.: see	1556		284290
Arsenites, n.o.s.: see	1557		284290
ARSINE	2188		285000
ARSINE, ADSORBED	3522		285000
ARTICLES, EEE	0486		930690
ARTICLES, EXPLOSIVE, EXTREMELY INSENSITIVE	0486		930690
ARTICLES, EXPLOSIVE, N.O.S.	0349		930690
ARTICLES, EXPLOSIVE, N.O.S.	0350		930690
ARTICLES, EXPLOSIVE, N.O.S.	0351		930690
ARTICLES, EXPLOSIVE, N.O.S.	0352		930690
ARTICLES, EXPLOSIVE, N.O.S.	0353		930690
ARTICLES, EXPLOSIVE, N.O.S.	0354		930690
ARTICLES, EXPLOSIVE, N.O.S.	0355		930690
ARTICLES, EXPLOSIVE, N.O.S.	0356		930690
ARTICLES, EXPLOSIVE, N.O.S.	0462		930690
ARTICLES, EXPLOSIVE, N.O.S.	0463		930690
ARTICLES, EXPLOSIVE, N.O.S.	0464		930690
ARTICLES, EXPLOSIVE, N.O.S.	0465		930690
ARTICLES, EXPLOSIVE, N.O.S.	0466		930690
ARTICLES, EXPLOSIVE, N.O.S.	0467		930690
ARTICLES, EXPLOSIVE, N.O.S.	0468		930690
ARTICLES, EXPLOSIVE, N.O.S.	0469		930690
ARTICLES, EXPLOSIVE, N.O.S.	0470		930690
ARTICLES, EXPLOSIVE, N.O.S.	0471		930690
ARTICLES, EXPLOSIVE, N.O.S.	0472		930690
ARTICLES, PRESSURIZED, HYDRAULIC (containing non-flammable gas)	3164		++++++
ARTICLES, PRESSURIZED, PNEUMATIC (containing non-flammable gas)	3164		++++++
ARTICLES, PYROPHORIC	0380		930690
ARTICLES, PYROTECHNIC for technical purposes	0428		360490
ARTICLES, PYROTECHNIC for technical purposes	0429		360490
ARTICLES, PYROTECHNIC for technical purposes	0430		360490
ARTICLES, PYROTECHNIC for technical purposes	0431		360490
ARTICLES, PYROTECHNIC for technical purposes	0432		360490
ARYLSULPHONIC ACIDS, LIQUID with more than 5% free sulphuric acid	2584		290410
ARYLSULPHONIC ACIDS, LIQUID with not more than 5% free sulphuric acid	2586		290410
ARYLSULPHONIC ACIDS, SOLID with more than 5% free sulphuric acid	2583		290410
ARYLSULPHONIC ACIDS, SOLID with not more than 5% free sulphuric acid	2585		290410
ASBESTOS, AMPHIBOLE	2212		252410
ASBESTOS, CHRYSOTILE	2590		252490
Aviation regulated liquid, n.o.s.	3334	Exempt	++++++
Aviation regulated solid, n.o.s.	3335	Exempt	++++++
AZODICARBONAMIDE	3242		292700
BARIUM	1400		280519
BARIUM ALLOYS, PYROPHORIC	1854		280519
BARIUM AZIDE, dry or wetted with less than 50% water, by mass	0224	Prohibited	
BARIUM AZIDE, WETTED with not less than 50% water, by mass	1571		285000
BARIUM BROMATE	2719		282990
BARIUM CHLORATE, SOLID	1445		282919
BARIUM CHLORATE SOLUTION	3405		282919
BARIUM COMPOUND, N.O.S.	1564		++++++
BARIUM CYANIDE	1565		283719

Name and description	UN No.	Note	NHM Code
BARIUM HYPOCHLORITE with more than 22% available chlorine	2741		282890
BARIUM NITRATE	1446		283429
BARIUM OXIDE	1884		281640
BARIUM PERCHLORATE, SOLID	1447		282990
BARIUM PERCHLORATE SOLUTION	3406		282990
BARIUM PERMANGANATE	1448		284169
BARIUM PEROXIDE	1449		281640
BATTERIES, CONTAINING SODIUM	3292		8506++
BATTERIES, DRY, CONTAINING POTASSIUM HYDROXIDE SOLID, electric storage	3028		8507++
Batteries, nickel-metal hydride	3496	Exempt	850680
BATTERIES, WET, FILLED WITH ACID, electric storage	2794		8507++
BATTERIES, WET, FILLED WITH ALKALI, electric storage	2795		8507++
BATTERIES, WET, NON-SPILLABLE, electric storage	2800		8507++
BATTERY FLUID, ACID	2796		280700
BATTERY FLUID, ALKALI	2797		2815++
BATTERY-POWERED EQUIPMENT	3171		++++++
BATTERY-POWERED VEHICLE	3171		++++++
BENZALDEHYDE	1990		291221
BENZENE	1114		290220 270710
BENZENESULPHONYL CHLORIDE	2225		290490
BENZIDINE	1885		292159
BENZONITRILE	2224		292690
BENZOQUINONE	2587		291469
BENZOTRICHLORIDE	2226		290399
BENZOTRIFLUORIDE	2338		290399
BENZOYL CHLORIDE	1736		291632
BENZYL BROMIDE	1737		290399
BENZYL CHLORIDE	1738		290399
BENZYL CHLOROFORMATE	1739		291590
Benzyl cyanide: see	2470		292690
BENZYLDIMETHYLAMINE	2619		292149
BENZYLIDENE CHLORIDE	1886		290399
BENZYL IODIDE	2653		290399
BERYLLIUM COMPOUND, N.O.S.	1566		28++++
BERYLLIUM NITRATE	2464		283429
BERYLLIUM POWDER	1567		811212
Bhusa	1327	Exempt	121300
BICYCLO[2.2.1]HEPTA-2,5-DIENE, STABILIZED	2251		290219
BIOLOGICAL SUBSTANCE, CATEGORY B	3373		++++++
BIOMEDICAL WASTE, N.O.S.	3291		382530
BIPYRIDILUM PESTICIDE, LIQUID, FLAMMABLE, TOXIC, flash-point less than 23 °C	2782		380893
BIPYRIDILUM PESTICIDE, LIQUID, TOXIC	3016		380893
BIPYRIDILUM PESTICIDE, LIQUID, TOXIC, FLAMMABLE, flash-point not less than 23 °C	3015		380893
BIPYRIDILUM PESTICIDE, SOLID, TOXIC	2781		380893
BISULPHATES, AQUEOUS SOLUTION	2837		283329
BISULPHITES, AQUEOUS SOLUTION, N.O.S.	2693		283220
BLACK POWDER, COMPRESSED	0028		360200
BLACK POWDER, granular or as a meal	0027		360200
BLACK POWDER, IN PELLETS	0028		360200
BOMBS, PHOTO-FLASH	0037		930690
BOMBS, PHOTO-FLASH	0038		930690
BOMBS, PHOTO-FLASH	0039		930690
BOMBS, PHOTO-FLASH	0299		930690
BOMBS, SMOKE, NON-EXPLOSIVE with corrosive liquid, without initiating device	2028		930690
BOMBS with bursting charge	0033		930690
BOMBS with bursting charge	0034		930690
BOMBS with bursting charge	0035		930690
BOMBS with bursting charge	0291		930690
BOMBS WITH FLAMMABLE LIQUID with bursting charge	0399		930690
BOMBS WITH FLAMMABLE LIQUID with bursting charge	0400		930690
BOOSTERS WITH DETONATOR	0225		360300
BOOSTERS WITH DETONATOR	0268		360300
BOOSTERS without detonator	0042		360300
BOOSTERS without detonator	0283		360300
BORNEOL	1312		290619
BORON TRIBROMIDE	2692		281290
BORON TRICHLORIDE	1741		281210
BORON TRIFLUORIDE	1008		281290
BORON TRIFLUORIDE, ADSORBED	3519		281290
BORON TRIFLUORIDE ACETIC ACID COMPLEX, LIQUID	1742		294200
BORON TRIFLUORIDE ACETIC ACID COMPLEX, SOLID	3419		294200
BORON TRIFLUORIDE DIETHYL ETHERATE	2604		294200
BORON TRIFLUORIDE DIHYDRATE	2851		294200
BORON TRIFLUORIDE DIMETHYL ETHERATE	2965		294200

Name and description	UN No.	Note	NHM Code
BORON TRIFLUORIDE PROPIONIC ACID COMPLEX, LIQUID	1743		294200
BORON TRIFLUORIDE PROPIONIC ACID COMPLEX, SOLID	3420		294200
BROMATES, INORGANIC, AQUEOUS SOLUTION, N.O.S.	3213		282990
BROMATES, INORGANIC, N.O.S.	1450		282990
BROMINE	1744		280130
BROMINE CHLORIDE	2901		281210
BROMINE PENTAFLUORIDE	1745		281290
BROMINE SOLUTION	1744		280130
BROMINE TRIFLUORIDE	1746		281290
BROMOACETIC ACID, SOLID	3425		291590
BROMOACETIC ACID SOLUTION	1938		291590
BROMOACETONE	1569		291470
omega-Bromoacetone: see	2645		291470
BROMOACETYL BROMIDE	2513		291590
BROMOBENZENE	2514		290399
BROMOBENZYL CYANIDES, LIQUID	1694		292690
BROMOBENZYL CYANIDES, SOLID	3449		292690
1-BROMOBUTANE	1126		290339
2-BROMOBUTANE	2339		290339
BROMOCHLOROMETHANE	1887		290379
1-BROMO-3-CHLOROPROPANE	2688		290379
2-Bromoethyl ethyl ether	2340		290919
BROMOFORM	2515		290339
1-BROMO-3-METHYLBUTANE	2341		290339
BROMOMETHYLPROPANES	2342		290339
2-Bromo-2-nitropropane-1,3-diol	3241		290559
2-BROMOPENTANE	2343		290339
BROMOPROPANES	2344		290339
3-BROMOPROPYNE	2345		290339
BROMOTRIFLUOROETHYLENE	2419		290378
BROMOTRIFLUOROMETHANE	1009		290376
BRUCINE	1570		293999
BURSTERS, explosive	0043		930690
BUTADIENES AND HYDROCARBON MIXTURE, STABILIZED, having a vapour pressure at 70 °C not exceeding 1.1 MPa (11 bar) and a density at 50 °C not lower than 0.525 kg/l	1010		271114
BUTADIENES, STABILIZED (1,2-butadiene)	1010		271114 290129
BUTADIENES, STABILIZED (1,3-butadiene)	1010		271114 290124
BUTANE	1011		271113 290110
BUTANEDIONE	2346		291419
BUTANOLS	1120		290514 290513
BUTYL ACETATES	1123		291533 291539
BUTYL ACID PHOSPHATE	1718		291990
BUTYL ACRYLATES, STABILIZED	2348		291612
n-BUTYLAMINE	1125		292119
N-BUTYLANILINE	2738		292142
BUTYLBENZENES	2709		290290
n-Butyl bromide: see	1126		290339
Butyl chlorides: see	1127		290319
n-BUTYL CHLOROFORMATE	2743		291590
tert-BUTYL CYCLOHEXYL CHLOROFORMATE	2747		291590
1-BUTYLENE	1012		290123
cis-2-BUTYLENE	1012		290123
trans-2-BUTYLENE	1012		290123
BUTYLENES MIXTURE	1012		271114 290123
1,2-BUTYLENE OXIDE, STABILIZED	3022		291090
n-BUTYL FORMATE	1128		291513
tert-BUTYL HYPOCHLORITE	3255	Prohibited	
N,n-BUTYLLIMIDAZOLE	2690		293329
n-BUTYL ISOCYANATE	2485		292910
tert-BUTYL ISOCYANATE	2484		292910
BUTYL MERCAPTAN	2347		293090
n-BUTYL METHACRYLATE, STABILIZED	2227		291614
BUTYL METHYL ETHER	2350		290919
BUTYL NITRITES	2351		292090
BUTYL PROPIONATES	1914		291550
BUTYL TOLUENES	2667		290290
BUTYLTRICHLOROSILANE	1747		293100
5-tert-BUTYL-2,4,6-TRINITRO-m-XYLENE	2956		290420
BUTYL VINYL ETHER, STABILIZED	2352		290919

Name and description	UN No.	Note	NHM Code
1,4-BUTYNEDIOL	2716		290539
BUTYRALDEHYDE	1129		291219
BUTYRALDOXIME	2840		292800
BUTYRIC ACID	2820		291560
BUTYRIC ANHYDRIDE	2739		291590
BUTYRONITRILE	2411		292690
BUTYRYL CHLORIDE	2353		291590
CACODYLIC ACID	1572		293100
CADMUM COMPOUND	2570	+++++	
CAESIUM	1407		280519
CAESIUM HYDROXIDE	2682		282590
CAESIUM HYDROXIDE SOLUTION	2681		282590
CAESIUM NITRATE	1451		283429
Cajeputene: see	2052		290219
CALCIUM	1401		280512
CALCIUM ALLOYS, PYROPHORIC	1855		280512
CALCIUM ARSENATE	1573		284290
CALCIUM ARSENATE AND CALCIUM ARSENITE MIXTURE, SOLID	1574		284290
CALCIUM CARBIDE	1402		284910
CALCIUM CHLORATE	1452		282919
CALCIUM CHLORATE, AQUEOUS SOLUTION	2429		282919
CALCIUM CHLORITE	1453		282890
CALCIUM CYANAMIDE with more than 0.1% calcium carbide	1403		310290
CALCIUM CYANIDE	1575		283719
CALCIUM DITHIONITE	1923		283190
CALCIUM HYDRIDE	1404		285000
CALCIUM HYDROSULPHITE	1923		283190
CALCIUM HYPOCHLORITE, DRY	1748		282810
CALCIUM HYPOCHLORITE, DRY, CORROSIVE	3485		282810
CALCIUM HYPOCHLORITE, HYDRATED, CORROSIVE with not less than 5.5% but not more than 16% water	3487		282810
CALCIUM HYPOCHLORITE, HYDRATED MIXTURE, CORROSIVE with not less than 5.5% but not more than 16% water	3487		282810
CALCIUM HYPOCHLORITE, HYDRATED MIXTURE, with not less than 5.5% but not more than 16% water	2880		282810
CALCIUM HYPOCHLORITE, HYDRATED, with not less than 5.5% but not more than 16% water	2880		282810
CALCIUM HYPOCHLORITE MIXTURE, DRY, CORROSIVE with more than 10% but not more than 39% available chlorine	3486		282810
CALCIUM HYPOCHLORITE MIXTURE, DRY, CORROSIVE with more than 39% available chlorine (8.8% available oxygen)	3485		282810
CALCIUM HYPOCHLORITE MIXTURE, DRY with more than 10% but not more than 39% available chlorine	2208		282810
CALCIUM HYPOCHLORITE MIXTURE, DRY with more than 39% available chlorine (8.8% available oxygen)	1748		282810
CALCIUM MANGANESE SILICON	2844		285000
CALCIUM NITRATE	1454		283429
Calcium oxide	1910	Exempt	282590 252220
CALCIUM PERCHLORATE	1455		282990
CALCIUM PERMANGANATE	1456		284169
CALCIUM PEROXIDE	1457		282590
CALCIUM PHOSPHIDE	1360		284800
CALCIUM, PYROPHORIC	1855		280512
CALCIUM RESINATE	1313		380620
CALCIUM RESINATE, FUSED	1314		380620
CALCIUM SILICIDE	1405		285000
Calomel: see	2025		285200
CAMPHOR OIL	1130		151590
CAMPHOR, synthetic	2717		291249
CAPACITOR, ASYMMETRIC (with an energy storage capacity greater than 0.3 Wh)	3508		8532++
CAPACITOR, ELECTRIC DOUBLE LAYER (with an energy storage capacity greater than 0.3 Wh)	3499		8532++
CAPROIC ACID	2829		291590
CARBAMATE PESTICIDE, LIQUID, FLAMMABLE, TOXIC, flash-point less than 23 °C	2758		3808++
CARBAMATE PESTICIDE, LIQUID, TOXIC	2992		3808++
CARBAMATE PESTICIDE, LIQUID, TOXIC, FLAMMABLE, flash-point not less than 23 °C	2991		3808++
CARBAMATE PESTICIDE, SOLID, TOXIC	2757		3808++
CARBON, ACTIVATED	1362		380210
CARBON, animal or vegetable origin	1361		280300
Carbon bisulphide: see	1131		281310
CARBON DIOXIDE	1013		281121
CARBON DIOXIDE, REFRIGERATED LIQUID	2187		281121
Carbon dioxide, solid	1845	Exempt	281121
CARBON DISULPHIDE	1131		281310
CARBON MONOXIDE, COMPRESSED	1016		281129

Name and description	UN No.	Note	NHM Code
Carbon paper: see	1379		481160
CARBON TETRABROMIDE	2516		290339
CARBON TETRACHLORIDE	1846		290314
CARBONYL FLUORIDE	2417		281290
CARBONYL SULPHIDE	2204		285300
CARTRIDGES, FLASH	0049		360490
CARTRIDGES, FLASH	0050		360490
CARTRIDGES FOR TOOLS, BLANK	0014		930621 930630
CARTRIDGES FOR WEAPONS with bursting charge	0005		930630 930621
CARTRIDGES FOR WEAPONS with bursting charge	0006		930630 930621
CARTRIDGES FOR WEAPONS with bursting charge	0007		930630 930621
CARTRIDGES FOR WEAPONS with bursting charge	0321		930630 930621
CARTRIDGES FOR WEAPONS with bursting charge	0348		930630 930621
CARTRIDGES FOR WEAPONS with bursting charge	0412		930630 930621
CARTRIDGES FOR WEAPONS, BLANK	0014		930630 930621
CARTRIDGES FOR WEAPONS, BLANK	0326		930630 930621
CARTRIDGES FOR WEAPONS, BLANK	0327		930630 930621
CARTRIDGES FOR WEAPONS, BLANK	0338		930630 930621
CARTRIDGES FOR WEAPONS, BLANK	0413		930630 930621
CARTRIDGES FOR WEAPONS, INERT PROJECTILE	0012		930630 930621
CARTRIDGES FOR WEAPONS, INERT PROJECTILE	0328		930630 930621
CARTRIDGES FOR WEAPONS, INERT PROJECTILE	0339		930630 930621
CARTRIDGES FOR WEAPONS, INERT PROJECTILE	0417		930630 930621
CARTRIDGES, OIL WELL	0277		930630
CARTRIDGES, OIL WELL	0278		930630
CARTRIDGES, POWER DEVICE	0275		930630
CARTRIDGES, POWER DEVICE	0276		930630
CARTRIDGES, POWER DEVICE	0323		930630
CARTRIDGES, POWER DEVICE	0381		930630
CARTRIDGES, SIGNAL	0054		360490
CARTRIDGES, SIGNAL	0312		360490
CARTRIDGES, SIGNAL	0405		360490
CARTRIDGES, SMALL ARMS	0012		930621 930630
CARTRIDGES, SMALL ARMS	0339		930621 930630
CARTRIDGES, SMALL ARMS	0417		930621 930630
CARTRIDGES, SMALL ARMS, BLANK	0014		930621 930630
CARTRIDGES, SMALL ARMS, BLANK	0327		930621 930630
CARTRIDGES, SMALL ARMS, BLANK	0338		930621 930630
CASES, CARTRIDGE, EMPTY, WITH PRIMER	0055		930690
CASES, CARTRIDGE, EMPTY, WITH PRIMER	0379		930690
CASES, COMBUSTIBLE, EMPTY, WITHOUT PRIMER	0446		930690
CASES, COMBUSTIBLE, EMPTY, WITHOUT PRIMER	0447		930690
CASTOR BEANS	2969		120799
CASTOR FLAKE	2969		120799
CASTOR MEAL	2969		120890
CASTOR POMACE	2969		230690
CAUSTIC ALKALI LIQUID, N.O.S.	1719		282590
Caustic potash: see	1814		281520
Caustic soda liquor: see	1824		281512
Caustic soda: see	1824		281512
CELLS, CONTAINING SODIUM	3292		8506++
CELLULOID in block, rods, rolls, sheets, tubes, etc., except scrap	2000		391220
CELLULOID, SCRAP	2002		391590

Name and description	UN No.	Note	NHM Code
CERIUM, slabs, ingots or rods	1333		280530
CERIUM, turnings or gritty powder	3078		280530
CHARGES, BURSTING, PLASTICS BONDED	0457		930690
CHARGES, BURSTING, PLASTICS BONDED	0458		930690
CHARGES, BURSTING, PLASTICS BONDED	0459		930690
CHARGES, BURSTING, PLASTICS BONDED	0460		930690
CHARGES, DEMOLITION	0048		930690
CHARGES, DEPTH	0056		930690
CHARGES, EXPLOSIVE, COMMERCIAL without detonator	0442		930690
CHARGES, EXPLOSIVE, COMMERCIAL without detonator	0443		930690
CHARGES, EXPLOSIVE, COMMERCIAL without detonator	0444		930690
CHARGES, EXPLOSIVE, COMMERCIAL without detonator	0445		930690
CHARGES, PROPELLING	0271		930690
CHARGES, PROPELLING	0272		930690
CHARGES, PROPELLING	0415		930690
CHARGES, PROPELLING	0491		930690
CHARGES, PROPELLING, FOR CANNON	0242		930690
CHARGES, PROPELLING, FOR CANNON	0279		930690
CHARGES, PROPELLING, FOR CANNON	0414		930690
CHARGES, SHAPED, FLEXIBLE, LINEAR	0237		360300
CHARGES, SHAPED, FLEXIBLE, LINEAR	0288		360300
CHARGES, SHAPED, without detonator	0059		930690
CHARGES, SHAPED, without detonator	0439		930690
CHARGES, SHAPED, without detonator	0440		930690
CHARGES, SHAPED, without detonator	0441		930690
CHARGES, SUPPLEMENTARY, EXPLOSIVE	0060		930690
CHEMICAL KIT	3316		382200
CHEMICAL SAMPLE, TOXIC	3315	++++++	
CHEMICAL UNDER PRESSURE, N.O.S.	3500		380000
CHEMICAL UNDER PRESSURE, CORROSIVE, N.O.S.	3503		380000
CHEMICAL UNDER PRESSURE, FLAMMABLE, N.O.S.	3501		380000
CHEMICAL UNDER PRESSURE, FLAMMABLE, CORROSIVE, N.O.S.	3505		380000
CHEMICAL UNDER PRESSURE, FLAMMABLE, TOXIC, N.O.S.	3504		380000
CHEMICAL UNDER PRESSURE, TOXIC, N.O.S.	3502		380000
CHLORAL, ANHYDROUS, STABILIZED	2075		291300
CHLORATE AND BORATE MIXTURE	1458		28291+ 2840++
CHLORATE AND MAGNESIUM CHLORIDE MIXTURE, SOLID	1459		28291+ 282731
CHLORATE AND MAGNESIUM CHLORIDE MIXTURE SOLUTION	3407		28291+ 282731
CHLORATES, INORGANIC, AQUEOUS SOLUTION, N.O.S.	3210		282919
CHLORATES, INORGANIC, N.O.S.	1461		282919
CHLORIC ACID, AQUEOUS SOLUTION with not more than 10% chloric acid	2626		281119
CHLORINE	1017		280110
CHLORINE, ADSORBED	3520		280110
CHLORINE PENTAFLUORIDE	2548		281290
CHLORINE TRIFLUORIDE	1749		281210
CHLORITES, INORGANIC, N.O.S.	1462		282890
CHLORITE SOLUTION	1908		282890
Chloroacetaldehyde: see	2232		291300
CHLOROACETIC ACID, MOLTEN	3250		291540
CHLOROACETIC ACID, SOLID	1751		291540
CHLOROACETIC ACID SOLUTION	1750		291540
CHLOROACETONE, STABILIZED	1695		291470
CHLOROACETONITRILE	2668		292690
CHLOROACETOPHENONE, LIQUID	3416		291470
CHLOROACETOPHENONE, SOLID	1697		291470
CHLOROACETYL CHLORIDE	1752		291590
CHLOROANILINES, LIQUID	2019		292142
CHLOROANILINES, SOLID	2018		292142
CHLOROANISIDINES	2233		292229
CHLOROBENZENE	1134		290399
CHLOROBENZOTRIFLUORIDES	2234		290399
CHLOROBENZYL CHLORIDES, LIQUID	2235		290399
CHLOROBENZYL CHLORIDES, SOLID	3427		290399
CHLOROBUTANES	1127		290319
CHLOROCRESOLS, SOLID	3437		290819
CHLOROCRESOLS SOLUTION	2669		290819
CHLORODIFLUOROBROMOMETHANE	1974		290376
1-CHLORO-1,1-DIFLUOROETHANE	2517		290379
CHLORODIFLUOROMETHANE	1018		290379
CHLORODIFLUOROMETHANE AND CHLOROPENTAFLUOROETHANE MIXTURE with fixed boiling point, with approximately 49% chlorodifluoromethane	1973		382479
CHLORODINITROBENZENES, LIQUID	1577		290490

Name and description	UN No.	Note	NHM Code
CHLORODINITROBENZENES, SOLID	3441		290490
2-CHLOROETHANAL	2232		291300
2-Chloroethanol: see	1135		290559
CHLOROFORM	1888		290313
CHLOROFORMATES, TOXIC, CORROSIVE, FLAMMABLE, N.O.S.	2742		291590
CHLOROFORMATES, TOXIC, CORROSIVE, N.O.S.	3277		291590
CHLOROMETHYL CHLOROFORMATE	2745		291590
CHLOROMETHYL ETHYL ETHER	2354		290919
3-CHLORO-4-METHYLPHENYL ISOCYANATE, LIQUID	2236		292910
3-CHLORO-4-METHYLPHENYL ISOCYANATE, SOLID	3428		292910
CHLORONITROANILINES	2237		292142
CHLORONITROBENZENES, LIQUID	3409		290490
CHLORONITROBENZENES, SOLID	1578		290490
CHLORONITROTOLUENES, LIQUID	2433		290490
CHLORONITROTOLUENES, SOLID	3457		290490
CHLOROPENTAFLUOROETHANE	1020		290377
CHLOROPHENOLATES, LIQUID	2904		290819
CHLOROPHENOLATES, SOLID	2905		290819
CHLOROPHENOLS, LIQUID	2021		290819
CHLOROPHENOLS, SOLID	2020		290819
CHLOROPHENYLTRICHLOROSILANE	1753		293100
CHLOROPICRIN	1580		290490
CHLOROPICRIN AND METHYL BROMIDE MIXTURE with more than 2% chloropicrin	1581		290490
CHLOROPICRIN AND METHYL CHLORIDE MIXTURE	1582		290490
CHLOROPICRIN MIXTURE, N.O.S.	1583		290490
CHLOROPLATINIC ACID, SOLID	2507		281119
CHLOROPRENE, STABILIZED	1991		290329
1-CHLOROPROPANE	1278		290319
2-CHLOROPROPANE	2356		290319
3-CHLOROPROPANOL-1	2849		290559
2-CHLOROPROPENE	2456		290329
2-CHLOROPROPIONIC ACID	2511		291590
2-CHLOROPYRIDINE	2822		293339
CHLOROSILANES, CORROSIVE, FLAMMABLE, N.O.S.	2986		293100
CHLOROSILANES, CORROSIVE, N.O.S.	2987		293100
CHLOROSILANES, FLAMMABLE, CORROSIVE, N.O.S.	2985		293100
CHLOROSILANES, TOXIC, CORROSIVE, FLAMMABLE, N.O.S.	3362		293100
CHLOROSILANES, TOXIC, CORROSIVE, N.O.S.	3361		293100
CHLOROSILANES, WATER-REACTIVE, FLAMMABLE, CORROSIVE, N.O.S.	2988		293100
CHLOROSULPHONIC ACID (with or without sulphur trioxide)	1754		280620
1-CHLORO-1,2,2,2-TETRAFLUOROETHANE	1021		290379
CHLOROTOLUENES	2238		290399
4-CHLORO- <i>o</i> -TOLUIDINE HYDROCHLORIDE, SOLID	1579		292143
4-CHLORO- <i>o</i> -TOLUIDINE HYDROCHLORIDE SOLUTION	3410		292143
CHLOROTOLUIDINES, LIQUID	3429		292143
CHLOROTOLUIDINES, SOLID	2239		292143
1-CHLORO-2,2,2-TRIFLUOROETHANE	1983		290379
CHLOROTRIFLUOROMETHANE	1022		290377
CHLOROTRIFLUOROMETHANE AND TRIFLUOROMETHANE AZEOTROPIC MIXTURE with approximately 60% chlorotrifluoromethane	2599		382471
CHROMIC ACID SOLUTION	1755		281910
CHROMIC FLUORIDE, SOLID	1756		282619
CHROMIC FLUORIDE SOLUTION	1757		282619
Chromium (VI) dichloride dioxide: see	1758		282749
Chromium (III) fluoride, solid: see	1756		282619
CHROMIUM NITRATE	2720		283429
CHROMIUM OXYCHLORIDE	1758		282749
CHROMIUM TRIOXIDE, ANHYDROUS	1463		281910
CHROMOSULPHURIC ACID	2240		280700
Chrysotile: see	2590		252490
Cinene: see	2052		290219
Cinnamene: see	2055		290250
Cinnamol: see	2055		290250
CLINICAL WASTE, UNSPECIFIED, N.O.S.	3291		382530
COAL GAS, COMPRESSED	1023		270500
COAL TAR DISTILLATES, FLAMMABLE	1136		270799
COATING SOLUTION (includes surface treatments or coatings used for industrial or other purposes such as vehicle under coating, drum or barrel lining)	1139		3208++
COBALT NAPHTHENATES, POWDER	2001		291829
COBALT RESINATE, PRECIPITATED	1318		380620
COMPONENTS, EXPLOSIVE TRAIN, N.O.S.	0382		360300
COMPONENTS, EXPLOSIVE TRAIN, N.O.S.	0383		360300
COMPONENTS, EXPLOSIVE TRAIN, N.O.S.	0384		360300
COMPONENTS, EXPLOSIVE TRAIN, N.O.S.	0461		360300
COMPRESSED GAS, FLAMMABLE, N.O.S.	1954		++++++

Name and description	UN No.	Note	NHM Code
COMPRESSED GAS, N.O.S.	1956		++++++
COMPRESSED GAS, OXIDIZING, N.O.S.	3156		++++++
COMPRESSED GAS, TOXIC, CORROSIVE, N.O.S.	3304		++++++
COMPRESSED GAS, TOXIC, FLAMMABLE, CORROSIVE, N.O.S.	3305		++++++
COMPRESSED GAS, TOXIC, FLAMMABLE, N.O.S.	1953		++++++
COMPRESSED GAS, TOXIC, N.O.S.	1955		++++++
COMPRESSED GAS, TOXIC, OXIDIZING, CORROSIVE, N.O.S.	3306		++++++
COMPRESSED GAS, TOXIC, OXIDIZING, N.O.S.	3303		++++++
CONTRIVANCES, WATER-ACTIVATED with burster, expelling charge or propelling charge	0248		930690
CONTRIVANCES, WATER-ACTIVATED with burster, expelling charge or propelling charge	0249		930690
COPPER ACETOARSENITE	1585		294200
COPPER ARSENITE	1586		284290
COPPER BASED PESTICIDE, LIQUID, FLAMMABLE, TOXIC, flash-point less than 23 °C	2776		380892
COPPER BASED PESTICIDE, LIQUID, TOXIC	3010		380892
COPPER BASED PESTICIDE, LIQUID, TOXIC, FLAMMABLE, flash-point not less than 23 °C	3009		380892
COPPER BASED PESTICIDE, SOLID, TOXIC	2775		380892
COPPER CHLORATE	2721		282919
COPPER CHLORIDE	2802		282739
COPPER CYANIDE	1587		283719
COPRA	1363		120300
CORD, DETONATING, flexible	0065		360300
CORD, DETONATING, flexible	0289		360300
CORD, DETONATING, metal clad	0102		360300
CORD (FUSE), DETONATING, metal clad	0290		360300
CORD, DETONATING, MILD EFFECT, metal clad	0104		360300
CORD, IGNITER	0066		360300
CORROSIVE LIQUID, ACIDIC, INORGANIC, N.O.S.	3264		28++++
CORROSIVE LIQUID, ACIDIC, ORGANIC, N.O.S.	3265		29++++
CORROSIVE LIQUID, BASIC, INORGANIC, N.O.S.	3266		28++++
CORROSIVE LIQUID, BASIC, ORGANIC, N.O.S.	3267		29++++
CORROSIVE LIQUID, FLAMMABLE, N.O.S.	2920		++++++
CORROSIVE LIQUID, N.O.S.	1760		++++++
CORROSIVE LIQUID, OXIDIZING, N.O.S.	3093		++++++
CORROSIVE LIQUID, SELF-HEATING, N.O.S.	3301		++++++
CORROSIVE LIQUID, TOXIC, N.O.S.	2922		++++++
CORROSIVE LIQUID, WATER-REACTIVE, N.O.S.	3094		++++++
CORROSIVE SOLID, ACIDIC, INORGANIC, N.O.S.	3260		28++++
CORROSIVE SOLID, ACIDIC, ORGANIC, N.O.S.	3261		29++++
CORROSIVE SOLID, BASIC, INORGANIC, N.O.S.	3262		28++++
CORROSIVE SOLID, BASIC, ORGANIC, N.O.S.	3263		29++++
CORROSIVE SOLID, FLAMMABLE, N.O.S.	2921		++++++
CORROSIVE SOLID, N.O.S.	1759		++++++
CORROSIVE SOLID, OXIDIZING, N.O.S.	3084		++++++
CORROSIVE SOLID, SELF-HEATING, N.O.S.	3095		++++++
CORROSIVE SOLID, TOXIC, N.O.S.	2923		++++++
CORROSIVE SOLID, WATER-REACTIVE, N.O.S.	3096		++++++
COTTON WASTE, OILY	1364		5202++
COTTON, WET	1365		520100 520300
COUMARIN DERIVATIVE PESTICIDE, LIQUID, FLAMMABLE, TOXIC, flash-point less than 23 °C	3024		380899
COUMARIN DERIVATIVE PESTICIDE, LIQUID, TOXIC	3026		380899
COUMARIN DERIVATIVE PESTICIDE, LIQUID, TOXIC, FLAMMABLE, flash-point not less than 23 °C	3025		380899
COUMARIN DERIVATIVE PESTICIDE, SOLID, TOXIC	3027		380899
CRESOLS, LIQUID	2076		290712
CRESOLS, SOLID	3455		290712
CRESYLIC ACID	2022		290712
Crocidolite, see:	2212		252410
CROTONALDEHYDE	1143		291219
CROTONALDEHYDE, STABILIZED	1143		291219
CROTONIC ACID, LIQUID	3472		291619
CROTONIC ACID, SOLID	2823		291619
CROTONYLENE	1144		290129
CUPRIETHYLENEDIAMINE SOLUTION	1761		292121
Cutback bitumens at or above 100 °C and below its flash-point: see	3257		271500
Cutback bitumens with a flash-point above 60 °C, at or above its flash-point: see	3256		271500
Cutback bitumens with a flash-point not greater than 60 °C: see	1999		271500
CUTTERS, CABLE, EXPLOSIVE	0070		930690
CYANIDE SOLUTION, N.O.S.	1935		283719
CYANIDES, INORGANIC, SOLID, N.O.S.	1588		283719
CYANOGEN	1026		292690
CYANOGEN BROMIDE	1889		285300
CYANOGEN CHLORIDE, STABILIZED	1589		285300
CYANURIC CHLORIDE	2670		293369
CYCLOBUTANE	2601		290219
CYCLOBUTYL CHLOROFORMATE	2744		291590

Name and description	UN No.	Note	NHM Code
1,5,9-CYCLODODECATRIENE	2518		290219
CYCLOHEPTANE	2241		290219
CYCLOHEPTATRIENE	2603		290219
CYCLOHEPTENE	2242		290219
CYCLOHEXANE	1145		290211
CYCLOHEXANONE	1915		291422
CYCLOHEXENE	2256		290219
CYCLOHEXYLTRICHLOROSILANE	1762		293100
CYCLOHEXYL ACETATE	2243		291539
CYCLOHEXYLAMINE	2357		292130
CYCLOHEXYL ISOCYANATE	2488		292910
CYCLOHEXYL MERCAPTAN	3054		293090
CYCLOHEXYLTRICHLOROSILANE	1763		293100
CYCLONITE AND CYCLOTETRAMETHYLENETETRANITRAMINE MIXTURE, DESENSITIZED with not less than 10% phlegmaliser by mass	0391		293369
CYCLONITE AND CYCLOTETRAMETHYLENETETRANITRAMINE MIXTURE, WETTED with not less than 15% water, by mass	0391		293369
CYCLONITE AND HMX MIXTURE, DESENSITIZED with not less than 10% phlegmatiser by mass	0391		293369
CYCLONITE AND HMX MIXTURE, WETTED with not less than 15% water, by mass	0391		293369
CYCLONITE AND OCTOGEN MIXTURE, DESENSITIZED with not less than 10% phlegmatiser by mass	0391		293369
CYCLONITE AND OCTOGEN MIXTURE, WETTED with not less than 15% water, by mass	0391		293369
CYCLONITE, DESENSITIZED	0483		293369
CYCLONITE, WETTED with not less than 15% water, by mass	0072		293369
CYCLOOCTADIENE PHOSPHINES	2940		293100
CYCLOOCTADIENES	2520		290219
CYCLOOCTATETRAENE	2358		290219
CYCLOPENTANE	1146		290219
CYCLOPENTANOL	2244		290619
CYCLOPENTANONE	2245		291429
CYCLOPENTENE	2246		290219
CYCLOPROPANE	1027		290219
CYCLOTETRAMETHYLENETETRANITRAMINE, DESENSITIZED	0484		293369
CYCLOTETRAMETHYLENETETRANITRAMINE, WETTED with not less than 15% water, by mass	0226		293369
CYCLOTRIMETHYLENETRINITRAMINE AND CYCLOTETRAMETHYLENETETRANITRAMINE MIXTURE, DESENSITIZED with not less than 10% phlegmatiser by mass	0391		293369
CYCLOTRIMETHYLENETRINITRAMINE AND CYCLOTETRAMETHYLENETETRANITRAMINE MIXTURE, WETTED with not less than 15% water, by mass	0391		293369
CYCLOTRIMETHYLENETRINITRAMINE AND HMX MIXTURE, DESENSITIZED with not less than 10% phlegmatiser by mass	0391		293369
CYCLOTRIMETHYLENETRINITRAMINE AND HMX MIXTURE, WETTED with not less than 15% water, by mass	0391		293369
CYCLOTRIMETHYLENETRINITRAMINE AND OCTOGEN MIXTURE, DESENSITIZED with not less than 10% phlegmatiser by mass	0391		293369
CYCLOTRIMETHYLENETRINITRAMINE AND OCTOGEN MIXTURE, WETTED with not less than 15% water, by mass	0391		293369
CYCLOTRIMETHYLENETRINITRAMINE, DESENSITIZED	0483		293369
CYCLOTRIMETHYLENETRINITRAMINE, WETTED with not less than 15% water, by mass	0072		293369
CYMINES	2046		290270
Cymol: see	2046		290270
Dangerous goods in apparatus	3363	Exempt	8++++
Dangerous goods in machinery	3363	Exempt	8++++
DECABORANE	1868		285000
DECAHYDRONAPHTHALENE	1147		290219
Decalin: see	1147		290219
n-DECANE	2247		290110
DEFLAGRATING METAL SALTS OF AROMATIC NITRODERIVATIVES, N.O.S.	0132		290899
DESENSITIZED EXPLOSIVE, LIQUID, N.O.S.	3379		360200
DESENSITIZED EXPLOSIVE, SOLID, N.O.S.	3380		360200
DETONATOR ASSEMBLIES, NON-ELECTRIC for blasting	0360		360300
DETONATOR ASSEMBLIES, NON-ELECTRIC for blasting	0361		360300
DETONATOR ASSEMBLIES, NON-ELECTRIC for blasting	0500		360300
DETONATORS FOR AMMUNITION	0073		360300
DETONATORS FOR AMMUNITION	0364		360300
DETONATORS FOR AMMUNITION	0365		360300
DETONATORS FOR AMMUNITION	0366		360300
DETONATORS, ELECTRIC for blasting	0030		360300
DETONATORS, ELECTRIC for blasting	0255		360300
DETONATORS, ELECTRIC for blasting	0456		360300
DETONATORS, NON-ELECTRIC for blasting	0029		360300
DETONATORS, NON-ELECTRIC for blasting	0267		360300
DETONATORS, NON-ELECTRIC for blasting	0455		360300
DEUTERIUM, COMPRESSED	1957		284590
DEVICES, SMALL, HYDROCARBON GAS POWERED with release device	3150		++++++
DIACETONE ALCOHOL	1148		291440
DIALLYLAMINE	2359		292119

Name and description	UN No.	Note	NHM Code
DIALYL ETHER	2360		290919
4,4'-DIAMINODIPHENYL METHANE	2651		292159
Diaminopropylamine: see	2269		292129
Di-n-AMYLAMINE	2841		292119
DIAZODINITROPHENOL, WETTED with not less than 40% water, or mixture of alcohol and water, by mass	0074	Prohibited	
DIBENZYLDICHLOROSILANE	2434		293100
DIBORANE	1911		285000
1,2-DIBROMOBUTAN-3-ONE	2648		291470
DIBROMOCHLOROPROPANES	2872		290379
DIBROMODIFLUOROMETHANE	1941		290378
DIBROMOMETHANE	2664		290339
DI-n-BUTYLAMINE	2248		292119
DIBUTYLAMINOETHANOL	2873		292219
DIBUTYL ETHERS	1149		290919
DICHLOROACETIC ACID	1764		291540
1,3-DICHLOROACETONE	2649		291470
DICHLOROACETYL CHLORIDE	1765		291590
DICHLOROANILINES, LIQUID	1590		292142
DICHLOROANILINES, SOLID	3442		292142
o-DICHLOROBENZENE	1591		290399
2,2-DICHLORODIETHYL ETHER	1916		290919
DICHLORODIFLUOROMETHANE	1028		290377
DICHLORODIFLUOROMETHANE AND 1,1-DIFLUOROETHANE AZEOTROPIC MIXTURE with approximately 74% dichlorodifluoromethane	2602		382479
DICHLORODIMETHYL ETHER, SYMMETRICAL	2249	Prohibited	
1,1-DICHLOROETHANE	2362		290319
1,2-DICHLOROETHYLENE	1150		290329
DICHLOROFLUOROMETHANE	1029		290379
alpha-Dichlorhydrin: see	2750		290559
DICHLOROISOCYANURIC ACID SALTS	2465		293369
DICHLOROISOCYANURIC ACID, DRY	2465		293369
DICHLOROISOPROPYL ETHER	2490		290919
DICHLOROMETHANE	1593		290312
1,1-DICHLORO-1-NITROETHANE	2650		290490
DICHLOROPENTANES	1152		290319
DICHLOROPHENYL ISOCYANATES	2250		292910
DICHLOROPHENYLTRICHLOROSILANE	1766		293100
1,2-DICHLOROPROPANE	1279		290319
1,3-DICHLOROPROPANOL-2	2750		290559
DICHLOROPROPENES	2047		290329
DICHLOROSILANE	2189		281210
1,2-DICHLORO-1,1,2,2-TETRAFLUOROETHANE	1958		290377
DICYCLOHEXYLAMINE	2565		292130
DICYCLOHEXYLAMMONIUM NITRITE	2687		292130
DICYCLOPENTADIENE	2048		290219
1,2-DI-(DIMETHYLAMINO) ETHANE	2372		292129
DIDYMUM NITRATE	1465		283429
DIESEL FUEL	1202		274100
1,2-Diethoxyethane: see	1153		290919
DIETHOXYMETHANE	2373		291100
3,3-DIETHOXYPROPENE	2374		291100
DIETHYLAMINE	1154		292119
2-DIETHYLAMINOETHANOL	2686		292219
3-DIETHYLAMINOPROPYLAMINE	2684		292129
N,N-DIETHYLANILINE	2432		292142
DIETHYLBENZENE	2049		290290
DIETHYL CARBONATE	2366		292090
DIETHYLDICHLOROSILANE	1767		293100
Diethylenediamine: see	2579		293359
DIETHYLENEGLYCOL DINITRATE, DESENSITIZED with not less than 25% non-volatile, water-insoluble phlegmatizer, by mass	0075		292090
DIETHYLENETRIAMINE	2079		292129
DIETHYL ETHER	1155		290911
N,N-DIETHYLETHYLENEDIAMINE	2685		292129
DIETHYL KETONE	1156		291419
DIETHYL SULPHATE	1594		292090
DIETHYL SULPHIDE	2375		293090
DIETHYLTHIOPHOSPHORYL CHLORIDE	2751		292019
1,1-DIFLUOROETHANE	1030		290339
1,1-DIFLUOROETHYLENE	1959		290339
DIFLUOROMETHANE	3252		290339
Di fluoromethane, pentafluoroethane, and 1,1,1,2-tetrafluoroethane zeotropic mixture with approximately 10% di fluoromethane and 70% pentafluoroethane: see	3339		382474

Name and description	UN No.	Note	NHM Code
Difluoromethane, pentafluoroethane, and 1,1,1,2-tetrafluoroethane zeotropic mixture with approximately 20% difluoromethane and 40% pentafluoroethane: see	3338		382474
Difluoromethane, pentafluoroethane, and 1,1,1,2-tetrafluoroethane zeotropic mixture with approximately 23% difluoromethane and 25% pentafluoroethane: see	3340		382474
DIFLUOROPHOSPHORIC ACID, ANHYDROUS	1768		281119
2,3-DIHYDROPYRAN	2376		293299
DIISOBUTYLAMINE	2361		292119
DIISOBUTYLENE, ISOMERIC COMPOUNDS	2050		290129
DIISOBUTYL KETONE	1157		291419
DIISOCTYL ACID PHOSPHATE	1902		291990
DIISOPROPYLAMINE	1158		292119
DIISOPROPYL ETHER	1159		290919
DIKETENE, STABILIZED	2521		293220
1,1-DIMETHOXYETHANE	2377		291100
1,2-DIMETHOXYETHANE	2252		290919
DIMETHYLAMINE, ANHYDROUS	1032		292111
DIMETHYLAMINE AQUEOUS SOLUTION	1160		292111
2-DIMETHYLAMINOACETONITRILE	2378		292690
2-DIMETHYLAMINOETHANOL	2051		292219
2-DIMETHYLAMINOETHYL ACRYLATE	3302		292219
2-DIMETHYLAMINOETHYL METHACRYLATE	2522		292219
N,N-DIMETHYLANILINE	2253		292142
2,3-DIMETHYLBUTANE	2457		290110
1,3-DIMETHYLBUTYLAMINE	2379		292119
DIMETHYLCARBAMOYL CHLORIDE	2262		292419
DIMETHYL CARBONATE	1161		292090
DIMETHYL CYCLOHEXANES	2263		290219
N,N-DIMETHYL CYCLOHEXYLAMINE	2264		292130
DIMETHYLDICHLOROSILANE	1162		293100
DIMETHYLDIETHOXYSILANE	2380		293100
DIMETHYLDIOXANES	2707		293299
DIMETHYL DISULPHIDE	2381		293090
DIMETHYL ETHER	1033		290919
N,N-DIMETHYLFORMAMIDE	2265		292419
DIMETHYLHYDRAZINE, SYMMETRICAL	2382		292800
DIMETHYLHYDRAZINE, UNSYMMETRICAL	1163		292800
2,2-DIMETHYLPROPANE	2044		290110
DIMETHYL-N-PROPYLAMINE	2266		292119
DIMETHYL SULPHATE	1595		292090
DIMETHYL SULPHIDE	1164		293090
DIMETHYL THIOPHOSPHORYL CHLORIDE	2267		292019
DINGU	0489		293399
DINITROANILINES	1596		292142
DINITROBENZENES, LIQUID	1597		290420
DINITROBENZENES, SOLID	3443		290420
DINITRO- $\alpha$ -CRESOL	1598		290899
DINITROGEN TETROXIDE	1067		281129
DINITROGLYCOLURIL	0489		293399
DINITROPHENOL, dry or wetted with less than 15% water, by mass	0076		290899
DINITROPHENOL SOLUTION	1599		290899
DINITROPHENOL, WETTED with not less than 15% water, by mass	1320		290899
DINITROPHENOLATES, alkali metals, dry or wetted with less than 15% water, by mass	0077		290899
DINITROPHENOLATES, WETTED with not less than 15% water, by mass	1321		290899
DINITRORESORCINOL, dry or wetted with less than 15% water, by mass	0078		290899
DINITRORESORCINOL, WETTED with not less than 15% water, by mass	1322		290899
DINITROSOBENZENE	0406		290420
DINITROTOLUENES, LIQUID	2038		290420
DINITROTOLUENES, MOLTEN	1600		290420
DINITROTOLUENES, SOLID	3454		290420
DIOXANE	1165		293299
DIOXOLANE	1166		293299
DIPENTENE	2052		290219
DIPHENYLAMINE CHLOROARSINE	1698		293499
DIPHENYLCHLOROARSINE, LIQUID	1699		293100
DIPHENYLCHLOROARSINE, SOLID	3450		293100
DIPHENYLDICHLOROSILANE	1769		293100
DIPHENYLMETHYL BROMIDE	1770		290399
DIPICRYLAMINE	0079		292144
DIPICRYL SULPHIDE, dry or wetted with less than 10% water, by mass	0401		290899
DIPICRYL SULPHIDE, WETTED with not less than 10% water, by mass	2852		290899
DIPROPYLAMINE	2383		292119
Dipropylene triamine: see	2269		292129
Di-n-PROPYL ETHER	2384		290919
DIPROPYL KETONE	2710		291419
DISINFECTANT, LIQUID, CORROSIVE, N.O.S.	1903		380894

Name and description	UN No.	Note	NHM Code
DISINFECTANT, LIQUID, TOXIC, N.O.S.	3142		380894
DISINFECTANT, SOLID, TOXIC, N.O.S.	1601		380894
DISODIUM TRIOXOSILICATE	3253		283911
DIVINYL ETHER, STABILIZED	1167		290919
DODECYLTRICHLOROSILANE	1771		293100
Drum or barrel lining: see	1139		3208++
Dry ice	1845	Exempt	281121
DYE INTERMEDIATE, LIQUID, CORROSIVE, N.O.S.	2801	++++++	
DYE INTERMEDIATE, LIQUID, TOXIC, N.O.S.	1602	++++++	
DYE INTERMEDIATE, SOLID, CORROSIVE, N.O.S.	3147	++++++	
DYE INTERMEDIATE, SOLID, TOXIC, N.O.S.	3143	++++++	
DYE, LIQUID, CORROSIVE, N.O.S.	2801	320+++	
DYE, LIQUID, TOXIC, N.O.S.	1602	320+++	
DYE, SOLID, CORROSIVE, N.O.S.	3147	320+++	
DYE, SOLID, TOXIC, N.O.S.	3143	320+++	
Electric storage batteries: see	2794		8507++
Electric storage batteries: see	2795		8507++
Electric storage batteries: see	2800		8507++
Electric storage batteries: see	3028		8507++
ELEVATED TEMPERATURE LIQUID, FLAMMABLE, N.O.S. with flash-point above 60 °C, at or above its flash-point	3256		++++++
ELEVATED TEMPERATURE LIQUID, N.O.S., at or above 100 °C and below its flash-point (including molten metals, molten salts, etc.)	3257		++++++
ELEVATED TEMPERATURE SOLID, N.O.S., at or above 240 °C	3258		++++++
EMPTY BATTERY-WAGON		4.3.2.4	992+++
EMPTY DEMOUNTABLE TANK		4.3.2.4	++++++
EMPTY IBC		4.1.1.11	++++++
EMPTY INTERMEDIATE BULK CONTAINER (IBC)		4.1.1.11	++++++
EMPTY LARGE CONTAINER		7.3	993+++
EMPTY LARGE PACKAGING		4.1.1.11	++++++
EMPTY MEGC		4.3.2.4	993+++
EMPTY PACKAGING		4.1.1.11	++++++
EMPTY PORTABLE TANK		4.2.1.5,	993+++
		4.2.2.6	
EMPTY RECEPTACLE		4.1.6	++++++
EMPTY SMALL CONTAINER		7.3	++++++
EMPTY TANK-CONTAINER		4.3.2.4	993+++
EMPTY TANK WAGON		4.3.2.4	992+++
EMPTY WAGON		7.3	992+++
Enamel: see	1263		3208++
Enamel: see	3066		3208++
Enamel: see	3469		3208++
Enamel: see	3470		3208++
ENGINE, FUEL CELL, FLAMMABLE GAS POWERED	3529		8407++
ENGINE, FUEL CELL, FLAMMABLE LIQUID POWERED	3528		8407++
ENGINE, INTERNAL COMBUSTION	3530		8407++
ENGINE, INTERNAL COMBUSTION, FLAMMABLE GAS POWERED	3529		8407++
ENGINE, INTERNAL COMBUSTION, FLAMMABLE LIQUID POWERED	3528		8407++
ENVIRONMENTALLY HAZARDOUS SUBSTANCE, LIQUID, N.O.S.	3082		++++++
ENVIRONMENTALLY HAZARDOUS SUBSTANCE, SOLID, N.O.S.	3077		++++++
EPIBROMOHYDRIN	2558		291090
EPICHLOROHYDRIN	2023		291030
1,2-EPOXY-3-ETHOXYPROPANE	2752		291090
ESTERS, N.O.S.	3272		29+++
ETHANE	1035		290110
ETHANE, REFRIGERATED LIQUID	1961		290110
ETHANOL	1170		220710 220720
ETHANOL AND GASOLINE MIXTURE, with more than 10% ethanol	3475		272200 272400
ETHANOL AND MOTOR SPIRIT MIXTURE, with more than 10% ethanol	3475		272200 272400
ETHANOL AND PETROL MIXTURE, with more than 10% ethanol	3475		272200 272400
ETHANOL SOLUTION	1170		220890
ETHANOLAMINE	2491		292211
ETHANOLAMINE SOLUTION	2491		292211
ETHERS, N.O.S.	3271		2909++
2-Ethoxyethanol: see	1171		290944
2-Ethoxyethyl acetate: see	1172		291539
ETHYL ACETATE	1173		291531
ETHYLACETYLENE, STABILIZED	2452		290129
ETHYL ACRYLATE, STABILIZED	1917		291612
ETHYL ALCOHOL	1170		220710 220720

Name and description	UN No.	Note	NHM Code
ETHYL ALCOHOL SOLUTION	1170		220890
ETHYLAMINE	1036		292119
ETHYLAMINE, AQUEOUS SOLUTION with not less than 50% but not more than 70% ethylamine	2270		292119
ETHYL AMYL KETONE	2271		291419
N-ETHYLANILINE	2272		292142
2-ETHYLANILINE	2273		292149
ETHYLBENZENE	1175		290260
N-ETHYL-N-BENZYLANILINE	2274		292149
N-ETHYLBENZYLTOUIDINES, LIQUID	2753		292149
N-ETHYLBENZYLTOUIDINES, SOLID	3460		292149
ETHYL BORATE	1176		292090
ETHYL BROMIDE	1891		290339
ETHYL BROMOACETATE	1603		291590
2-ETHYLBUTANOL	2275		290519
2-ETHYLBUTYL ACETATE	1177		291539
ETHYL BUTYL ETHER	1179		290919
2-ETHYLBUTYRALDEHYDE	1178		291219
ETHYL BUTYRATE	1180		291560
ETHYL CHLORIDE	1037		290311
ETHYL CHLOROACETATE	1181		291540
ETHYL CHLOROFORMATE	1182		291590
ETHYL 2-CHLOROPROPIONATE	2935		291590
ETHYL CHLOROTHIOFORMATE	2826		293090
ETHYL CROTONATE	1862		291619
ETHYLDICHLOROARSINE	1892		293100
ETHYLDICHLOROSILANE	1183		293100
ETHYLENE, ACETYLENE AND PROPYLENE MIXTURE, REFRIGERATED LIQUID containing at least 71.5% ethylene with not more than 22.5% acetylene and not more than 6% propylene	3138		271119
ETHYLENE	1962		271114 290121
ETHYLENE CHLOROHYDRIN	1135		290559
ETHYLENEDIAMINE	1604		292121
ETHYLENE DIBROMIDE	1605		290331
ETHYLENE DICHLORIDE	1184		290315
ETHYLENE GLYCOL DIETHYL ETHER	1153		290944
ETHYLENE GLYCOL MONOETHYL ETHER	1171		290944
ETHYLENE GLYCOL MONOETHYL ETHER ACETATE	1172		291539
ETHYLENE GLYCOL MONOMETHYL ETHER	1188		290944
ETHYLENE GLYCOL MONOMETHYL ETHER ACETATE	1189		291539
ETHYLENEIMINE, STABILIZED	1185		293399
ETHYLENE OXIDE	1040		291010
ETHYLENE OXIDE AND CARBON DIOXIDE MIXTURE with more than 87% ethylene oxide	3300		291010 281121
ETHYLENE OXIDE AND CARBON DIOXIDE MIXTURE with more than 9% but not more than 87% ethylene oxide	1041		291010 281121
ETHYLENE OXIDE AND CARBON DIOXIDE MIXTURE with not more than 9% ethylene oxide	1952		291010 281121
ETHYLENE OXIDE AND CHLOROTETRAFLUOROETHANE MIXTURE with not more than 8.8% ethylene oxide	3297		291010 290342
ETHYLENE OXIDE AND DICHLORODIFLUOROMETHANE MIXTURE with not more than 12.5% ethylene oxide	3070		291010 290342
ETHYLENE OXIDE AND PENTAFLUOROETHANE MIXTURE with not more than 7.9% ethylene oxide	3298		291010 290330
ETHYLENE OXIDE AND PROPYLENE OXIDE MIXTURE, not more than 30% ethylene oxide	2983		291010 291020
ETHYLENE OXIDE AND TETRAFLUOROETHANE MIXTURE with not more than 5.6% ethylene oxide	3299		291010 290330
ETHYLENE OXIDE WITH NITROGEN up to a total pressure of 1 MPa (10 bar) at 50 °C	1040		291010
ETHYLENE, REFRIGERATED LIQUID	1038		271114 290121
ETHYL ETHER	1155		290911
ETHYL FLUORIDE	2453		290339
ETHYL FORMATE	1190		291513
2-ETHYLHEXYLAMINE	2276		292119
2-ETHYLHEXYL CHLOROFORMATE	2748		291590
ETHYL ISOBUTYRATE	2385		291560
ETHYL ISOCYANATE	2481		292910
ETHYL LACTATE	1192		291811
ETHYL MERCAPTAN	2363		293090
ETHYL METHACRYLATE, STABILIZED	2277		291614
ETHYL METHYL ETHER	1039		290919
ETHYL METHYL KETONE	1193		291412
ETHYL NITRITE SOLUTION	1194		292090
ETHYL ORTHOFORMATE	2524		291590
ETHYL OXALATE	2525		291711

Name and description	UN No.	Note	NHM Code
ETHYLPHENYLDICHLOROSILANE	2435		293100
1-ETHYLPYPERIDINE	2386		293339
ETHYL PROPIONATE	1195		291550
ETHYL PROPYL ETHER	2615		290919
N-ETHYLTOLUIDINES	2754		292143
ETHYLTRICHLOROSILANE	1196		293100
EXPLOSIVE, BLASTING, TYPE A	0081		360100
EXPLOSIVE, BLASTING, TYPE B	0082		360200
EXPLOSIVE, BLASTING, TYPE B	0331		360200
EXPLOSIVE, BLASTING, TYPE C	0083		360200
EXPLOSIVE, BLASTING, TYPE D	0084		360200
EXPLOSIVE, BLASTING, TYPE E	0241		360200
EXPLOSIVE, BLASTING, TYPE E	0332		360200
EXTRACTS, AROMATIC, LIQUID	1169		3301++
EXTRACTS, FLAVOURING, LIQUID	1197		130219
FABRICS, ANIMAL, N.O.S. with oil	1373		5+++++
FABRICS IMPREGNATED WITH WEAKLY NITRATED NITROCELLULOSE, N.O.S.	1353		590390
FABRICS, SYNTHETIC, N.O.S. with oil	1373		5+++++
FABRICS, VEGETABLE, N.O.S. with oil	1373		5+++++
FERRIC ARSENATE	1606		284290
FERRIC ARSENITE	1607		284290
FERRIC CHLORIDE, ANHYDROUS	1773		282739
FERRIC CHLORIDE SOLUTION	2582		282739
FERRIC NITRATE	1466		283429
FERROCERIUM	1323		360690
FERROSILICON with 30% or more but less than 90% silicon	1408		72022+
FERROUS ARSENATE	1608		284290
FERROUS METAL BORINGS, SHAVINGS, TURNINGS or CUTTINGS in a form liable to self-heating	2793		720441
FERTILIZER AMMONIATING SOLUTION with free ammonia	1043		281420 310510
Fibres, animal burnt, wet or damp	1372	Exempt	5+++++
FIBRES, ANIMAL, N.O.S. with oil	1373		5+++++
FIBRES IMPREGNATED WITH WEAKLY NITRATED NITROCELLULOSE, N.O.S.	1353		5+++++
FIBRES, SYNTHETIC, N.O.S. with oil	1373		5+++++
Fibres, vegetable burnt, wet or damp	1372	Exempt	5+++++
Fibres, vegetable, dry	3360	Exempt	5+++++
FIBRES, VEGETABLE, N.O.S. with oil	1373		5+++++
FILMS, NITROCELLULOSE BASE, gelatin coated, except scrap	1324		3706++
FIRE EXTINGUISHER CHARGES, corrosive liquid	1774		381300
FIRE EXTINGUISHERS with compressed or liquefied gas	1044		842410
FIRELIGHTERS, SOLID with flammable liquid	2623		360690
FIREWORKS	0333	2.2.1.1.7	360410
FIREWORKS	0334	2.2.1.1.7	360410
FIREWORKS	0335	2.2.1.1.7	360410
FIREWORKS	0336	2.2.1.1.7	360410
FIREWORKS	0337		360410
FIRST AID KIT	3316		382200
Fish meal, stabilized	2216	Exempt	230120
FISH MEAL, UNSTABILIZED	1374		230120
Fish scrap, stabilized	2216	Exempt	230120
FISH SCRAP, UNSTABILIZED	1374		230120
FLAMMABLE LIQUID, CORROSIVE, N.O.S.	2924		++++++
FLAMMABLE LIQUID, N.O.S.	1993		++++++
FLAMMABLE LIQUID, TOXIC, CORROSIVE, N.O.S.	3286		++++++
FLAMMABLE LIQUID, TOXIC, N.O.S.	1992		++++++
FLAMMABLE SOLID, CORROSIVE, INORGANIC, N.O.S.	3180		28++++
FLAMMABLE SOLID, CORROSIVE, ORGANIC, N.O.S.	2925		29++++
FLAMMABLE SOLID, INORGANIC, N.O.S.	3178		28++++
FLAMMABLE SOLID, ORGANIC, MOLTEN, N.O.S.	3176		29++++
FLAMMABLE SOLID, ORGANIC, N.O.S.	1325		29++++
FLAMMABLE SOLID, OXIDIZING, N.O.S.	3097	Prohibited	
FLAMMABLE SOLID, TOXIC, INORGANIC, N.O.S.	3179		28++++
FLAMMABLE SOLID, TOXIC, ORGANIC, N.O.S.	2926		29++++
FLARES, AERIAL	0093		360490
FLARES, AERIAL	0403		360490
FLARES, AERIAL	0404		360490
FLARES, AERIAL	0420		360490
FLARES, AERIAL	0421		360490
FLARES, SURFACE	0092		360490
FLARES, SURFACE	0418		360490
FLARES, SURFACE	0419		360490
FLASH POWDER	0094		360490
FLASH POWDER	0305		360490
FLUORINE, COMPRESSED	1045		280130
FLUOROACETIC ACID	2642		291590

Name and description	UN No.	Note	NHM Code
FLUOROANILINES	2941		292142
FLUOROBENZENE	2387		290399
FLUOROBORIC ACID	1775		281119
FLUOROPHOSPHORIC ACID, ANHYDROUS	1776		281119
FLUOROSILICATES, N.O.S.	2856		282690
FLUOROSILICIC ACID	1778		281119
FLUOROSULPHONIC ACID	1777		281119
FLUOROTOLUENES	2388		290399
FORMALDEHYDE SOLUTION with not less than 25% formaldehyde	2209		291211
FORMALDEHYDE SOLUTION, FLAMMABLE	1198		291211
FORMIC ACID with more than 85% acid by mass	1779		291511
FORMIC ACID with not less than 5% but not more than 85% acid by mass	3412		291511
FRACTURING DEVICES, EXPLOSIVE without detonator, for oil wells	0099		930690
FUEL, AVIATION, TURBINE ENGINE	1863	+++++	
FUEL CELL CARTRIDGES CONTAINED IN EQUIPMENT, containing corrosive substances	3477		847+++
FUEL CELL CARTRIDGES CONTAINED IN EQUIPMENT, containing flammable liquids	3473		847+++
FUEL CELL CARTRIDGES CONTAINED IN EQUIPMENT, containing hydrogen in metal hydride	3479		847+++
FUEL CELL CARTRIDGES CONTAINED IN EQUIPMENT, containing liquefied flammable gas	3478		847+++
FUEL CELL CARTRIDGES CONTAINED IN EQUIPMENT, containing water-reactive substances	3476		847+++
FUEL CELL CARTRIDGES, containing corrosive substances	3477		8473++
FUEL CELL CARTRIDGES, containing flammable liquids	3473		8473++
FUEL CELL CARTRIDGES, containing hydrogen in metal hydride	3479		8473++
FUEL CELL CARTRIDGES, containing liquefied flammable gas	3478		8473++
FUEL CELL CARTRIDGES, containing water-reactive substances	3476		8473++
FUEL CELL CARTRIDGES PACKED WITH EQUIPMENT, containing corrosive substances	3477		847+++
FUEL CELL CARTRIDGES PACKED WITH EQUIPMENT, containing flammable liquids	3473		847+++
FUEL CELL CARTRIDGES PACKED WITH EQUIPMENT, containing hydrogen in metal hydride	3479		847+++
FUEL CELL CARTRIDGES PACKED WITH EQUIPMENT, containing liquefied flammable gas	3478		847+++
FUEL CELL CARTRIDGES PACKED WITH EQUIPMENT, containing water-reactive substances	3476		847+++
FUMARYL CHLORIDE	1780		291719
FUMIGATED CARGO TRANSPORT UNIT	3359	+++++	
FURALDEHYDES	1199		293212
FURAN	2389		293219
FURFURYL ALCOHOL	2874		293213
FURFURYLAMINE	2526		293219
FUSE, DETONATING, metal clad	0102		360300
FUSE, DETONATING, metal clad	0290		360300
FUSE, DETONATING, MILD EFFECT, metal clad	0104		360300
FUSE, IGNITER, tubular, metal clad	0103		360300
FUSE, NON-DETONATING	0101		360300
FUSEL OIL	1201		290519
FUSE, SAFETY	0105		360300
FUZES, DETONATING	0106		360300
FUZES, DETONATING	0107		360300
FUZES, DETONATING	0257		360300
FUZES, DETONATING	0367		360300
FUZES, DETONATING with protective features	0408		360300
FUZES, DETONATING with protective features	0409		360300
FUZES, DETONATING with protective features	0410		360300
FUZES, IGNITING	0316		360300
FUZES, IGNITING	0317		360300
FUZES, IGNITING	0368		360300
GALLIUM	2803		811292
GAS CARTRIDGES without a release device, non-refillable	2037	+++++	
GAS OIL	1202		274200
GASOLINE	1203		272+00
GAS, REFRIGERATED LIQUID, FLAMMABLE, N.O.S.	3312	+++++	
GAS, REFRIGERATED LIQUID, N.O.S.	3158	+++++	
GAS, REFRIGERATED LIQUID, OXIDIZING, N.O.S.	3311	+++++	
GAS SAMPLE, NON-PRESSURIZED, FLAMMABLE, N.O.S., not refrigerated liquid	3167	+++++	
GAS SAMPLE, NON-PRESSURIZED, TOXIC, FLAMMABLE, N.O.S., not refrigerated liquid	3168	+++++	
GAS SAMPLE, NON-PRESSURIZED, TOXIC, N.O.S., not refrigerated liquid	3169	+++++	
GENETICALLY MODIFIED MICROORGANISMS	3245		300290
GENETICALLY MODIFIED ORGANISMS	3245	+++++	
GERMANE	2192		285000
GERMANE, ADSORBED	3523		285000
Germanium hydride: see	2192		285000
Glycer-1,3-dichlorohydrin: see	2750		290559
GLYCEROL alpha-MONOCHLOROHYDRIN	2689		290559
GLYCIDALDEHYDE	2622		291249
GRENADES, hand or rifle, with bursting charge	0284		930690
GRENADES, hand or rifle, with bursting charge	0285		930690
GRENADES, hand or rifle, with bursting charge	0292		930690
GRENADES, hand or rifle, with bursting charge	0293		930690
GRENADES, PRACTICE, hand or rifle	0110		930690

Name and description	UN No.	Note	NHM Code
GRENADES, PRACTICE, hand or rifle	0318		930690
GRENADES, PRACTICE, hand or rifle	0372		930690
GRENADES, PRACTICE, hand or rifle	0452		930690
GUANIDINE NITRATE	1467		292529
GUANYLNITROSAMINOGUANYLIDENE HYDRAZINE, WETTED with not less than 30% water, by mass	0113	Prohibited	
GUANYLNITROSAMINOGUANYLTETRAZENE, WETTED with not less than 30% water, or mixture of alcohol and water, by mass	0114	Prohibited	
GUNPOWDER, COMPRESSED	0028		360200
GUNPOWDER, granular or as a meal	0027		360200
GUNPOWDER, IN PELLETS	0028		360200
HAFNIUM POWDER, DRY	2545		8112++
HAFNIUM POWDER, WETTED with not less than 25% water	1326		8112++
HALOGENATED MONOMETHYLDIPHENYLMETHANES, LIQUID	3151		290399
HALOGENATED MONOMETHYLDIPHENYLMETHANES, SOLID	3152		290399
Hay	1327	Exempt	121490
HEATING OIL, LIGHT	1202		274300
HELUM, COMPRESSED	1046		280429
HELUM, REFRIGERATED LIQUID	1963		280429
HEPTAFLUOROPROPANE	3296		290339
n-HEPTALDEHYDE	3056		291219
HEPTANES	1206		290110
n-HEPTENE	2278		290129
HEXACHLOROACETONE	2661		291470
HEXACHLOROBENZENE	2729		290399
HEXACHLOROBUTADIENE	2279		290329
HEXACHLOROCYCLOPENTADIENE	2646		290389
HEXACHLOROPHENE	2875		290819
HEXADECYLTRICHLOROSILANE	1781		293100
HEXADIENES	2458		290129
HEXAETHYL TETRAPHOSPHATE	1611		291990
HEXAETHYL TETRAPHOSPHATE AND COMPRESSED GAS MIXTURE	1612		291990
HEXAFLUOROACETONE	2420		291470
HEXAFLUOROACETONE HYDRATE, LIQUID	2552		291470
HEXAFLUOROACETONE HYDRATE, SOLID	3436		291470
HEXAFLUOROETHANE	2193		290339
HEXAFLUOROPHOSPHORIC ACID	1782		281119
HEXAFLUOROPROPYLENE	1858		290339
HEXALDEHYDE	1207		291219
HEXAMETHYLENEDIAMINE, SOLID	2280		292122
HEXAMETHYLENEDIAMINE SOLUTION	1783		292122
HEXAMETHYLENE DIISOCYANATE	2281		292910
HEXAMETHYLENEIMINE	2493		293399
HEXAMETHYLENETETRAMINE	1328		293399
HEXANES	1208		290110
HEXANITRODIPHENYLAMINE	0079		292144
HEXANITROSTILBENE	0392		290420
HEXANOLS	2282		290519
1-HEXENE	2370		290129
HEXOGEN AND CYCLOTETRAMETHYLENETETRANITRAMINE MIXTURE, DESENSITIZED with not less than 10% phlegmatiser by mass	0391		293369
HEXOGEN AND CYCLOTETRAMETHYLENETETRANITRAMINE MIXTURE, WETTED with not less than 15% water, by mass	0391		293369
HEXOGEN AND HMX MIXTURE, DESENSITIZED with not less than 10% phlegmatiser by mass	0391		293369
HEXOGEN AND HMX MIXTURE, WETTED with not less than 15% water, by mass	0391		293369
HEXOGEN AND OCTOGEN MIXTURE, DESENSITIZED with not less than 10% phlegmatiser by mass	0391		293369
HEXOGEN AND OCTOGEN MIXTURE, WETTED with not less than 15% water, by mass	0391		293369
HEXOGEN, DESENSITIZED	0483		293369
HEXOGEN, WETTED with not less than 15% water, by mass	0072		293369
HEXOLITE, dry or wetted with less than 15% water, by mass	0118		360200
HEXOTOL, dry or wetted with less than 15% water, by mass	0118		360200
HEXTONAL	0393		360200
HEXYL	0079		292144
HEXYLTRICHLOROSILANE	1784		293100
HMX, DESENSITIZED	0484		293369
HMX, WETTED with not less than 15% water, by mass	0226		293369
HYDRAZINE AQUEOUS SOLUTION, FLAMMABLE with more than 37% hydrazine, by mass	3484		282510
HYDRAZINE AQUEOUS SOLUTION, with more than 37% hydrazine by mass	2030		282510
HYDRAZINE, ANHYDROUS	2029		282510
HYDRAZINE, AQUEOUS SOLUTION with not more than 37% hydrazine, by mass	3293		282510
HYDRIODIC ACID	1787		281119
HYDROBROMIC ACID	1788		281119
HYDROCARBON GAS MIXTURE, COMPRESSED, N.O.S.	1964		271129
HYDROCARBON GAS MIXTURE, LIQUEFIED, N.O.S.	1965		271119 271113
HYDROCARBON GAS REFILLS FOR SMALL DEVICES with release device	3150		++++++

Name and description	UN No.	Note	NHM Code
HYDROCARBONS, LIQUID, N.O.S.	3295		290+++
HYDROCHLORIC ACID	1789		280610
HYDROCYANIC ACID, AQUEOUS SOLUTION with not more than 20% hydrogen cyanide	1613		281119
HYDROFLUORIC ACID	1790		281111
HYDROFLUORIC ACID AND SULPHURIC ACID MIXTURE	1786		281119
HYDROGEN AND METHANE MIXTURE, COMPRESSED	2034		271129
Hydrogen arsenide: see	2188		285000
HYDROGEN BROMIDE, ANHYDROUS	1048		281119
HYDROGEN CHLORIDE, ANHYDROUS	1050		280610
HYDROGEN CHLORIDE, REFRIGERATED LIQUID	2186	Prohibited	
HYDROGEN, COMPRESSED	1049		280410
HYDROGEN CYANIDE, AQUEOUS SOLUTION with not more than 20% hydrogen cyanide	1613		281119
HYDROGEN CYANIDE, SOLUTION IN ALCOHOL with not more than 45% hydrogen cyanide	3294		281119
HYDROGEN CYANIDE, STABILIZED containing less than 3% water	1051		281119
HYDROGEN CYANIDE, STABILIZED, containing less than 3% water and absorbed in a porous inert material	1614		281119
HYDROGEN DIFLUORIDES, SOLID, N.O.S.	1740		282619
HYDROGEN DIFLUORIDES, SOLUTION, N.O.S.	3471		282619
HYDROGEN FLUORIDE, ANHYDROUS	1052		281111
HYDROGEN IN A METAL HYDRIDE STORAGE SYSTEM	3468		285000
HYDROGEN IN A METAL HYDRIDE STORAGE SYSTEM CONTAINED IN EQUIPMENT	3468		285000
HYDROGEN IN A METAL HYDRIDE STORAGE SYSTEM PACKED WITH EQUIPMENT	3468		285000
HYDROGEN IODIDE, ANHYDROUS	2197		281119
HYDROGEN PEROXIDE AND PEROXYACETIC ACID MIXTURE with acid(s), water and not more than 5% peroxyacetic acid, STABILIZED	3149		284700
HYDROGEN PEROXIDE, AQUEOUS SOLUTION with not less than 20% but not more than 60% hydrogen peroxide (stabilized as necessary)	2014		284700
HYDROGEN PEROXIDE, AQUEOUS SOLUTION with not less than 8% but less than 20% hydrogen peroxide (stabilized as necessary)	2984		284700
HYDROGEN PEROXIDE, AQUEOUS SOLUTION, STABILIZED with more than 60% hydrogen peroxide and not more than 70% hydrogen peroxide	2015		284700
HYDROGEN PEROXIDE, AQUEOUS SOLUTION, STABILIZED with more than 70% hydrogen peroxide	2015		284700
HYDROGEN, REFRIGERATED LIQUID	1966		280410
HYDROGEN SELENIDE, ADSORBED	3526		281119
HYDROGEN SELENIDE, ANHYDROUS	2202		281119
Hydrogen silicide: see	2203		285000
HYDROGEN SULPHIDE	1053		281119
1-HYDROXYBENZOTRIAZOLE, ANHYDROUS, dry or wetted with less than 20% water, by mass	0508		293399
1-HYDROXYBENZOTRIAZOLE MONOHYDRATE	3474		293399
3-Hydroxybutan-2-one: see	2621		291440
HYDROXYLAMINE SULPHATE	2865		282510
1-Hydroxy-3-methyl-2-penten-4-yne: see	2705		290529
HYPOCHLORITES, INORGANIC, N.O.S.	3212		282890
HYPOCHLORITE SOLUTION	1791		282890
IGNITERS	0121		360300
IGNITERS	0314		360300
IGNITERS	0315		360300
IGNITERS	0325		360300
IGNITERS	0454		360300
3,3'-IMINODIPROPYLAMINE	2269		292129
INFECTIOUS SUBSTANCE, AFFECTING ANIMALS only	2900		300+++
INFECTIOUS SUBSTANCE, AFFECTING HUMANS	2814		300+++
INSECTICIDE GAS, FLAMMABLE, N.O.S.	3354		3808++
INSECTICIDE GAS, N.O.S.	1968		3808++
INSECTICIDE GAS, TOXIC, FLAMMABLE, N.O.S.	3355		3808++
INSECTICIDE GAS, TOXIC, N.O.S.	1967		3808++
IODINE	3495		280120
IODINE MONOCHLORIDE, LIQUID	3498		281210
IODINE MONOCHLORIDE, SOLID	1792		281210
IODINE PENTAFLUORIDE	2495		281290
2-IOODOBUTANE	2390		290339
IODOMETHYLPROPANES	2391		290339
IODOPROPANES	2392		290339
I.p.d.i.: see	2290		292910
iron (III) chloride, anhydrous: see	1773		282739
iron chloride, anhydrous: see	1773		282739
IRON OXIDE, SPENT obtained from coal gas purification	1376		282110
IRON PENTACARBONYL	1994		293100
Iron perchloride, anhydrous, see	1773		282739
Iron sesquichloride, anhydrous, see	1773		282739
IRON SPONGE, SPENT obtained from coal gas purification	1376		282110
ISOBUTANE	1969		271113
ISOBUTANOL	1212		290514
ISOBUTYL ACETATE	1213		291539
ISOBUTYL ACRYLATE, STABILIZED	2527		291612

Name and description	UN No.	Note	NHM Code
ISOBUTYL ALCOHOL	1212		290514
ISOBUTYL ALDEHYDE	2045		291219
ISOBUTYLAMINE	1214		292119
ISOBUTYLENE	1055		290123
ISOBUTYL FORMATE	2393		291513
ISOBUTYL ISOBUTYRATE	2528		291560
ISOBUTYL ISOCYANATE	2486		292910
ISOBUTYL METHACRYLATE, STABILIZED	2283		291614
ISOBUTYL PROPIONATE	2394		291550
ISOBUTYRALDEHYDE	2045		291219
ISOBUTYRIC ACID	2529		291560
ISOBUTYRONITRILE	2284		292690
ISOBUTYRYL CHLORIDE	2395		291590
ISOCYANATES, FLAMMABLE, TOXIC, N.O.S.	2478		292910
ISOCYANATE SOLUTION, FLAMMABLE, TOXIC, N.O.S.	2478		292910
ISOCYANATE SOLUTION, TOXIC, FLAMMABLE, N.O.S.	3080		292910
ISOCYANATE SOLUTION, TOXIC, N.O.S.	2206		292910
ISOCYANATES, TOXIC, FLAMMABLE, N.O.S.	3080		292910
ISOCYANATES, TOXIC, N.O.S.	2206		292910
ISOCYANATOBENZOTRIFLUORIDES	2285		292910
3-Isocyanatomethyl-3,5,5-trimethylcyclohexyl isocyanate: see	2290		292910
Isododecane: see	2286		290110
ISOHEPTENE	2287		290129
ISOHEXENE	2288		290129
ISOOCTENES	1216		290129
Isopentane: see	1265		290110
ISOPENTENES	2371		290129
ISOPHORONEDIAMINE	2289		292239
ISOPHORONE DIISOCYANATE	2290		292910
ISOPRENE, STABILIZED	1218		290124
ISOPROPANOL	1219		290512
ISOPROPENYL ACETATE	2403		291539
ISOPROPENYLBENZENE	2303		290290
ISOPROPYL ACETATE	1220		291539
ISOPROPYL ACID PHOSPHATE	1793		291990
ISOPROPYL ALCOHOL	1219		290512
ISOPROPYLAMINE	1221		292119
ISOPROPYLBENZENE	1918		290270
ISOPROPYL BUTYRATE	2405		291560
Isopropyl chloride: see	2356		290319
ISOPROPYL CHLOROACETATE	2947		291540
ISOPROPYL CHLOROFORMATE	2407		291590
ISOPROPYL 2-CHLOROPROPIONATE	2934		291590
Isopropylethylene: see	2561		290129
ISOPROPYL ISOBUTYRATE	2406		291560
ISOPROPYL ISOCYANATE	2483		292910
Isopropyl mercaptan: see	2402		293090
ISOPROPYL NITRATE	1222		292090
ISOPROPYL PROPIONATE	2409		291550
Isopropyltoluene: see	2046		290270
Isopropyltoluol: see	2046		290270
ISOSORBIDE DINITRATE MIXTURE with not less than 60% lactose, mannose, starch or calcium hydrogen phosphate	2907		293299
ISOSORBIDE-5-MONONITRATE	3251		293299
JET PERFORATING GUNS, CHARGED, oil well, without detonator	0124		930690
JET PERFORATING GUNS, CHARGED, oil well, without detonator	0494		930690
KEROSENE	1223		273100
KETONES, LIQUID, N.O.S.	1224		2914++
KRILL MEAL	3497		030700
KRYPTON, COMPRESSED	1056		280429
KRYPTON, REFRIGERATED LIQUID	1970		280429
Lacquer: see	1263		3208++
Lacquer: see	3066		3208++
Lacquer: see	3469		3208++
Lacquer: see	3470		3208++
LEAD ACETATE	1616		291529
LEAD ARSENATES	1617		284290
LEAD ARSENITES	1618		284290
LEAD AZIDE, WETTED with not less than 20% water, or mixture of alcohol and water, by mass	0129	Prohibited	
LEAD COMPOUND, SOLUBLE, N.O.S.	2291		28++++
LEAD CYANIDE	1620		283719
LEAD DIOXIDE	1872		282490
LEAD NITRATE	1469		283429
LEAD PERCHLORATE, SOLID	1470		282990
LEAD PERCHLORATE SOLUTION	3408		282990

Name and description	UN No.	Note	NHM Code
LEAD PHOSPHITE, DIBASIC	2989		283510
LEAD STYPHNATE, WETTED with not less than 20% water, or mixture of alcohol and water, by mass	0130	Prohibited	
LEAD SULPHATE with more than 3% free acid	1794		283329
Lead tetraethyl: see	1649		381111
Lead tetramethyl: see	1649		381111
LEAD TRINITRORESORCINATE, WETTED with not less than 20% water, or mixture of alcohol and water, by mass	0130	Prohibited	
LIFE-SAVING APPLIANCES NOT SELF-INFLATING containing dangerous goods as equipment	3072		890690
LIFE-SAVING APPLIANCES, SELF-INFLATING	2990		890710
LIGHTER REFILLS containing flammable gas	1057		961390
LIGHTERS containing flammable gas	1057		9613++
LIGHTERS, FUSE	0131		360300
Limonene, inactive: see	2052		290219
LIQUEFIED GASES, non-flammable, charged with nitrogen, carbon dioxide or air	1058		++++++
LIQUEFIED GAS, FLAMMABLE, N.O.S.	3161		++++++
LIQUEFIED GAS, N.O.S.	3163		++++++
LIQUEFIED GAS, OXIDIZING, N.O.S.	3157		++++++
LIQUEFIED GAS, TOXIC, CORROSIVE, N.O.S.	3308		++++++
LIQUEFIED GAS, TOXIC, FLAMMABLE, CORROSIVE, N.O.S.	3309		++++++
LIQUEFIED GAS, TOXIC, FLAMMABLE, N.O.S.	3160		++++++
LIQUEFIED GAS, TOXIC, N.O.S.	3162		++++++
LIQUEFIED GAS, TOXIC, OXIDIZING, CORROSIVE, N.O.S.	3310		++++++
LIQUEFIED GAS, TOXIC, OXIDIZING, N.O.S.	3307		++++++
Liquid filler: see	1263		3208++
Liquid filler: see	3066		3208++
Liquid filler: see	3469		3208++
Liquid filler: see	3470		3208++
Liquid lacquer base: see	1263		3208++
Liquid lacquer base: see	3066		3208++
Liquid lacquer base: see	3469		3208++
Liquid lacquer base: see	3470		3208++
LITHIUM	1415		280519
LITHIUM ALUMINIUM HYDRIDE	1410		285000
LITHIUM ALUMINIUM HYDRIDE, ETHEREAL	1411		285000
LITHIUM BOROHYDRIDE	1413		285000
LITHIUM FERROSILICON	2830		285000
LITHIUM HYDRIDE	1414		285000
LITHIUM HYDRIDE, FUSED SOLID	2805		285000
LITHIUM HYDROXIDE	2680		282520
LITHIUM HYDROXIDE SOLUTION	2679		282520
LITHIUM HYPOCHLORITE, DRY	1471		282890
LITHIUM HYPOCHLORITE MIXTURE	1471		282890
LITHIUM ION BATTERIES CONTAINED IN EQUIPMENT (including lithium ion polymer batteries)	3481		847+++
LITHIUM ION BATTERIES (including lithium ion polymer batteries)	3480		850780
LITHIUM ION BATTERIES PACKED WITH EQUIPMENT (including lithium ion polymer batteries)	3481		847+++
LITHIUM METAL BATTERIES (including lithium alloy batteries)	3090		850650
LITHIUM METAL BATTERIES CONTAINED IN EQUIPMENT (including lithium alloy batteries)	3091		850650
LITHIUM METAL BATTERIES PACKED WITH EQUIPMENT (including lithium alloy batteries)	3091		850650
LITHIUM NITRATE	2722		283429
LITHIUM NITRIDE	2806		285000
LITHIUM PEROXIDE	1472		282590
LITHIUM SILICON	1417		285000
LONDON PURPLE	1621		284800
Lye: see	1823		281511
MACHINERY, FUEL CELL, FLAMMABLE GAS POWERED	3529		8407++
MACHINERY, FUEL CELL, FLAMMABLE LIQUID POWERED	3528		8407++
MACHINERY, INTERNAL COMBUSTION	3530		8407++
MACHINERY, INTERNAL COMBUSTION, FLAMMABLE GAS POWERED	3529		8407++
MACHINERY, INTERNAL COMBUSTION, FLAMMABLE LIQUID POWERED	3528		8407++
MAGNESIUM ALLOYS POWDER	1418		810430
MAGNESIUM ALLOYS with more than 50% magnesium in pellets, turnings or ribbons	1869		8104++
MAGNESIUM ALUMINIUM PHOSPHIDE	1419		284800
MAGNESIUM ARSENATE	1622		284290
MAGNESIUM BROMATE	1473		282990
MAGNESIUM CHLORATE	2723		282919
MAGNESIUM DIAMIDE	2004		285300
MAGNESIUM FLUOROSILICATE	2853		282690
MAGNESIUM GRANULES, COATED, particle size not less than 149 microns	2950		810430
MAGNESIUM HYDRIDE	2010		285000
MAGNESIUM in pellets, turnings or ribbons	1869		8104++
MAGNESIUM NITRATE	1474		283429
MAGNESIUM PERCHLORATE	1475		282990
MAGNESIUM PEROXIDE	1476		281610
MAGNESIUM PHOSPHIDE	2011		284800
MAGNESIUM POWDER	1418		810430

Name and description	UN No.	Note	NHM Code
MAGNESIUM SILICIDE	2624		285000
Magnetized material	2807	Exempt	+++++
MALEIC ANHYDRIDE	2215		291714
MALEIC ANHYDRIDE, MOLTEN	2215		291714
MALONONITRILE	2647		292690
MANEB	2210		380892
MANEB PREPARATION with not less than 60% maneb	2210		380892
MANEB PREPARATION, STABILIZED against self-heating	2968		380892
MANEB, STABILIZED against self-heating	2968		380892
Manganese ethylene-1,2-dithiocarbamate: see	2210		380892
Manganese ethylene-di-dithiocarbamate: see	2210		380892
MANGANESE NITRATE	2724		283429
MANGANESE RESINATE	1330		380620
MANNITOL HEXANITRATE, WETTED with not less than 40% water, or mixture of alcohol and water, by mass	0133		292090
MATCHES, FUSEE	2254		360500
MATCHES, SAFETY (book, card or strike on box)	1944		360500
MATCHES, 'STRIKE ANYWHERE'	1331		360500
MATCHES, WAX 'VESTA'	1945		360500
MEDICAL WASTE, N.O.S.	3291		382530
MEDICINE, LIQUID, FLAMMABLE, TOXIC, N.O.S.	3248		300+++
MEDICINE, LIQUID, TOXIC, N.O.S.	1851		300+++
MEDICINE, SOLID, TOXIC, N.O.S.	3249		300+++
p-Mentha-1,8-diene: see	2052		290219
MERCAPTAN MIXTURE, LIQUID, FLAMMABLE, N.O.S.	3336		293090
MERCAPTAN MIXTURE, LIQUID, FLAMMABLE, TOXIC, N.O.S.	1228		293090
MERCAPTAN MIXTURE, LIQUID, TOXIC, FLAMMABLE, N.O.S.	3071		293090
MERCAPTANS, LIQUID, FLAMMABLE, N.O.S.	3336		293090
MERCAPTANS, LIQUID, FLAMMABLE, TOXIC, N.O.S.	1228		293090
MERCAPTANS, LIQUID, TOXIC, FLAMMABLE, N.O.S.	3071		293090
2-Mercaptoethanol: see	2966		293090
5-MERCAPTOTETRAZOL-1-ACETIC ACID	0448		293499
MERCURIC ARSENATE	1623		285200
MERCURIC CHLORIDE	1624		285200
MERCURIC NITRATE	1625		285200
MERCURIC POTASSIUM CYANIDE	1626		285200
Mercurous chloride, see	2025		285200
MERCUROUS NITRATE	1627		285200
MERCURY	2809		280540
MERCURY ACETATE	1629		285200
MERCURY AMMONIUM CHLORIDE	1630		285200
MERCURY BASED PESTICIDE, LIQUID, FLAMMABLE, TOXIC, flash-point less than 23 °C	2778		380892
MERCURY BASED PESTICIDE, LIQUID, TOXIC	3012		380892
MERCURY BASED PESTICIDE, LIQUID, TOXIC, FLAMMABLE, flash-point not less than 23 °C	3011		380892
MERCURY BASED PESTICIDE, SOLID, TOXIC	2777		380892
MERCURY BENZOATE	1631		285200
MERCURY BROMIDES	1634		285200
MERCURY COMPOUND, LIQUID, N.O.S.	2024		285200
MERCURY COMPOUND, SOLID, N.O.S.	2025		285200
MERCURY CONTAINED IN MANUFACTURED ARTICLES	3506		2852++
MERCURY CYANIDE	1636		285200
MERCURY FULMINATE, WETTED with not less than 20% water, or mixture of alcohol and water, by mass	0135	Prohibited	
MERCURY GLUCONATE	1637		285200
MERCURY IODIDE	1638		285200
MERCURY NUCLEATE	1639		285200
MERCURY OLEATE	1640		285200
MERCURY OXIDE	1641		285200
MERCURY OXYCYANIDE, DESENSITIZED	1642		285200
MERCURY POTASSIUM IODIDE	1643		285200
MERCURY SALICYLATE	1644		285200
MERCURY SULPHATE	1645		285200
MERCURY THIOCYANATE	1646		285200
Mesitylene: see	2325		290290
MESITYL OXIDE	1229		291419
METAL CARBONYLS, LIQUID, N.O.S.	3281		293100
METAL CARBONYLS, SOLID, N.O.S.	3466		293100
METAL CATALYST, DRY	2881		38151+
METAL CATALYST, WETTED with a visible excess of liquid	1378		38151+
METALDEHYDE	1332		291250
METAL HYDRIDES, FLAMMABLE, N.O.S.	3182		285000
METAL HYDRIDES, WATER-REACTIVE, N.O.S.	1409		285000
METALLIC SUBSTANCE, WATER-REACTIVE, N.O.S.	3208		++++++
METALLIC SUBSTANCE, WATER-REACTIVE, SELF-HEATING, N.O.S.	3209		++++++
METAL POWDER, FLAMMABLE, N.O.S.	3089		81++++

Name and description	UN No.	Note	NHM Code
METAL POWDER, SELF-HEATING, N.O.S.	3189		81++++
METAL SALTS OF ORGANIC COMPOUNDS, FLAMMABLE, N.O.S.	3181		29++++
METHACRYLALDEHYDE, STABILIZED	2396		291219
METHACRYLIC ACID, STABILIZED	2531		291613
METHACRYLONITRILE, STABILIZED	3079		292690
METHALLYL ALCOHOL	2614		290519
METHANE, COMPRESSED	1971		271129
METHANE, REFRIGERATED LIQUID	1972		271119
METHANESULPHONYL CHLORIDE	3246		290490
METHANOL	1230		290511
METHOXYMETHYL ISOCYANATE	2605		292910
4-METHOXY-4-METHYL PENTAN-2-ONE	2293		291450
1-METHOXY-2-PROPANOL	3092		290949
METHYL ACETATE	1231		291539
METHYLACETYLENE AND PROPADIENE MIXTURE, STABILIZED	1060		271119
METHYL ACRYLATE, STABILIZED	1919		291612
METHYLAL	1234		291100
METHYLALLYL CHLORIDE	2554		290329
METHYLAMINE, ANHYDROUS	1061		292111
METHYLAMINE, AQUEOUS SOLUTION	1235		292111
METHYLAMYL ACETATE	1233		291539
Methyl amyl alcohol: see	2053		290519
N-METHYLANILINE	2294		292142
alpha-METHYLBENZYL ALCOHOL, LIQUID	2937		290629
alpha-METHYLBENZYL ALCOHOL, SOLID	3438		290629
METHYL BROMIDE with not more than 2% chloropicrin	1062		290339
METHYL BROMIDE AND ETHYLENE DIBROMIDE MIXTURE, LIQUID	1647		290339
METHYL BROMOACETATE	2643		291590
2-METHYLBUTANAL	3371		290110
3-METHYLBUTAN-2-ONE	2397		291419
2-METHYL-1-BUTENE	2459		290129
2-METHYL-2-BUTENE	2460		290129
3-METHYL-1-BUTENE	2561		290129
N-METHYLBUTYLAMINE	2945		292119
METHYL tert-BUTYL ETHER	2398		290919
METHYL BUTYRATE	1237		291560
METHYL CHLORIDE	1063		290311
METHYL CHLORIDE AND METHYLENE CHLORIDE MIXTURE	1912		290319
METHYL CHLOROACETATE	2295		291540
METHYL CHLOROFORMATE	1238		291560
METHYL CHLOROMETHYL ETHER	1239		290919
METHYL 2-CHLOROPROPIONATE	2933		291590
METHYLCHLOROSILANE	2534		293100
Methyl cyanide: see	1648		292690
METHYLCYCLOHEXANE	2296		290219
METHYLCYCLOHEXANOLS, flammable	2617		290612
METHYLCYCLOHEXANONE	2297		291422
METHYLCYCLOPENTANE	2298		290219
METHYL DICHLOROACETATE	2299		291540
METHYLDICHLOROSILANE	1242		293100
Methylene chloride: see	1593		290312
METHYL ETHYL KETONE	1193		291412
2-METHYL-5-ETHYL PYRIDINE	2300		293339
METHYL FLUORIDE	2454		290339
METHYL FORMATE	1243		291513
2-METHYLFURAN	2301		293219
Methyl glycol, see	1188		290944
2-METHYL-2-HEPTANETHIOL	3023		293090
5-METHYLHEXAN-2-ONE	2302		291419
METHYLHYDRAZINE	1244		292800
METHYL IODIDE	2644		290339
METHYL ISOBUTYL CARBINOL	2053		290519
METHYL ISOBUTYL KETONE	1245		291413
METHYL ISOCYANATE	2480		292910
METHYL ISOPROPENYL KETONE, STABILIZED	1246		291419
METHYL ISOTHOIYCYNATE	2477		293090
METHYL ISOVALERATE	2400		291560
METHYL MAGNESIUM BROMIDE IN ETHYL ETHER	1928		293100
METHYL MERCAPTAN	1064		293090
Methyl mercaptopropionaldehyde: see	2785		293090
METHYL METHACRYLATE MONOMER, STABILIZED	1247		291614
4-METHYLMORPHOLINE	2535		293499
N-METHYLMORPHOLINE	2535		293499
METHYL NITRITE	2455	Prohibited	
METHYL ORTHOSILICATE	2606		292090

Name and description	UN No.	Note	NHM Code
METHYLPENTADIENE	2461		290129
2-METHYLPENTAN-2-OL	2560		290519
4-Methylpentan-2-ol: see	2053		290519
3-Methyl-2-penten-4-yne: see	2705		290529
METHYLPHENYLDICHLOROSILANE	2437		293100
1-METHYLPYPERIDINE	2399		293339
METHYL PROPIONATE	1248		291550
Methylpropylbenzene: see	2046		290270
METHYL PROPYL ETHER	2612		290919
METHYL PROPYL KETONE	1249		291419
Methyl pyridines: see	2313		293339
METHYLTETRAHYDROFURAN	2536		293219
METHYL TRICHLOROACETATE	2533		291540
METHYLTRICHLOROSILANE	1250		293100
alpha-METHYLVALERALDEHYDE	2367		291219
METHYL VINYL KETONE, STABILIZED	1251		291419
M.i.b.c.: see	2053		290519
MINES with bursting charge	0136		930690
MINES with bursting charge	0137		930690
MINES with bursting charge	0138		930690
MINES with bursting charge	0294		930690
Mixture A: see	1965		271113 271119
Mixture A 0: see	1965		271113 271119
Mixture A 01: see	1965		271113 271119
Mixture A 02: see	1965		271113 271119
Mixture A 1: see	1965		271119 271113
Mixture B: see	1965		271119 271113
Mixture B 1: see	1965		271119 271113
Mixture B 2: see	1965		271119 271113
Mixture C: see	1965		271119 271113
Mixture F1: see	1078		38247+
Mixture F2: see	1078		38247+
Mixture F3: see	1078		38247+
Mixture P1: see	1060		271119
Mixture P2: see	1060		271119
Mixtures of solids containing flammable liquid, n.o.s. having a flash-point up to 60 °C: see	3175		++++++
MOLYBDENUM PENTACHLORIDE	2508		282739
Monochlorobenzene: see	1134		290399
MONONITROTOLUIDINES	2660		292143
MORPHOLINE	2054		293499
MOTOR FUEL ANTI-KNOCK MIXTURE	1649		381111
MOTOR FUEL ANTI-KNOCK MIXTURE, FLAMMABLE	3483		381111
MOTOR SPIRIT	1203		272+00
Muriatic acid: see	1789		280610
MUSK XYLENE	2956		290420
NAPHTHALENE, CRUDE	1334		270740
NAPHTHALENE, MOLTEN	2304		290290
NAPHTHALENE, REFINED	1334		290290
alpha-NAPHTHYLAMINE	2077		292145
beta-NAPHTHYLAMINE, SOLID	1650		292145
beta-NAPHTHYLAMINE SOLUTION	3411		292145
NAPHTHYLTHIOUREA	1651		293090
NAPHTHYLUREA	1652		292421
NATURAL GAS, COMPRESSED with high methane content	1971		271121
NATURAL GAS, REFRIGERATED LIQUID with high methane content	1972		271111
NEON, COMPRESSED	1065		280429
NEON, REFRIGERATED LIQUID	1913		280429
NICKEL CARBONYL	1259		293100
NICKEL CYANIDE	1653		283719
NICKEL NITRATE	2725		283429
NICKEL NITRITE	2726		283410
NICOTINE	1654		293999
NICOTINE COMPOUND, LIQUID, N.O.S.	3144		293999
NICOTINE COMPOUND, SOLID, N.O.S.	1655		293999
NICOTINE HYDROCHLORIDE, LIQUID	1656		293999
NICOTINE HYDROCHLORIDE, SOLID	3444		293999

Name and description	UN No.	Note	NHM Code
NICOTINE HYDROCHLORIDE, SOLUTION	1656		293999
NICOTINE PREPARATION, LIQUID, N.O.S.	3144		293999
NICOTINE PREPARATION, SOLID, N.O.S.	1655		293999
NICOTINE SALICYLATE	1657		293999
NICOTINE SULPHATE, SOLID	3445		293999
NICOTINE SULPHATE, SOLUTION	1658		293999
NICOTINE TARTRATE	1659		293999
NITRATES, INORGANIC, AQUEOUS SOLUTION, N.O.S.	3218		283429
NITRATES, INORGANIC, N.O.S.	1477		283429
NITRATING ACID MIXTURE with more than 50% nitric acid	1796		280800
NITRATING ACID MIXTURE with not more than 50% nitric acid	1796		280800
NITRATING ACID MIXTURE, SPENT, with more than 50% nitric acid	1826		280800 382569
NITRATING ACID MIXTURE, SPENT, with not more than 50% nitric acid	1826		280800 382569
NITRIC ACID, other than red fuming	2031		280800
NITRIC ACID, RED FUMING	2032		280800
NITRIC OXIDE AND DINITROGEN TETROXIDE MIXTURE	1975		281129
NITRIC OXIDE AND NITROGEN DIOXIDE MIXTURE	1975		281129
NITRIC OXIDE, COMPRESSED	1660		281129
NITRILES, FLAMMABLE, TOXIC, N.O.S.	3273		292690
NITRILES, TOXIC, FLAMMABLE, N.O.S.	3275		292690
NITRILES, LIQUID, TOXIC, N.O.S.	3276		292690
NITRILES, SOLID, TOXIC, N.O.S.	3439		292690
NITRITES, INORGANIC, AQUEOUS SOLUTION, N.O.S.	3219		283410
NITRITES, INORGANIC, N.O.S.	2627		283410
NITROANILINES (o-, m-, p-)	1661		292142
NITROANISOLE, LIQUID	2730		290930
NITROANISOLE, SOLID	3458		290930
NITROBENZENE	1662		290420
NITROBENZENESULPHONIC ACID	2305		290490
5-NITROBENZOTRIAZOL	0385		293399
NITROBENZOTRIFLUORIDES, LIQUID	2306		290490
NITROBENZOTRIFLUORIDES, SOLID	3431		290490
NITROBROMOBENZENES, LIQUID	2732		290490
NITROBROMOBENZENES, SOLID	3459		290490
NITROCELLULOSE, dry or wetted with less than 25% water (or alcohol), by mass	0340		391220
NITROCELLULOSE MEMBRANE FILTERS, with not more than 12.6% nitrogen, by dry mass	3270		392099
NITROCELLULOSE, PLASTICIZED with not less than 18% plasticizing substance, by mass	0343		391220
NITROCELLULOSE SOLUTION, FLAMMABLE with not more than 12.6% nitrogen, by dry mass, and not more than 55% nitrocellulose	2059		391220
NITROCELLULOSE, unmodified or plasticized with less than 18% plasticizing substance, by mass	0341		391220
NITROCELLULOSE, WETTED with not less than 25% alcohol, by mass	0342		391220
NITROCELLULOSE WITH ALCOHOL (not less than 25% alcohol, by mass, and not more than 12.6% nitrogen, by dry mass)	2556		391220
NITROCELLULOSE, with not more than 12.6% nitrogen, by dry mass, MIXTURE WITH or WITHOUT PLASTICIZER, WITH or WITHOUT PIGMENT	2557		391220
NITROCELLULOSE WITH WATER (not less than 25% water, by mass)	2555		391220
3-NITRO-4-CHLORO-BENZOTRIFLUORIDE	2307		290490
NITROCRESOLS, LIQUID	3434		290899
NITROCRESOLS, SOLID	2446		290899
NITROETHANE	2842		290420
NITROGEN, COMPRESSED	1066		280430
NITROGEN DIOXIDE	1067		281129
NITROGEN, REFRIGERATED LIQUID	1977		280430
NITROGEN TRIFLUORIDE	2451		281290
NITROGEN TRIOXIDE	2421	Prohibited	
NITROGLYCERIN MIXTURE, DESENSITIZED, LIQUID, FLAMMABLE, N.O.S. with not more than 30% nitroglycerin, by mass	3343		292090
NITROGLYCERIN MIXTURE, DESENSITIZED, LIQUID, N.O.S. with not more than 30% nitroglycerin, by mass	3357		292090
NITROGLYCERIN MIXTURE, DESENSITIZED, SOLID, N.O.S. with more than 2% but not more than 10% nitroglycerin, by mass	3319		292090
NITROGLYCERIN, DESENSITIZED with not less than 40% non-volatile water-insoluble phlegmatizer, by mass	0143		360200
NITROGLYCERIN, SOLUTION IN ALCOHOL with more than 1% but not more than 5% nitroglycerin	3064		292090
NITROGLYCERIN SOLUTION IN ALCOHOL with more than 1% but not more than 10% nitroglycerin	0144		360200
NITROGLYCERIN SOLUTION IN ALCOHOL with not more than 1% nitroglycerin	1204		292090
NITROGUANIDINE, dry or wetted with less than 20% water, by mass	0282		292529
NITROGUANIDINE, WETTED with not less than 20% water, by mass	1336		292529
NITROHYDROCHLORIC ACID	1798	Prohibited	
NITROMANNITE, WETTED with not less than 40% water, or mixture of alcohol and water, by mass	0133		292090
NITROMETHANE	1261		290420
NITRONAPHTHALENE	2538		290420
NITROPHENOLS (o-, m-, p-)	1663		290899

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4-NITROPHENYLHYDRAZINE, with not less than 30% water, by mass	3376		292800
NITROPROPANES	2608		290420
p-NITROSODIMETHYLANILINE	1369		292119
NITROSTARCH, dry or wetted with less than 20% water, by mass	0146		360200
NITROSTARCH, WETTED with not less than 20% water, by mass	1337		360200
NITROSYL CHLORIDE	1069		281210
NITROSYLSULPHURIC ACID, LIQUID	2308		281119
NITROSYLSULPHURIC ACID, SOLID	3456		281119
NITROTOLUENES, LIQUID	1664		290420
NITROTOLUENES, SOLID	3446		290420
NITROTOLIDINES (MONO)	2660		292143
NITROTRIAZOLONE	0490		293399
NITRO UREA	0147		292419
NITROUS OXIDE	1070		281129
NITROUS OXIDE, REFRIGERATED LIQUID	2201		281129
NITROXYLENES, LIQUID	1665		290420
NITROXYLENES, SOLID	3447		290420
NONANES	1920		290110
NONYLTRICHLOROSILANE	1799		293100
2,5-NORBORNADIENE, STABILIZED	2251		290219
NTO	0490		293399
OCTADECYLTRICHLOROSILANE	1800		293100
OCTADIENES	2309		290129
OCTAFLUOROBUT-2-ENE	2422		290339
OCTAFLUOROCYCLOBUTANE	1976		290389
OCTAFLUOROPROPANE	2424		290339
OCTANES	1262		290110
OCTOGEN, DESENSITIZED	0484		293369
OCTOGEN, WETTED with not less than 15% water, by mass	0226		293369
OCTOL, dry or wetted with less than 15% water, by mass	0266		360200
OCTOLITE, dry or wetted with less than 15% water, by mass	0266		360200
OCTONAL	0496		360200
OCTYL ALDEHYDES	1191		291219
OCTYLTRICHLOROSILANE	1801		293100
OIL GAS, COMPRESSED	1071		271129
Oleum: see	1831		280700
ORGANIC PEROXIDES (list)		2.2.52.4	++++++
ORGANIC PEROXIDE TYPE B, LIQUID	3101		29++++
ORGANIC PEROXIDE TYPE B, LIQUID, TEMPERATURE CONTROLLED	3111	Prohibited	
ORGANIC PEROXIDE TYPE B, SOLID	3102		29++++
ORGANIC PEROXIDE TYPE B, SOLID, TEMPERATURE CONTROLLED	3112	Prohibited	
ORGANIC PEROXIDE TYPE C, LIQUID	3103		29++++
ORGANIC PEROXIDE TYPE C, LIQUID, TEMPERATURE CONTROLLED	3113	Prohibited	
ORGANIC PEROXIDE TYPE C, SOLID	3104		29++++
ORGANIC PEROXIDE TYPE C, SOLID, TEMPERATURE CONTROLLED	3114	Prohibited	
ORGANIC PEROXIDE TYPE D, LIQUID	3105		29++++
ORGANIC PEROXIDE TYPE D, LIQUID, TEMPERATURE CONTROLLED	3115	Prohibited	
ORGANIC PEROXIDE TYPE D, SOLID	3106		29++++
ORGANIC PEROXIDE TYPE D, SOLID, TEMPERATURE CONTROLLED	3116	Prohibited	
ORGANIC PEROXIDE TYPE E, LIQUID	3107		29++++
ORGANIC PEROXIDE TYPE E, LIQUID, TEMPERATURE CONTROLLED	3117	Prohibited	
ORGANIC PEROXIDE TYPE E, SOLID	3108		29++++
ORGANIC PEROXIDE TYPE E, SOLID, TEMPERATURE CONTROLLED	3118	Prohibited	
ORGANIC PEROXIDE TYPE F, LIQUID	3109		29++++
ORGANIC PEROXIDE TYPE F, LIQUID, TEMPERATURE CONTROLLED	3119	Prohibited	
ORGANIC PEROXIDE TYPE F, SOLID	3110		29++++
ORGANIC PEROXIDE TYPE F, SOLID, TEMPERATURE CONTROLLED	3120	Prohibited	
ORGANIC PIGMENTS, SELF-HEATING	3313		320+++
ORGANOARSENIC COMPOUND, LIQUID, N.O.S.	3280		293100
ORGANOARSENIC COMPOUND, SOLID, N.O.S.	3465		293100
ORGANOCHLORINE PESTICIDE, LIQUID, FLAMMABLE, TOXIC, flash-point less than 23 °C	2762		380891
ORGANOCHLORINE PESTICIDE, LIQUID, TOXIC	2996		380891
ORGANOCHLORINE PESTICIDE, LIQUID, TOXIC, FLAMMABLE, flash-point not less than 23 °C	2995		380891
ORGANOCHLORINE PESTICIDE, SOLID, TOXIC	2761		380891
ORGANOMETALLIC COMPOUND, LIQUID, TOXIC, N.O.S.	3282		293100
ORGANOMETALLIC COMPOUND, SOLID, TOXIC, N.O.S.	3467		293100
ORGANOMETALLIC SUBSTANCE, LIQUID, PYROPHORIC	3392		293100
ORGANOMETALLIC SUBSTANCE, LIQUID, PYROPHORIC, WATER-REACTIVE	3394		293100
ORGANOMETALLIC SUBSTANCE, LIQUID, WATER-REACTIVE	3398		293100
ORGANOMETALLIC SUBSTANCE, LIQUID, WATER-REACTIVE, FLAMMABLE	3399		293100
ORGANOMETALLIC SUBSTANCE, SOLID, PYROPHORIC	3391		293100
ORGANOMETALLIC SUBSTANCE, SOLID, PYROPHORIC, WATER-REACTIVE	3393		293100
ORGANOMETALLIC SUBSTANCE, SOLID, SELF-HEATING	3400		293100
ORGANOMETALLIC SUBSTANCE, SOLID, WATER-REACTIVE	3395		293100
ORGANOMETALLIC SUBSTANCE, SOLID, WATER-REACTIVE, FLAMMABLE	3396		293100

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ORGANOMETALLIC SUBSTANCE, SOLID, WATER-REACTIVE, SELF-HEATING	3397		293100
ORGANOPHOSPHORUS COMPOUND, TOXIC, FLAMMABLE, N.O.S.	3279	++++++	
ORGANOPHOSPHORUS COMPOUND, LIQUID, TOXIC, N.O.S.	3278	++++++	
ORGANOPHOSPHORUS COMPOUND, SOLID, TOXIC, N.O.S.	3464	++++++	
ORGANOPHOSPHORUS PESTICIDE, LIQUID, FLAMMABLE, TOXIC, flash-point less than 23 °C	2784	3808++	
ORGANOPHOSPHORUS PESTICIDE, LIQUID, TOXIC	3018	3808++	
ORGANOPHOSPHORUS PESTICIDE, LIQUID, TOXIC, FLAMMABLE, flash-point not less than 23 °C	3017	3808++	
ORGANOPHOSPHORUS PESTICIDE, SOLID, TOXIC	2783	3808++	
ORGANOTIN COMPOUND, LIQUID, N.O.S.	2788	293100	
ORGANOTIN COMPOUND, SOLID, N.O.S.	3146	293100	
ORGANOTIN PESTICIDE, LIQUID, FLAMMABLE, TOXIC, flash-point less than 23 °C	2787	3808++	
ORGANOTIN PESTICIDE, LIQUID, TOXIC	3020	3808++	
ORGANOTIN PESTICIDE, LIQUID, TOXIC, FLAMMABLE, flash-point not less than 23 °C	3019	3808++	
ORGANOTIN PESTICIDE, SOLID, TOXIC	2786	3808++	
OSMIUM TETROXIDE	2471		284390
OXIDIZING LIQUID, CORROSIVE, N.O.S.	3098	++++++	
OXIDIZING LIQUID, N.O.S.	3139	++++++	
OXIDIZING LIQUID, TOXIC, N.O.S.	3099	++++++	
OXIDIZING SOLID, CORROSIVE, N.O.S.	3085	++++++	
OXIDIZING SOLID, FLAMMABLE, N.O.S.	3137	Prohibited	
OXIDIZING SOLID, N.O.S.	1479	++++++	
OXIDIZING SOLID, SELF-HEATING, N.O.S.	3100	Prohibited	
OXIDIZING SOLID, TOXIC, N.O.S.	3087	++++++	
OXIDIZING SOLID, WATER-REACTIVE, N.O.S.	3121	Prohibited	
OXYGEN, COMPRESSED	1072		280440
OXYGEN DIFLUORIDE, COMPRESSED	2190		281290
OXYGEN GENERATOR, CHEMICAL	3356	++++++	
OXYGEN, REFRIGERATED LIQUID	1073		280440
PACKAGINGS, DISCARDED, EMPTY, UNCLEANED	3509	++++++	
PAINT (including paint, lacquer, enamel, stain, shellac, varnish, polish, liquid filler and liquid lacquer base)	1263		3208++
PAINT (including paint, lacquer, enamel, stain, shellac, varnish, polish, liquid filler and liquid lacquer base)	3066		3208++
PAINT, CORROSIVE, FLAMMABLE (including paint, lacquer, enamel, stain, shellac, varnish, polish, liquid filler and liquid lacquer base)	3470		3208++
PAINT, FLAMMABLE, CORROSIVE (including paint, lacquer, enamel, stain, shellac, varnish, polish, liquid filler and liquid lacquer base)	3469		3208++
PAINT RELATED MATERIAL (including paint thinning and reducing compound)	1263		381400
PAINT RELATED MATERIAL (including paint thinning and reducing compound)	3066		381400
PAINT RELATED MATERIAL, CORROSIVE, FLAMMABLE (including paint thinning and reducing compound)	3470		381400
PAINT RELATED MATERIAL, FLAMMABLE, CORROSIVE (including paint thinning and reducing compound)	3469		381400
Paint thinning: see	1263		381400
Paint thinning: see	3066		381400
Paint thinning: see	3469		381400
Paint thinning: see	3470		381400
PAPER, UNSATURATED OIL TREATED, incompletely dried	1379		481160
PARAFORMALDEHYDE	2213		291260
PARALDEHYDE	1264		291250
PENTABORANE	1380		285000
PENTACHLOROETHANE	1669		290319
PENTACHLOROPHENOL	3155		290811
PENTAERYTHRITE TETRANITRATE, DESENSITIZED with not less than 15% phlegmatizer, by mass	0150		292090
PENTAERYTHRITE TETRANITRATE MIXTURE, DESENSITIZED, SOLID, N.O.S. with more than 10% but not more than 20% PETN, by mass	3344		292090
PENTAERYTHRITE TETRANITRATE, WETTED with not less than 25% water, by mass	0150		292090
PENTAERYTHRITE TETRANITRATE with not less than 7% wax, by mass	0411		292090
PENTAERYTHRITOL TETRANITRATE, DESENSITIZED with not less than 15% phlegmatizer, by mass	0150		292090
PENTAERYTHRITOL TETRANITRATE MIXTURE, DESENSITIZED, SOLID, N.O.S. with more than 10% but not more than 20% PETN, by mass	3344		292090
PENTAERYTHRITOL TETRANITRATE, WETTED with not less than 25% water, by mass	0150		292090
PENTAERYTHRITOL TETRANITRATE with not less than 7% wax, by mass	0411		292090
PENTAFLUOROETHANE	3220		290339
Pentafluoroethane, 1,1,1-trifluoroethane, and 1,1,1,2-tetrafluoroethane zeotropic mixture with approximately 44% pentafluoroethane and 52% 1,1,1-trifluoroethane: see	3337		382474
PENTAMETHYLHEPTANE	2286		290110
PENTANE-2,4-DIONE	2310		291419
PENTANES, liquid	1265		290110
n-Pentane: see	1265		290110
PENTANOLS	1105		290519
1-PENTENE	1108		290129
1-PENTOL	2705		290529
PENTOLITE, dry or wetted with less than 15% water, by mass	0151		360200

Name and description	UN No.	Note	NHM Code
PERCHLORATES, INORGANIC, AQUEOUS SOLUTION, N.O.S.	3211		282990
PERCHLORATES, INORGANIC, N.O.S.	1481		282990
PERCHLORIC ACID with more than 50% but not more than 72% acid, by mass	1873		281119
PERCHLORIC ACID with not more than 50% acid, by mass	1802		281119
Perchloroethylene: see	1897		290323
PERCHLOROMETHYL MERCAPTAN	1670		293090
PERCHLORYL FLUORIDE	3083		281210
PERFLUORO(ETHYL VINYL ETHER)	3154		290919
PERFLUORO(METHYL VINYL ETHER)	3153		290919
PERFUMERY PRODUCTS with flammable solvents	1266		330300
PERMANGANATES, INORGANIC, AQUEOUS SOLUTION, N.O.S.	3214		284169
PERMANGANATES, INORGANIC, N.O.S.	1482		284169
PEROXIDES, INORGANIC, N.O.S.	1483		282590
PERSULPHATES, INORGANIC, AQUEOUS SOLUTION, N.O.S.	3216		283340
PERSULPHATES, INORGANIC, N.O.S.	3215		283340
PESTICIDE, LIQUID, FLAMMABLE, TOXIC, N.O.S., flash-point less than 23 °C	3021		3808++
PESTICIDE, LIQUID, TOXIC, FLAMMABLE, N.O.S., flash-point not less than 23 °C	2903		3808++
PESTICIDE, LIQUID, TOXIC, N.O.S.	2902		3808++
PESTICIDE, SOLID, TOXIC, N.O.S.	2588		3808++
PETN, DESENSITIZED with not less than 15% phlegmatizer, by mass	0150		292090
PETN MIXTURE, DESENSITIZED, SOLID, N.O.S. with more than 10% but not more than 20% PETN, by mass	3344		292090
PETN, WETTED with not less than 25% water, by mass	0150		292090
PETN with not less than 7% wax, by mass	0411		292090
PETROL	1203		272+00
PETROLEUM CRUDE OIL	1267		270900
PETROLEUM DISTILLATES, N.O.S.	1268		27++++
PETROLEUM GASES, LIQUEFIED	1075		271119
PETROLEUM PRODUCTS, N.O.S.	1268		27++++
PETROLEUM SOUR CRUDE OIL, FLAMMABLE, TOXIC	3494		270900
PHENACYL BROMIDE	2645		291470
PHENETIDINES	2311		292229
PHENOLATES, LIQUID	2904		290711
PHENOLATES, SOLID	2905		290711
PHENOL, MOLTEN	2312		290711
PHENOL, SOLID	1671		290711
PHENOL SOLUTION	2821		290711
PHENOLSULPHONIC ACID, LIQUID	1803		290899
PHENOXYACETIC ACID DERIVATIVE PESTICIDE, LIQUID, FLAMMABLE, TOXIC, flash-point less than 23 °C	3346		380893
PHENOXYACETIC ACID DERIVATIVE PESTICIDE, LIQUID, TOXIC	3348		380893
PHENOXYACETIC ACID DERIVATIVE PESTICIDE, LIQUID, TOXIC, FLAMMABLE, flash-point not less than 23 °C	3347		380893
PHENOXYACETIC ACID DERIVATIVE PESTICIDE, SOLID, TOXIC	3345		380893
PHENYLACETONITRILE, LIQUID	2470		292690
PHENYLACETYL CHLORIDE	2577		291639
PHENYLCARBYLAMINE CHLORIDE	1672		292529
PHENYL CHLOROFORMATE	2746		291590
PHENYLENEDIAMINES (o-, m-, p-)	1673		292151
Phenylethylene: see	2055		290250
PHENYLHYDRAZINE	2572		292800
PHENYL ISOCYANATE	2487		292910
PHENYL MERCAPTAN	2337		293090
PHENYLMERCURIC ACETATE	1674		285200
PHENYLMERCURIC COMPOUND, N.O.S.	2026		285200
PHENYLMERCURIC HYDROXIDE	1894		285200
PHENYLMERCURIC NITRATE	1895		285200
PHENYLPHOSPHORUS DICHLORIDE	2798		293100
PHENYLPHOSPHORUS THIODICHLORIDE	2799		292019
PHENYLTRICHLOROSILANE	1804		293100
PHOSGENE	1076		281210
9-PHOSPHABICYCLO-NONANES	2940		293100
PHOSPHINE	2199		284800
PHOSPHINE, ADSORBED	3525		284800
Phosphoretted hydrogen: see	2199		284800
PHOSPHORIC ACID, SOLID	3453		280920
PHOSPHORIC ACID, SOLUTION	1805		280920
Phosphoric acid, anhydrous: see	1807		280910
PHOSPHOROUS ACID	2834		281119
PHOSPHORUS, AMORPHOUS	1338		280470
PHOSPHORUS HEPTASULPHIDE, free from yellow and white phosphorus	1339		281390
PHOSPHORUS OXYBROMIDE	1939		281290
PHOSPHORUS OXYBROMIDE, MOLTEN	2576		281290
PHOSPHORUS OXYCHLORIDE	1810		281210

Name and description	UN No	Note	NHM Code
PHOSPHORUS PENTABROMIDE	2691		281290
PHOSPHORUS PENTACHLORIDE	1806		281210
PHOSPHORUS PENTAFLUORIDE	2198		281290
PHOSPHORUS PENTAFLUORIDE, ADSORBED	3524		281290
PHOSPHORUS PENTASULPHIDE, free from yellow and white phosphorus	1340		281390
PHOSPHORUS PENTOXIDE	1807		280910
PHOSPHORUS SESQUISULPHIDE, free from yellow and white phosphorus	1341		281390
PHOSPHORUS TRIBROMIDE	1808		281290
PHOSPHORUS TRICHLORIDE	1809		281210
PHOSPHORUS TRIOXIDE	2578		281129
PHOSPHORUS TRISULPHIDE, free from yellow and white phosphorus	1343		281390
PHOSPHORUS, WHITE, DRY	1381		280470
PHOSPHORUS, WHITE, IN SOLUTION	1381		280470
PHOSPHORUS, WHITE, MOLTEN	2447		280470
PHOSPHORUS, WHITE, UNDER WATER	1381		280470
PHOSPHORUS, YELLOW, DRY	1381		280470
PHOSPHORUS, YELLOW, IN SOLUTION	1381		280470
PHOSPHORUS, YELLOW, UNDER WATER	1381		280470
PHthalic ANHYDRIDE with more than 0.05% of maleic anhydride	2214		291735
PICOLINES	2313		293339
PICRAMIDE	0153		292142
PICRIC ACID, dry or wetted with less than 30% water, by mass	0154		290899
PICRIC ACID, WETTED with not less than 10% water, by mass	3364		290899
PICRIC ACID, WETTED with not less than 30% water, by mass	1344		290899
PICRITE, dry or wetted with less than 20% water, by mass	0282		292529
PICRITE, WETTED with not less than 20% water, by mass	1336		292529
PICRYL CHLORIDE	0155		290490
PICRYL CHLORIDE WETTED with not less than 10% water, by mass	3365		290490
alpha-PINENE	2368		290219
PINE OIL	1272		380590
PIPERAZINE	2579		293359
PIPERIDINE	2401		293332
Pivaloyl chloride: see	2438		291590
PLASTICS MOULDING COMPOUND in dough, sheet or extruded rope form evolving flammable vapour	3314	39++++	
PLASTICS, NITROCELLULOSE-BASED, SELF-HEATING, N.O.S.	2006		391290
Polish: see	1263		3208++
Polish: see	3066		3208++
Polish: see	3469		3208++
Polish: see	3470		3208++
POLYAMINES, FLAMMABLE, CORROSIVE, N.O.S.	2733		2921++
POLYAMINES, LIQUID, CORROSIVE, FLAMMABLE, N.O.S.	2734		2921++
POLYAMINES, LIQUID, CORROSIVE, N.O.S.	2735		2921++
POLYAMINES, SOLID, CORROSIVE, N.O.S.	3259		2921++
POLYCHLORINATED BIPHENYLS, LIQUID	2315		290399
POLYCHLORINATED BIPHENYLS, SOLID	3432		290399
POLYESTER RESIN KIT, liquid base material	3269		3907++
POLYESTER RESIN KIT, solid base material	3527		3907++
POLYHALOGENATED BIPHENYLS, LIQUID	3151		290399
POLYHALOGENATED BIPHENYLS, SOLID	3152		290399
POLYHALOGENATED TERPHENYLS, LIQUID	3151		290399
POLYHALOGENATED TERPHENYLS, SOLID	3152		290399
POLYMERIC BEADS, EXPANDABLE, evolving flammable vapour	2211		390311
POLYMERIZING SUBSTANCE, LIQUID, STABILIZED, N.O.S.	3532	39++++	
POLYMERIZING SUBSTANCE, LIQUID, TEMPERATURE CONTROLLED, N.O.S.	3534	Prohibited	
POLYMERIZING SUBSTANCE, SOLID, STABILIZED, N.O.S.	3531	39++++	
POLYMERIZING SUBSTANCE, SOLID, TEMPERATURE CONTROLLED, N.O.S.	3533	Prohibited	
POTASSIUM	2257		280519
POTASSIUM ARSENATE	1677		284290
POTASSIUM ARSENITE	1678		284290
Potassium bisulphate: see	2509		283329
POTASSIUM BOROHYDRIDE	1870		285000
POTASSIUM BROMATE	1484		282990
POTASSIUM CHLORATE	1485		282919
POTASSIUM CHLORATE, AQUEOUS SOLUTION	2427		282919
POTASSIUM CUPROCYANIDE	1679		283720
POTASSIUM CYANIDE SOLUTION	3413		283719
POTASSIUM CYANIDE, SOLID	1680		283719
POTASSIUM DITHIONITE	1929		283190
POTASSIUM FLUORIDE SOLUTION	3422		282619
POTASSIUM FLUORIDE, SOLID	1812		282619
POTASSIUM FLUOROACETATE	2628		291590
POTASSIUM FLUOROSILICATE	2655		282690
Potassium hydrate: see	1814		281520
POTASSIUM HYDROGENDIFLUORIDE, SOLID	1811		282619
POTASSIUM HYDROGENDIFLUORIDE SOLUTION	3421		282619

Name and description	UN No.	Note	NHM Code
POTASSIUM HYDROGEN SULPHATE	2509		283329
POTASSIUM HYDROSULPHITE	1929		283190
Potassium hydroxide, liquid: see	1814		281520
POTASSIUM HYDROXIDE, SOLID	1813		281520
POTASSIUM HYDROXIDE SOLUTION	1814		281520
POTASSIUM METAL ALLOYS, LIQUID	1420		280519
POTASSIUM METAL ALLOYS, SOLID	3403		280519
POTASSIUM METAVANADATE	2864		284190
POTASSIUM MONOXIDE	2033		282590
POTASSIUM NITRATE	1486		283421
POTASSIUM NITRATE AND SODIUM NITRITE MIXTURE	1487		283421
			283410
POTASSIUM NITRITE	1488		283410
POTASSIUM PERCHLORATE	1489		282990
POTASSIUM PERMANGANATE	1490		284161
POTASSIUM PEROXIDE	1491		281530
POTASSIUM PERSULPHATE	1492		283340
POTASSIUM PHOSPHIDE	2012		284800
POTASSIUM SODIUM ALLOYS, LIQUID	1422		280519
POTASSIUM SODIUM ALLOYS, SOLID	3404		280519
POTASSIUM SULPHIDE, ANHYDROUS	1382		283090
POTASSIUM SULPHIDE, HYDRATED with not less than 30% water of crystallization	1847		283090
POTASSIUM SULPHIDE with less than 30% water of crystallization	1382		283090
POTASSIUM SUPEROXIDE	2466		281530
POWDER CAKE, WETTED with not less than 17% alcohol, by mass	0433		360100
POWDER CAKE, WETTED with not less than 25% water, by mass	0159		360100
POWDER PASTE, WETTED with not less than 17% alcohol, by mass	0433		360100
POWDER PASTE, WETTED with not less than 25% water, by mass	0159		360100
POWDER, SMOKELESS	0160		360100
POWDER, SMOKELESS	0161		360100
POWDER, SMOKELESS	0509		360200
Preparations containing flammable liquid, n.o.s. having a flash-point up to 60 °C: see	3175		++++++
PRIMERS, CAP TYPE	0044		360300
PRIMERS, CAP TYPE	0377		360300
PRIMERS, CAP TYPE	0378		360300
PRIMERS, TUBULAR	0319		360300
PRIMERS, TUBULAR	0320		360300
PRIMERS, TUBULAR	0376		360300
PRINTING INK RELATED MATERIAL (including printing ink thinning or reducing compound), flammable	1210		381400
PRINTING INK, flammable	1210		3215++
PROJECTILES, inert with tracer	0345		930690
PROJECTILES, inert with tracer	0424		930690
PROJECTILES, inert with tracer	0425		930690
PROJECTILES with burster or expelling charge	0346		930690
PROJECTILES with burster or expelling charge	0347		930690
PROJECTILES with burster or expelling charge	0426		930690
PROJECTILES with burster or expelling charge	0427		930690
PROJECTILES with burster or expelling charge	0434		930690
PROJECTILES with burster or expelling charge	0435		930690
PROJECTILES with bursting charge	0167		930690
PROJECTILES with bursting charge	0168		930690
PROJECTILES with bursting charge	0169		930690
PROJECTILES with bursting charge	0324		930690
PROJECTILES with bursting charge	0344		930690
PROPADIENE, STABILIZED	2200		290129
PROPANE	1978		271112
PROPANETHIOLS	2402		293090
n-PROPANOL	1274		280512
PROPELLANT, LIQUID	0495		360200
PROPELLANT, LIQUID	0497		360200
PROPELLANT, SOLID	0498		360100
PROPELLANT, SOLID	0499		360100
PROPELLANT, SOLID	0501		360100
PROPIONALDEHYDE	1275		291219
PROPIONIC ACID with not less than 10% and less than 90% acid by mass	1848		291550
PROPIONIC ACID with not less than 90% acid by mass	3463		291550
PROPIONIC ANHYDRIDE	2496		291590
PROPIONITRILE	2404		292690
PROPYNYL CHLORIDE	1815		291590
n-PROPYL ACETATE	1276		291539
PROPYL ALCOHOL, NORMAL	1274		290512
PROPYLAMINE	1277		292119
n-PROPYLBENZENE	2364		290290
Propyl chloride: see	1278		290319
n-PROPYL CHLOROFORMATE	2740		291590

Name and description	UN No.	Note	NHM Code
PROPYLENE	1077		271114 290122
PROPYLENE CHLOROHYDRIN	2611		290559
1,2-PROPYLENEDIAMINE	2258		292129
Propylene dichloride: see	1279		290319
PROPYLENEIMINE, STABILIZED	1921		293399
PROPYLENE OXIDE	1280		291020
PROPYLENE TETRAMER	2850		290129
Propylene trimer: see	2057		290129
PROPYL FORMATES	1281		291513
n-PROPYL ISOCYANATE	2482		292910
Propyl mercaptan: see	2402		293090
n-PROPYL NITRATE	1865		292090
PROPYLTRICHLOROSILANE	1816		293100
Pyrazine hexahydrate: see	2579		293359
PYRETHROID PESTICIDE, LIQUID, FLAMMABLE, TOXIC, flash-point less than 23 °C	3350		380891
PYRETHROID PESTICIDE, LIQUID, TOXIC	3352		380891
PYRETHROID PESTICIDE, LIQUID, TOXIC, FLAMMABLE, flash-point not less than 23 °C	3351		380891
PYRETHROID PESTICIDE, SOLID, TOXIC	3349		380891
PYRIDINE	1282		293331
PYROPHORIC ALLOY, N.O.S.	1383		81++++
PYROPHORIC LIQUID, INORGANIC, N.O.S.	3194		28++++
PYROPHORIC LIQUID, ORGANIC, N.O.S.	2845		29++++
PYROPHORIC METAL, N.O.S.	1383		81++++
PYROPHORIC SOLID, INORGANIC, N.O.S.	3200		28++++
PYROPHORIC SOLID, ORGANIC, N.O.S.	2846		29++++
PYROSULPHURYL CHLORIDE	1817		281210
PYRROLIDINE	1922		293399
QUINOLINE	2656		293349
RADIOACTIVE MATERIAL, EXCEPTED PACKAGE - ARTICLES	2911		2844++
RADIOACTIVE MATERIAL, EXCEPTED PACKAGE - ARTICLES MANUFACTURED FROM NATURAL URANIUM or DEPLETED URANIUM or NATURAL THORIUM	2909		2844++
RADIOACTIVE MATERIAL, EXCEPTED PACKAGE - EMPTY PACKAGING	2908		2844++
RADIOACTIVE MATERIAL, EXCEPTED PACKAGE - INSTRUMENTS	2911		2844++
RADIOACTIVE MATERIAL, EXCEPTED PACKAGE - LIMITED QUANTITY OF MATERIAL	2910		2844++
RADIOACTIVE MATERIAL, LOW SPECIFIC ACTIVITY (LSA-I), non fissile or fissile-exception	2912		2844++
RADIOACTIVE MATERIAL, LOW SPECIFIC ACTIVITY (LSA-II), FISSILE	3324		2844++
RADIOACTIVE MATERIAL, LOW SPECIFIC ACTIVITY (LSA-II), non fissile or fissile-exception	3321		2844++
RADIOACTIVE MATERIAL, LOW SPECIFIC ACTIVITY (LSA-III), non fissile or fissile-exception	3322		2844++
RADIOACTIVE MATERIAL, LOW SPECIFIC ACTIVITY (LSA-III), FISSILE	3325		2844++
RADIOACTIVE MATERIAL, SURFACE CONTAMINATED OBJECTS (SCO-I or SCO-II), FISSILE	3326		2844++
RADIOACTIVE MATERIAL, SURFACE CONTAMINATED OBJECTS (SCO-I or SCO-II), non fissile or fissile-exception	2913		2844++
RADIOACTIVE MATERIAL, TRANSPORTED UNDER SPECIAL ARRANGEMENT, FISSILE	3331		2844++
RADIOACTIVE MATERIAL, TRANSPORTED UNDER SPECIAL ARRANGEMENT, non fissile or fissile-exception	2919		2844++
RADIOACTIVE MATERIAL, TYPE A PACKAGE, FISSILE, non-special form	3327		2844++
RADIOACTIVE MATERIAL, TYPE A PACKAGE, non-special form, non fissile or fissile-exception	2915		2844++
RADIOACTIVE MATERIAL, TYPE A PACKAGE, SPECIAL FORM, FISSILE	3333		2844++
RADIOACTIVE MATERIAL, TYPE A PACKAGE, SPECIAL FORM, non fissile or fissile-exception	3332		2844++
RADIOACTIVE MATERIAL, TYPE B(M) PACKAGE, FISSILE	3329		2844++
RADIOACTIVE MATERIAL, TYPE B(M) PACKAGE, non fissile or fissile-exception	2917		2844++
RADIOACTIVE MATERIAL, TYPE B(U) PACKAGE, FISSILE	3328		2844++
RADIOACTIVE MATERIAL, TYPE B(U) PACKAGE, non fissile or fissile-exception	2916		2844++
RADIOACTIVE MATERIAL, TYPE C PACKAGE, FISSILE	3330		2844++
RADIOACTIVE MATERIAL, TYPE C PACKAGE, non fissile or fissile-exception	3323		2844++
RADIOACTIVE MATERIAL, URANIUM HEXAFLUORIDE, FISSILE	2977		2844++
RADIOACTIVE MATERIAL, URANIUM HEXAFLUORIDE, non fissile or fissile-exception	2978		2844++
Rags, oily	1856	Exempt	5+++++
RDX AND CYCLOTETRAMETHYLENETETRANITRAMINE MIXTURE, DESENSITIZED with not less than 10% phlegmatiser by mass	0391		293369
RDX AND CYCLOTETRAMETHYLENETETRANITRAMINE MIXTURE, WETTED with not less than 15% water, by mass	0391		293369
RDX AND HMX MIXTURE, DESENSITIZED with not less than 10% phlegmatiser by mass	0391		293369
RDX AND HMX MIXTURE, WETTED with not less than 15% water, by mass	0391		293369
RDX AND OCTOGEN MIXTURE, DESENSITIZED with not less than 10% phlegmatiser by mass	0391		293369
RDX AND OCTOGEN MIXTURE, WETTED with not less than 15% water, by mass	0391		293369
RDX, DESENSITIZED	0483		293369
RDX, WETTED with not less than 15% water, by mass	0072		293369
RECEPTACLES, SMALL, CONTAINING GAS without a release device, non-refillable	2037		++++++
Red phosphorus: see	1338		280470
Reducing compound: see	1263		381400
Reducing compound: see	3066		381400
Reducing compound: see	3489		381400
Reducing compound: see	3470		381400

Name and description	UN No.	Note	NHM Code
REFRIGERANT GAS, N.O.S.	1078		38247+
REFRIGERANT GAS R 12	1028		290377
REFRIGERANT GAS R 12B1	1974		290376
REFRIGERANT GAS R 13	1022		290377
REFRIGERANT GAS R 13B1	1009		290376
REFRIGERANT GAS R 14	1982		290339
REFRIGERANT GAS R 21	1029		290379
REFRIGERANT GAS R 22	1018		290379
REFRIGERANT GAS R 23	1984		290339
REFRIGERANT GAS R 32	3252		290339
REFRIGERANT GAS R 40	1063		290311
REFRIGERANT GAS R 41	2454		290339
REFRIGERANT GAS R 114	1958		290377
REFRIGERANT GAS R 115	1020		290377
REFRIGERANT GAS R 116	2193		290339
REFRIGERANT GAS R 124	1021		290379
REFRIGERANT GAS R 125	3220		290339
REFRIGERANT GAS R 133a	1983		290379
REFRIGERANT GAS R 134a	3159		290339
REFRIGERANT GAS R 142b	2517		290379
REFRIGERANT GAS R 143a	2035		290339
REFRIGERANT GAS R 152a	1030		290339
REFRIGERANT GAS R 161	2453		290339
REFRIGERANT GAS R 218	2424		290339
REFRIGERANT GAS R 227	3296		290339
REFRIGERANT GAS R 404A	3337		382474
REFRIGERANT GAS R 407A	3338		382474
REFRIGERANT GAS R 407B	3339		382474
REFRIGERANT GAS R 407C	3340		382474
REFRIGERANT GAS R 500	2602		382479
REFRIGERANT GAS R 502	1973		382479
REFRIGERANT GAS R 503	2599		382471
REFRIGERANT GAS R 1113	1082		290377
REFRIGERANT GAS R 1132a	1959		290339
REFRIGERANT GAS R 1216	1858		290339
REFRIGERANT GAS R 1318	2422		290339
REFRIGERANT GAS RC 318	1976		290389
REFRIGERATING MACHINES containing flammable, non-toxic, liquefied gas	3358		8418++
REFRIGERATING MACHINES containing non-flammable, non-toxic gases or ammonia solutions (UN 2672)	2857		8418++
REGULATED MEDICAL WASTE, N.O.S.	3291		382530
RELEASE DEVICES, EXPLOSIVE	0173		360300
RESIN SOLUTION, flammable	1866		380690
RESORCINOL	2876		290721
RIVETS, EXPLOSIVE	0174		930690
Road oils at or above 100 °C and below its flash-point: see	3257		270600
Road oils with a flash-point above 60 °C, at or above its flash-point: see	3256		270600
Road oils with a flash-point not greater than 60 °C: see	1999		270600
ROCKET MOTORS	0186		930690
ROCKET MOTORS	0280		930690
ROCKET MOTORS	0281		930690
ROCKET MOTORS	0510		930690
ROCKET MOTORS, LIQUID FUELLED	0395		930690
ROCKET MOTORS, LIQUID FUELLED	0396		930690
ROCKET MOTORS WITH HYPERGOLIC LIQUIDS with or without expelling charge	0250		930690
ROCKET MOTORS WITH HYPERGOLIC LIQUIDS with or without expelling charge	0322		930690
ROCKETS with bursting charge	0180		930690
ROCKETS with bursting charge	0181		930690
ROCKETS with bursting charge	0182		930690
ROCKETS with bursting charge	0295		930690
ROCKETS with expelling charge	0436		930690
ROCKETS with expelling charge	0437		930690
ROCKETS with expelling charge	0438		930690
ROCKETS with inert head	0183		930690
ROCKETS with inert head	0502		930690
ROCKETS, LINE-THROWING	0238		930690
ROCKETS, LINE-THROWING	0240		930690
ROCKETS, LINE-THROWING	0453		930690
ROCKETS, LIQUID FUELLED with bursting charge	0397		930690
ROCKETS, LIQUID FUELLED with bursting charge	0398		930690
ROSIN OIL	1286		380690
RUBBER SCRAP, powdered or granulated	1345		400400
RUBBER SHODDY, powdered or granulated	1345		400400
RUBBER SOLUTION	1287		400520
RUBIDIUM	1423		280519
RUBIDIUM HYDROXIDE	2678		282590

Name and description	UN No.	Note	NHM Code
RUBIDIUM HYDROXIDE SOLUTION	2677		282590
Rubidium nitrate: see	1477		283429
SAFETY DEVICES, electrically initiated	3268	++++++	
SAFETY DEVICES, PYROTECHNIC	0503		870895
SAMPLES, EXPLOSIVE, other than initiating explosive	0190		360200
Seat-belt pretensioners: see	0503		870895
Seat-belt pretensioners: see	3268		870895
SEED CAKE with more than 1.5% oil and not more than 11% moisture	1386		2306++
SEED CAKE with not more than 1.5% oil and not more than 11% moisture	2217		2306++
SELENATES	2630		284290
SELENIC ACID	1905		281119
SELENITES	2630		284290
SELENIUM COMPOUND, LIQUID, N.O.S.	3440	++++++	
SELENIUM COMPOUND, SOLID, N.O.S.	3283	++++++	
SELENIUM DISULPHIDE	2657		281390
SELENIUM HEXAFLUORIDE	2194		281290
SELENIUM OXYCHLORIDE	2879		281210
SELF-HEATING LIQUID, CORROSIVE, INORGANIC, N.O.S.	3188		28++++
SELF-HEATING LIQUID, CORROSIVE, ORGANIC, N.O.S.	3185		29++++
SELF-HEATING LIQUID, INORGANIC, N.O.S.	3186		28++++
SELF-HEATING LIQUID, ORGANIC, N.O.S.	3183		29++++
SELF-HEATING LIQUID, TOXIC, INORGANIC, N.O.S.	3187		28++++
SELF-HEATING LIQUID, TOXIC, ORGANIC, N.O.S.	3184		29++++
SELF-HEATING SOLID, CORROSIVE, INORGANIC, N.O.S.	3192		28++++
SELF-HEATING SOLID, CORROSIVE, ORGANIC, N.O.S.	3126		29++++
SELF-HEATING SOLID, INORGANIC, N.O.S.	3190		28++++
SELF-HEATING SOLID, ORGANIC, N.O.S.	3088		29++++
SELF-HEATING SOLID, OXIDIZING, N.O.S.	3127	Prohibited	
SELF-HEATING SOLID, TOXIC, INORGANIC, N.O.S.	3191		28++++
SELF-HEATING SOLID, TOXIC, ORGANIC, N.O.S.	3128		29++++
SELF-REACTIVE LIQUID TYPE B	3221	++++++	
SELF-REACTIVE LIQUID TYPE B, TEMPERATURE CONTROLLED	3231	Prohibited	
SELF-REACTIVE LIQUID TYPE C	3223		++++++
SELF-REACTIVE LIQUID TYPE C, TEMPERATURE CONTROLLED	3233	Prohibited	
SELF-REACTIVE LIQUID TYPE D	3225		++++++
SELF-REACTIVE LIQUID TYPE D, TEMPERATURE CONTROLLED	3235	Prohibited	
SELF-REACTIVE LIQUID TYPE E	3227		++++++
SELF-REACTIVE LIQUID TYPE E, TEMPERATURE CONTROLLED	3237	Prohibited	
SELF-REACTIVE LIQUID TYPE F	3229		++++++
SELF-REACTIVE LIQUID TYPE F, TEMPERATURE CONTROLLED	3239	Prohibited	
SELF-REACTIVE SOLID TYPE B	3222		++++++
SELF-REACTIVE SOLID TYPE B, TEMPERATURE CONTROLLED	3232	Prohibited	
SELF-REACTIVE SOLID TYPE C	3224		++++++
SELF-REACTIVE SOLID TYPE C, TEMPERATURE CONTROLLED	3234	Prohibited	
SELF-REACTIVE SOLID TYPE D	3226		++++++
SELF-REACTIVE SOLID TYPE D, TEMPERATURE CONTROLLED	3236	Prohibited	
SELF-REACTIVE SOLID TYPE E	3228		++++++
SELF-REACTIVE SOLID TYPE E, TEMPERATURE CONTROLLED	3238	Prohibited	
SELF-REACTIVE SOLID TYPE F	3230		++++++
SELF-REACTIVE SOLID TYPE F, TEMPERATURE CONTROLLED	3240	Prohibited	
SELF-REACTIVE SUBSTANCES (list)		2.2.41.4	++++++
SHALE OIL	1288		270900 274900
Shellac: see	1263		3208++
Shellac: see	3066		3208++
Shellac: see	3469		3208++
Shellac: see	3470		3208++
SIGNAL DEVICES, HAND	0191		360490
SIGNAL DEVICES, HAND	0373		360490
SIGNALS, DISTRESS, ship	0194		360490
SIGNALS, DISTRESS, ship	0195		360490
SIGNALS, DISTRESS, ship	0505		360490
SIGNALS, DISTRESS, ship	0506		360490
SIGNALS, RAILWAY TRACK, EXPLOSIVE	0192		360490
SIGNALS, RAILWAY TRACK, EXPLOSIVE	0193		360490
SIGNALS, RAILWAY TRACK, EXPLOSIVE	0492		360490
SIGNALS, RAILWAY TRACK, EXPLOSIVE	0493		360490
SIGNALS, SMOKE	0196		360490
SIGNALS, SMOKE	0197		360490
SIGNALS, SMOKE	0313		360490
SIGNALS, SMOKE	0487		360490
SIGNALS, SMOKE	0507		360490
SILANE	2203		285000
SILICON POWDER, AMORPHOUS	1346		280461 280469

Name and description	UN No.	Note	NHM Code
SILICON TETRACHLORIDE	1818		281210
SILICON TETRAFLUORIDE	1859		281290
SILICON TETRAFLUORIDE, ADSORBED	3521		281290
SILVER ARSENITE	1683		284329
SILVER CYANIDE	1684		284329
SILVER NITRATE	1493		284321
SILVER PICRATE, WETTED with not less than 30% water, by mass	1347		284329
SLUDGE ACID	1906		280700 382569
SODA LIME with more than 4% sodium hydroxide	1907		282590
SODIUM	1428		280511
Sodium aluminate, solid	2812	Exempt	284190
SODIUM ALUMINATE SOLUTION	1819		284190
SODIUM ALUMINIUM HYDRIDE	2835		285000
SODIUM AMMONIUM VANADATE	2863		284190
SODIUM ARSANILATE	2473		293100
SODIUM ARSENATE	1685		284290
SODIUM ARSENITE, AQUEOUS SOLUTION	1686		284290
SODIUM ARSENITE, SOLID	2027		284290
SODIUM AZIDE	1687		285000
Sodium bifluoride: see	2439		282619
SODIUM BOROHYDRIDE	1426		285000
SODIUM BOROHYDRIDE AND SODIUM HYDROXIDE SOLUTION, with not more than 12% sodium borohydride and not more than 40% sodium hydroxide by mass	3320		285000
SODIUM BROMATE	1494		282990
SODIUM CACODYLATE	1688		293100
SODIUM CARBONATE PEROXYHYDRATE	3378		283699
SODIUM CHLORATE	1495		282911
SODIUM CHLORATE, AQUEOUS SOLUTION	2428		282911
SODIUM CHLORITE	1496		282890
SODIUM CHLOROACETATE	2659		291540
SODIUM CUPROCYANIDE, SOLID	2316		283720
SODIUM CUPROCYANIDE SOLUTION	2317		283720
SODIUM CYANIDE, SOLID	1689		283711
SODIUM CYANIDE SOLUTION	3414		283711
SODIUM DINITRO- <i>o</i> -CRESOLATE, dry or wetted with less than 15% water, by mass	0234		290899
SODIUM DINITRO- <i>o</i> -CRESOLATE, WETTED with not less than 10% water, by mass	3369		290899
SODIUM DINITRO- <i>o</i> -CRESOLATE, WETTED with not less than 15% water, by mass	1348		290899
SODIUM DITHIONITE	1384		283110
SODIUM FLUORIDE, SOLID	1690		282619
SODIUM FLUORIDE SOLUTION	3415		282619
SODIUM FLUOROACETATE	2629		291590
SODIUM FLUOROSILICATE	2674		282690
Sodium hydrate: see	1824		281512
SODIUM HYDRIDE	1427		285000
SODIUM HYDROGENDIFLUORIDE	2439		282619
SODIUM HYDROSULPHIDE with less than 25% water of crystallization	2318		283010
SODIUM HYDROSULPHIDE, HYDRATED with not less than 25% water of crystallization	2949		283010
SODIUM HYDROSULPHITE	1384		283110
SODIUM HYDROXIDE, SOLID	1823		281511
SODIUM HYDROXIDE SOLUTION	1824		281512
Sodium metasilicate pentahydrate: see	3253		283911
SODIUM METHYLATE	1431		290519
SODIUM METHYLATE SOLUTION in alcohol	1289		290519
SODIUM MONOXIDE	1825		282590
SODIUM NITRATE	1498		310250
SODIUM NITRATE AND POTASSIUM NITRATE MIXTURE	1499		283429
SODIUM NITRITE	1500		283410
SODIUM PENTACHLOROPHENATE	2567		290819
SODIUM PERBORATE MONOHYDRATE	3377		284030
SODIUM PERCHLORATE	1502		282990
SODIUM PERMANGANATE	1503		284169
SODIUM PEROXIDE	1504		281530
SODIUM PEROXBORATE, ANHYDROUS	3247		284030
SODIUM PERSULPHATE	1505		283340
SODIUM PHOSPHIDE	1432		284800
SODIUM PICRAMATE, dry or wetted with less than 20% water, by mass	0235		292229
SODIUM PICRAMATE, WETTED with not less than 20% water, by mass	1349		292229
SODIUM SULPHIDE with less than 30% water of crystallization	1385		283010
SODIUM SULPHIDE, ANHYDROUS	1385		283010
SODIUM SULPHIDE, HYDRATED with not less than 30% water	1849		283010
SODIUM SUPEROXIDE	2547		281530
SOLIDS CONTAINING CORROSIVE LIQUID, N.O.S.	3244		++++++
SOLIDS CONTAINING FLAMMABLE LIQUID, N.O.S. having a flash-point up to 60 °C	3175		++++++
SOLIDS CONTAINING TOXIC LIQUID, N.O.S.	3243		++++++

Name and description	UN No.	Note	NHM Code
SOUNDING DEVICES, EXPLOSIVE	0204		360490
SOUNDING DEVICES, EXPLOSIVE	0296		360490
SOUNDING DEVICES, EXPLOSIVE	0374		360490
SOUNDING DEVICES, EXPLOSIVE	0375		360490
Stain: see	1263		3208++
Stain: see	3066		3208++
Stain: see	3469		3208++
Stain: see	3470		3208++
Stain: see	3066		3208++
STANNIC CHLORIDE, ANHYDROUS	1827		282739
STANNIC CHLORIDE PENTAHYDRATE	2440		282739
STANNIC PHOSPHIDES	1433		284800
STIBINE	2676		285000
Straw	1327	Exempt	121300
STRONTIUM ARSENITE	1691		284290
STRONTIUM CHLORATE	1506		282919
STRONTIUM NITRATE	1507		283429
STRONTIUM PERCHLORATE	1508		282990
STRONTIUM PEROXIDE	1509		281640
STRONTIUM PHOSPHIDE	2013		284800
STRYCHNINE	1692		293999
STRYCHNINE SALTS	1692		293999
STYPHNIC ACID, dry or wetted with less than 20% water, or mixture of alcohol and water, by mass	0219		290899
STYPHNIC ACID, WETTED with not less than 20% water, or mixture of alcohol and water, by mass	0394		290899
STYRENE MONOMER, STABILIZED	2055		290250
SUBSTANCES, EVI, N.O.S.	0482		360200
SUBSTANCES, EXPLOSIVE, N.O.S.	0357		360200
SUBSTANCES, EXPLOSIVE, N.O.S.	0358		360200
SUBSTANCES, EXPLOSIVE, N.O.S.	0359		360200
SUBSTANCES, EXPLOSIVE, N.O.S.	0473	Prohibited	
SUBSTANCES, EXPLOSIVE, N.O.S.	0474		360200
SUBSTANCES, EXPLOSIVE, N.O.S.	0475		360200
SUBSTANCES, EXPLOSIVE, N.O.S.	0476		360200
SUBSTANCES, EXPLOSIVE, N.O.S.	0477		360200
SUBSTANCES, EXPLOSIVE, N.O.S.	0478		360200
SUBSTANCES, EXPLOSIVE, N.O.S.	0479		360200
SUBSTANCES, EXPLOSIVE, N.O.S.	0480		360200
SUBSTANCES, EXPLOSIVE, N.O.S.	0481		360200
SUBSTANCES, EXPLOSIVE, N.O.S.	0485		360200
SUBSTANCES, EXPLOSIVE, VERY INSENSITIVE, N.O.S.	0482		360200
SUBSTITUTED NITROPHENOL PESTICIDE, LIQUID, FLAMMABLE, TOXIC, flash-point less than 23 °C	2780		380893
SUBSTITUTED NITROPHENOL PESTICIDE, LIQUID, TOXIC	3014		380893
SUBSTITUTED NITROPHENOL PESTICIDE, LIQUID, TOXIC, FLAMMABLE, flash-point not less than 23 °C	3013		380893
SUBSTITUTED NITROPHENOL PESTICIDE, SOLID, TOXIC	2779		380893
SULPHAMIC ACID	2967		281119
SULPHUR	1350		250300 280200
SULPHUR CHLORIDES	1828		281210
SULPHUR DIOXIDE	1079		281129
SULPHUR HEXAFLUORIDE	1080		281290
SULPHURIC ACID with more than 51% acid	1830		280700
SULPHURIC ACID with not more than 51% acid	2796		280700
SULPHURIC ACID, FUMING	1831		280700
SULPHURIC ACID, SPENT	1832		280700 382569
SULPHUR, MOLTEN	2448		250300
SULPHUROUS ACID	1833		281119
SULPHUR TETRAFLUORIDE	2418		281290
SULPHUR TRIOXIDE, STABILIZED	1829		281129
SULPHURYL CHLORIDE	1834		281210
SULPHURYL FLUORIDE	2191		281290
Table tennis balls, see	2000		950640
Tars, liquid, including road oils, and cutback bitumens, at or above 100 °C and below its flash-point: see	3257		270600
Tars, liquid, including road oils, and cutback bitumens, with a flash-point above 60 °C, at or above its flash-point: see	3256		270600
TARS, LIQUID, including road oils, and cutback bitumens	1999		270600
TEAR GAS CANDLES	1700		930690
TEAR GAS SUBSTANCE, LIQUID, N.O.S.	1683		++++++
TEAR GAS SUBSTANCE, SOLID, N.O.S.	3448		++++++
TELLURIUM COMPOUND, N.O.S.	3284		28++++
TELLURIUM HEXAFLUORIDE	2195		281290
TERPENE HYDROCARBONS, N.O.S.	2319		290219
TERPINOLENE	2541		3805++
TETRABROMOETHANE	2504		290339

Name and description	UN No	Note	NHM Code
1,1,2,2-TETRACHLOROETHANE	1702		290319
TETRACHLOROETHYLENE	1897		290323
TETRAETHYL DITHIOPYROPHOSPHATE	1704		292019
TETRAETHYLENEPENTAMINE	2320		292129
Tetraethyl lead: see	1649		381111
TETRAETHYL SILICATE	1292		292090
1,1,1,2-TETRAFLUOROETHANE	3159		290339
TETRAFLUOROETHYLENE, STABILIZED	1081		290339
TETRAFLUOROMETHANE	1982		290339
1,2,3,6-TETRAHYDROBENZALDEHYDE	2498		291229
TETRAHYDROFURAN	2056		293211
TETRAHYDROFURFYLAMINE	2943		293219
TETRAHYDROPHthalic ANHYDRIDES with more than 0.05% of maleic anhydride	2698		293499
1,2,3,6-TETRAHYDROPYRIDINE	2410		293339
TETRAHYDROTHIOPHENE	2412		293499
Tetramethoxysilane: see	2606		292090
TETRAMETHYLAMMONIUM HYDROXIDE, SOLID	3423		292390
TETRAMETHYLAMMONIUM HYDROXIDE SOLUTION	1835		292390
Tetramethyl lead: see	1649		381111
TETRAMETHYLSILANE	2749		293100
TETRANITROANILINE	0207		292142
TETRANITROMETHANE	1510		290420
TETRAPROPYL ORTHOTITANATE	2413		292090
TETRAZENE, WETTED with not less than 30% water, or mixture of alcohol and water, by mass	0114	Prohibited	
TETRAZOL-1-ACETIC ACID	0407		293399
1H-TETRAZOLE	0504		293399
TETRYL	0208		292149
Textile waste, wet	1857	Exempt	5+++++
THALLIUM CHLORATE	2573		282990
THALLIUM COMPOUND, N.O.S.	1707		++++++
THALLIUM NITRATE	2727		283429
4-THIAPENTANAL	2785		293090
Thia-4-pentanal: see	2785		293090
THIOACETIC ACID	2436		293090
THiocarbamate PESTICIDE, LIQUID, FLAMMABLE, TOXIC, flash-point less than 23 °C	2772		380893
THiocarbamate PESTICIDE, LIQUID, TOXIC	3006		380893
THiocarbamate PESTICIDE, LIQUID, TOXIC, FLAMMABLE, flash-point not less than 23 °C	3005		380893
THiocarbamate PESTICIDE, SOLID, TOXIC	2771		380893
THIOGLYCOL	2966		293090
THIOGLYCOLIC ACID	1940		293090
THIOLACTIC ACID	2936		293090
THIONYL CHLORIDE	1836		281210
THIOPHENE	2414		293499
THIOPHOSGENE	2474		293090
THIOPHOSPHORYL CHLORIDE	1837		281210
THIOUREA DIOXIDE	3341		293090
TINCTURES, MEDICINAL	1293		300490
TITANIUM DISULPHIDE	3174		283090
TITANIUM HYDRIDE	1871		285000
TITANIUM POWDER, DRY	2546		810820
TITANIUM POWDER, WETTED with not less than 25% water	1352		810820
TITANIUM SPONGE GRANULES	2878		810820
TITANIUM SPONGE POWDERS	2878		810820
TITANIUM TETRACHLORIDE	1838		282739
TITANIUM TRICHLORIDE MIXTURE	2869		282739
TITANIUM TRICHLORIDE MIXTURE, PYROPHORIC	2441		282739
TITANIUM TRICHLORIDE, PYROPHORIC	2441		282739
TNT AND HEXANITROSTILBENE MIXTURE	0388		290420
TNT AND TRINITROBENZENE MIXTURE	0388		290420
TNT, dry or wetted with less than 30% water, by mass	0209		290420
TNT MIXTURE CONTAINING TRINITROBENZENE AND HEXANITROSTILBENE	0389		290420
TNT, WETTED with not less than 10% water, by mass	3366		290420
TNT, WETTED with not less than 30% water, by mass	1356		290420
TOLUENE	1294		290230
			270720
TOLUENE DIISOCYANATE	2078		292910
TOLUIDINES, LIQUID	1708		292143
TOLUIDINES, SOLID	3451		292143
2,4-TOLUYLENEDIAMINE, SOLID	1709		292151
2,4-TOLUYLENEDIAMINE SOLUTION	3418		292151
TORPEDOES with bursting charge	0329		930690
TORPEDOES with bursting charge	0330		930690
TORPEDOES with bursting charge	0451		930690
TORPEDOES, LIQUID FUELLED with inert head	0450		930690
TORPEDOES, LIQUID FUELLED with or without bursting charge	0449		930690

Name and description	UN No	Note	NHM Code
TOXIC BY INHALATION LIQUID, CORROSIVE, N.O.S. with an LC <sub>50</sub> lower than or equal to 1000 ml/m <sup>3</sup> and saturated vapour concentration greater than or equal to 10 LC <sub>50</sub>	3390		++++++
TOXIC BY INHALATION LIQUID, CORROSIVE, N.O.S. with an LC <sub>50</sub> lower than or equal to 200 ml/m <sup>3</sup> and saturated vapour concentration greater than or equal to 500 LC <sub>50</sub>	3389		++++++
TOXIC BY INHALATION LIQUID, FLAMMABLE, CORROSIVE, N.O.S. with an LC <sub>50</sub> lower than or equal to 200 ml/m <sup>3</sup> and saturated vapour concentration greater than or equal to 500 LC <sub>50</sub>	3488		++++++
TOXIC BY INHALATION LIQUID, FLAMMABLE, CORROSIVE, N.O.S. with an LC <sub>50</sub> lower than or equal to 1000 ml/m <sup>3</sup> and saturated vapour concentration greater than or equal to 10 LC <sub>50</sub>	3489		++++++
TOXIC BY INHALATION LIQUID, FLAMMABLE, N.O.S. with an LC <sub>50</sub> lower than or equal to 200 ml/m <sup>3</sup> and saturated vapour concentration greater than or equal to 500 LC <sub>50</sub>	3383		++++++
TOXIC BY INHALATION LIQUID, FLAMMABLE, N.O.S. with an LC <sub>50</sub> lower than or equal to 1000 ml/m <sup>3</sup> and saturated vapour concentration greater than or equal to 10 LC <sub>50</sub>	3384		++++++
TOXIC BY INHALATION LIQUID, N.O.S. with an LC <sub>50</sub> lower than or equal to 1000 ml/m <sup>3</sup> and saturated vapour concentration greater than or equal to 10 LC <sub>50</sub>	3382		++++++
TOXIC BY INHALATION LIQUID, N.O.S. with an LC <sub>50</sub> lower than or equal to 200 ml/m <sup>3</sup> and saturated vapour concentration greater than or equal to 500 LC <sub>50</sub>	3381		++++++
TOXIC BY INHALATION LIQUID, OXIDIZING, N.O.S. with an LC <sub>50</sub> lower than or equal to 200 ml/m <sup>3</sup> and saturated vapour concentration greater than or equal to 500 LC <sub>50</sub>	3387		++++++
TOXIC BY INHALATION LIQUID, OXIDIZING, N.O.S. with an LC <sub>50</sub> lower than or equal to 1000 ml/m <sup>3</sup> and saturated vapour concentration greater than or equal to 10 LC <sub>50</sub>	3388		++++++
TOXIC BY INHALATION LIQUID, WATER-REACTIVE, FLAMMABLE, N.O.S. with an LC <sub>50</sub> lower than or equal to 200 ml/m <sup>3</sup> and saturated vapour concentration greater than or equal to 500 LC <sub>50</sub>	3490		++++++
TOXIC BY INHALATION LIQUID, WATER-REACTIVE, FLAMMABLE, N.O.S. with an LC <sub>50</sub> lower than or equal to 1000 ml/m <sup>3</sup> and saturated vapour concentration greater than or equal to 10 LC <sub>50</sub>	3491		++++++
TOXIC BY INHALATION LIQUID, WATER-REACTIVE, N.O.S. with an LC <sub>50</sub> lower than or equal to 1000 ml/m <sup>3</sup> and saturated vapour concentration greater than or equal to 10 LC <sub>50</sub>	3386		++++++
TOXIC BY INHALATION LIQUID, WATER-REACTIVE, N.O.S. with an LC <sub>50</sub> lower than or equal to 200 ml/m <sup>3</sup> and saturated vapour concentration greater than or equal to 500 LC <sub>50</sub>	3385		++++++
TOXIC LIQUID, CORROSIVE, INORGANIC, N.O.S.	3289		28++++
TOXIC LIQUID, CORROSIVE, ORGANIC, N.O.S.	2927		29++++
TOXIC LIQUID, FLAMMABLE, ORGANIC, N.O.S.	2929		29++++
TOXIC LIQUID, INORGANIC, N.O.S.	3287		28++++
TOXIC LIQUID, ORGANIC, N.O.S.	2810		29++++
TOXIC LIQUID, OXIDIZING, N.O.S.	3122		++++++
TOXIC LIQUID, WATER-REACTIVE, N.O.S.	3123		++++++
TOXIC SOLID, CORROSIVE, INORGANIC, N.O.S.	3290		28++++
TOXIC SOLID, CORROSIVE, ORGANIC, N.O.S.	2928		29++++
TOXIC SOLID, FLAMMABLE, ORGANIC, N.O.S.	2930		29++++
TOXIC SOLID, INORGANIC, N.O.S.	3288		28++++
TOXIC SOLID, ORGANIC, N.O.S.	2811		29++++
TOXIC SOLID, OXIDIZING, N.O.S.	3086		++++++
TOXIC SOLID, SELF-HEATING, N.O.S.	3124		++++++
TOXIC SOLID, WATER-REACTIVE, N.O.S.	3125		++++++
TOXINS, EXTRACTED FROM LIVING SOURCES, LIQUID, N.O.S.	3172		300290
TOXINS, EXTRACTED FROM LIVING SOURCES, SOLID, N.O.S.	3462		300290
TRACERS FOR AMMUNITION	0212		360490
TRACERS FOR AMMUNITION	0306		360490
Tremolite: see	2212		252490
TRIALLYLAMINE	2610		292119
TRIALLYL BORATE	2609		292090
TRIAZINE PESTICIDE, LIQUID, FLAMMABLE, TOXIC, flash-point less than 23 °C	2764		380893
TRIAZINE PESTICIDE, LIQUID, TOXIC	2998		380893
TRIAZINE PESTICIDE, LIQUID, TOXIC, FLAMMABLE, flash-point not less than 23 °C	2997		380893
TRIAZINE PESTICIDE, SOLID, TOXIC	2763		380893
TRIBUTYLAMINE	2542		292119
TRIBUTYLPHOSPHANE	3254		293100
TRICHLOROACETIC ACID	1839		291540
TRICHLOROACETIC ACID SOLUTION	2564		291540
TRICHLOROACETYL CHLORIDE	2442		291590
TRICHLOROBENZENES, LIQUID	2321		290399
TRICHLOROBUTENE	2322		290329
1,1,1-TRICHLOROETHANE	2831		290319
TRICHLOROETHYLENE	1710		290322
TRICHLOROISOCYANURIC ACID, DRY	2468		293369
TRICHLOROSILANE	1295		281290
TRICRESYL PHOSPHATE with more than 3% ortho isomer	2574		291990
TRIETHYLAMINE	1296		292119
TRIETHYLENETETRAMINE	2259		292129
TRIETHYL PHOSPHITE	2323		292090

Name and description	UN No.	Note	NHM Code
TRIFLUOROACETIC ACID	2699		291590
TRIFLUOROACETYL CHLORIDE	3057		291590
TRIFLUOROCHLOROETHYLENE, STABILIZED	1082		290377
1,1,1-TRIFLUOROETHANE	2035		290339
TRIFLUROMETHANE	1984		290339
TRIFLUROMETHANE, REFRIGERATED LIQUID	3136		290339
2-TRIFLUOROMETHYLANILINE	2942		292143
3-TRIFLUOROMETHYLANILINE	2948		292143
TRIISOBUTYLENE	2324		290129
TRIISOPROPYL BORATE	2616		292090
TRIMETHYLACETYL CHLORIDE	2438		291590
TRIMETHYLAMINE, ANHYDROUS	1083		292111
TRIMETHYLAMINE, AQUEOUS SOLUTION, not more than 50% trimethylamine, by mass	1297		292111
1,3,5-TRIMETHYLBENZENE	2325		290290
TRIMETHYL BORATE	2416		292090
TRIMETHYLCHLOROSILANE	1298		293100
TRIMETHYLCYCLO-HEXYLAMINE	2326		292130
TRIMETHYLHEXAMETHYLENEDIAMINES	2327		292129
TRIMETHYLHEXAMETHYLENE DIISOCYANATE	2328		292910
TRIMETHYL PHOSPHITE	2329		292090
TRINITROANILINE	0153		292142
TRINITROANISOLE	0213		290930
TRINITROBENZENE, dry or wetted with less than 30% water, by mass	0214		290420
TRINITROBENZENE, WETTED with not less than 10% water, by mass	3367		290420
TRINITROBENZENE, WETTED with not less than 30% water, by mass	1354		290420
TRINITROBENZENESULPHONIC ACID	0386		290490
TRINITROBENZOIC ACID, dry or wetted with less than 30% water, by mass	0215		291639
TRINITROBENZOIC ACID, WETTED with not less than 10% water, by mass	3368		291639
TRINITROBENZOIC ACID, WETTED with not less than 30% water, by mass	1355		291639
TRINITROCHLOROBENZENE	0155		290490
TRINITROCHLOROBENZENE WETTED with not less than 10% water, by mass	3365		290490
TRINITRO-m-CRESOL	0216		290899
TRINITROFLUORENONE	0387		291470
TRINITRONAPHTHALENE	0217		290420
TRINITROPHENETOLE	0218		290899
TRINITROPHENOL, dry or wetted with less than 30% water, by mass	0154		290899
TRINITROPHENOL WETTED with not less than 10% water, by mass	3364		290899
TRINITROPHENOL, WETTED with not less than 30% water, by mass	1344		290899
TRINITROPHENYLMETHYLNITRAMINE	0208		292149
TRINITRORESORCINOL, dry or wetted with less than 20% water, or mixture of alcohol and water, by mass	0219		290899
TRINITRORESORCINOL, WETTED with not less than 20% water, or mixture of alcohol and water, by mass	0394		290899
TRINITROTOLUENE AND HEXANITROSTILBENE MIXTURE	0388		290420
TRINITROTOLUENE AND TRINITROBENZENE MIXTURE	0388		290420
TRINITROTOLUENE, dry or wetted with less than 30% water, by mass	0209		290420
TRINITROTOLUENE MIXTURE CONTAINING TRINITROBENZENE AND HEXANITROSTILBENE	0389		290420
TRINITROTOLUENE, WETTED with not less than 10% water, by mass	3366		290420
TRINITROTOLUENE, WETTED with not less than 30% water, by mass	1356		290420
TRIPROPYLAMINE	2260		292119
TRIPROPYLENE	2057		290129
TRIS-(1-AZIRIDINYL) PHOSPHINE OXIDE SOLUTION	2501		293399
TRITONAL	0390		360200
TUNGSTEN HEXAFLUORIDE	2196		282619
TURPENTINE	1299		380510
TURPENTINE SUBSTITUTE	1300		272100
UNDECANE	2330		290110
URANIUM HEXAFLUORIDE, RADIOACTIVE MATERIAL, EXCEPTED PACKAGE, less than 0.1 kg per package, non-fissile or fissile-excepted	3507		2844++
UREA HYDROGEN PEROXIDE	1511		292419
UREA NITRATE, dry or wetted with less than 20% water, by mass	0220		292419
UREA NITRATE, WETTED with not less than 10% water, by mass	3370		292419
UREA NITRATE, WETTED with not less than 20% water, by mass	1357		292419
VALERALDEHYDE	2058		291219
VALERYL CHLORIDE	2502		291590
VANADIUM COMPOUND, N.O.S.	3285		++++++
VANADIUM OXYTRICHLORIDE	2443		282749
VANADIUM PENTOXIDE, non-fused form	2862		282530
VANADIUM TETRACHLORIDE	2444		282739
VANADIUM TRICHLORIDE	2475		282739
VANADYL SULPHATE	2931		283329
Varnish: see	1263		3208++
Varnish: see	3066		3208++
Varnish: see	3469		3208++
Varnish: see	3470		3208++

Name and description	UN No.	Note	NHM Code
VEHICLE, FLAMMABLE GAS POWERED	3166		8407++
VEHICLE, FLAMMABLE LIQUID POWERED	3166		8407++
VEHICLE, FUEL CELL, FLAMMABLE GAS POWERED	3166		8407++
VEHICLE, FUEL CELL, FLAMMABLE LIQUID POWERED	3166		8407++
Vehicle under coating: see	1139		3208++
VINYL ACETATE, STABILIZED	1301		291532
Vinylbenzene: see	2055		290250
VINYL BROMIDE, STABILIZED	1085		290339
VINYL BUTYRATE, STABILIZED	2838		291560
VINYL CHLORIDE, STABILIZED	1086		290321
VINYL CHLOROACETATE	2589		291540
VINYL ETHYL ETHER, STABILIZED	1302		290919
VINYL FLUORIDE, STABILIZED	1860		290339
VINYLDENE CHLORIDE, STABILIZED	1303		290329
VINYL ISOBUTYL ETHER, STABILIZED	1304		290919
VINYL METHYL ETHER, STABILIZED	1087		290919
VINYL PYRIDINES, STABILIZED	3073		293339
VINYL TOLUENES, STABILIZED	2618		290290
VINYLTRICHLOROSILANE	1305		293100
WARHEADS, ROCKET with burster or expelling charge	0370		930690
WARHEADS, ROCKET with burster or expelling charge	0371		930690
WARHEADS, ROCKET with bursting charge	0286		930690
WARHEADS, ROCKET with bursting charge	0287		930690
WARHEADS, ROCKET with bursting charge	0369		930690
WARHEADS, TORPEDO with bursting charge	0221		930690
Wastes containing flammable liquid, n.o.s. having a flash-point up to 60 °C: see	3175		++++++
WATER-REACTIVE LIQUID, CORROSIVE, N.O.S.	3129		++++++
WATER-REACTIVE LIQUID, N.O.S.	3148		++++++
WATER-REACTIVE LIQUID, TOXIC, N.O.S.	3130		++++++
WATER-REACTIVE SOLID, CORROSIVE, N.O.S.	3131		++++++
WATER-REACTIVE SOLID, FLAMMABLE, N.O.S.	3132		++++++
WATER-REACTIVE SOLID, N.O.S.	2813		++++++
WATER-REACTIVE SOLID, OXIDIZING, N.O.S.	3133	Prohibited	
WATER-REACTIVE SOLID, SELF-HEATING, N.O.S.	3135		++++++
WATER-REACTIVE SOLID, TOXIC, N.O.S.	3134		++++++
White spirit: see	1300		272100
WOOD PRESERVATIVES, LIQUID	1306		++++++
Wool waste, wet	1387	Exempt	5++++
XANTHATES	3342		293090
XENON	2036		280429
XENON, REFRIGERATED LIQUID	2591		280429
XYLENES	1307		29024+ 270730
XYLENOLS, LIQUID	3430		290719
XYLENOLS, SOLID	2261		290719
XYLIDINES, LIQUID	1711		292149
XYLIDINES, SOLID	3452		292149
XYLYL BROMIDE, LIQUID	1701		290399
XYLYL BROMIDE, SOLID	3417		290399
ZINC AMMONIUM NITRITE	1512		283410
ZINC ARSENATE	1712		284290
ZINC ARSENATE AND ZINC ARSENITE MIXTURE	1712		284290
ZINC ARSENITE	1712		284290
ZINC ASHES	1435		262019
ZINC BROMATE	2469		282990
ZINC CHLORATE	1513		282919
ZINC CHLORIDE, ANHYDROUS	2331		282739
ZINC CHLORIDE SOLUTION	1840		282739
ZINC CYANIDE	1713		283719
ZINC DITHIONITE	1931		283190
ZINC DUST	1436		790310
ZINC FLUOROSILICATE	2855		282690
ZINC HYDROSULPHITE	1931		283190
ZINC NITRATE	1514		283429
ZINC PERMANGANATE	1515		284169
ZINC PEROXIDE	1516		281700
ZINC PHOSPHIDE	1714		284800
ZINC POWDER	1436		790310
ZINC RESINATE	2714		380620
ZIRCONIUM, DRY, coiled wire, finished metal sheets, strip (thinner than 254 microns but not thinner than 18 microns)	2858		810990
ZIRCONIUM, DRY, finished sheets, strip or coiled wire	2009		810990
ZIRCONIUM HYDRIDE	1437		285000
ZIRCONIUM NITRATE	2728		283429
ZIRCONIUM PICRAMATE, dry or wetted with less than 20% water, by mass	0236		292229

Name and description	UN No.	Note	NHM Code
ZIRCONIUM PICRAMATE, WETTED with not less than 20% water, by mass	1517		292229
ZIRCONIUM POWDER, DRY	2008		810920
ZIRCONIUM POWDER, WETTED with not less than 25% water	1358		810920
ZIRCONIUM SCRAP	1932		810930
ZIRCONIUM SUSPENDED IN A FLAMMABLE LIQUID	1308		810920
ZIRCONIUM TETRACHLORIDE	2503		282739

### Chapter 3.3 Special provisions applicable to certain articles or substances

3.3.1 When Column (6) of Table A of Chapter 3.2 indicates that a special provision is relevant to a substance or article, the meaning and requirements of that special provision are as set forth below. Where a special provision includes a requirement for package marking, the provisions of 5.2.1.2 (a) and (b) shall be met. If the required mark is in the form of specific wording indicated in quotation marks, such as "DAMAGED LITHIUM BATTERIES", the size of the mark shall be at least 12 mm, unless otherwise indicated in the special provision or elsewhere in RID.

16 Samples of new or existing explosive substances or articles may be carried as directed by the competent authorities (see 2.2.1.1.3) for purposes including: testing, classification, research and development, quality control, or as a commercial sample. Explosive samples which are not wetted or desensitized shall be limited to 10 kg in small packages as specified by the competent authorities. Explosive samples which are wetted or desensitized shall be limited to 25 kg.

23 Even though this substance has a flammability hazard, it only exhibits such hazard under extreme fire conditions in confined areas.

32 This substance is not subject to the requirements of RID when in any other form.

37 This substance is not subject to the requirements of RID when coated.

38 This substance is not subject to the requirements of RID when it contains not more than 0.1% calcium carbide.

39 This substance is not subject to the requirements of RID when it contains less than 30% or not less than 90% silicon.

43 When offered for carriage as pesticides, these substances shall be carried under the relevant pesticide entry and in accordance with the relevant pesticide provisions (see 2.2.61.1.10 to 2.2.61.1.11.2).

45 Antimony sulphides and oxides which contain not more than 0.5% of arsenic calculated on the total mass are not subject to the requirements of RID.

47 Ferricyanides and ferrocyanides are not subject to the requirements of RID.

48 The carriage of this substance, when it contains more than 20% hydrocyanic acid, is prohibited.

59 These substances are not subject to the requirements of RID when they contain not more than 50% magnesium.

60 If the concentration is more than 72%, the carriage of this substance is prohibited.

61 The technical name which shall supplement the proper shipping name shall be the ISO common name (see also ISO 1750:1981 "Pesticides and other agrochemicals - common names", as amended), other name listed in the WHO "Recommended Classification of Pesticides by Hazard and Guidelines to Classification" or the name of the active substance (see also 3.1.2.8.1 and 3.1.2.8.1.1).

62 This substance is not subject to the requirements of RID when it contains not more than 4% sodium hydroxide.

65 Hydrogen peroxide aqueous solutions with less than 8% hydrogen peroxide are not subject to the requirements of RID.

66 Cinnabar is not subject to the requirements of RID.

103 The carriage of ammonium nitrites and mixtures of an inorganic nitrite with an ammonium salt is prohibited.

105 Nitrocellulose meeting the descriptions of UN No. 2556 or UN No. 2557 may be classified in Class 4.1.

113 The carriage of chemically unstable mixtures is prohibited.

119 Refrigerating machines include machines or other appliances which have been designed for the specific purpose of keeping food or other items at a low temperature in an internal compartment, and air conditioning units. Refrigerating machines and refrigerating machine components are not subject to the provisions of RID if they contain less than 12 kg of gas in Class 2, group A or O according to 2.2.2.1.3, or if they contain less than 12 litres ammonia solution (UN No. 2672).

122 The subsidiary risks and the UN number (generic entry) for each of the currently assigned organic peroxide formulations are given in 2.2.52.4, 4.1.4.2 packing instruction IBC 520 and 4.2.5.2.6 portable tank instruction T 23.

123 (Reserved)

127 Other inert material or inert material mixture may be used, provided this inert material has identical phlegmatizing properties.

131 The phlegmatized substance shall be significantly less sensitive than dry PETN.

135 The dihydrated sodium salt of dichloroisocyanuric acid does not meet the criteria for inclusion in Class 5.1 and is not subject to RID unless meeting the criteria for inclusion in another Class.

138 p-Bromobenzyl cyanide is not subject to the requirements of RID.

141 Products which have undergone sufficient heat treatment so that they present no hazard during carriage are not subject to the requirements of RID.

142 Solvent extracted soya bean meal containing not more than 1.5% oil and 11% moisture, which is substantially free of flammable solvent, is not subject to the requirements of RID.

144 An aqueous solution containing not more than 24% alcohol by volume is not subject to the requirements of RID.

145 Alcoholic beverages of packing group III, when carried in receptacles of 250 litres or less, are not subject to the requirements of RID.

152 The classification of this substance will vary with particle size and packaging, but borderlines have not been experimentally determined. Appropriate classifications shall be made in accordance with 2.2.1.

153 This entry applies only if it is demonstrated, on the basis of tests, that the substances when in contact with water are not combustible nor show a tendency to auto-ignition and that the mixture of gases evolved is not flammable.

162 (Deleted)

163 A substance mentioned by name in Table A of Chapter 3.2 shall not be carried under this entry. Substances carried under this entry may contain 20% or less nitrocellulose provided the nitrocellulose contains not more than 12.6% nitrogen (by dry mass).

168 Asbestos which is immersed or fixed in a natural or artificial binder (such as cement, plastics, asphalt, resins or mineral ore) in such a way that no escape of hazardous quantities of respirable asbestos fibres can occur during carriage is not subject to the requirements of RID. Manufactured articles containing asbestos and not meeting this provision are nevertheless not subject to the requirements of RID when packed so that no escape of hazardous quantities of respirable asbestos fibres can occur during carriage.

169 Phthalic anhydride in the solid state and tetrahydrophthalic anhydrides, with not more than 0.05% maleic anhydride, are not subject to the requirements of RID. Phthalic anhydride molten at a temperature above its flash-point, with not more than 0.05% maleic anhydride, shall be classified under UN No. 3256.

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

- The substance shall be allocated to packing group I, II or III, if appropriate, by application of the packing group criteria provided in Part 2 corresponding to the nature of the predominant subsidiary risk;
- Packages shall be labelled with subsidiary risk labels corresponding to each subsidiary risk exhibited by the material; corresponding placards shall be affixed to cargo transport units in accordance with the relevant provisions of 5.3.1;
- For the purposes of documentation and package marking, the proper shipping name shall be supplemented with the name of the constituents which most predominantly contribute to this (these) subsidiary risk(s) and which shall be enclosed in parenthesis;
- The dangerous goods transport document shall indicate the label model number(s) corresponding to each subsidiary risk in parenthesis after the Class number "7" and, where assigned the packing group as required by 5.4.1.1.1 (d).

For packing, see also 4.1.9.1.5.

177 Barium sulphate is not subject to the requirements of RID.

178 This designation shall be used only when no other appropriate designation exists in Table A of Chapter 3.2, and only with the approval of the competent authority of the country of origin (see 2.2.1.1.3).

181 Packages containing this type of substance shall bear a label conforming to model No. 1 (see 5.2.2.2.2) unless the competent authority of the country of origin has permitted this label to be dispensed with for the specific packaging employed because test data have proved that the substance in this packaging does not exhibit explosive behaviour (see 5.2.2.1.9).

182 The group of alkali metals includes lithium, sodium, potassium, rubidium and caesium.

183 The group of alkaline earth metals includes magnesium, calcium, strontium and barium.

186 In determining the ammonium nitrate content, all nitrate ions for which a molecular equivalent of ammonium ions is present in the mixture shall be calculated as ammonium nitrate.

188 Cells and batteries offered for carriage are not subject to other provisions of RID if they meet the following:

- (a) For a lithium metal or lithium alloy cell, the lithium content is not more than 1 g, and for a lithium-ion cell, the Watt-hour rating is not more than 20 Wh;
- (b) For a lithium metal or lithium alloy battery the aggregate lithium content is not more than 2 g, and for a lithium-ion battery, the Watt-hour rating is not more than 100 Wh. Lithium ion batteries subject to this provision shall be marked with the Watt-hour rating on the outside case, except those manufactured before 1 January 2009;
- (c) Each cell or battery meets the provisions of 2.2.9.1.7 (a) and (e);
- (d) Cells and batteries, except when installed in equipment, shall be packed in inner packagings that completely enclose the cell or battery. Cells and batteries shall be protected so as to prevent short circuits. This includes protection against contact with conductive materials within the same packaging that could lead to a short circuit. The inner packagings shall be packed in strong outer packagings which conform to the provisions of 4.1.1.1, 4.1.1.2 and 4.1.1.5;
- (e) Cells and batteries when installed in equipment shall be protected from damage and short circuit, and the equipment shall be equipped with an effective means of preventing accidental activation. This requirement does not apply to devices which are intentionally active in carriage (radio frequency identification (RFID) transmitters, watches, sensors, etc.) and which are not capable of generating a dangerous evolution of heat. When batteries are installed in equipment, the equipment shall be packed in strong outer packagings constructed of suitable material of adequate strength and design in relation to the packaging's capacity and its intended use unless the battery is afforded equivalent protection by the equipment in which it is contained;
- (f) Each package shall be marked with the appropriate lithium battery mark, as illustrated in 5.2.1.9.

This requirement does not apply to:

- (i) packages containing only button cell batteries installed in equipment (including circuit boards); and
- (ii) packages containing no more than four cells or two batteries installed in equipment, where there are not more than two packages in the consignment;

- (g) Except when batteries are installed in equipment, each package shall be capable of withstanding a 1.2 m drop test in any orientation without damage to cells or batteries contained therein, without shifting of the contents so as to allow battery to battery (or cell to cell) contact and without release of contents; and
- (h) Except when batteries are installed in or packed with equipment, packages shall not exceed 30 kg gross mass.

As used above and elsewhere in RID, "lithium content" means the mass of lithium in the anode of a lithium metal or lithium alloy cell.

Separate entries exist for lithium metal batteries and lithium ion batteries to facilitate the carriage of these batteries for specific modes of carriage and to enable the application of different emergency response actions.

A single cell battery as defined in Part III, sub-section 38.3.2.3 of the Manual of Tests and Criteria is considered a "cell" and shall be carried according to the requirements for "cells" for the purpose of this special provision.

190 Aerosol dispensers shall be provided with protection against inadvertent discharge. Aerosols with a capacity not exceeding 50 ml containing only non-toxic constituents are not subject to the requirements of RID.

191 Receptacles, small, with a capacity not exceeding 50 ml, containing only non-toxic constituents are not subject to the requirements of RID.

194 The UN number (generic entry) for each of the currently assigned self-reactive substances is given in 2.2.41.4.

196 Formulations which in laboratory testing neither detonate in the cavitated state nor deflagrate, which show no effect when heated under confinement and which exhibit no explosive power may be carried under this entry. The formulation must also be thermally stable (i.e. the SADT is 60 °C or higher for a 50 kg package). Formulations not meeting these criteria shall be carried under the provisions of Class 5.2, (see 2.2.52.4).

198 Nitrocellulose solutions containing not more than 20% nitrocellulose may be carried as paint, perfumery products or printing ink, as applicable (see UN Nos. 1210, 1263, 1266, 3066, 3469 and 3470).

199 Lead compounds which, when mixed in a ratio of 1:1000 with 0.07M hydrochloric acid and stirred for one hour at a temperature of 23 °C ± 2 °C, exhibit a solubility of 5% or less (see ISO 3711:1990 "Lead chromate pigments and lead chromate – molybdate pigments – Specifications and methods of test") are considered insoluble and are not subject to the requirements of RID unless they meet the criteria for inclusion in another class.

201 Lighters and lighter refills shall comply with the provisions of the country in which they were filled. They shall be provided with protection against inadvertent discharge. The liquid portion of the gas shall not exceed 85% of the capacity of the receptacle at 15 °C. The receptacles, including the closures, shall be capable of withstanding an internal pressure of twice the pressure of the liquefied petroleum gas at 55 °C. The valve mechanisms and ignition devices shall be securely sealed, taped or otherwise fastened or designed to prevent operation or leakage of the contents during carriage. Lighters shall not contain more than 10 g of liquefied petroleum gas. Lighter refills shall not contain more than 65 g of liquefied petroleum gas.

NOTE: For waste lighters collected separately see Chapter 3.3, special provision 654.

203 This entry shall not be used for polychlorinated biphenyls, liquid, UN No. 2315 and polychlorinated biphenyls, solid, UN No. 3432.

204 (Deleted)

205 This entry shall not be used for UN No. 3155 PENTACHLOROPHENOL.

207 Plastics moulding compounds may be made from polystyrene, poly(methyl methacrylate) or other polymeric material.

208 The commercial grade of calcium nitrate fertilizer, when consisting mainly of a double salt (calcium nitrate and ammonium nitrate) containing not more than 10% ammonium nitrate and at least 12% water of crystallization, is not subject to the requirements of RID.

210 Toxins from plant, animal or bacterial sources which contain infectious substances, or toxins that are contained in infectious substances, shall be classified in Class 6.2.

215 This entry only applies to the technically pure substance or to formulations derived from it having an SADT higher than 75 °C and therefore does not apply to formulations which are self-reactive substances (for self-reactive substances, see 2.2.41.4).  
Homogeneous mixtures containing not more than 35% by mass of azodicarbonamide and at least 65% of inert substance are not subject to the requirements of RID unless criteria of other classes are met.

216 Mixtures of solids which are not subject to the requirements of RID and flammable liquids may be carried under this entry without first applying the classification criteria of Class 4.1, provided there is no free liquid visible at the time the substance is loaded or at the time the packaging or cargo transport unit is closed. Sealed packets and articles containing less than 10 ml of a packing group II or III flammable liquid absorbed into a solid material are not subject to RID provided there is no free liquid in the packet or article.

217 Mixtures of solids which are not subject to the requirements of RID and toxic liquids may be carried under this entry without first applying the classification criteria of Class 6.1, provided there is no free liquid visible at the time the substance is loaded or at the time the packaging or cargo transport unit is closed. This entry shall not be used for solids containing a packing group I liquid.

218 Mixtures of solids which are not subject to the requirements of RID and corrosive liquids may be carried under this entry without first applying the classification criteria of Class 8, provided there is no free liquid visible at the time the substance is loaded or at the time the packaging or cargo transport unit is closed.

219 Genetically modified microorganisms (GMMOs) and genetically modified organisms (GMOs) packed and marked in accordance with packing instruction P 904 of 4.1.4.1 are not subject to any other requirements of RID.  
If GMMOs or GMOs meet the criteria for inclusion in Class 6.1 or 6.2 (see 2.2.61.1 and 2.2.62.1) the requirements in RID for the carriage of toxic substances or infectious substances apply.

220 Only the technical name of the flammable liquid component of this solution or mixture shall be shown in parentheses immediately following the proper shipping name.

221 Substances included under this entry shall not be of packing group I.

224 Unless it can be demonstrated by testing that the sensitivity of the substance in its frozen state is no greater than in its liquid state, the substance shall remain liquid during normal transport conditions. It shall not freeze at temperatures above -15 °C.

225 Fire extinguishers under this entry may include installed actuating cartridges (cartridges, power device of classification code 1.4C or 1.4S), without changing the classification of Class 2, group A or O according to 2.2.2.1.3 provided the total quantity of deflagrating (propellant) explosives does not exceed 3.2 g per extinguishing unit.

Fire extinguishers shall be manufactured, tested, approved and labelled according to the provisions applied in the country of manufacture.

**NOTE:** "Provisions applied in the country of manufacture" means the provisions applicable in the country of manufacture or those applicable in the country of use.

Fire extinguishers under this entry include:

- (a) portable fire extinguishers for manual handling and operation;
- (b) fire extinguishers for installation in aircraft;
- (c) fire extinguishers mounted on wheels for manual handling;
- (d) fire extinguishing equipment or machinery mounted on wheels or wheeled platforms or units carried similar to (small) trailers, and
- (e) fire extinguishers composed of a non-rollable pressure drum and equipment, and handled e.g. by fork lift or crane when loaded or unloaded.

**NOTE:** Pressure receptacles which contain gases for use in the above-mentioned fire extinguishers or for use in stationary fire-fighting installations shall meet the requirements of Chapter 6.2 and all requirements applicable to the relevant dangerous goods when these pressure receptacles are carried separately.

226 Formulations of this substance containing not less than 30% non-volatile, non-flammable phlegmatizer are not subject to the requirements of RID.

227 When phlegmatized with water and inorganic inert material the content of urea nitrate may not exceed 75% by mass and the mixture shall not be capable of being detonated by the Series 1, type (a), test in the Manual of Tests and Criteria, Part I.

228 Mixtures not meeting the criteria for flammable gases (see 2.2.2.1.5) shall be carried under UN No. 3163.

230 Lithium cells and batteries may be carried under this entry if they meet the provisions of 2.2.9.1.7.

235 This entry applies to articles which contain Class 1 explosive substances and which may also contain dangerous goods of other classes. These articles are used to enhance safety in vehicles, vessels or aircraft – e.g. air bag inflators, air bag modules, seat-belt pretensioners, and pyromechanical devices.

236 Polyester resin kits consist of two components: a base material (either Class 3 or Class 4.1, packing group II or III) and an activator (organic peroxide). The organic peroxide shall be type D, E, or F, not requiring temperature control. The packing group shall be II or III, according to the criteria of either Class 3 or Class 4.1, as appropriate, applied to the base material. The quantity limit shown in column (7a) of Table A of Chapter 3.2 applies to the base material.

237 The membrane filters, including paper separators, coating or backing materials, etc., that are present in carriage, shall not be liable to propagate a detonation as tested by one of the tests described in the Manual of Tests and Criteria, Part I, Test series 1 (a).

In addition the competent authority may determine, on the basis of the results of suitable burning rate tests taking account of the standard tests in the Manual of Tests and Criteria, Part III, sub-section 33.2.1, that nitrocellulose membrane filters in the form in which they are to be carried are not subject to the requirements applicable to flammable solids in Class 4.1.

238 (a) Batteries can be considered as non-spillable, provided that they are capable of withstanding the vibration and pressure differential tests given below, without leakage of battery fluid.

**Vibration test:** The battery is rigidly clamped to the platform of a vibration machine and a simple harmonic motion having an amplitude of 0.8 mm (1.6 mm maximum total excursion) is applied. The frequency is varied at the rate of 1 Hz/min between the limits of 10 Hz and 55 Hz. The entire range of frequencies and return is traversed in 95 ± 5 minutes for each mounting position (direction of vibration) of the battery. The battery is tested in three mutually perpendicular positions (to include testing with fill openings and vents, if any, in an inverted position) for equal time periods.

**Pressure differential test:** Following the vibration test, the battery is stored for six hours at 24 °C ± 4 °C while subjected to a pressure differential of at least 88 kPa. The battery is tested in three mutually perpendicular positions (to include testing with fill openings and vents, if any, in an inverted position) for at least six hours in each position.

(b) Non-spillable batteries are not subject to the requirements of RID if, at a temperature of 55 °C, the electrolyte will not flow from a ruptured or cracked case and there is no free liquid to flow and if, as packaged for carriage, the terminals are protected from short circuit.

239 Batteries or cells shall not contain dangerous substances other than sodium, sulphur or sodium compounds (e.g. sodium polysulphides and sodium tetrachloroaluminate). Batteries or cells shall not be offered for carriage at a temperature such that liquid elemental sodium is present in the battery or cell unless approved and under the conditions established by the competent authority of the country of origin. If the country of origin is not an RID Contracting State, the approval and conditions of carriage shall be recognized by the competent authority of the first RID Contracting State reached by the consignment.

Cells shall consist of hermetically sealed metal casings which fully enclose the dangerous substances and which are so constructed and closed as to prevent the release of the dangerous substances under normal conditions of carriage.

Batteries shall consist of cells secured within and fully enclosed by a metal casing so constructed and closed as to prevent the release of the dangerous substances under normal conditions of carriage.

240 This entry only applies to vehicles powered by wet batteries, sodium batteries, lithium metal batteries or lithium ion batteries and equipment powered by wet batteries or sodium batteries carried with these batteries installed. Lithium batteries shall meet the requirements of 2.2.9.1.7, except as otherwise provided for in special provision 667.

For the purpose of this special provision, vehicles are self-propelled apparatus designed to carry one or more persons or goods. Examples of such vehicles are electrically-powered cars, motorcycles, scooters, three- and four-wheeled vehicles or motorcycles, trucks, locomotives, bicycles (pedal cycles with an electric motor) and other vehicles of this type (e.g. self-balancing vehicles or vehicles not equipped with at least one seating position), wheel chairs, lawn tractors, self-propelled farming and construction equipment, boats and aircraft. This includes vehicles carried in a packaging. In this case some parts of the vehicle may be detached from its frame to fit into the packaging.

Examples of equipment are lawnmowers, cleaning machines or model boats and model aircraft. Equipment powered by lithium metal batteries or lithium ion batteries shall be assigned to the entries UN 3091 LITHIUM METAL BATTERIES CONTAINED IN EQUIPMENT or UN 3091 LITHIUM METAL BATTERIES PACKED WITH EQUIPMENT or UN 3481 LITHIUM ION BATTERIES CONTAINED IN EQUIPMENT or UN 3481 LITHIUM ION BATTERIES PACKED WITH EQUIPMENT, as appropriate.

Hybrid electric vehicles powered by both an internal combustion engine and wet batteries, sodium batteries, lithium metal batteries or lithium ion batteries, carried with the battery(ies) installed shall be assigned to the entries UN 3166 VEHICLE, FLAMMABLE GAS POWERED or UN 3166 VEHICLE, FLAMMABLE LIQUID POWERED, as appropriate. Vehicles which contain a fuel cell shall be assigned to the entries UN 3166 VEHICLE, FUEL CELL, FLAMMABLE GAS POWERED or UN 3166 VEHICLE, FUEL CELL, FLAMMABLE LIQUID POWERED, as appropriate.

Vehicles may contain other dangerous goods than batteries (e.g. fire extinguishers, compressed gas accumulators or safety devices) required for their functioning or safe operation without being subject to any additional requirements for these other dangerous goods, unless otherwise specified in RID.

241 The formulation shall be prepared so that it remains homogeneous and does not separate during carriage. Formulations with low nitrocellulose contents and not showing dangerous properties when tested for their liability to detonate, deflagrate or explode when heated under defined confinement by tests of Test series 1 (a), 2 (b) and 2 (c) respectively in the Manual of Tests and Criteria, Part I and not being a flammable solid when tested in accordance with test No. 1 in the Manual of Tests and Criteria, Part III, sub-section 33.2.1.4 (chips, if necessary, crushed and sieved to a particle size of less than 1.25 mm) are not subject to the requirements of RID.

242 Sulphur is not subject to the requirements of RID when it has been formed to a specific shape (e.g. prills, granules, pellets, pastilles or flakes).

243 Gasoline, motor spirit and petrol for use in spark-ignition engines (e.g. in automobiles, stationary engines and other engines) shall be assigned to this entry regardless of variations in volatility.

244 This entry includes e.g. aluminium dross, aluminium skimmings, spent cathodes, spent potliner, and aluminium salt slags.

247 Alcoholic beverages containing more than 24% alcohol but not more than 70% by volume, when carried as part of the manufacturing process, may be carried in wooden barrels with a capacity of more than 250 litres and not more than 500 litres meeting the general requirements of 4.1.1, as appropriate, on the following conditions:

- The wooden barrels shall be checked and tightened before filling;
- Sufficient ullage (not less than 3%) shall be left to allow for the expansion of the liquid;
- The wooden barrels shall be carried with the bungholes pointing upwards;
- The wooden barrels shall be carried in containers meeting the requirements of the CSC. Each wooden barrel shall be secured in custom-made cradles and be wedged by appropriate means to prevent it from being displaced in any way during carriage.

249 Ferrocium, stabilized against corrosion, with a minimum iron content of 10% is not subject to the requirements of RID.

250 This entry may only be used for samples of chemicals taken for analysis in connection with the implementation of the Convention on the Prohibition of the Development, Production, Stockpiling and Use of Chemical Weapons and on their Destruction. The carriage of substances under this entry shall be in accordance with the chain of custody and security procedures specified by the Organisation for the Prohibition of Chemical Weapons.

The chemical sample may only be carried providing prior approval has been granted by the competent authority or the Director General of the Organisation for the Prohibition of Chemical Weapons and providing the sample complies with the following provisions:

- It shall be packed according to packing instruction 623 in the ICAO Technical Instructions (see S-3-8 of the Supplement); and
- During carriage, a copy of the document of approval for transport, showing the quantity limitations and the packing provisions shall be attached to the transport document.

251 The entry CHEMICAL KIT or FIRST AID KIT is intended to apply to boxes, cases etc. containing small quantities of various dangerous goods which are used for example for medical, analytical, testing or repair purposes. Such kits may not contain dangerous goods for which the quantity "0" has been indicated in column (7a) of Table A of Chapter 3.2.

Components shall not react dangerously (see "dangerous reaction" in 1.2.1). The total quantity of dangerous goods in any one kit shall not exceed either 1 l or 1 kg. The packing group assigned to the kit as a whole shall be the most stringent packing group assigned to any individual substance in the kit.

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

Kits which are carried on board wagons for first-aid or operating purposes are not subject to the requirements of RID.

Chemical kits and first aid kits containing dangerous goods in inner packagings which do not exceed the quantity limits for limited quantities applicable to individual substances as specified in column (7a) of Table A of Chapter 3.2 may be carried in accordance with Chapter 3.4.

252 Provided the ammonium nitrate remains in solution under all conditions of carriage, aqueous solutions of ammonium nitrate, with not more than 0.2% combustible material, in a concentration not exceeding 80%, are not subject to the requirements of RID.

266 This substance, when containing less alcohol, water or phlegmatizer than specified, shall not be carried unless specifically authorized by the competent authority (see 2.2.1.1).

267 Any explosives, blasting, type C containing chlorates shall be segregated from explosives containing ammonium nitrate or other ammonium salts.

270 Aqueous solutions of Class 5.1 inorganic solid nitrate substances are considered as not meeting the criteria of Class 5.1 if the concentration of the substances in solution at the minimum temperature encountered during carriage is not greater than 80% of the saturation limit.

271 Lactose or glucose or similar materials, may be used as a phlegmatizer, provided that the substance contains not less than 90%, by mass, of phlegmatizer. The competent authority may authorize these mixtures to be classified in Class 4.1 on the basis of a test Series 6 (c) of Section 16 of Part I of the Manual of Tests and Criteria on at least three packages as prepared for carriage. Mixtures containing at least 98%, by mass, of phlegmatizer are not subject to the requirements of RID. Packages containing mixtures with not less than 90%, by mass, of phlegmatizer need not bear a label conforming to model No. 6.1.

272 This substance shall not be carried under the provisions of Class 4.1 unless specifically authorized by the competent authority (see UN No. 0143 or UN No. 0150 as appropriate).

273 Maneb and maneb preparations stabilized against self-heating need not be classified in Class 4.2 when it can be demonstrated by testing that a cubic volume of 1 m<sup>3</sup> of substance does not self-ignite and that the temperature at the centre of the sample does not exceed 200 °C, when the sample is maintained at a temperature of not less than 75 °C ± 2 °C for a period of 24 hours.

274 The provisions of 3.1.2.8 apply.

275 These substances shall not be classified and carried unless authorized by the competent authority on the basis of results from Series 2 tests and a Series 6 (c) test of Part I of the Manual of Tests and Criteria on packages as prepared for carriage (see 2.2.1.1). The competent authority shall assign the packing group on the basis of 2.2.3 criteria and the package type used for the Series 6 (c) test.

276 The substance is assigned to this classification or packing group based on human experience rather than the strict application of classification criteria set out in RID.

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

278 (Deleted)

279 Articles, containing gas, intended to function as shock absorbers, including impact energy-absorbing devices, or pneumatic springs are not subject to the requirements of RID provided:

- Each article has a gas space capacity not exceeding 1.6 litres and a charge pressure not exceeding 280 bar where the product of the capacity (litres) and charge pressure (bars) does not exceed 80 (i.e. 0.5 litres gas space and 160 bar charge pressure, 1 litre gas space and 80 bar charge pressure, 1.6 litres gas space and 50 bar charge pressure, 0.28 litres gas space and 280 bar charge pressure);
- Each article has a minimum burst pressure of 4 times the charge pressure at 20 °C for products not exceeding 0.5 litres gas space capacity and 5 times charge pressure for products greater than 0.5 litres gas space capacity;
- Each article is manufactured from material which will not fragment upon rupture;
- Each article is manufactured in accordance with a quality assurance standard acceptable to the competent authority; and
- The design type has been subjected to a fire test demonstrating that the article relieves its pressure by means of a fire degradable seal or other pressure relief device, such that the article will not fragment and that the article does not rocket.

See also 1.1.3.2 (d) for equipment used for the operation of the vehicle.

280 An oxygen generator, chemical, containing oxidizing substances shall meet the following conditions:

- The generator when containing an explosive actuating device shall only be carried under this entry when excluded from Class 1 in accordance with the NOTE under paragraph 2.2.1.1 (b);
- The generator, without its packaging, shall be capable of withstanding a 1.8 m drop test onto a rigid, non-resilient, flat and horizontal surface, in the position most likely to cause damage, without loss of its contents and without actuation;
- When a generator is equipped with an actuating device, it shall have at least two positive means of preventing unintentional actuation.

281 Nitrocellulose membrane filters covered by this entry, each with a mass not exceeding 0.5 g, are not subject to the requirements of RID when contained individually in an article or a sealed packet.

288 These substances shall not be classified and carried unless authorized by the competent authority on the basis of results from Series 2 tests and a Series 6 (c) test of Part I of the Manual of tests and Criteria on packages as prepared for carriage (see 2.2.1.1).

289 Safety devices, electrically initiated and safety devices, pyrotechnic installed in wagons, vehicles, vessels or aircraft or in completed components such as steering columns, door panels, seats, etc. are not subject to RID.

290 When this radioactive material meets the definitions and criteria of other classes as defined in Part 2, it shall be classified in accordance with the following:

- Where the substance meets the criteria for dangerous goods in excepted quantities as set out in Chapter 3.5, the packagings shall be in accordance with 3.5.2 and meet the testing requirements of 3.5.3. All other requirements applicable to radioactive material, excepted packages as set out in 1.7.1.5 shall apply without reference to the other class;
- Where the quantity exceeds the limits specified in 3.5.1.2 the substance shall be classified in accordance with the predominant subsidiary risk. The transport document shall describe the substance with the UN number and proper shipping name applicable to the other class supplemented with the name applicable to the radioactive excepted package according to Column (2) of Table A of Chapter 3.2, and the substance shall be carried in accordance with the provisions applicable to that UN number. An example of the information shown on the transport document is: "UN 1993 FLAMMABLE LIQUID, N.O.S. (ethanol and toluene mixture), Radioactive material, excepted package – limited quantity of material, 3, PG II".  
In addition, the requirements of 2.2.7.2.4.1 shall apply;

- The provisions of Chapter 3.4 for the carriage of dangerous goods packed in limited quantities shall not apply to substances classified in accordance with sub-paragraph (b);
- When the substance meets a special provision that exempts this substance from all dangerous goods provisions of the other classes it shall be classified in accordance with the applicable UN number of Class 7 and all requirements specified in 1.7.1.5 shall apply.

291 Flammable liquefied gases shall be contained within refrigerating machine components. These components shall be designed and tested to at least three times the working pressure of the machinery. The refrigerating machines shall be designed and constructed to contain the liquefied gas and preclude the risk of bursting or cracking of the pressure retaining components during normal conditions of carriage. Refrigerating machines and refrigerating-machine components are not subject to the requirements of RID if they contain less than 12 kg of gas.

292 (Deleted)

293 The following definitions apply to matches:

- Fusee matches are matches the heads of which are prepared with a friction-sensitive igniter composition and a pyrotechnic composition which burns with little or no flame, but with intense heat;
- Safety matches are matches which are combined with or attached to the box, book or card that can be ignited by friction only on a prepared surface;
- Strike anywhere matches are matches that can be ignited by friction on a solid surface;
- Wax Vesta matches are matches that can be ignited by friction either on a prepared surface or on a solid surface.

295 Batteries need not be individually marked and labelled if the pallet bears the appropriate mark and label.

296 These entries apply to life-saving appliances such as life rafts, personal flotation devices and self-inflating slides. UN No. 2990 applies to self-inflating appliances and UN No. 3072 applies to life-saving appliances that are not self-inflating. Life-saving appliances may contain:

- Signal devices (Class 1) which may include smoke and illumination signal flares packed in packagings that prevent them from being inadvertently activated;
- For UN No. 2990 only, cartridges, power device of Division 1.4, compatibility group S, may be contained for purposes of the self-inflating mechanism and provided that the quantity of explosives per appliance does not exceed 3.2 g;
- Class 2 compressed or liquefied gases, group A or O, according to 2.2.2.1.3;
- Electric storage batteries (Class 8) and lithium batteries (Class 9);
- First aid kits or repair kits containing small quantities of dangerous goods (e.g. substances of Class 3, 4.1, 5.2, 8 or 9); or
- "Strike anywhere" matches packed in packagings that prevent them from being inadvertently activated.

Life-saving appliances packed in strong rigid outer packagings with a total maximum gross mass of 40 kg,

containing no dangerous goods other than compressed or liquefied gases of Class 2, group A or group O, in receptacles with a capacity not exceeding 120 ml, installed solely for the purpose of the activation of the appliance, are not subject to the requirements of RID.

298 (Deleted)

300 Fish meal, fish scrap and krill meal shall not be loaded if the temperature at the time of loading exceeds 35 °C or 5 °C above the ambient temperature whichever is higher.

302 Fumigated cargo transport units containing no other dangerous goods are only subject to the provisions of 5.5.2.

303 Receptacles shall be assigned to the classification code of the gas or mixture of gases contained therein determined in accordance with the provisions of section 2.2.2.

304 This entry may only be used for the transport of non-activated batteries which contain dry potassium hydroxide and which are intended to be activated prior to use by addition of an appropriate amount of water to the individual cells.

305 These substances are not subject to the requirements of RID when in concentrations of not more than 50 mg/kg.

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

307 This entry may only be used for uniform mixtures containing ammonium nitrate as the main ingredient within the following composition limits:

- Not less than 90% ammonium nitrate with not more than 0.2% total combustible/organic material calculated as carbon and with added matter, if any, which is inorganic and inert towards ammonium nitrate; or
- Less than 90% but more than 70% ammonium nitrate with other inorganic materials or more than 80% but less than 90% ammonium nitrate mixed with calcium carbonate and/or dolomite and/or mineral calcium sulphate and not more than 0.4% total combustible/organic material calculated as carbon; or
- Nitrogen type ammonium nitrate based fertilizers containing mixtures of ammonium nitrate and ammonium sulphate with more than 45% but less than 70% ammonium nitrate and not more than 0.4% total combustible/organic material calculated as carbon such that the sum of the percentage compositions of ammonium nitrate and ammonium sulphate exceeds 70%.

309 This entry applies to non sensitized emulsions, suspensions and gels consisting primarily of a mixture of ammonium nitrate and fuel, intended to produce a Type E blasting explosive only after further processing prior to use.

The mixture for emulsions typically has the following composition: 60-85% ammonium nitrate, 5-30% water, 2-8% fuel, 0.5-4% emulsifier agent, 0-10% soluble flame suppressants, and trace additives. Other inorganic nitrate salts may replace part of the ammonium nitrate.

The mixture for suspensions and gels typically has the following composition: 60-85% ammonium nitrate, 0-5% sodium or potassium perchlorate, 0-17% hexamine nitrate or monomethylamine nitrate, 5-30% water, 2-15% fuel, 0.5-4% thickening agent, 0-10% soluble flame suppressants, and trace additives. Other inorganic nitrate salts may replace part of the ammonium nitrate.

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

310 The testing requirements in the Manual of Tests and Criteria, Part III sub-section 38.3 do not apply to production runs, consisting of not more than 100 cells and batteries, or to pre-production prototypes of cells and batteries when these prototypes are carried for testing when packaged in accordance with packing instruction P 910 of 4.1.4.1.

The transport document shall include the following statement:

"CARRIAGE IN ACCORDANCE WITH SPECIAL PROVISION 310".

Damaged or defective cells, batteries, or cells and batteries contained in equipment shall be carried in accordance with special provision 376 and packaged in accordance with packing instructions P 908 of 4.1.4.1 or LP 904 of 4.1.4.3, as applicable.

Cells, batteries or cells and batteries contained in equipment carried for disposal or recycling may be packaged in accordance with special provision 377 and packing instruction P 909 of 4.1.4.1.

311 Substances shall not be carried under this entry unless approved by the competent authority on the basis of the results of appropriate tests according to Part I of the Manual of Tests and Criteria. Packaging shall ensure that the percentage of diluent does not fall below that stated in the competent authority approval, at any time during carriage.

312 Vehicles powered by a fuel cell engine shall be assigned to UN 3166 VEHICLE, FUEL CELL, FLAMMABLE GAS POWERED or UN 3166 VEHICLE, FUEL CELL, FLAMMABLE LIQUID POWERED, as appropriate. These entries include hybrid electric vehicles powered by both a fuel cell and an internal combustion engine with wet batteries, sodium batteries, lithium metal batteries or lithium ion batteries, carried with the battery(ies) installed.

Other vehicles which contain an internal combustion engine shall be assigned to the entries UN 3166 VEHICLE, FLAMMABLE GAS POWERED or UN 3166 VEHICLE, FLAMMABLE LIQUID POWERED, as appropriate. These entries include hybrid electric vehicles powered by both an internal combustion engine and wet batteries, sodium batteries, lithium metal batteries or lithium ion batteries, carried with the battery(ies) installed.

Lithium batteries shall meet the requirements of 2.2.9.1.7, except as otherwise provided for in special provision 667.

313 (Deleted)

314 (a) These substances are liable to exothermic decomposition at elevated temperatures. Decomposition can be initiated by heat or by impurities (e.g. powdered metals (iron, manganese, cobalt, magnesium) and their compounds);  
(b) During the course of carriage, these substances shall be shaded from direct sunlight and all sources of heat and be placed in adequately ventilated areas.

315 This entry shall not be used for Class 6.1 substances which meet the inhalation toxicity criteria for packing group I described in 2.2.61.1.8.

316 This entry applies only to calcium hypochlorite, dry, when carried in non friable tablet form.

317 "Fissile-excepted" applies only to those fissile material and packages containing fissile material which are excepted in accordance with 2.2.7.2.3.5.

318 For the purposes of documentation, the proper shipping name shall be supplemented with the technical name (see 3.1.2.8). When the infectious substances to be carried are unknown, but suspected of meeting the criteria for inclusion in Category A and assignment to UN No. 2814 or 2900, the words "suspected Category A infectious substance" shall be shown, in parentheses, following the proper shipping name on the transport document.

319 Substances packed and packages marked in accordance with packing instruction P650 are not subject to any other requirements of RID.

320 (Deleted)

321 These storage systems shall always be considered as containing hydrogen.

322 When carried in non-friable tablet form, these goods are assigned to packing group III.

323 (Reserved)

324 This substance needs to be stabilized when in concentrations of not more than 99%.

325 In the case of non-fissile or fissile excepted uranium hexafluoride, the material shall be classified under UN No. 2978.

326 In the case of fissile uranium hexafluoride, the material shall be classified under UN No. 2977.

327 Waste aerosols consigned in accordance with 5.4.1.1.3 may be carried under this entry for the purposes of reprocessing or disposal. They need not be protected against movement and inadvertent discharge, provided that measures to prevent dangerous build up of pressure and dangerous atmospheres are addressed. Waste aerosols, other than those leaking or severely deformed, shall be packed in accordance with packing instruction P 207 and special provision PP 87, or packing instruction LP 200 and special packing provision L 2. Leaking or severely deformed aerosols shall be carried in salvage packagings provided appropriate measures are taken to ensure there is no dangerous build up of pressure.

**NOTE:** For maritime carriage, waste aerosols shall not be carried in closed containers.

328 This entry applies to fuel cell cartridges including when contained in equipment or packed with equipment. Fuel cell cartridges installed in or integral to a fuel cell system are regarded as contained in equipment. Fuel cell cartridge means an article that stores fuel for discharge into the fuel cell through (a) valve(s) that control(s) the discharge of fuel into the fuel cell. Fuel cell cartridges, including when contained in equipment, shall be designed and constructed to prevent fuel leakage under normal conditions of carriage.

Fuel cell cartridge design types using liquids as fuels shall pass an internal pressure test at a pressure of 100 kPa (gauge) without leakage.

Except for fuel cell cartridges containing hydrogen in metal hydride which shall be in compliance with special provision 339, each fuel cell cartridge design type shall be shown to pass a 1.2 meter drop test onto an unyielding surface in the orientation most likely to result in failure of the containment system with no loss of contents.

When lithium metal or lithium ion batteries are contained in the fuel cell system, the consignment shall be consigned under this entry and under the appropriate entries for UN 3091 LITHIUM METAL BATTERIES CONTAINED IN EQUIPMENT or UN 3481 LITHIUM ION BATTERIES CONTAINED IN EQUIPMENT.

329 (Reserved)

330 (Deleted)

331 (Reserved)

332 Magnesium nitrate hexahydrate is not subject to the requirements of RID.

333 Ethanol and gasoline, motor spirit or petrol mixtures for use in spark-ignition engines (e.g. in automobiles, stationary engines and other engines) shall be assigned to this entry regardless of variations in volatility.

334 A fuel cell cartridge may contain an activator provided it is fitted with two independent means of preventing unintended mixing with the fuel during carriage.

335 Mixtures of solids which are not subject to the requirements of RID and environmentally hazardous liquids or solids shall be classified as UN 3077 and may be carried under this entry provided there is no free liquid visible at the time the substance is loaded or at the time the packaging or cargo transport unit is closed. Each cargo transport unit shall be leakproof when used for carriage in bulk. If free liquid is visible at the time the mixture is loaded or at the time the packaging or cargo transport unit is closed, the mixture shall be classified as UN 3082. Sealed packets and articles containing less than 10 ml of an environmentally hazardous liquid, absorbed into a solid material but with no free liquid in the packet or article, or containing less than 10 g of an environmentally hazardous solid, are not subject to the requirements of RID.

336 A single package of non-combustible solid LSA-II or LSA-III material, if carried by air, shall not contain an activity greater than 3 000 A<sub>2</sub>.

337 Type B(U) and Type B(M) packages, if carried by air, shall not contain activities greater than the following:  
(a) For low dispersible radioactive material: as authorized for the package design as specified in the certificate of approval;  
(b) For special form radioactive material: 3 000 A<sub>1</sub> or 100 000 A<sub>2</sub>, whichever is the lower; or  
(c) For all other radioactive material: 3 000 A<sub>2</sub>.

338 Each fuel cell cartridge carried under this entry and designed to contain a liquefied flammable gas shall:  
(a) Be capable of withstanding, without leakage or bursting, a pressure of at least two times the equilibrium pressure of the contents at 55 °C;  
(b) Not contain more than 200 ml liquefied flammable gas, the vapour pressure of which shall not exceed 1 000 kPa at 55 °C; and  
(c) Pass the hot water bath test prescribed in 6.2.6.3.1.

339 Fuel cell cartridges containing hydrogen in a metal hydride carried under this entry shall have a water capacity less than or equal to 120 ml.

The pressure in the fuel cell cartridge shall not exceed 5 MPa at 55 °C. The design type shall withstand, without leaking or bursting, a pressure of twice the design pressure of the cartridge at 55 °C or 200 kPa more than the design pressure of the cartridge at 55 °C, whichever is greater. The pressure at which this test is conducted is referred to in the drop test and the hydrogen cycling test as the "minimum shell burst pressure".

Fuel cell cartridges shall be filled in accordance with procedures provided by the manufacturer. The manufacturer shall provide the following information with each fuel cell cartridge:

(a) Inspection procedures to be carried out before initial filling and before refilling of the fuel cell cartridge;

- (b) Safety precautions and potential hazards to be aware of;
- (c) Method for determining when the rated capacity has been achieved;
- (d) Minimum and maximum pressure range;
- (e) Minimum and maximum temperature range; and
- (f) Any other requirements to be met for initial filling and refilling including the type of equipment to be used for initial filling and refilling.

The fuel cell cartridges shall be designed and constructed to prevent fuel leakage under normal conditions of carriage. Each cartridge design type, including cartridges integral to a fuel cell, shall be subjected to and shall pass the following tests:

#### Drop test

A 1.8 metre drop test onto an unyielding surface in four different orientations:

- (a) Vertically, on the end containing the shut-off valve assembly;
- (b) Vertically, on the end opposite to the shut-off valve assembly;
- (c) Horizontally, onto a steel apex with a diameter of 38 mm, with the steel apex in the upward position; and
- (d) At a 45° angle on the end containing the shut-off valve assembly.

There shall be no leakage, determined by using a soap bubble solution or other equivalent means on all possible leak locations, when the cartridge is charged to its rated charging pressure. The fuel cell cartridge shall then be hydrostatically pressurized to destruction. The recorded burst pressure shall exceed 85% of the minimum shell burst pressure.

#### Fire test

A fuel cell cartridge filled to rated capacity with hydrogen shall be subjected to a fire engulfment test. The cartridge design, which may include a vent feature integral to it, is deemed to have passed the fire test if:

- (a) The internal pressure vents to zero gauge pressure without rupture of the cartridge; or
- (b) The cartridge withstands the fire for a minimum of 20 minutes without rupture.

#### Hydrogen cycling test

This test is intended to ensure that a fuel cell cartridge design stress limits are not exceeded during use.

The fuel cell cartridge shall be cycled from not more than 5% rated hydrogen capacity to not less than 95% rated hydrogen capacity and back to not more than 5% rated hydrogen capacity. The rated charging pressure shall be used for charging and temperatures shall be held within the operating temperature range. The cycling shall be continued for at least 100 cycles.

Following the cycling test, the fuel cell cartridge shall be charged and the water volume displaced by the cartridge shall be measured. The cartridge design is deemed to have passed the hydrogen cycling test if the water volume displaced by the cycled cartridge does not exceed the water volume displaced by an uncycled cartridge charged to 95% rated capacity and pressurized to 75% of its minimum shell burst pressure.

#### Production leak test

Each fuel cell cartridge shall be tested for leaks at  $15^{\circ}\text{C} \pm 5^{\circ}\text{C}$ , while pressurized to its rated charging pressure. There shall be no leakage, determined by using a soap bubble solution or other equivalent means on all possible leak locations.

Each fuel cell cartridge shall be permanently marked with the following information:

- (a) The rated charging pressure in MPa;
- (b) The manufacturer's serial number of the fuel cell cartridges or unique identification number; and
- (c) The date of expiry based on the maximum service life (year in four digits; month in two digits).

**340** Chemical kits, first aid kits and polyester resin kits containing dangerous substances in inner packagings which do not exceed the quantity limits for excepted quantities applicable to individual substances as specified in column (7b) of Table A of Chapter 3.2, may be carried in accordance with Chapter 3.5. Class 5.2 substances, although not individually authorized as excepted quantities in column (7b) of Table A of Chapter 3.2, are authorized in such kits and are assigned Code E2 (see 3.5.1.2).

**341** (Reserved)

342 Glass inner receptacles (such as ampoules or capsules) intended only for use in sterilization devices, when containing less than 30 ml of ethylene oxide per inner packaging with not more than 300 ml per outer packaging, may be carried in accordance with the provisions in Chapter 3.5, irrespective of the indication of "EO" in column (7b) of Table A of Chapter 3.2 provided that:

- After filling, each glass inner receptacle has been determined to be leak-tight by placing the glass inner receptacle in a hot water bath at a temperature, and for a period of time, sufficient to ensure that an internal pressure equal to the vapour pressure of ethylene oxide at 55 °C is achieved. Any glass inner receptacle showing evidence of leakage, distortion or other defect under this test shall not be carried under the terms of this special provision;
- In addition to the packaging required by 3.5.2, each glass inner receptacle is placed in a sealed plastics bag compatible with ethylene oxide and capable of containing the contents in the event of breakage or leakage of the glass inner receptacle; and
- Each glass inner receptacle is protected by a means of preventing puncture of the plastics bag (e.g. sleeves or cushioning) in the event of damage to the packaging (e.g. by crushing).

343 This entry applies to crude oil containing hydrogen sulphide in sufficient concentration that vapours evolved from the crude oil can present an inhalation hazard. The packing group assigned shall be determined by the flammability hazard and inhalation hazard, in accordance with the degree of danger presented.

344 The provisions of 6.2.6 shall be met.

345 This gas contained in open cryogenic receptacles with a maximum capacity of 1 litre constructed with glass double walls having the space between the inner and outer wall evacuated (vacuum insulated) is not subject to RID provided each receptacle is carried in an outer packaging with suitable cushioning or absorbent materials to protect it from impact damage.

346 Open cryogenic receptacles conforming to the requirements of packing instruction P 203 of 4.1.4.1 and containing no dangerous goods except for UN No. 1977 nitrogen, refrigerated liquid, which is fully absorbed in a porous material are not subject to any other requirements of RID.

347 This entry shall only be used if the results of Test series 6 (d) of Part I of the Manual of Tests and Criteria have demonstrated that any hazardous effects arising from functioning are confined within the package.

348 Batteries manufactured after 31 December 2011 shall be marked with the Watt-hour rating on the outside case.

349 Mixtures of a hypochlorite with an ammonium salt are not to be accepted for carriage. UN No. 1791 hypochlorite solution is a substance of Class 8.

350 Ammonium bromate and its aqueous solutions and mixtures of a bromate with an ammonium salt are not to be accepted for carriage.

351 Ammonium chlorate and its aqueous solutions and mixtures of a chlorate with an ammonium salt are not to be accepted for carriage.

352 Ammonium chlorite and its aqueous solutions and mixtures of a chlorite with an ammonium salt are not to be accepted for carriage.

353 Ammonium permanganate and its aqueous solutions and mixtures of a permanganate with an ammonium salt are not to be accepted for carriage.

354 This substance is toxic by inhalation.

355 Oxygen cylinders for emergency use carried under this entry may include installed actuating cartridges (cartridges, power device of Division 1.4, Compatibility Group C or S), without changing the classification in Class 2 provided the total quantity of deflagrating (propellant) explosives does not exceed 3.2 g per oxygen cylinder. The cylinders with the installed actuating cartridges as prepared for carriage shall have an effective means of preventing inadvertent activation.

356 Metal hydride storage systems intended to be installed in wagons, vehicles, vessels or aircraft shall be approved by the competent authority of the country of manufacture<sup>1</sup> before acceptance for carriage. The transport document shall include an indication that the package was approved by the competent authority of the country of manufacture or a copy of the competent authority of the country of manufacture<sup>1</sup> approval shall accompany each consignment.

<sup>1</sup> If the country of manufacture is not an RID Contracting State, the approval shall be recognized by the competent authority of an RID Contracting State.

357 Petroleum crude oil containing hydrogen sulphide in sufficient concentration that vapours evolved from the crude oil can present an inhalation hazard shall be consigned under the entry UN 3494 PETROLEUM SOUR CRUDE OIL, FLAMMABLE, TOXIC.

358 Nitroglycerin solution in alcohol with more than 1% but not more than 5% nitroglycerin may be classified in Class 3 and assigned to UN No. 3064 provided all the requirements of packing instruction P 300 of 4.1.4.1 are complied with.

359 Nitroglycerin solution in alcohol with more than 1% but not more than 5% nitroglycerin shall be classified in Class 1 and assigned to UN No. 0144 if not all the requirements of packing instruction P 300 of 4.1.4.1 are complied with.

360 Vehicles only powered by lithium metal batteries or lithium ion batteries shall be classified under the entry UN 3171 battery-powered vehicle.

361 This entry applies to electric double layer capacitors with an energy storage capacity greater than 0.3 Wh. Capacitors with an energy storage capacity of 0.3 Wh or less are not subject to RID. Energy storage capacity means the energy held by a capacitor, as calculated using the nominal voltage and capacitance. All capacitors to which this entry applies, including capacitors containing an electrolyte that does not meet the classification criteria of any class of dangerous goods, shall meet the following conditions:

- Capacitors not installed in equipment shall be carried in an uncharged state. Capacitors installed in equipment shall be carried either in an uncharged state or protected against short circuit;
- Each capacitor shall be protected against a potential short circuit hazard in carriage as follows:
  - When a capacitor's energy storage capacity is less than or equal to 10 Wh or when the energy storage capacity of each capacitor in a module is less than or equal to 10 Wh, the capacitor or module shall be protected against short circuit or be fitted with a metal strap connecting the terminals; and
  - When the energy storage capacity of a capacitor or a capacitor in a module is more than 10 Wh, the capacitor or module shall be fitted with a metal strap connecting the terminals;
- Capacitors containing dangerous goods shall be designed to withstand a 95 kPa pressure differential;
- Capacitors shall be designed and constructed to relieve safely pressure that may build up in use, through a vent or a weak point in the capacitor casing. Any liquid which is released upon venting shall be contained by the packaging or by the equipment in which a capacitor is installed; and
- Capacitors shall be marked with the energy storage capacity in Wh.

Capacitors containing an electrolyte not meeting the classification criteria of any class of dangerous goods, including when installed in equipment, are not subject to other provisions of RID.

Capacitors containing an electrolyte meeting the classification criteria of any class of dangerous goods, with an energy storage capacity of 10 Wh or less are not subject to other provisions of RID when they are capable of withstanding a 1.2 metre drop test unpackaged on an unyielding surface without loss of contents.

Capacitors containing an electrolyte meeting the classification criteria of any class of dangerous goods that are not installed in equipment and with an energy storage capacity of more than 10 Wh are subject to RID.

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

**NOTE:** Capacitors which by design maintain a terminal voltage (e.g. asymmetrical capacitors) do not belong to this entry.

362 (Reserved)

363 (a) This entry applies to engines or machinery, powered by fuels classified as dangerous goods via internal combustion systems or fuel cells (e.g. combustion engines, generators, compressors, turbines, heating units, etc.), except vehicle equipment assigned to UN No. 3166 referred to in SP 666.

**NOTE:** This entry does not apply to equipment referred to in 1.1.3.2 (a), (d) and (e), 1.1.3.3 and 1.1.3.7.

(b) Engines or machinery which are empty of liquid or gaseous fuels and which do not contain other dangerous goods, are not subject to RID.

**NOTE 1:** An engine or machinery is considered to be empty of liquid fuel when the liquid fuel tank has been drained and the engine or machinery cannot be operated due to a lack of fuel. Engine or

machinery components such as fuel lines, fuel filters and injectors do not need to be cleaned, drained or purged to be considered empty of liquid fuels. In addition, the liquid fuel tank does not need to be cleaned or purged.

2: An engine or machinery is considered to be empty of gaseous fuels when the gaseous fuel tanks are empty of liquid (for liquefied gases), the pressure in the tanks does not exceed 2 bar and the fuel shut-off or isolation valve is closed and secured.

(c) Engines and machinery containing fuels meeting the classification criteria of Class 3, shall be assigned to the entries UN 3528 ENGINE, INTERNAL COMBUSTION, FLAMMABLE LIQUID POWERED or UN 3528 ENGINE, FUEL CELL, FLAMMABLE LIQUID POWERED or UN 3528 MACHINERY, INTERNAL COMBUSTION, FLAMMABLE LIQUID POWERED or UN 3528 MACHINERY, FUEL CELL, FLAMMABLE LIQUID POWERED, as appropriate.

(d) Engines and machinery containing fuels meeting the classification criteria of flammable gases of Class 2, shall be assigned to the entries UN 3529 ENGINE, INTERNAL COMBUSTION, FLAMMABLE GAS POWERED or UN 3529 ENGINE, FUEL CELL, FLAMMABLE GAS POWERED or UN 3529 MACHINERY, INTERNAL COMBUSTION, FLAMMABLE GAS POWERED or UN 3529 MACHINERY, FUEL CELL, FLAMMABLE GAS POWERED, as appropriate.

Engines and machinery powered by both a flammable gas and a flammable liquid shall be assigned to the appropriate UN No. 3529 entry.

(e) Engines and machinery containing liquid fuels meeting the classification criteria of 2.2.9.1.10 for environmentally hazardous substances and not meeting the classification criteria of any other class shall be assigned to the entries UN 3530 ENGINE, INTERNAL COMBUSTION or UN 3530 MACHINERY, INTERNAL COMBUSTION, as appropriate.

(f) Engines or machinery may contain other dangerous goods than fuels (e.g. batteries, fire extinguishers, compressed gas accumulators or safety devices) required for their functioning or safe operation without being subject to any additional requirements for these other dangerous goods, unless otherwise specified in RID. However, lithium batteries shall meet the requirements of 2.2.9.1.7, except as provided for in special provision 667.

(g) The engines or machinery are not subject to any other requirements of RID if the following requirements are met:

- (i) The engine or machinery, including the means of containment containing dangerous goods, shall be in compliance with the construction requirements specified by the competent authority of the country of manufacture<sup>2</sup>;
- (ii) Any valves or openings (e.g. venting devices) shall be closed during carriage;
- (iii) The engines or machinery shall be oriented to prevent inadvertent leakage of dangerous goods and secured by means capable of restraining the engines or machinery to prevent any movement during carriage which would change the orientation or cause them to be damaged;

(iv) for UN No. 3528 and UN No. 3530:  
Where the engine or machinery contains more than 60 l of liquid fuel and has a capacity of more than 450 l but not more than 3 000 l, it shall be labelled on two opposite sides in accordance with 5.2.2.  
Where the engine or machinery contains more than 60 l of liquid fuel and has a capacity of more than 3 000 l, it shall be placarded on two opposite sides. Placards shall correspond to the labels required in Column (5) of Table A of Chapter 3.2 and shall conform to the specifications given in 5.3.1.7. Placards shall be displayed on a background of contrasting colour, or shall have either a dotted or solid outer boundary line.

(v) for UN No. 3529:  
Where the fuel tank of the engine or machinery has a water capacity of more than 450 l but not more than 1 000 l, it shall be labelled on two opposite sides in accordance with 5.2.2.  
Where the fuel tank of the engine or machinery has a water capacity of more than 1 000 l, it shall be placarded on two opposite sides. Placards shall correspond to the labels required in Column (5) of Table A of Chapter 3.2 and shall conform to the specifications given in 5.3.1.7. Placards shall be displayed on a background of contrasting colour, or shall have either a dotted or solid outer boundary line.

(vi) A transport document in accordance with 5.4.1 is required only when the engine or machinery contains more than 1 000 l of liquid fuels, for UN 3528 and UN 3530, or the fuel tank has a water capacity of more than 1 000 l, for UN 3529.  
This transport document shall contain the following additional statement:  
"TRANSPORT IN ACCORDANCE WITH SPECIAL PROVISION 363".

<sup>2</sup> For example, compliance with the relevant provisions of Directive 2006/42/EC of the European Parliament and of the Council of 17 May 2006 on machinery, and amending Directive 95/16/EC (Official Journal of the European Union No. L 157 of 9 June 2006, p. 24 – 86).

364 This article may only be carried under the provisions of Chapter 3.4 if, as presented for carriage, the package is capable of passing the test in accordance with Test Series 6 (d) of Part I of the Manual of Tests and Criteria as determined by the competent authority.

365 For manufactured instruments and articles containing mercury, see UN No. 3506.

366 Manufactured instruments and articles containing not more than 1 kg of mercury are not subject to RID.

367 For the purposes of documentation:

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

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

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

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

368 In the case of non-fissile or fissile-excepted uranium hexafluoride, the material shall be classified under UN No. 3507 or UN No. 2978.

369 In accordance with 2.1.3.5.3 (a), this radioactive material in an excepted package possessing toxic and corrosive properties is classified in Class 6.1 with radioactivity and corrosivity subsidiary risks.

Uranium hexafluoride may be classified under this entry only if the conditions of 2.2.7.2.4.1.2, 2.2.7.2.4.1.5, 2.2.7.2.4.5.2 and, for fissile-excepted material, of 2.2.7.2.3.5 are met.

In addition to the provisions applicable to the carriage of Class 6.1 substances with a corrosivity subsidiary risk, the provisions of 5.1.3.2, 5.1.5.2.2, 5.1.5.4.1 (b), 7.5.11 CW 33 (3.1), (5.1) to (5.4) and (6) shall apply.

No Class 7 label is required to be displayed.

370 This entry applies to:

- ammonium nitrate with more than 0.2% combustible substances, including any organic substance calculated as carbon, to the exclusion of any added substance; and
- ammonium nitrate with not more than 0.2% combustible substances, including any organic substance calculated as carbon, to the exclusion of any added substance, that gives a positive result when tested in accordance with Test Series 2 (see Manual of Tests and Criteria, Part I). See also UN No. 1942.

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

- (a) The water capacity of the pressure receptacle shall not exceed 0.5 litres and the working pressure shall not exceed 25 bar at 15 °C;
- (b) The minimum burst pressure of the pressure receptacle shall be at least four times the pressure of the gas at 15 °C;
- (c) Each article shall be manufactured in such a way that unintentional firing or release is avoided under normal conditions of handling, packing, carriage and use. This may be fulfilled by an additional locking device linked to the activator;
- (d) Each article shall be manufactured in such a way as to prevent hazardous projections of the pressure receptacle or parts of the pressure receptacle;
- (e) Each pressure receptacle shall be manufactured from material which will not fragment upon rupture;
- (f) The design type of the article shall be subjected to a fire test. For this test, the provisions of paragraphs 16.6.1.2 except letter g, 16.6.1.3.1 to 16.6.1.3.6, 16.6.1.3.7 (b) and 16.6.1.3.8 of the Manual of Tests and Criteria shall be applied. It shall be demonstrated that the article relieves its pressure by means of a fire degradable seal or other pressure relief device, in such a way that the pressure receptacle will not fragment and that the article or fragments of the article do not rocket more than 10 metres;
- (g) The design type of the article shall be subjected to the following test. A stimulating mechanism shall be used to initiate one article in the middle of the packaging. There shall be no hazardous ef-

fects outside the package such as disruption of the package, metal fragments or a receptacle which passes through the packaging.

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

**372** This entry applies to asymmetric capacitors with an energy storage capacity greater than 0.3 Wh. Capacitors with an energy storage capacity of 0.3 Wh or less are not subject to RID.

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

$$\text{Wh} = \frac{1}{2} C_N (U_R^2 - U_L^2) \times \frac{1}{3600},$$

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

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

- (a) Capacitors or modules shall be protected against short circuit;
- (b) Capacitors shall be designed and constructed to safely relieve pressure that may build up in use, through a vent or a weak point in the capacitor casing. Any liquid which is released upon venting shall be contained by packaging or by equipment in which a capacitor is installed;
- (c) Capacitors shall be marked with the energy storage capacity in Wh; and
- (d) Capacitors containing an electrolyte meeting the classification criteria of any class of dangerous goods shall be designed to withstand a 95 kPa pressure differential;

Capacitors containing an electrolyte not meeting the classification criteria of any class of dangerous goods, including when configured in a module or when installed in equipment are not subject to other provisions of RID.

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

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

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

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

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

- (a) Each radiation detector shall meet the following conditions.
  - (i) The pressure in each detector shall not exceed 105 kPa absolute at 20 °C;
  - (ii) The amount of gas shall not exceed 13 g per detector;
  - (iii) Each detector shall be manufactured under a registered quality assurance programme;
    - NOTE:** ISO 9001 may be used for this purpose.
  - (iv) Each neutron radiation detector shall be of welded metal construction with brazed metal to ceramic feed through assemblies. These detectors shall have a minimum burst pressure of 1800 kPa as demonstrated by design type qualification testing; and
  - (v) Each detector shall be tested to a  $1 \times 10^{-10} \text{ cm}^3/\text{s}$  leaktightness standard before filling.
- (b) Radiation detectors carried as individual components shall be carried as follows:
  - (i) Detectors shall be packed in a sealed intermediate plastics liner with sufficient absorbent or adsorbent material to absorb or adsorb the entire gas contents;
  - (ii) They shall be packed in strong outer packaging. The completed package shall be capable of withstanding a 1.8 m drop test without leakage of gas contents from detectors;

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

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

- (i) The detectors shall be contained in a strong sealed outer casing;
- (ii) The casing shall contain sufficient absorbent or adsorbent material to absorb or adsorb the entire gas contents;
- (iii) The completed systems shall be packed in strong outer packagings capable of withstanding a 1.8 m drop test without leakage unless a system's outer casing affords equivalent protection.

Packing instruction P 200 of 4.1.4.1 is not applicable.

The transport document shall include the following statement:

"TRANSPORT IN ACCORDANCE WITH SPECIAL PROVISION 373".

Neutron radiation detectors containing not more than 1 g of boron trifluoride, including those with solder glass joints, are not subject to RID provided they meet the requirements in paragraph (a) and are packed in accordance with paragraph (b). Radiation detection systems containing such detectors are not subject to RID provided they are packed in accordance with paragraph (c).

374 (Reserved)

375 These substances when carried in single or combination packagings containing a net quantity per single or inner packaging of 5 l or less for liquids or having a net mass per single or inner packaging of 5 kg or less for solids, are not subject to any other provisions of RID provided the packagings meet the general provisions of 4.1.1.1, 4.1.1.2 and 4.1.1.4 to 4.1.1.8.

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

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

- Cells or batteries identified as being defective for safety reasons;
- Cells or batteries that have leaked or vented;
- Cells or batteries that cannot be diagnosed prior to carriage; or
- Cells or batteries that have sustained physical or mechanical damage.

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

Cells and batteries shall be carried according to the provisions applicable to UN No. 3090, UN No. 3091, UN No. 3480 and No. UN 3481, except special provision 230 and as otherwise stated in this special provision.

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

Cells and batteries shall be packed in accordance with packing instructions P 908 of 4.1.4.1 or LP 904 of 4.1.4.3, as applicable.

Cells and batteries liable to rapidly disassemble, dangerously react, produce a flame or a dangerous evolution of heat or a dangerous emission of toxic, corrosive or flammable gases or vapours under normal conditions of carriage shall not be carried except under conditions approved by the competent authority of any RID Contracting State who may also recognize an approval granted by the competent authority of a country which is not an RID Contracting State provided that this approval has been granted in accordance with the procedures applicable according to RID, ADR, ADN, the IMDG Code or the ICAO Technical Instructions. In this case the cells and batteries are assigned to transport category 0.

377 Lithium ion and lithium metal cells and batteries and equipment containing such cells and batteries carried for disposal or recycling, either packed together with or packed without non-lithium batteries, may be packaged in accordance with packing instruction P 909 of 4.1.4.1.

These cells and batteries are not subject to the requirements of 2.2.9.1.7 (a) to (e).

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

Identified damaged or defective batteries shall be carried in accordance with special provision 376 and packaged in accordance with packing instruction P 908 of 4.1.4.1 or LP 904 of 4.1.4.3, as applicable.

**378** Radiation detectors containing this gas in non-refillable pressure receptacles not meeting the requirements of Chapter 6.2 and packing instruction P 200 of 4.1.4.1 may be carried under this entry provided:

- (a) The working pressure in each receptacle does not exceed 50 bar;
- (b) The receptacle capacity does not exceed 12 litres;
- (c) Each receptacle has a minimum burst pressure of at least 3 times the working pressure when a relief device is fitted and at least 4 times the working pressure when no relief device is fitted;
- (d) Each receptacle is manufactured from material which will not fragment upon rupture;
- (e) Each detector is manufactured under a registered quality assurance programme;

NOTE: ISO 9001 may be used for this purpose.

- (f) Detectors are carried in strong outer packagings. The complete package shall be capable of withstanding a 1.2 metre drop test without breakage of the detector or rupture of the outer packaging. Equipment that includes a detector shall be packed in a strong outer packaging unless the detector is afforded equivalent protection by the equipment in which it is contained; and

- (g) The transport document includes the following statement:

"TRANSPORT IN ACCORDANCE WITH SPECIAL PROVISION 378".

Radiation detectors, including detectors in radiation detection systems, are not subject to any other requirements of RID if the detectors meet the requirements in (a) to (f) above and the capacity of detector receptacles does not exceed 50 ml.

**379** Anhydrous ammonia adsorbed or absorbed on a solid contained in ammonia dispensing systems or receptacles intended to form part of such systems are not subject to the other provisions of RID if the following conditions are observed:

- (a) The adsorption or absorption presents the following properties:

- (i) The pressure at a temperature of 20 °C in the receptacle is less than 0.6 bar;
  - (ii) The pressure at a temperature of 35 °C in the receptacle is less than 1 bar;
  - (iii) The pressure at a temperature of 85 °C in the receptacle is less than 12 bar.

- (b) The adsorbent or absorbent material shall not have dangerous properties listed in classes 1 to 8;

- (c) The maximum contents of a receptacle shall be 10 kg of ammonia; and

- (d) Receptacles containing adsorbed or absorbed ammonia shall meet the following conditions:

- (i) Receptacles shall be made of a material compatible with ammonia as specified in ISO 11114-1:2012;

- (ii) Receptacles and their means of closure shall be hermetically sealed and able to contain the generated ammonia;

- (iii) Each receptacle shall be able to withstand the pressure generated at 85 °C with a volumetric expansion no greater than 0.1%;

- (iv) Each receptacle shall be fitted with a device that allows for gas evacuation once pressure exceeds 15 bar without violent rupture, explosion or projection; and

- (v) Each receptacle shall be able to withstand a pressure of 20 bar without leakage when the pressure relief device is deactivated.

When carried in an ammonia dispenser, the receptacles shall be connected to the dispenser in such a way that the assembly is guaranteed to have the same strength as a single receptacle.

The properties of mechanical strength mentioned in this special provision shall be tested using a prototype of a receptacle and/or dispenser filled to nominal capacity, by increasing the temperature until the specified pressures are reached.

The test results shall be documented, shall be traceable and shall be communicated to the relevant authorities upon request.

**380** (Reserved)

**381** (Reserved)

**382** Polymeric beads may be made from polystyrene, poly (methyl methacrylate) or other polymeric material. When it can be demonstrated that no flammable vapour, resulting in a flammable atmosphere, is evolved according to test U1 (Test method for substances liable to evolve flammable vapours) of Part III, subsection 38.4.4 of the Manual of Tests and Criteria, polymeric beads, expandable need not be classified under this UN number. This test should only be performed when de-classification of a substance is considered.

383 Table tennis balls manufactured from celluloid are not subject to RID where the net mass of each table tennis ball does not exceed 3.0 g and the total net mass of table tennis balls does not exceed 500 g per package.

384 (Reserved)

385 This entry applies to vehicles powered by flammable liquid or gas internal combustion engines or fuel cells.

Hybrid electric vehicles powered by both, an internal combustion engine and wet batteries, sodium batteries, lithium metal batteries or lithium ion batteries, carried with the batteries installed shall be assigned to this entry. Vehicles powered by wet batteries, sodium batteries, lithium metal batteries or lithium ion batteries, carried with the batteries installed, shall be assigned to the entry UN 3171 BATTERYPOWERED VEHICLE (see special provision 240).

For the purpose of this special provision, vehicles are self-propelled apparatus designed to carry one or more persons or goods. Examples of such vehicles are cars, motorcycles, trucks, locomotives, scooters, three- and four-wheeled vehicles or motorcycles, lawn tractors, self-propelled farming and construction equipment, boats and aircraft.

Dangerous goods such as batteries, air bags, fire extinguishers, compressed gas accumulators, safety devices and other integral components of the vehicle that are necessary for the operation of the vehicle or for the safety of its operator or passengers, shall be securely installed in the vehicle and are not otherwise subject to RID. However, lithium batteries shall meet the requirements of 2.2.9.1.7, except as otherwise provided for in special provision 667.

386 Substances stabilized by temperature control are not accepted for carriage by rail (see 2.2.41.2.3). When chemical stabilization is employed, the person offering the packaging, IBC or tank for carriage shall ensure that the level of stabilization is sufficient to prevent the substance in the packaging, IBC or tank from dangerous polymerization at a bulk mean temperature of 50 °C, or, in the case of a portable tank, 45 °C. Where chemical stabilization becomes ineffective at lower temperatures within the anticipated duration of carriage, carriage by rail is not permitted. In making this determination factors to be taken into consideration include, but are not limited to, the capacity and geometry of the packaging, IBC or tank and the effect of any insulation present, the temperature of the substance when offered for carriage, the duration of the journey and the ambient temperature conditions typically encountered in the journey (considering also the season of year), the effectiveness and other properties of the stabilizer employed, applicable operational controls imposed by regulation (e.g. requirements to protect from sources of heat, including other cargo carried at a temperature above ambient) and any other relevant factors.

387– (Reserved)

499

500 (Deleted)

501 For naphthalene, molten, see UN No. 2304.

502 UN No. 2006 plastics, nitrocellulose-based, self-heating, n.o.s., and 2002 celluloid scrap are substances of Class 4.2.

503 For phosphorus, white, molten, see UN No. 2447.

504 UN No. 1847 potassium sulphide, hydrated with not less than 30% water of crystallization, UN No. 1849 sodium sulphide, hydrated with not less than 30% water of crystallization and UN No. 2949 sodium hydro-sulphide, hydrated with not less than 25% water of crystallization are substances of Class 8.

505 UN No. 2004 magnesium diamide is a substance of Class 4.2.

506 Alkaline earth metals and alkaline earth metal alloys in pyrophoric form are substances of Class 4.2.

UN No. 1869 magnesium or magnesium alloys containing more than 50% magnesium as pellets, turnings or ribbons, are substances of Class 4.1.

507 UN No. 3048 aluminium phosphide pesticides, with additives inhibiting the emission of toxic flammable gases are substances of Class 6.1.

508 UN No. 1871 titanium hydride and UN No. 1437 zirconium hydride are substances of Class 4.1. UN No. 2870 aluminium borohydride is a substance of Class 4.2.

509 UN No. 1908 chlorite solution is a substance of Class 8.

510 UN No. 1755 chromic acid solution is a substance of Class 8.

511 UN No. 1625 mercuric nitrate, UN No. 1627 mercurous nitrate and UN No. 2727 thallium nitrate are substances of Class 6.1. Thorium nitrate, solid, uranyl nitrate hexahydrate solution and uranyl nitrate, solid are substances of Class 7.

512 UN No. 1730 antimony pentachloride, liquid, UN No. 1731 antimony pentachloride solution, UN No. 1732 antimony pentafluoride and UN No. 1733 antimony trichloride are substances of Class 8.

513 UN No. 0224 barium azide, dry or wetted with less than 50% water, by mass, is not permitted for carriage by rail. UN No. 1571 barium azide, wetted with not less than 50% water, by mass, is a substance of Class 4.1. UN No. 1854 barium alloys, pyrophoric, are substances of Class 4.2. UN No. 1445 barium chlorate, solid, UN No. 1446 barium nitrate, UN No. 1447 barium perchlorate, solid, UN No. 1448 barium permanganate, UN No. 1449 barium peroxide, UN No. 2719 barium bromate, UN No. 2741 barium hypochlorite with more than 22% available chlorine, UN No. 3405 barium chlorate, solution and UN No. 3406 barium perchlorate, solution, are substances of Class 5.1. UN No. 1565 barium cyanide and UN No. 1884 barium oxide are substances of Class 6.1.

514 UN No. 2464 beryllium nitrate is a substance of Class 5.1.

515 UN No. 1581 chloropicrin and methyl bromide mixture and UN No. 1582 chloropicrin and methyl chloride mixture are substances of Class 2.

516 UN No. 1912 methyl chloride and methylene chloride mixture is a substance of Class 2.

517 UN No. 1690 sodium fluoride, solid, UN No. 1812 potassium fluoride, solid, UN No. 2505 ammonium fluoride, UN No. 2674 sodium fluorosilicate, UN No. 2856 fluorosilicates, n.o.s., UN No. 3415 sodium fluoride, solution and UN No. 3422 potassium fluoride, solution, are substances of Class 6.1.

518 UN No. 1463 chromium trioxide, anhydrous (chromic acid, solid) is a substance of Class 5.1.

519 UN No. 1048 hydrogen bromide, anhydrous, is a substance of Class 2.

520 UN No. 1050 hydrogen chloride, anhydrous, is a substance of Class 2

521 Solid chlorites and hypochlorites are substances of Class 5.1.

522 UN No. 1873 perchloric acid aqueous solution with more than 50% but not more than 72% pure acid, by mass are substances of Class 5.1. Perchloric acid solutions containing more than 72% pure acid, by mass, or mixtures of perchloric acid with any liquid other than water, are not to be accepted for carriage.

523 UN No. 1382 anhydrous potassium sulphide and UN No. 1385 anhydrous sodium sulphide and their hydrates with less than 30% water of crystallization, and UN No. 2318 sodium hydrosulphide with less than 25% water of crystallization are substances of Class 4.2.

524 UN No. 2858 finished zirconium products of a thickness of 18 µm or more are substances of Class 4.1.

525 Solutions of inorganic cyanides with a total cyanide ion content of more than 30% shall be classified in packing group I, solutions with a total cyanide ion content of more than 3% and not more than 30% in packing group II and solutions with a cyanide ion content of more than 0.3% and not more than 3% in packing group III.

526 UN No. 2000 celluloid is assigned to Class 4.1.

527 (Reserved)

528 UN No. 1353 fibres or fabrics impregnated with weakly nitrated cellulose, non-self heating are substances of Class 4.1.

529 UN No. 0135 mercury fulminate, wetted with not less than 20% water, or mixture of alcohol and water, by mass, is not permitted for carriage by rail. Mercurous chloride (calomel) is a substance of Class 6.1 (UN No. 2025).

530 UN No. 3293 hydrazine, aqueous solution with not more than 37% hydrazine, by mass, is a substance of Class 6.1.

531 Mixtures having a flash-point below 23 °C and containing more than 55% nitrocellulose, whatever its nitrogen content or containing not more than 55% nitrocellulose with a nitrogen content above 12.6% (by dry mass), are substances of Class 1 (see UN Nos. 0340 or 0342) or of Class 4.1 (UN Nos. 2555, 2556 or 2557).

532 UN No. 2672 ammonia solution containing not less than 10% but not more than 35% ammonia is a substance of Class 8.

533 UN No. 1198 formaldehyde solutions, flammable are substances of Class 3. Formaldehyde solutions, non-flammable, with less than 25% formaldehyde are not subject to the requirements of RID.

534 While in some climatic conditions, petrol (gasoline) may have a vapour pressure at 50 °C of more than 110 kPa (1.10 bar) but not more than 150 kPa (1.50 bar) it is to continue to be considered as a substance having a vapour pressure at 50 °C of not more than 110 kPa (1.10 bar).

535 UN No. 1469 lead nitrate, UN No. 1470 lead perchlorate, solid and UN No. 3408 lead perchlorate, solution are substances of Class 5.1.

536 For naphthalene, solid, see UN No. 1334.

537 UN No. 2869 titanium trichloride mixture, not pyrophoric, is a substance of Class 8.

538 For sulphur (in the solid state), see UN No. 1350.

539 Solutions of isocyanates having a flash-point of not less than 23 °C are substances of Class 6.1.

540 UN No. 1326 hafnium powder, wetted, UN No. 1352 titanium powder, wetted or UN No. 1358 zirconium powder, wetted, with not less than 25% water, are substances of Class 4.1.

541 Nitrocellulose mixtures with a water content, alcohol content or plasticizer content lower than the stated limits are substances of Class 1.

542 Talc containing tremolite and/or actinolite is covered by this entry.

543 UN No. 1005 ammonia, anhydrous, UN No. 3318 ammonia solution with more than 50% ammonia and UN No. 2073 ammonia solution, with more than 35% but not more than 50% ammonia, are substances of Class 2. Ammonia solutions with not more than 10% ammonia are not subject to the requirements of RID.

544 UN No. 1032 dimethylamine, anhydrous, UN No. 1036 ethylamine, UN No. 1061 methylamine, anhydrous and UN No. 1083 trimethylamine, anhydrous, are substances of Class 2.

545 UN No. 0401 dipicryl sulphide, wetted with less than 10% water by mass is a substance of Class 1.

546 UN No. 2009 zirconium, dry, finished sheets, strip or coiled wire, in thicknesses of less than 18 µm, is a substance of Class 4.2. Zirconium, dry, finished sheets, strip or coiled wire, in thicknesses of 254 µm or more, is not subject to the requirements of RID.

547 UN No. 2210 maneb or UN No. 2210 maneb preparations in self-heating form are substances of Class 4.2.

548 Chlorosilanes which, in contact with water, emit flammable gases, are substances of Class 4.3.

549 Chlorosilanes having a flash-point of less than 23 °C and which, in contact with water, do not emit flammable gases are substances of Class 3. Chlorosilanes having a flash-point equal to or greater than 23 °C and which, in contact with water, do not emit flammable gases are substances of Class 8.

550 UN No. 1333 cerium in slabs, rods or ingots is a substance of Class 4.1.

551 Solutions of these isocyanates having a flash-point below 23 °C are substances of Class 3.

552 Metals and metal alloys in powdered or other flammable form, liable to spontaneous combustion, are substances of Class 4.2. Metals and metal alloys in powdered or other flammable form which, in contact with water, emit flammable gases are substances of Class 4.3.

553 This mixture of hydrogen peroxide and peroxyacetic acid shall, in laboratory testing (see Manual of Tests and Criteria, Part II, section 20), neither detonate in the cavitated state nor deflagrate at all and shall show no effect when heated under confinement nor any explosive power. The formulation shall be thermally stable (self-accelerating decomposition temperature 60 °C or higher for a 50 kg package), and a liquid compatible with peroxyacetic acid shall be used for desensitization. Formulations not meeting these criteria are to be regarded as substances of Class 5.2 (see Manual of Tests and Criteria, Part II, paragraph 20.4.3 (g)).

554 Metal hydrides which, in contact with water, emit flammable gases are substances of Class 4.3. UN No. 2870 aluminium borohydride or UN No. 2870 aluminium borohydride in devices is a substance of Class 4.2.

555 Dust and powder of metals in non-spontaneously combustible form, non-toxic which nevertheless, in contact with water, emit flammable gases, are substances of Class 4.3.

556 Organometallic compounds and their solutions which ignite spontaneously are substances of Class 4.2. Flammable solutions with organometallic compounds in concentrations which, in contact with water, neither emit flammable gases in dangerous quantities nor ignite spontaneously are substances of Class 3.

557 Dust and powder of metals in pyrophoric form are substances of Class 4.2.

558 Metals and metal alloys in pyrophoric form are substances of Class 4.2. Metals and metal alloys which, in contact with water, do not emit flammable gases and are not pyrophoric or self-heating, but which are easily ignited, are substances of Class 4.1.

559 (Deleted)

560 An elevated temperature liquid, n.o.s. at or above 100 °C (including molten metals and molten salts) and, for a substance having a flashpoint, at a temperature below its flashpoint, is a substance of Class 9 (UN No. 3257).

561 Chloroformates having predominantly corrosive properties are substances of Class 8.

562 Spontaneously combustible organometallic compounds are substances of Class 4.2. Water-reactive organometallic compounds, flammable, are substances of Class 4.3.

563 UN No. 1905 selenic acid is a substance of Class 8.

564 UN No. 2443 vanadium oxytrichloride, UN No. 2444 vanadium tetrachloride and UN No. 2475 vanadium trichloride are substances of Class 8.

565 Unspecified wastes resulting from medical/veterinary treatment of humans/animals or from biological research, and which are unlikely to contain substances of Class 6.2 shall be assigned to this entry. Decontaminated clinical wastes or wastes resulting from biological research which previously contained infectious substances are not subject to the requirements of Class 6.2.

566 UN No. 2030 hydrazine aqueous solution, with more than 37% hydrazine, by mass, is a substance of Class 8.

567 (Deleted)

568 Barium azide with a water content lower than the stated limit is a substance of Class 1, UN No. 0224 and is not permitted for carriage by rail.

569– (Reserved)

579

580 (Deleted)

581 This entry covers mixtures of propadiene with 1 to 4% methylacetylene as well as the following mixtures:

Mixture	Content, % by volume			Permitted technical name for purposes of 5.4.1.1
	Methylacetylene and propadiene, not more than	Propane and propylene, not more than	C <sub>4</sub> -saturated hydrocarbons, not less than	
P 1	63	24	14	"Mixture P 1"
P 2	48	50	5	"Mixture P 2"

582 This entry covers, inter alia, mixtures of gases indicated by the letter R ..., with the following properties:

Mixture	Maximum vapour pressure at 70 °C (MPa)	Minimum density at 50 °C (kg/l)	Permitted technical name for purposes of 5.4.1.1
F 1	1.3	1.30	"Mixture F 1"
F 2	1.9	1.21	"Mixture F 2"
F 3	3.0	1.09	"Mixture F 3"

NOTE 1: Trichlorofluoromethane (refrigerant R 11), 1,1,2-trichloro-1,2,2-trifluoroethane (refrigerant R 113), 1,1,1-trichloro-2,2,2-trifluoroethane (refrigerant R 113a), 1-chloro-1,2,2-trifluoroethane (refrigerant R 133) and 1-chloro-1,1,2-trifluoroethane (refrigerant R 133b) are not substances of Class 2. They may, however, enter into the composition of mixtures F 1 to F 3.

2: The reference densities correspond to the densities of dichlorofluoromethane (1.30 kg/l), dichlorodifluoromethane (1.21 kg/l) and chlorodifluoromethane (1.09 kg/l).

583 This entry covers, inter alia, mixtures of gases with the following properties:

Mixture	Maximum vapour pressure at 70 °C (MPa)	Minimum density at 50 °C (kg/l)	Permitted technical name <sup>(a)</sup> for purposes of 5.4.1.1
A	1.1	0.525	"Mixture A" or "Butane"
A 01	1.6	0.516	"Mixture A 01" or "Butane"
A 02	1.6	0.505	"Mixture A 02" or "Butane"
A 0	1.6	0.495	"Mixture A 0" or "Butane"
A 1	2.1	0.485	"Mixture A 1"
B 1	2.6	0.474	"Mixture B 1"
B 2	2.6	0.463	"Mixture B 2"
B	2.6	0.450	"Mixture B"
C	3.1	0.440	"Mixture C" or "Propane"

<sup>(a)</sup> For carriage in tanks, the trade names "Butane" or "Propane" may be used only as a complement.

584 This gas is not subject to the requirements of RID when:

- it contains not more than 0.5% air in the gaseous state;
- it is contained in metal capsules (sodors, sparklets) free from defects which may impair their strength;
- the leakproofness of the closure of the capsule is ensured;
- a capsule contains not more than 25 g of this gas;
- a capsule contains not more than 0.75 g of this gas per cm<sup>3</sup> of capacity.

585 (Deleted)

586 Hafnium, titanium and zirconium powders shall contain a visible excess of water. Hafnium, titanium and zirconium powders, wetted, mechanically produced, of a particle size of 53 µm and over, or chemically produced, of a particle size of 840 µm and over, are not subject to the requirements of RID.

587 Barium stearate and barium titanate are not subject to the requirements of RID.

588 Solid hydrated forms of aluminium bromide and aluminium chloride are not subject to the requirements of RID.

589 (Deleted)

590 Ferric chloride hexahydrate is not subject to the requirements of RID.

591 Lead sulphate with not more than 3% free acid is not subject to the requirements of RID.

592 Uncleaned empty packagings (including empty IBCs and large packagings), empty tank-wagons, empty demountable tanks, empty portable tanks, empty tank-containers and empty small containers which have contained this substance are not subject to the requirements of RID.

593 This gas, intended for the cooling of e.g. medical or biological specimens, if contained in double wall receptacles which comply with the provisions of packing instruction P 203, paragraph (6) for open cryogenic receptacles of 4.1.4.1 is not subject to the requirements of RID except as specified in 5.5.3.

594 The following articles, manufactured and filled according to the provisions applied in the country of manufacture, are not subject to the requirements of RID:

- (a) UN No. 1044 fire extinguishers provided with protection against inadvertent discharge, when:
  - they are packaged in a strong outer packaging; or
  - they are large fire extinguishers which meet the requirements of special packing provision PP 91 of packing instruction P 003 in 4.1.4.1;
- (b) UN No. 3164 articles, pressurized pneumatic or hydraulic, designed to withstand stresses greater than the internal gas pressure by virtue of transmission of force, intrinsic strength or construction, when they are packaged in a strong outer packaging.

**NOTE:** "Provisions applied in the country of manufacture" means the provisions applicable in the country of manufacture or those applicable in the country of use.

596 Cadmium pigments, such as cadmium sulphides, cadmium sulphoselenides and cadmium salts of higher fatty acids (e.g. cadmium stearate), are not subject to the requirements of RID.

597 Acetic acid solutions with not more than 10% pure acid by mass, are not subject to the requirements of RID.

598 The following are not subject to the requirements of RID:

(a) New storage batteries when:

- they are secured in such a way that they cannot slip, fall or be damaged;
- they are provided with carrying devices, unless they are suitably stacked, e.g. on pallets;
- there are no dangerous traces of alkalis or acids on the outside;
- they are protected against short circuits.

(b) Used storage batteries when:

- their cases are undamaged;
- they are secured in such a way that they cannot leak, slip, fall or be damaged, e.g. by stacking on pallets;
- there are no dangerous traces of alkalis or acids on the outside of the articles;
- they are protected against short circuits.

"Used storage batteries" means storage batteries carried for recycling at the end of their normal service life.

599 (Deleted)

600 Vanadium pentoxide, fused and solidified, is not subject to the requirements of RID.

601 Pharmaceutical products (medicines) ready for use, which are substances manufactured and packaged for retail sale or distribution for personal or household consumption are not subject to the requirements of RID.

602 Phosphorus sulphides which are not free from yellow and white phosphorus are not to be accepted for carriage.

603 Anhydrous hydrogen cyanide not meeting the description for UN No. 1051 or UN No. 1614 is not to be accepted for carriage. Hydrogen cyanide (hydrocyanic acid) containing less than 3% water is stable, if the pH-value is  $2.5 \pm 0.5$  and the liquid is clear and colourless.

604 (Deleted)

605 (Deleted)

606 (Deleted)

607 Mixtures of potassium nitrate and sodium nitrite with an ammonium salt are not to be accepted for carriage.

608 (Deleted)

609 Tetranitromethane not free from combustible impurities is not to be accepted for carriage.

610 The carriage of this substance, when it contains more than 45% hydrogen cyanide is prohibited.

611 Ammonium nitrate containing more than 0.2% combustible substances (including any organic substance calculated as carbon) is not to be accepted for carriage unless it is a constituent of a substance or article of Class 1.

612 (Reserved)

613 Chloric acid solution containing more than 10% chloric acid and mixtures of chloric acid with any liquid other than water is not to be accepted for carriage.

614 2,3,7,8-tetrachlorodibenzo-p-dioxin (TCDD) in concentrations considered highly toxic according to the criteria in 2.2.61.1 is not to be accepted for carriage.

615 (Reserved)

616 Substances containing more than 40% liquid nitric esters shall satisfy the exudation test specified in 2.3.1.

617 In addition to the type of explosive, the commercial name of the particular explosive shall be marked on the package.

618 In receptacles containing 1,2-butadiene, the oxygen concentration in the gaseous phase shall not exceed 50 ml/m<sup>3</sup>.

## 619- (Reserved)

622

623 UN No. 1829 sulphur trioxide shall be inhibited. Sulphur trioxide, at least 99.95% pure, without inhibitor (non-stabilized), shall not be accepted for carriage by rail. Sulphur trioxide, at least 99.95% pure may be carried by road without inhibitor in tanks, provided its temperature is maintained at 32.5 °C or above.

625 Packages containing these articles shall be clearly marked as follows: "UN 1950 AEROSOLS".

## 626- (Reserved)

631

632 Considered to be spontaneously flammable (pyrophoric).

633 Packages and small containers containing this substance shall bear the following mark: "KEEP AWAY FROM ANY SOURCE OF IGNITION". This mark shall be in an official language of the forwarding country, and also, if that language is not English, French, German or Italian, in English, French, German or Italian, unless any agreements concluded between the countries concerned in the transport operation provide otherwise.

634 (Deleted)

635 Packages containing these articles need not bear a label conforming to model No. 9 unless the article is fully enclosed by packaging, crates or other means that prevent the ready identification of the article.

636 (a) Cells contained in equipment shall not be capable of being discharged during carriage to the extent that the open circuit voltage falls below 2 volts or two thirds of the voltage of the undischarged cell, whichever is the lower.

(b) Up to the intermediate processing facility:

- lithium cells and batteries with a gross mass of not more than 500 g each or lithium ion cells with a Watt-hour rating of not more than 20 Wh, lithium ion batteries with a Watt-hour rating of not more than 100 Wh, lithium metal cells with a lithium content of not more than 1 g and lithium metal batteries with an aggregate lithium content of not more than 2 g, not contained in equipment, collected and handed over for carriage for sorting, disposal or recycling; as well as
- lithium cells and batteries contained in equipment from private households collected and handed over for carriage for depollution, dismantling, recycling or disposal

**NOTE:** "Equipment from private households" means equipment which comes from private households and equipment which comes from commercial, industrial, institutional and other sources which, because of its nature and quantity, is similar to that from private households. Equipment likely to be used by both private households and users other than private households shall in any event be considered to be equipment from private households.

are not subject to the other provisions of RID including special provision 376 and paragraph 2.2.9.1.7, if they meet the following conditions:

(i) The provisions of packing instruction P 909 of 4.1.4.1 apply except for the additional requirements 1 and 2;

(ii) A quality assurance system is in place to ensure that the total amount of lithium cells or batteries per wagon or large container does not exceed 333 kg;

**NOTE:** The total quantity of lithium cells and batteries in the mix may be assessed by means of a statistical method included in the quality assurance system. A copy of the quality assurance records shall be made available to the competent authority upon request.

(iii) Packages are marked "LITHIUM BATTERIES FOR DISPOSAL" or "LITHIUM BATTERIES FOR RECYCLING" as appropriate.

If equipment containing lithium cells or batteries is carried unpackaged or on pallets in accordance with packing instruction P 909 (3) of 4.1.4.1, this mark may alternatively be affixed to the external surface of the wagons or containers.

**637** Genetically modified microorganisms and genetically modified organisms are those which are not dangerous for humans and animals, but which could alter animals, plants, microbiological substances and ecosystems in such a way as cannot occur naturally.

Genetically modified microorganisms and genetically modified organisms are not subject to the provisions of RID when authorized for use by the competent authorities of the countries of origin, transit and destination.<sup>3</sup>

Live vertebrate or invertebrate animals shall not be used to carry these substances classified under this UN number unless the substance can be carried in no other way.

**638** Substances related to self-reactive substances (see 2.2.41.1.19).

**639** See 2.2.2.3, classification code 2F, UN No. 1965, NOTE 2.

**640** The physical and technical characteristics mentioned in column (2) of Table A of Chapter 3.2 determine different tank codes for the carriage of substances of the same packing group in RID tanks.

In order to identify these physical and technical characteristics of the product carried in the tank, the following shall be added, to the particulars required in the transport document, only in case of carriage in RID tanks:

"Special provision 640X" where "X" is the applicable capital letter appearing after the reference to special provision 640 in column (6) of Table A of Chapter 3.2.

These particulars may, however, be dispensed with in the case of carriage in the type of tank which, for substances of a specific packing group of a specific UN number, meets at least the most stringent requirements.

**642** Except as authorized under 1.1.4.2, this entry of the UN Model Regulations shall not be used for the carriage of fertilizer ammoniating solutions with free ammonia.

**643** Stone or aggregate asphalt mixture is not subject to the requirements for Class 9.

**644** This substance is admitted for carriage, provided that:

1. The pH is between 5 and 7 measured in an aqueous solution of 10% of the substance carried;
2. The solution does not contain more than 0.2% combustible material or chlorine compounds in quantities such that the chlorine level exceeds 0.02%.

**645** The classification code as mentioned in Column (3b) of Table A of Chapter 3.2 shall be used only with the approval of the competent authority of an RID Contracting State prior to carriage. The approval shall be given in writing as a classification approval certificate (see 5.4.1.2.1 (g)) and shall be provided with a unique reference. When assignment to a division is made in accordance with the procedure in 2.2.1.1.7.2, the competent authority may require the default classification to be verified on the basis of test data derived from Test Series 6 of the Manual of Tests and Criteria, Part I, Section 16.

**646** Carbon made by steam activation process is not subject to the requirements of RID.

**647** The carriage of vinegar and acetic acid food grade with not more than 25% pure acid by mass is subject only to the following requirements:

- (a) Packagings, including IBCs and large packagings, and tanks shall be manufactured from stainless steel or plastic material which is permanently resistant to corrosion of vinegar/acetic acid food grade;
- (b) Packagings, including IBCs and large packagings, and tanks shall be subjected to a visual inspection by the owner at least once a year. The results of the inspections shall be recorded and the records kept for at least one year. Damaged packagings, including IBCs and large packagings, and tanks shall not be filled;
- (c) Packagings, including IBCs and large packagings, and tanks shall be filled in a way that no product is spilled or adheres to the outer surface;
- (d) Seals and closures shall be resistant to vinegar/acetic acid food grade. Packagings, including IBCs and large packagings, and tanks shall be hermetically sealed by the packer or the filler so that under normal conditions of carriage there will be no leakage;
- (e) Combination packagings with inner packaging made of glass or plastic (see packing instruction P001 in 4.1.4.1) which fulfil the general packing requirements of 4.1.1.1, 4.1.1.2, 4.1.1.4, 4.1.1.5, 4.1.1.6,

<sup>3</sup> See in particular Part C of Directive 2001/18/EC of the European Parliament and of the Council on the deliberate release into the environment of genetically modified organisms and repealing Council Directive 90/220/EEC (Official Journal of the European Communities, No. L 106, of 17 April 2001, pp. 8-14), which sets out the authorization procedures for the European Community.

4.1.1.7 and 4.1.1.8 may be used;

The other provisions of RID do not apply.

648 Articles impregnated with this pesticide, such as fibreboard plates, paper strips, cotton-wool balls, sheets of plastics material, in hermetically closed wrappings, are not subject to the provisions of RID.

649 (Deleted)

650 Waste consisting of packaging residues, solidified residues and liquid residues of paint may be carried under the conditions of packing group II. In addition to the provisions of UN No. 1263, packing group II, the waste may also be packed and carried as follows:

(a) The waste may be packed in accordance with packing instruction P002 of 4.1.4.1 or to packing instruction IBC06 of 4.1.4.2;

(b) The waste may be packed in flexible IBCs of types 13H3, 13H4 and 13H5 in overpacks with complete walls;

(c) Testing of packagings and IBCs indicated under (a) or (b) may be carried out in accordance with the requirements of Chapters 6.1 or 6.5, as appropriate, in relation to solids, at the packing group II performance level.

The tests shall be carried out on packagings and IBCs, filled with a representative sample of the waste, as prepared for carriage;

(d) Carriage in bulk in sheeted wagons, movable roof wagons, closed containers or sheeted large containers, all with complete walls is allowed. The body of wagons or containers shall be leakproof or rendered leakproof, for example by means of a suitable and sufficiently stout inner lining;

(e) If the waste is carried under the conditions of this special provision, the goods shall be declared in accordance with 5.4.1.1.3 in the transport document, as follows:

"UN 1263 WASTE PAINT, 3, II", or

"UN 1263 WASTE PAINT, 3, PG II".

651 (Reserved)

652 (Reserved)

653 The carriage of this gas in cylinders having a test pressure capacity product of maximum 15.2 MPa·litre (152 bar·litre) is not subject to the other provisions of RID if the following conditions are met:

- The provisions for construction and testing of cylinders are observed;
- The cylinders are contained in outer packagings which at least meet the requirements of Part 4 for combination packagings. The general provisions of packing of 4.1.1.1, 4.1.1.2 and 4.1.1.5 to 4.1.1.7 shall be observed;
- The cylinders are not packed together with other dangerous goods;
- The total gross mass of a package does not exceed 30 kg; and
- Each package is clearly and durably marked with "UN 1006" for argon compressed, "UN 1013" for carbon dioxide, "UN 1046" for helium compressed or "UN 1066" for nitrogen, compressed. This mark is displayed within a diamond-shaped area surrounded by a line that measures at least 100 mm by 100 mm.

654 Waste lighters collected separately and consigned in accordance with 5.4.1.1.3 may be carried under this entry for the purposes of disposal. They need not be protected against inadvertent discharge, provided that measures are taken to prevent the dangerous build up of pressure and dangerous atmospheres.

Waste lighters, other than those leaking or severely deformed, shall be packed in accordance with packing instruction P003. In addition the following provisions shall apply:

- only rigid packagings of a maximum capacity of 60 litres shall be used;
- the packagings shall be filled with water or any other appropriate protection material to avoid any ignition;
- under normal conditions of carriage all ignition devices of the lighters shall fully be covered by the protection material;
- the packagings shall be adequately vented to prevent the creation of flammable atmosphere and the build up of pressure;
- the packages shall only be carried in ventilated or open wagons or containers

Leaking or severely deformed lighters shall be carried in salvage packagings, provided appropriate measures are taken to ensure there is no dangerous build up of pressure.

**NOTE:** Special provision 201 and special packing provisions PP84 and RR5 of packing instruction P002 in 4.1.4.1 do not apply to waste lighters.

655 Cylinders and their closures designed, constructed, approved and marked in accordance with Directive 97/23/EC<sup>4</sup> or Directive 2014/68/EU<sup>5</sup> and used for breathing apparatus may be carried without conforming to Chapter 6.2, provided that they are subject to inspections and tests specified in 6.2.1.6.1 and the interval between tests specified in packing instruction P200 in 4.1.4.1 is not exceeded. The pressure used for the hydraulic pressure test is the pressure marked on the cylinder in accordance with Directive 97/23/EC or Directive 2014/68/EU.

656 (Deleted)

657 This entry shall be used for the technically pure substance only; for mixtures of LPG components, see UN No. 1965 or see UN No. 1075 in conjunction with NOTE 2 in 2.2.2.3.

658 UN No. 1057 LIGHTERS complying with standard EN ISO 9994:2006 + A1:2008 "Lighters – Safety Specification" and UN No. 1057 LIGHTER REFILLS, may be carried subject only to the provisions of 3.4.1 (a) to (g), 3.4.2 (except for the total gross mass of 30 kg), 3.4.3 (except for the total gross mass of 20 kg), 3.4.11 and 3.4.12, first sentence, provided the following conditions are met:  
(a) The total gross mass of each package is not more than 10 kg;  
(b) Not more than 100 kg gross mass of such packages is carried in a wagon or large container; and  
(c) Each outer packaging is clearly and durably marked with "UN 1057 LIGHTERS" or "UN 1057 LIGHTER REFILLS", as appropriate.

659 Substances to which PP 86 or TP 7 are assigned in Column (9a) and Column (11) of Table A in Chapter 3.2 and therefore require air to be eliminated from the vapour space, shall not be used for carriage under this UN number but shall be carried under their respective UN numbers as listed in Table A of Chapter 3.2.

NOTE: See also 2.2.2.1.7.

660 For the carriage of fuel gas containment systems designed to be fitted in motor vehicles containing this gas the provisions of sub-section 4.1.4.1, Chapter 5.2, Chapter 5.4 and Chapter 6.2 of RID need not be applied, provided the following conditions are met:  
(a) The fuel gas containment systems shall meet the requirements of ECE Regulation No. 67 Revision 2<sup>6</sup>, ECE Regulation No. 110 Revision 1<sup>7</sup> or ECE Regulation No. 115<sup>8</sup> or Regulation (EC) No. 79/2009<sup>9</sup> in combination with Regulation (EU) No. 406/2010<sup>10</sup>, as applicable.  
(b) The fuel gas containment systems shall be leakproof and shall not exhibit any signs of external damage which may affect their safety.

<sup>4</sup> Directive 97/23/EC of the European Parliament and of the Council of 29 May 1997 on the approximation of the laws of the Member States concerning pressure equipment (PED) (Official Journal of the European Communities No. L 181 of 9 July 1997, p. 1 – 55).

<sup>5</sup> Directive 2014/68/EU of the European Parliament and of the Council of 15 May 2014 on the harmonisation of the laws of the Member States relating to the making available on the market of pressure equipment (PED) (Official Journal of the European Union No. L 189 of 27 June 2014, p. 164 – 259).

<sup>6</sup> ECE Regulation No. 67 (Uniform provisions concerning the approval of:  
I. Approval of specific equipment of vehicles of category M and N using liquefied petroleum gases in their propulsion system;  
II. Approval of vehicles of category M and N fitted with specific equipment for the use of liquefied petroleum gases in their propulsion system with regard to the installation of such equipment).

<sup>7</sup> ECE Regulation No. 110 (Uniform provisions concerning the approval of:  
I. Specific components of motor vehicles using compressed natural gas (CNG) and/or liquefied natural gas (LNG) in their propulsion system;  
II. Vehicles with regard to the installation of specific components of an approved type for the use of compressed natural gas (CNG) and/or liquefied natural gas (LNG) in their propulsion system).

<sup>8</sup> ECE Regulation No. 115 (Uniform provisions concerning the approval of: I. Specific LPG (liquefied petroleum gases) retrofit systems to be installed in motor vehicles for the use of LPG in their propulsion system; II. Specific CNG (compressed natural gas) retrofit systems to be installed in motor vehicles for the use of CNG in their propulsion system).

<sup>9</sup> Regulation (EC) No 79/2009 of the European Parliament and of the Council of 14 January 2009 on type-approval of hydrogen-powered motor vehicles, and amending Directive 2007/46/EC.

<sup>10</sup> Commission Regulation (EU) No 406/2010 of 26 April 2010 implementing Regulation (EC) No 79/2009 of the European Parliament and of the Council on type-approval of hydrogen-powered motor vehicles.

**NOTE 1:** Criteria may be found in standard ISO 11623:2002 Transportable gas cylinders – Periodic inspection and testing of composite gas cylinders (or ISO DIS 19078 Gas cylinders – Inspection of the cylinder installation, and requalification of high pressure cylinders for the on-board storage of natural gas as a fuel for automotive vehicles).

**2:** If the fuel gas containment systems are not leakproof or overfilled or if they exhibit damage that could affect their safety, they shall only be carried in salvage pressure receptacles in conformity with RID.

(c) If the fuel gas containment system is equipped with two valves or more integrated in line, two valves shall be so closed as to be gastight under normal conditions of carriage. If only one valve exists or only one valve works properly all openings with the exception of the opening of the pressure relief device shall be so closed as to be gastight under normal conditions of carriage.

(d) Fuel gas containment systems shall be carried in such a way as to prevent obstruction of the pressure relief device or any damage to the valves and any other pressurised part of the fuel gas containment systems and unintentional release of the gas under normal conditions of carriage. The fuel gas containment system shall be secured so as to prevent slipping, rolling or vertical movement.

(e) Fuel gas containment systems shall satisfy the provisions of 4.1.6.8 (a), (b), (c), (d) or (e).

(f) The marking and labelling provisions of Chapter 5.2 shall be met, unless fuel gas containment systems are consigned in a handling device. If so, the marks and danger labels shall be affixed to the handling device.

(g) **Documentation**

Every consignment that is carried in accordance with this special provision shall be accompanied by a transport document, containing at least the following information:

(i) The UN number of the gas contained in the fuel gas containment systems, preceded by the letters "UN";

(ii) The proper shipping name of the gas;

(iii) The label model number;

(iv) The number of fuel gas containment systems;

(v) In the case of liquefied gases the net mass in kg of the gas of each fuel gas containment system and  
in the case of compressed gases the water capacity in litres of each fuel gas containment system followed by the nominal working pressure;

(vi) The names and the addresses of the consignor and the consignee.

(i) to (v) shall appear according to one of the following examples:

Example 1: "UN 1971 NATURAL GAS, COMPRESSED, 2.1, 1 FUEL GAS CONTAINMENT SYSTEM OF 50 L IN TOTAL, 200 BAR".

Example 2: "UN 1965 HYDROCARBON GAS MIXTURE, LIQUEFIED, N.O.S., 2.1, 3 FUEL GAS CONTAINMENT SYSTEMS, EACH OF 15 KG NET MASS OF GAS".

**NOTE:** All other provisions of RID shall be applied.

**661** (Deleted)

**662** Cylinders not conforming to the provisions of Chapter 6.2 which are used exclusively on board a ship or aircraft, may be carried for the purpose of filling or inspection and subsequent return, provided the cylinders are designed and constructed in accordance with a standard recognized by the competent authority of the country of approval and all the other relevant requirements of RID are met including:

(a) The cylinders shall be carried with valve protection in conformity with 4.1.6.8;

(b) The cylinders shall be marked and labelled in conformity with 5.2.1 and 5.2.2; and

(c) All the relevant filling requirements of packing instruction P 200 of 4.1.4.1 shall be complied with.

The transport document shall include the following statement:

"CARRIAGE IN ACCORDANCE WITH SPECIAL PROVISION 662".

**663** This entry may only be used for packagings, large packagings or IBCs, or parts thereof, which have contained dangerous goods which are carried for disposal, recycling or recovery of their material, other than reconditioning, repair, routine maintenance, remanufacturing or reuse, and which have been emptied to the extent that only residues of dangerous goods adhering to the packaging parts are present when they are handed over for carriage.

**Scope:**

Residues present in the packagings, discarded, empty, uncleaned shall only be of dangerous goods of classes 3, 4.1, 5.1, 6.1, 8 or 9. In addition, they shall not be:

– Substances assigned to packing group I or that have "0" assigned in Column (7a) of Table A of Chap-

ter 3.2; nor

- Substances classified as desensitized explosive substances of Class 3 or Class 4.1; nor
- Substances classified as self-reactive substances of Class 4.1; nor
- Radioactive material; nor
- Asbestos (UN 2212 and UN 2590), polychlorinated biphenyls (UN 2315 and UN 3432) and polyhalogenated biphenyls, halogenated monomethylphenylmethanes or polyhalogenated terphenyls (UN 3151 and UN 3152).

General provisions:

Packagings, discarded, empty, uncleaned with residues presenting a primary or subsidiary risk of Class 5.1 shall not be packed together with other packagings, discarded, empty, uncleaned, or loaded together with other packagings, discarded, empty, uncleaned in the same container, wagon or bulk container.

Documented sorting procedures shall be implemented on the loading site to ensure compliance with the provisions applicable to this entry.

**NOTE:** All the other provisions of RID apply.

**664** (Reserved)

**665** When carried in bulk, hard coal, coke and anthracite, meeting the classification criteria of Class 4.2, packing group III may also be carried in open wagons or containers, provided that

- (a) The coal is conveyed from fresh extraction directly into the wagon or container (without measuring the temperature) or
- (b) The temperature of the cargo is not higher than 60 °C during or immediately after loading into the wagon or container. Using suitable measuring methods, the filler shall ensure and document that the maximum permissible temperature of the cargo is not exceeded during or immediately after loading the wagons or containers.

The consignor shall ensure that the following statement is included in the document accompanying the consignment (such as a bill of lading, cargo manifest or CMR/CIM consignment note):

**"CARRIAGE IN ACCORDANCE WITH SPECIAL PROVISION 665 OF RID".**

The other provisions of RID do not apply.

**666** Vehicles assigned to UN No. 3166 or UN No. 3171 and battery powered equipment assigned to UN 3171 in conformity with special provisions 240, 312 and 385, as well as any dangerous goods they contain that are necessary for their operation or the operation of their equipment, when carried as a load, are not subject to any other provisions of RID, provided the following conditions are met:

- (a) For liquid fuels, any valves between the engine or equipment and the fuel tank shall be closed during carriage unless it is essential for the equipment to remain operational. Where appropriate, the vehicles shall be loaded upright and secured against falling;
- (b) For gaseous fuels, the valve between the gas tank and engine shall be closed and the electric contact open unless it is essential for the equipment to remain operational;
- (c) Metal hydride storage systems shall be approved by the competent authority of the country of manufacture. If the country of manufacture is not an RID Contracting State the approval shall be recognized by the competent authority of an RID Contracting State;
- (d) The provisions of (a) and (b) do not apply to vehicles which are empty of liquid or gaseous fuels.

**NOTE 1:** A vehicle is considered to be empty of liquid fuel when the liquid fuel tank has been drained and the vehicle cannot be operated due to a lack of fuel. Vehicle components such as fuel lines, fuel filters and injectors do not need to be cleaned, drained or purged to be considered empty of liquid fuels. In addition, the liquid fuel tank does not need to be cleaned or purged.

**2:** A vehicle is considered to be empty of gaseous fuels when the gaseous fuel tanks are empty of liquid (for liquefied gases), the pressure in the tanks does not exceed 2 bar and the fuel shut-off or isolation valve is closed and secured.

**667** (a) The requirements of 2.2.9.1.7 (a) do not apply when pre-production prototype lithium cells or batteries or lithium cells or batteries of a small production run, consisting of not more than 100 cells or batteries, are installed in the vehicle, engine or machinery;

(b) The requirements of 2.2.9.1.7 do not apply to lithium cells or batteries installed in damaged or defective vehicles, engines or machinery. In such cases the following conditions shall be met:

- (i) If the damage or defect has no significant impact on the safety of the cell or battery, damaged and defective vehicles, engines or machinery, may be carried under the conditions defined in special provisions 363 or 666, as appropriate;
- (ii) If the damage or defect has a significant impact on the safety of the cell or battery, the lithium cell

or battery shall be removed and carried according to special provision 376.

However, if it is not possible to safely remove the cell or battery or it is not possible to verify the status of the cell or battery, the vehicle, engine or machinery may be towed or carried as specified in (i).

**668** Elevated temperature substances for the purpose of applying road markings are not subject to the requirements of RID, provided that the following conditions are met:

- (a) They do not fulfil the criteria of any class other than Class 9;
- (b) The temperature of the outer surface of the boiler does not exceed 70 °C;
- (c) The boiler is closed in such a way that any loss of product is prevented during carriage;
- (d) The maximum capacity of the boiler is limited to 3 000 l.

**669** A trailer fitted with equipment, powered by a liquid or gaseous fuel or an electric energy storage and production system, that is intended for use during carriage operated by this trailer, shall be assigned to UN numbers 3166 or 3171 and be subject to the same conditions as specified for these UN numbers, when carried as a load on a wagon, provided that the total capacity of the tanks containing liquid fuel does not exceed 500 litres.

## Chapter 3.4 Dangerous goods packed in limited quantities

**3.4.1** This Chapter provides the provisions applicable to the carriage of dangerous goods of certain classes packed in limited quantities. The applicable quantity limit for the inner packaging or article is specified for each substance in Column (7a) of Table A of Chapter 3.2. In addition, the quantity "0" has been indicated in this column for each entry not permitted to be carried in accordance with this Chapter.

Limited quantities of dangerous goods packed in such limited quantities, meeting the provisions of this Chapter are not subject to any other provisions of RID except the relevant provisions of:

- (a) Part 1, Chapters 1.1, 1.2, 1.3, 1.4, 1.5, 1.6, 1.8, 1.9;
- (b) Part 2;
- (c) Part 3, Chapters 3.1, 3.2, 3.3 (except special provisions 61, 178, 181, 220, 274, 625, 633 and 650 (e));
- (d) Part 4, paragraphs 4.1.1.1, 4.1.1.2, 4.1.1.4 to 4.1.1.8;
- (e) Part 5, 5.1.2.1 (a) (i) and (b), 5.1.2.2, 5.1.2.3, 5.2.1.10, 5.4.2;
- (f) Part 6, construction requirements of 6.1.4 and paragraphs 6.2.5.1 and 6.2.6.1 to 6.2.6.3;
- (g) Part 7, Chapter 7.1 and 7.2.1, 7.2.2, 7.5.1 (except 7.5.1.4), 7.5.2.4, 7.5.7 and 7.5.8.

**3.4.2** Dangerous goods shall be packed only in inner packagings placed in suitable outer packagings. Intermediate packagings may be used. In addition, for articles of division 1.4, compatibility group S, the provisions of section 4.1.5 shall be fully complied with. The use of inner packagings is not necessary for the carriage of articles such as aerosols or "receptacles, small, containing gas". The total gross mass of the package shall not exceed 30 kg.

**3.4.3** Except for articles of division 1.4, compatibility group S shrink-wrapped or stretch-wrapped trays meeting the conditions of 4.1.1.1, 4.1.1.2 and 4.1.1.4 to 4.1.1.8 are acceptable as outer packagings for articles or inner packagings containing dangerous goods carried in accordance with this Chapter. Inner packagings that are liable to break or be easily punctured, such as those made of glass, porcelain, stoneware or certain plastics, shall be placed in suitable intermediate packagings meeting the provisions of 4.1.1.1, 4.1.1.2 and 4.1.1.4 to 4.1.1.8, and be so designed that they meet the construction requirements of 6.1.4. The total gross mass of the package shall not exceed 20 kg.

**3.4.4** Liquid goods of Class 8, packing group II in glass, porcelain or stoneware inner packagings shall be enclosed in a compatible and rigid intermediate packaging.

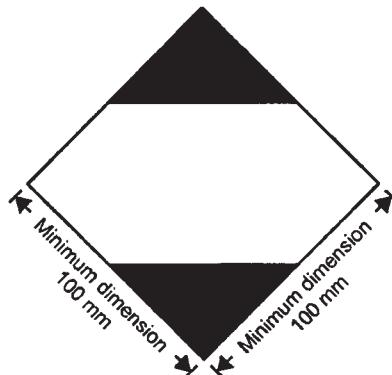
**3.4.5** (Reserved)

**3.4.6** (Reserved)

### 3.4.7 Marking of packages containing limited quantities

**3.4.7.1** Except for air transport, packages containing dangerous goods in limited quantities shall bear the mark shown in Figure 3.4.7.1:

Figure 3.4.7.1



Mark for packages containing limited quantities

The mark shall be readily visible, legible and able to withstand open weather exposure without a substantial reduction in effectiveness.

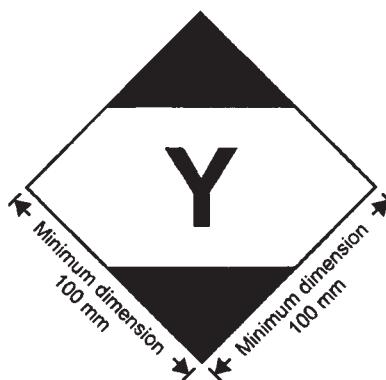
The mark shall be in the form of a square set at an angle of 45° (diamond-shaped). The top and bottom portions and the surrounding line shall be black. The centre area shall be white or a suitable contrasting background. The minimum dimensions shall be 100 mm × 100 mm and the minimum width of the line forming the diamond shall be 2 mm. Where dimensions are not specified, all features shall be in approximate proportion to those shown.

**3.4.7.2** If the size of the package so requires, the minimum outer dimensions shown in Figure 3.4.7.1 may be reduced to be not less than 50 mm × 50 mm provided the mark remains clearly visible. The minimum width of the line forming the diamond may be reduced to a minimum of 1 mm.

**3.4.8** **Marking of packages containing limited quantities conforming to Part 3, Chapter 4 of the ICAO Technical Instructions**

**3.4.8.1** Packages containing dangerous goods packed in conformity with the provisions of Part 3, Chapter 4 of the ICAO Technical Instructions may bear the mark shown in Figure 3.4.8.1 to certify conformity with these provisions:

**Figure 3.4.8.1**



Mark for packages containing limited quantities  
conforming to Part 3, Chapter 4 of the ICAO Technical Instructions

The mark shall be readily visible, legible and able to withstand open weather exposure without a substantial reduction in effectiveness.

The mark shall be in the form of a square set at an angle of 45° (diamond-shaped). The top and bottom portions and the surrounding line shall be black. The centre area shall be white or a suitable contrasting background. The minimum dimensions shall be 100 mm × 100 mm and the minimum width of the line forming the diamond shall be 2 mm. The symbol "Y" shall be placed in the centre of the mark and shall be clearly visible. Where dimensions are not specified, all features shall be in approximate proportion to those shown.

**3.4.8.2** If the size of the package so requires, the minimum outer dimensions shown in Figure 3.4.8.1 may be reduced to be not less than 50 mm × 50 mm provided the mark remains clearly visible. The minimum width of the line forming the diamond may be reduced to a minimum of 1 mm. The symbol "Y" shall remain in approximate proportion to that shown in Figure 3.4.8.1.

**3.4.9** Packages containing dangerous goods bearing the mark shown in 3.4.8 with or without the additional labels and marks for air transport shall be deemed to meet the provisions of section 3.4.1 as appropriate and of sections 3.4.2 to 3.4.4 and need not bear the mark shown in 3.4.7.

**3.4.10** Packages containing dangerous goods in limited quantities bearing the mark shown in 3.4.7 and conforming with the provisions of the ICAO Technical Instructions, including all necessary marks and labels specified in Parts 5 and 6, shall be deemed to meet the provisions of section 3.4.1 as appropriate and of sections 3.4.2 to 3.4.4.

**3.4.11 Use of overpacks**

For an overpack containing dangerous goods packed in limited quantities, the following applies:

Unless the marks representative of all dangerous goods in an overpack are visible, the overpack shall be:

- marked with the word "OVERPACK". The lettering of the "OVERPACK" mark shall be at least 12 mm high. The mark shall be in an official language of the country of origin and also, if that language is not English, French or German, in English, French or German, unless agreements, if any, concluded between the countries concerned in the transport operation provide otherwise; and
- marked with the marks required by this Chapter.

Except for air transport, the other provisions of 5.1.2.1 apply only if other dangerous goods which are not packed in limited quantities are contained in the overpack and only in relation to these other dangerous goods.

**3.4.12** In advance of carriage, consignors of dangerous goods packed in limited quantities shall inform the carrier in a traceable form of the total gross mass of such goods to be consigned.

Loaders of dangerous goods packed in limited quantities shall observe the provisions of 3.4.13 to 3.4.15 concerning marking.

**3.4.13** (a) Wagons carrying dangerous goods packed in limited quantities shall be marked in accordance with 3.4.15 on both sides except when the wagon contains other dangerous goods for which placarding in accordance with 5.3.1 is required. In this latter case, the wagon may display the required placards only, or both the placards in accordance with 5.3.1 and the marks in accordance with 3.4.15.

(b) Large containers carrying dangerous goods packed in limited quantities shall be marked in accordance with 3.4.15 on all four sides except when the large container contains other dangerous goods for which placarding in accordance with 5.3.1 is required. In this latter case, the large container may display the required placards only, or both the placards in accordance with 5.3.1 and the marks in accordance with 3.4.15.

If the marks affixed to the large containers are not visible from outside the carrying wagon, the same marks shall also be affixed to both sides of the wagon.

**3.4.14** The marks specified in 3.4.13 may be dispensed with, if the total gross mass of the packages containing dangerous goods packed in limited quantities carried does not exceed 8 tonnes per wagon or large container.**3.4.15** The marks specified in 3.4.13 shall be the same as the one required in 3.4.7, except that their minimum dimensions shall be 250 mm × 250 mm. These marks shall be removed or covered if no dangerous goods in limited quantities are carried.

## Chapter 3.5 Dangerous Goods packed in excepted quantities

### 3.5.1 Excepted quantities

3.5.1.1 Excepted quantities of dangerous goods of certain classes, other than articles, meeting the provisions of this Chapter are not subject to any other provisions of RID except for:

- (a) The training requirements in Chapter 1.3;
- (b) The classification procedures and packing group criteria in Part 2;
- (c) The packaging requirements of 4.1.1.1, 4.1.1.2, 4.1.1.4 and 4.1.1.6.

**NOTE:** In the case of radioactive material, the requirements for radioactive material in excepted packages in 1.7.1.5 apply.

3.5.1.2 Dangerous goods which may be carried as excepted quantities in accordance with the provisions of this Chapter are shown in column (7b) of Table A of Chapter 3.2 list by means of an alphanumeric code as follows:

Code	Maximum net quantity per inner packaging (in grams for solids and ml for liquids and gases)	Maximum net quantity per outer packaging (in grams for solids and ml for liquids and gases, or sum of grams and ml in the case of mixed packing)
E0	Not permitted as Excepted Quantity	
E1	30	1000
E2	30	500
E3	30	300
E4	1	500
E5	1	300

For gases, the volume indicated for inner packagings refers to the water capacity of the inner receptacle and the volume indicated for outer packagings refers to the combined water capacity of all inner packagings within a single outer packaging.

3.5.1.3 Where dangerous goods in excepted quantities for which different codes are assigned are packaged together the total quantity per outer packaging shall be limited to that corresponding to the most restrictive code.

3.5.1.4 Excepted quantities of dangerous goods assigned to codes E 1, E 2, E 4 and E 5 with a maximum net quantity of dangerous goods per inner packaging limited to 1 ml for liquids and gases and 1 g for solids and a maximum net quantity of dangerous goods per outer packaging which does not exceed 100 g for solids or 100 ml for liquids and gases are only subject to:

- (a) The provisions of 3.5.2, except that an intermediate packaging is not required if the inner packagings are securely packed in an outer packaging with cushioning material in such a way that, under normal conditions of carriage, they cannot break, be punctured, or leak their contents; and for liquids, the outer packaging contains sufficient absorbent material to absorb the entire contents of the inner packagings; and
- (b) The provisions of 3.5.3.

### 3.5.2 Packagings

Packagings used for the carriage of dangerous goods in excepted quantities shall be in compliance with the following:

- (a) There shall be an inner packaging and each inner packaging shall be constructed of plastic (with a minimum thickness of 0.2 mm when used for liquids), or of glass, porcelain, stoneware, earthenware or metal (see also 4.1.1.2) and the closure of each inner packaging shall be held securely in place with wire, tape or other positive means; any receptacle having a neck with moulded screw threads shall have a leak proof threaded type cap. The closure shall be resistant to the contents;
- (b) Each inner packaging shall be securely packed in an intermediate packaging with cushioning material in such a way that, under normal conditions of carriage, they cannot break, be punctured or leak their contents. For liquid dangerous goods, the intermediate or outer packaging shall contain sufficient absorbent material to absorb the entire contents of the inner packagings. When placed in the intermediate packaging, the absorbent material may be the cushioning material. Dangerous goods shall not react dangerously with cushioning, absorbent material and packaging material or reduce the integrity or function of the materials. Regardless of its orientation, the package shall completely contain the contents in case of breakage or leakage;
- (c) The intermediate packaging shall be securely packed in a strong, rigid outer packaging (wooden, fibreboard or other equally strong material);
- (d) Each package type shall be in compliance with the provisions in 3.5.3;

- (e) Each package shall be of such a size that there is adequate space to apply all necessary marks; and
- (f) Overpacks may be used and may also contain packages of dangerous goods or goods not subject to the requirements of RID.

### 3.5.3 Tests for packages

**3.5.3.1** The complete package as prepared for carriage, with inner packagings filled to not less than 95% of their capacity for solids or 98% for liquids, shall be capable of withstanding, as demonstrated by testing which is appropriately documented, without breakage or leakage of any inner packaging and without significant reduction in effectiveness:

- (a) Drops onto a rigid, non-resilient flat and horizontal surface from a height of 1.8 m:
  - (i) Where the sample is in the shape of a box, it shall be dropped in each of the following orientations:
    - flat on the base;
    - flat on the top;
    - flat on the longest side;
    - flat on the shortest side;
    - on a corner;
  - (ii) Where the sample is in the shape of a drum, it shall be dropped in each of the following orientations:
    - diagonally on the top chime, with the centre of gravity directly above the point of impact;
    - diagonally on the base chime;
    - flat on the side;

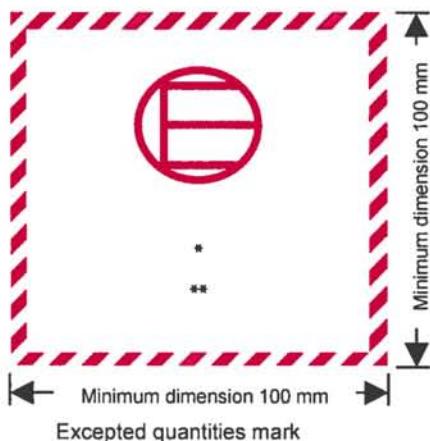
**NOTE:** Each of the above drops may be performed on different but identical packages.

- (b) A force applied to the top surface for a duration of 24 hours, equivalent to the total weight of identical packages if stacked to a height of 3 m (including the sample).

**3.5.3.2** For the purposes of testing, the substances to be carried in the packaging may be replaced by other substances except where this would invalidate the results of the tests. For solids, when another substance is used, it must have the same physical characteristics (mass, grain size, etc.) as the substance to be carried. In the drop tests for liquids, when another substance is used, its relative density (specific gravity) and viscosity should be similar to those of the substance to be carried.

### 3.5.4 Marking of packages

**3.5.4.1** Packages containing excepted quantities of dangerous goods prepared in accordance with this Chapter shall be durably and legibly marked with the mark shown in 3.5.4.2. The first or only label number indicated in column (5) of Table A of Chapter 3.2 for each of the dangerous goods contained in the package shall be shown in the mark. Where the name of the consignor or consignee is not shown elsewhere on the package this information shall be included within the mark.

**3.5.4.2 Excepted quantities mark****Figure 3.5.4.2**

- \* The first or only label number indicated in column (5) of Table A of Chapter 3.2 shall be shown in this location.
- \*\* The name of the consignor or of the consignee shall be shown in this location if not shown elsewhere on the package.

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

**3.5.4.3 Use of overpacks**

For an overpack containing dangerous goods packed in excepted quantities, the following applies:

Unless the marks representative of all dangerous goods in an overpack are visible, the overpack shall be:

- marked with the word "OVERPACK". The lettering of the "OVERPACK" mark shall be at least 12 mm high. The mark shall be in an official language of the country of origin and also, if that language is not English, French or German, in English, French or German, unless agreements, if any, concluded between the countries concerned in the transport operation provide otherwise; and
- marked with the marks required by this Chapter.

The other provisions of 5.1.2.1 apply only if other dangerous goods which are not packed in excepted quantities are contained in the overpack and only in relation to these other dangerous goods.

**3.5.5 Maximum number of packages in any wagon or container**

The number of packages in any wagon or container shall not exceed 1 000.

**3.5.6 Documentation**

If a document or documents (such as a bill of lading, air waybill or CMR/CIM consignment note) accompanies(y) dangerous goods in excepted quantities, at least one of these documents shall include the statement "DANGEROUS GOODS IN EXCEPTED QUANTITIES" and indicate the number of packages.

## **Part 4      Packing and tank provisions**

## 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 (P 201 and LP 200 for Class 2 and P 620, P 621, IBC 620 and LP 621 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 transshipment 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, reused or remanufactured 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;
- (b) shall not cause a dangerous effect e.g. catalysing a reaction or reacting with the dangerous goods; and
- (c) shall not allow permeation of the dangerous goods that could constitute a danger under normal conditions of carriage.

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 4.1.1.21.

**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, 6.3.5, 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

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

In this formula  $\alpha$  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,

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

$d_{15}$  and  $d_{50}$  being the relative densities<sup>1</sup> of the liquid at 15 °C and 50 °C and  $t_f$  the mean temperature of the liquid at the time of filling.

<sup>1</sup> Relative density (d) is considered to be synonymous with specific gravity (SG) and will be used throughout this Chapter.

**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 marks prescribed in 5.2.1.10. 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.

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

**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, 6.3.5, 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:

- 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
- at 50 °C less than four-sevenths of the sum of the marked test pressure plus 100 kPa; or
- 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	$V_{p55}$ (kPa)	$(V_{p55} \times 1,5)$ (kPa)	$(V_{p55} \times 1,5)$ 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.

**NOTE:** When such packagings are carried for disposal, recycling or recovery of their material, they may also be carried under UN 3509 provided the conditions of special provision 663 of Chapter 3.3 are met.

**4.1.1.12** Every packaging as specified in Chapter 6.1 intended to contain liquids shall successfully undergo a suitable leakproofness test. This test is part of a quality assurance programme as stipulated in 6.1.1.4 which shows the capability of meeting the appropriate test level indicated in 6.1.5.4.3:

- before it is first used for carriage;
- 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 dan-

gerous 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** Where ice is used as a coolant it shall not affect the integrity of the packaging.

**4.1.1.17** 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 an RID Contracting State, may nevertheless be used for carriage under RID.

**4.1.1.18 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).

**4.1.1.19 Use of salvage packagings and large salvage packagings**

**4.1.1.19.1** 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 and in large salvage packagings mentioned in 6.6.5.1.9. This does not prevent the use of a larger size packaging, an IBC of type 11A or a large packaging of appropriate type and performance level and under the conditions of 4.1.1.19.2 and 4.1.1.19.3.

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

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

**4.1.1.20 Use of salvage pressure receptacles**

**4.1.1.20.1** In the case of damaged, defective, leaking or non-conforming pressure receptacles, salvage pressure receptacles according to 6.2.3.11 may be used.

**NOTE:** A salvage pressure receptacle may be used as an overpack in accordance with 5.1.2. When used as an overpack, marks shall be in accordance with 5.1.2.1 instead of 5.2.1.3.

**4.1.1.20.2** Pressure receptacles shall be placed in salvage pressure receptacles of suitable size. The maximum size of the placed pressure receptacle is limited to a water capacity of 1 000 litres. More than one pressure receptacle may be placed in the same salvage pressure receptacle only if the contents are known and do not react dangerously with each other (see 4.1.1.6). In this case the total sum of water capacities of the placed pressure receptacles shall not exceed 1 000 litres. Appropriate measures shall be taken to prevent movement of the pressure receptacles within the salvage pressure receptacle e.g. by partitioning, securing or cushioning.

**4.1.1.20.3** A pressure receptacle may only be placed in a salvage pressure receptacle if:

- The salvage pressure receptacle is in accordance with 6.2.3.11 and a copy of the approval certificate is available;
- Parts of the salvage pressure receptacle which are, or are likely to be in direct contact with the dangerous goods will not be affected or weakened by those dangerous goods and will not cause a dangerous effect (e.g. catalyzing reaction or reacting with the dangerous goods); and
- The contents of the contained pressure receptacle(s) are limited in pressure and volume so that if totally discharged into the salvage pressure receptacle, the pressure in the salvage pressure receptacle at 65 °C will not exceed the test pressure of the salvage pressure receptacle (for gases, see packing instruction in P 200 (3) in 4.1.4.1). The reduction of the useable water capacity of the salvage pressure receptacle, e.g. by any contained equipment and cushioning, shall be taken into account.

**4.1.1.20.4** The proper shipping name, the UN number preceded by the letters "UN" and label(s) as required for packages in Chapter 5.2 applicable to the dangerous goods inside the contained pressure receptacle(s) shall be applied to the salvage pressure receptacle for carriage.

**4.1.1.20.5** Salvage pressure receptacles shall be cleaned, purged and visually inspected internally and externally after each use. They shall be periodically inspected and tested in accordance with 6.2.3.5 at least once every five years.

**4.1.1.21 Verification of the chemical compatibility of plastics packagings, including IBCs, by assimilation of filling substances to standard liquids****4.1.1.21.1 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 4.1.1.21.3 to 4.1.1.21.5 and using the list in Table 4.1.1.21.6, 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 4.1.1.21.2 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.

**4.1.1.21.2 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.

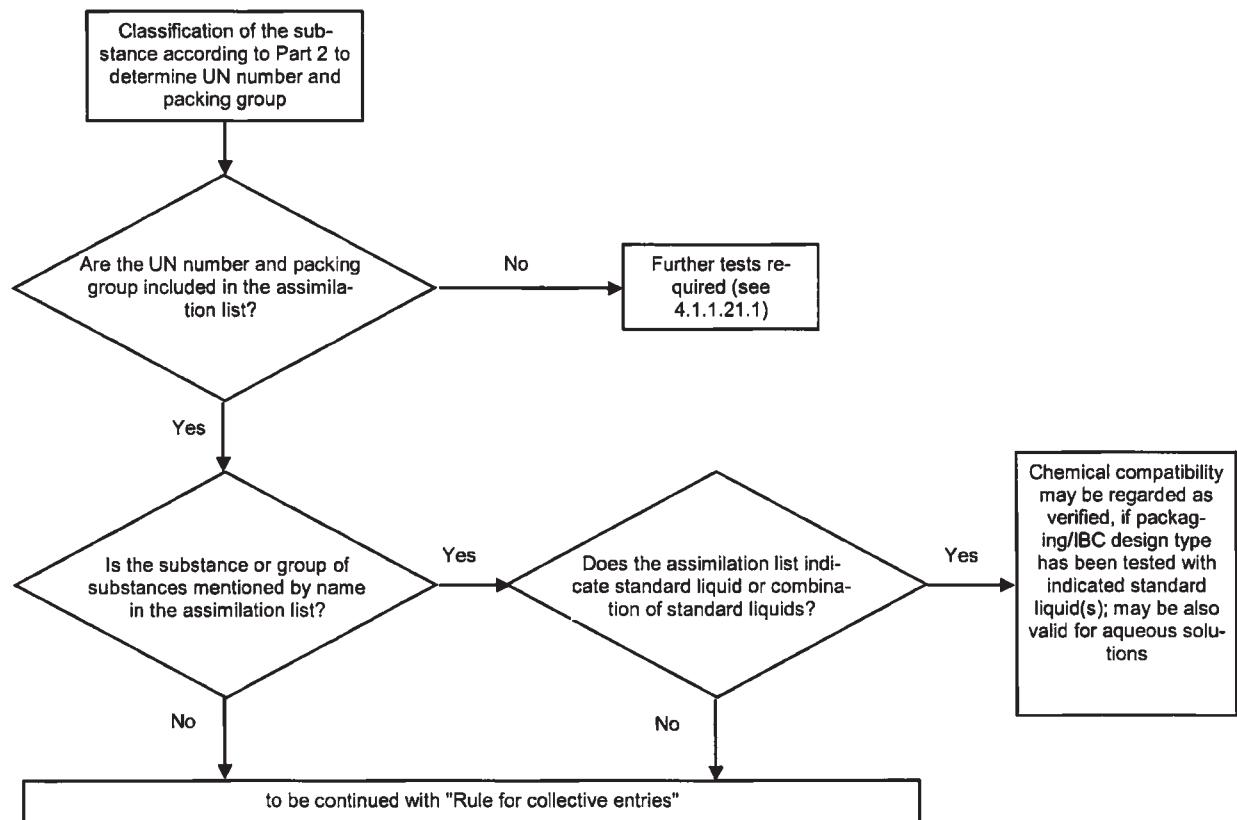
**4.1.1.21.3 Assimilation procedure**

The following steps shall be taken to assign filling substances to listed substances or groups of substances in Table 4.1.1.21.6 (see also scheme in Figure 4.1.1.21.1):

- (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 4.1.1.21.6;
- (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 4.1.1.21.4);

- (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 4.1.1.21.5, 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 4.1.1.21.1 and 4.1.1.21.2, 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 4.1.1.21.1: Scheme for the assimilation of filling substances to standard liquids**

#### 4.1.1.21.4 Aqueous solutions

Aqueous solutions of substances and groups of substances assimilated to specific standard liquid(s) in accordance with 4.1.1.21.3 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 4.1.1.21.6, 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".*

#### 4.1.1.21.5 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 4.1.1.21.2):

- (a) Perform the assimilation procedure for each dangerous component of the solution, mixture or preparation in accordance with 4.1.1.21.3 taking into account the conditions in 4.1.1.21.2. 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 4.1.1.21.1 and 4.1.1.21.2;
- (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 4.1.1.21.1 and 4.1.1.21.2:
  - (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 4.1.1.21.3 (d)).

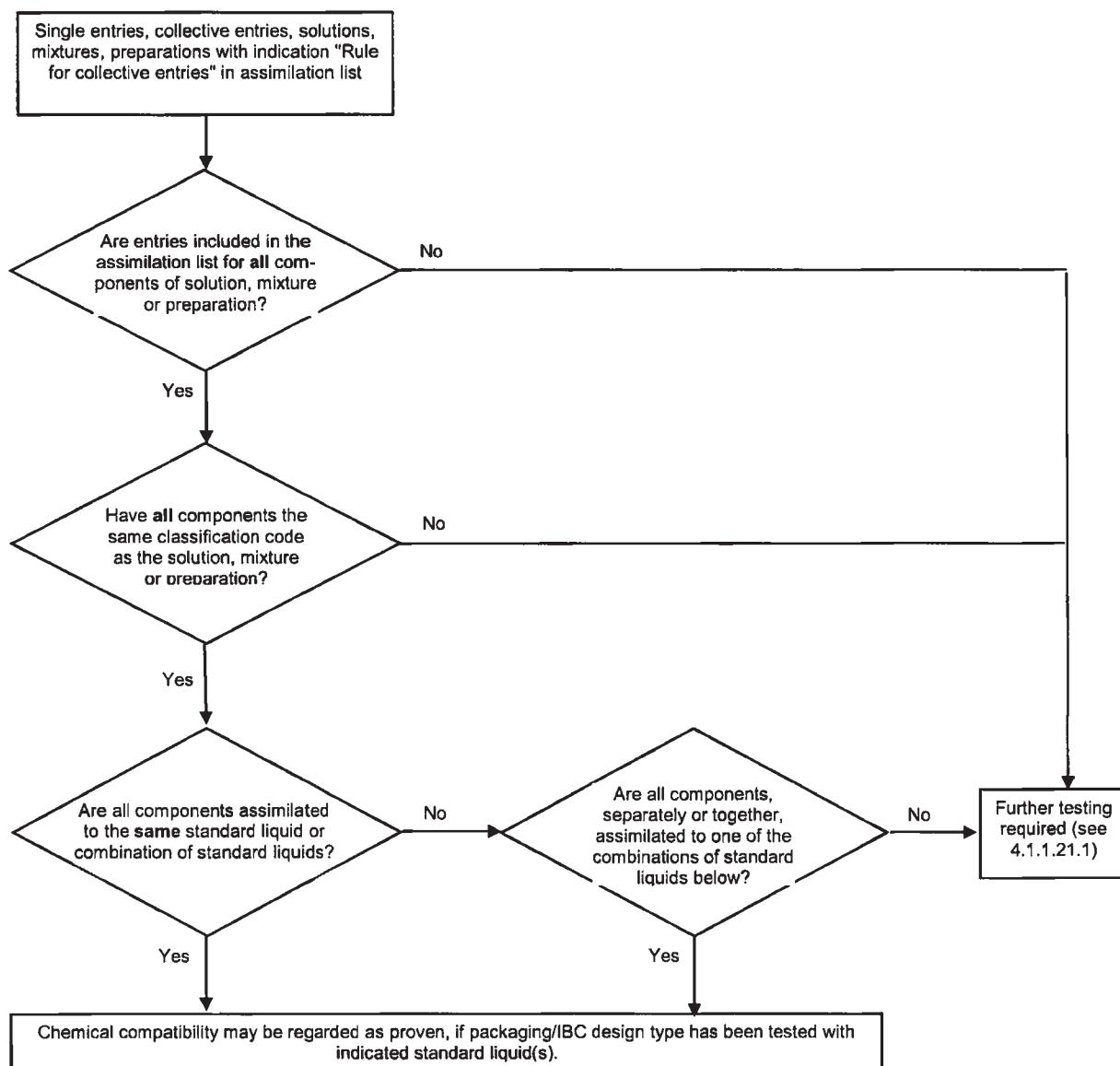
*Example 1: Mixture of UN 1940 THIOGLYCOLIC ACID (50%) and UN 2531 METHACRYLIC ACID, STABILIZED (50%); classification of the mixture: UN 3265 CORROSIVE LIQUID, ACIDIC, ORGANIC, N.O.S*

- 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 4.1.1.21.2: 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

**4.1.1.21.6 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 4.1.1.21.6, 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 4.1.1.21.5.

Table 4.1.1.21.6: Assimilation list

UN No.	Proper shipping name or technical name	Description	Class	Classification code 2.2	Packing group	Standard liquid
(1)	(2a)	(2b)	(3a)	(3b)	(4)	(5)
1090	<b>Acetone</b>		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	<b>Acrylonitrile, stabilized</b>		3	FT1	I	n-Butyl acetate/n-butyl acetate-saturated wetting solution
1104	<b>Amyl acetates</b>	pure isomers and isomeric mixture	3	F1	III	n-Butyl acetate/n-butyl acetate-saturated wetting solution
1105	<b>Pentanols</b>	pure isomers and isomeric mixture	3	F1	II/III	n-Butyl acetate/n-butyl acetate-saturated wetting solution
1106	<b>Amyl amines</b>	pure isomers and isomeric mixture	3	FC	II/III	Mixture of hydrocarbons and wetting solution
1109	<b>Amyl formates</b>	pure isomers and isomeric mixture	3	F1	III	n-Butyl acetate/n-butyl acetate-saturated wetting solution
1120	<b>Butanols</b>	pure isomers and isomeric mixture	3	F1	II/III	Acetic acid
1123	<b>Butyl acetates</b>	pure isomers and isomeric mixture	3	F1	II/III	n-Butyl acetate/n-butyl acetate-saturated wetting solution
1125	<b>n-Butylamine</b>		3	FC	II	Mixture of hydrocarbons and wetting solution
1128	<b>n-Butyl formate</b>		3	F1	II	n-Butyl acetate/n-butyl acetate-saturated wetting solution
1129	<b>Butyraldehyde</b>		3	F1	II	Mixture of hydrocarbons
1133	<b>Adhesives</b>	containing flammable liquid	3	F1	I/II/III	Rule for collective entries
1139	<b>Coating solution</b>	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	<b>Cyclohexane</b>		3	F1	II	Mixture of hydrocarbons
1146	<b>Cyclopentane</b>		3	F1	II	Mixture of hydrocarbons
1153	<b>Ethylene glycol diethyl ether</b>		3	F1	III	n-Butyl acetate/n-butyl acetate-saturated wetting solution and mixture of hydrocarbons
1154	<b>Diethylamine</b>		3	FC	II	Mixture of hydrocarbons and wetting solution
1158	<b>Diisopropylamine</b>		3	FC	II	Mixture of hydrocarbons and wetting solution
1160	<b>Dimethylamine aqueous solution</b>		3	FC	II	Mixture of hydrocarbons and wetting solution
1165	<b>Dioxane</b>		3	F1	II	Mixture of hydrocarbons

UN No.	Proper shipping name or technical name	Description	Class	Classification code 2.2	Packing group	Standard liquid
(1)	(2a)	(2b)	(3a)	(3b)	(4)	(5)
1169	Extracts, aromatic, liquid		3	F1	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 mono-methyl ether		3	F1	III	n-Butyl acetate/ n-butyl acetate-saturated wetting solution and mixture of hydrocarbons
1189	Ethylene glycol mono-methyl 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	II/III	Rule for collective entries
1198	Formaldehyde solution, flammable	aqueous solution, flash-point between 23 °C and 60 °C	3	FC	III	Acetic acid
1202	Diesel fuel	complying with EN 590:2013 + AC:2014 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 590:2013 + AC:2014 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	Description	Class	Classification code 2.2	Packing group	Standard liquid
(1)	3.1.2	3.1.2	2.2	2.2	2.1.1.3	
(1)	(2a)	(2b)	(3a)	(3b)	(4)	(5)
1206	<b>Heptanes</b>	pure isomers and iso-meric mixture	3	F1	II	Mixture of hydrocarbons
1207	<b>Hexaldehyde</b>	n-Hexaldehyde	3	F1	III	Mixture of hydrocarbons
1208	<b>Hexanes</b>	pure isomers and iso-meric mixture	3	F1	II	Mixture of hydrocarbons
1210	<b>Printing ink or Printing ink related material</b>	flammable, including printing ink thinning or reducing compound	3	F1	I/II/III	Rule for collective entries
1212	<b>Isobutanol</b>		3	F1	III	Acetic acid
1213	<b>Isobutyl acetate</b>		3	F1	II	n-Butyl acetate/n-butyl acetate-saturated wetting solution
1214	<b>Isobutylamine</b>		3	FC	II	Mixture of hydrocarbons and wetting solution
1216	<b>Isooctenes</b>	pure isomers and iso-meric mixture	3	F1	II	Mixture of hydrocarbons
1219	<b>Isopropanol</b>		3	F1	II	Acetic acid
1220	<b>Isopropyl acetate</b>		3	F1	II	n-Butyl acetate/n-butyl acetate-saturated wetting solution
1221	<b>Isopropylamine</b>		3	FC	I	Mixture of hydrocarbons and wetting solution
1223	<b>Kerosene</b>		3	F1	III	Mixture of hydrocarbons
1224	<b>3,3-Dimethyl-2-butanone</b>		3	F1	II	Mixture of hydrocarbons
1224	<b>Ketones, liquid, n.o.s.</b>		3	F1	II/III	Rule for collective entries
1230	<b>Methanol</b>		3	FT1	II	Acetic acid
1231	<b>Methyl acetate</b>		3	F1	II	n-Butyl acetate/n-butyl acetate-saturated wetting solution
1233	<b>Methylamyl acetate</b>		3	F1	III	n-Butyl acetate/n-butyl acetate-saturated wetting solution
1235	<b>Methylamine, aqueous solution</b>		3	FC	II	Mixture of hydrocarbons and wetting solution
1237	<b>Methyl butyrate</b>		3	F1	II	n-Butyl acetate/n-butyl acetate-saturated wetting solution
1247	<b>Methyl methacrylate monomer, stabilized</b>		3	F1	II	n-Butyl acetate/n-butyl acetate-saturated wetting solution
1248	<b>Methyl propionate</b>		3	F1	II	n-Butyl acetate/n-butyl acetate-saturated wetting solution
1262	<b>Octanes</b>	pure isomers and iso-meric mixture	3	F1	II	Mixture of hydrocarbons
1263	<b>Paint or Paint related material</b>	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	<b>Pentanes</b>	n-Pentane	3	F1	II	Mixture of hydrocarbons
1266	<b>Perfumery products</b>	with flammable solvents	3	F1	II/III	Rule for collective entries
1268	<b>Coal tar naphtha</b>	vapour pressure at 50 °C not more than 110 kPa	3	F1	II	Mixture of hydrocarbons

UN No.	Proper shipping name or technical name	Description	Class	Classification code 2.2	Packing group	Standard liquid
(1)	3.1.2	3.1.2	2.2	2.2	2.1.1.3	(5)
(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	II/III	Rule for collective entries
1287	Rubber solution		3	F1	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	Description	Class	Classification code 2.2	Packing group	Standard liquid
3.1.2		3.1.2	2.2	2.2	2.1.1.3	
(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 <sup>(*)</sup>
1791	Hypochlorite solution	aqueous solution	8	C9	II/III	Nitric acid <sup>(*)</sup>
<sup>(*)</sup> 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	Phenoxylic 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, flash-point 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	Description	Class	Classification code 2.2	Packing group	Standard liquid
3.1.2		3.1.2	2.2	2.2	2.1.1.3	
(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 iso- meric 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	Isobutylaldehyde		3	F1	II	Mixture of hydrocarbons
2050	Diisobutylene isomeric compounds		3	F1	II	Mixture of hydrocarbons

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

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

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

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

UN No.	Proper shipping name or technical name	Description	Class	Classification code 2.2	Packing group	Standard liquid
(1)	3.1.2	3.1.2	2.2	(3a)	2.1.1.3	
(2a)	(2b)		(3a)	(3b)	(4)	(5)
2920	Tetramethylammonium hydroxide	aqueous solution, flash-point between 23 °C and 60 °C	8	CF1	II	Water
2920	<b>Corrosive liquid, flammable, n.o.s.</b>		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	<b>Corrosive liquid, toxic, n.o.s.</b>		8	CT1	I/II/III	Rule for collective entries
2924	<b>Flammable liquid, corrosive, n.o.s.</b>	slightly corrosive	3	FC	I/II/III	Rule for collective entries
2927	<b>Toxic liquid, corrosive, organic, n.o.s.</b>		6.1	TC1	I/II	Rule for collective entries
2933	<b>Methyl 2-chloropropionate</b>		3	F1	III	n-Butyl acetate/n-butyl acetate-saturated wetting solution
2934	<b>Isopropyl 2-chloropropionate</b>		3	F1	III	n-Butyl acetate/n-butyl acetate-saturated wetting solution
2935	<b>Ethyl 2-chloropropionate</b>		3	F1	III	n-Butyl acetate/n-butyl acetate-saturated wetting solution
2936	<b>Thiolactic acid</b>		6.1	T1	II	Acetic acid
2941	<b>Fluoroanilines</b>	pure isomers and isomeric mixture	6.1	T1	III	Acetic acid
2943	<b>Tetrahydrofurfurylamine</b>		3	F1	III	Mixture of hydrocarbons
2945	<b>N-Methylbutylamine</b>		3	FC	II	Mixture of hydrocarbons and wetting solution
2946	<b>2-Amino-5-diethylaminopentane</b>		6.1	T1	III	Mixture of hydrocarbons and wetting solution
2947	<b>Isopropyl chloroacetate</b>		3	F1	III	n-Butyl acetate/n-butyl acetate-saturated wetting solution
2984	<b>Hydrogen peroxide, aqueous solution</b>	with not less than 8% but less than 20% hydrogen peroxide, stabilized as necessary	5.1	O1	III	Nitric acid
3056	<b>n-Heptaldehyde</b>		3	F1	III	Mixture of hydrocarbons
3065	<b>Alcoholic beverages</b>	with more than 24% alcohol by volume	3	F1	II/III	Acetic acid
3066	<b>Paint or Paint related material</b>	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	<b>Methacrylonitrile, stabilized</b>		6.1	TF1	I	n-Butyl acetate/n-butyl acetate-saturated wetting solution

UN No.	Proper shipping name or technical name	Description	Class	Classification code 2.2	Packing group	Standard liquid
(1)	3.1.2	3.1.2	2.2	2.2	2.1.1.3	
(1)	(2a)	(2b)	(3a)	(3b)	(4)	(5)
3082	sec-Alcohol C <sub>6</sub> -C <sub>17</sub> poly (3-6) ethoxylate		9	M6	III	n-Butyl acetate/ n-butyl acetate-saturated wetting solution and mixture of hydrocarbons
3082	Alcohol C <sub>12</sub> -C <sub>15</sub> poly (1-3) ethoxylate		9	M6	III	n-Butyl acetate/ n-butyl acetate-saturated wetting solution and mixture of hydrocarbons
3082	Alcohol C <sub>13</sub> -C <sub>15</sub> 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	Description	Class	Classification code 2.2	Packing group	Standard liquid
(1)	(2a)	(2b)	(3a)	(3b)	(4)	(5)
3101	Organic Peroxide, Type B, C, D, E or F, liquid		5.2	P1		n-Butyl acetate/ n-butyl acetate-saturated wetting solution
3103						and
3105	or					mixture of hydrocarbons
3107	Organic Peroxide, Type B, C, D, E or F, liquid, temperature controlled					and
3109						nitric acid <sup>(**)</sup>
3111						
3113						
3115						
3117						
3119						

<sup>(**)</sup> 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	Description	Class	Classification code 2.2	Packing group	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	Description	Class	Classification code 2.2	Packing group	Standard liquid
(1)	3.1.2	3.1.2	2.2	2.2	2.1.1.3	
(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 re-filling; 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 mark 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 or "LL" for special packing provisions specific to RID.

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, 4N, 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)
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**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, bundles of cylinders and salvage pressure receptacles, 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 RID Contracting 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, uncleared and unpackaged, the competent authority of the country of origin<sup>2</sup> 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 transshipment between cargo transport units and between cargo transport units and warehouses, as well as any removal from a pallet for subsequent manual or mechanical handling;
- (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 cargo transport unit 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 3.4.1.

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<sup>2</sup> If the country of origin is not an RID Contracting State, the competent authority of the first RID Contracting 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.

## 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	<b>Drums</b>	steel (1A1, 1A2)	250 kg	400 kg	400 kg
Plastics	30 l		aluminium (1B1, 1B2)	250 kg	400 kg	400 kg
Metal	40 l		other metal (1N1, 1N2)	250 kg	400 kg	400 kg
			plastics (1H1, 1H2)	250 kg	400 kg	400 kg
			plywood (1D)	150 kg	400 kg	400 kg
			fibre (1G)	75 kg	400 kg	400 kg
		<b>Boxes</b>	steel (4A)	250 kg	400 kg	400 kg
			aluminium (4B)	250 kg	400 kg	400 kg
			other metal (4N)	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
		<b>Jerricans</b>	steel (3A1, 3A2)	120 kg	120 kg	120 kg
			aluminium (3B1, 3B2)	120 kg	120 kg	120 kg
			plastics (3H1, 3H2)	120 kg	120 kg	120 kg
<b>Single packagings</b>						
<b>Drums</b>						
steel, non-removable head (1A1)			250 l	450 l	450 l	
steel, removable head (1A2)			250 l <sup>(a)</sup>	450 l	450 l	
aluminium, non-removable head (1B1)			250 l	450 l	450 l	
aluminium, removable head (1B2)			250 l <sup>(a)</sup>	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 <sup>(a)</sup>	450 l	450 l	
plastics, non-removable head (1H1)			250 l	450 l	450 l	
plastics, removable head (1H2)			250 l <sup>(a)</sup>	450 l	450 l	
<b>Jerricans</b>						
steel, non-removable head (3A1)			60 l	60 l	60 l	
steel, removable head (3A2)			60 l <sup>(a)</sup>	60 l	60 l	
aluminium, non-removable head (3B1)			60 l	60 l	60 l	
aluminium, removable head (3B2)			60 l <sup>(a)</sup>	60 l	60 l	
plastics, non-removable head (3H1)			60 l	60 l	60 l	
plastics, removable head (3H2)			60 l <sup>(a)</sup>	60 l	60 l	

<b>Single packagings (cont'd)</b>				
<b>Composite packagings</b>				
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	
<b>Pressure receptacles</b> , provided that the general provisions of 4.1.3.6 are met.				
<b>Additional requirement</b>				
For substances of Class 3, packing group III, which give off small quantities of carbon dioxide or nitrogen, the packagings shall be vented.				
<b>Special packing provisions</b>				
<b>PP 1</b>	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.			
<b>PP 2</b>	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.			
<b>PP 4</b>	For UN No. 1774, packagings shall meet the packing group II performance level.			
<b>PP 5</b>	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.			
<b>PP 6</b>	(Deleted)			
<b>PP 10</b>	For UN No. 1791, packing group II, the packaging shall be vented.			
<b>PP 31</b>	For UN No. 1131, packagings shall be hermetically sealed.			
<b>PP 33</b>	For UN No. 1308, packing groups I and II, only combination packagings with a maximum gross mass of 75 kg allowed.			
<b>PP 81</b>	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.			
<b>PP 93</b>	For UN No. 3532, packagings shall be designed and constructed to permit the release of gas or vapour to prevent a build-up of pressure that could rupture the packagings in the event of loss of stabilization.			
<b>Special packing provision specific to RID and ADR</b>				
<b>RR 2</b>	For UN No. 1261, removable head packagings are not permitted.			

(a) Only substances with a viscosity of more than 2 680 mm<sup>2</sup>/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	<b>Drums</b>						
Plastics <sup>(a)</sup>	50 kg	steel (1A1, 1A2)	400 kg	400 kg	400 kg			
Metal	50 kg	aluminium (1B1, 1B2)	400 kg	400 kg	400 kg			
Paper <sup>(a),(b),(c)</sup>	50 kg	other metal (1N1, 1N2)	400 kg	400 kg	400 kg			
Fibre <sup>(a),(b),(c)</sup>	50 kg	plastics (1H1, 1H2)	400 kg	400 kg	400 kg			
		plywood (1D)	400 kg	400 kg	400 kg			
		fibre (1G)	400 kg	400 kg	400 kg			
(a) These inner packagings shall be sift-proof.		<b>Boxes</b>						
(b) These inner packagings shall not be used when the substances being carried may become liquid during carriage (see 4.1.3.4).		steel (4A)	400 kg	400 kg	400 kg			
		aluminium (4B)	400 kg	400 kg	400 kg			
		other metal (4N)	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			
		<b>Jerricans</b>						
		steel (3A1, 3A2)	120 kg	120 kg	120 kg			
		aluminium (3B1, 3B2)	120 kg	120 kg	120 kg			
		plastics (3H1, 3H2)	120 kg	120 kg	120 kg			
<b>Single packagings</b>								
<b>Drums</b>								
steel (1A1 oder 1A2 <sup>(d)</sup> )			400 kg	400 kg	400 kg			
aluminium (1B1 oder 1B2 <sup>(d)</sup> )			400 kg	400 kg	400 kg			
metal, other than steel or aluminium (1N1 oder 1N2 <sup>(d)</sup> )			400 kg	400 kg	400 kg			
plastics (1H1 oder 1H2 <sup>(d)</sup> )			400 kg	400 kg	400 kg			
fibre (1G) <sup>(e)</sup>			400 kg	400 kg	400 kg			
plywood (1D) <sup>(e)</sup>			400 kg	400 kg	400 kg			
<b>Jerricans</b>								
steel (3A1 oder 3A2 <sup>(d)</sup> )			120 kg	120 kg	120 kg			
aluminium (3B1 oder 3B2 <sup>(d)</sup> )			120 kg	120 kg	120 kg			
plastics (3H1 oder 3H2 <sup>(d)</sup> )			120 kg	120 kg	120 kg			
<b>Boxes</b>								
steel (4A) <sup>(e)</sup>			Not allowed	400 kg	400 kg			
aluminium (4B) <sup>(e)</sup>			Not allowed	400 kg	400 kg			
other metal (4N) <sup>(e)</sup>			Not allowed	400 kg	400 kg			
natural wood (4C1) <sup>(e)</sup>			Not allowed	400 kg	400 kg			
plywood (4D) <sup>(e)</sup>			Not allowed	400 kg	400 kg			
reconstituted wood (4F) <sup>(e)</sup>			Not allowed	400 kg	400 kg			
natural wood with sift-proof walls (4C2) <sup>(e)</sup>			Not allowed	400 kg	400 kg			
fibreboard (4G) <sup>(e)</sup>			Not allowed	400 kg	400 kg			
solid plastics (4H2) <sup>(e)</sup>			Not allowed	400 kg	400 kg			
<b>Bags</b>								
bags (5H3, 5H4, 5L3, 5M2) <sup>(e)</sup>			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 the substances being carried may become liquid during carriage (see 4.1.3.4).								

<b>Single packagings (cont'd)</b>				
<b>Composite packagings</b>				
plastics receptacle with outer steel, aluminium, plywood, fibre or plastics drum (6HA1, 6HB1, 6HG1 <sup>(e)</sup> , 6HD1 <sup>(e)</sup> or 6HH1)	400 kg	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 <sup>(e)</sup> , 6HG2 <sup>(e)</sup> or 6HH2)	75 kg	75 kg	75 kg	75 kg
glass receptacle with outer steel, aluminium plywood or fibre drum (6PA1, 6PB1, 6PD1 <sup>(e)</sup> or 6PG1 <sup>(e)</sup> ) 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 <sup>(e)</sup> or 6PD2 <sup>(e)</sup> ) or with outer solid plastics or expanded plastics packaging (6PH2 or 6PH1 <sup>(e)</sup> )	75 kg	75 kg	75 kg	75 kg
<sup>(e)</sup> These packagings shall not be used when the substances being carried may become liquid during carriage (see 4.1.3.4).				
<b>Pressure receptacles</b> , provided that the general provisions of 4.1.3.6 are met.				
<b>Special packing provisions</b>				
<b>PP 6</b>	(Deleted)			
<b>PP 7</b>	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 full load in closed wagons or in closed containers. Each pallet shall not exceed 1 000 kg.			
<b>PP 8</b>	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.			
<b>PP 9</b>	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.			
<b>PP 11</b>	For UN No. 1309, packing group III, and UN No. 1362, 5H1, 5L1 and 5M1 bags are allowed if they are over-packed in plastic bags and are wrapped in shrink or stretch wrap on pallets.			
<b>PP 12</b>	For UN Nos. 1361, 2213 and UN No. 3077, 5H1, 5L1 and 5M1 bags are allowed when carried in closed wagons or closed containers.			
<b>PP 13</b>	For articles classified under UN No. 2870, only combination packagings meeting the packing group I performance level are authorized.			
<b>PP 14</b>	For UN Nos. 2211, 2698 and 3314, packagings are not required to meet the performance tests in Chapter 6.1.			
<b>PP 15</b>	For UN Nos. 1324 and 2623, packagings shall meet the packing group III performance level.			
<b>PP 20</b>	For UN No. 2217, any sift-proof, tearproof receptacle may be used.			
<b>PP 30</b>	For UN No. 2471, paper or fibre inner packagings are not permitted.			
<b>PP 34</b>	For UN No. 2969 (as whole beans), 5H1, 5L1 and 5M1 bags are permitted.			
<b>PP 37</b>	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.			
<b>PP 38</b>	For UN No. 1309, packing group II, bags are permitted only in closed wagons or closed containers.			
<b>PP 84</b>	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.			
<b>NOTE:</b> For waste lighters collected separately see Chapter 3.3, special provision 654.				
<b>PP 92</b>	For UN No. 3531, packagings shall be designed and constructed to permit the release of gas or vapour to prevent a build-up of pressure that could rupture the packagings in the event of loss of stabilization.			
<b>Special packing provision specific to RID and ADR</b>				
<b>RR 5</b>	Notwithstanding special packing provision PP84, only the general provisions 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.			
<b>NOTE:</b> For waste lighters collected separately see Chapter 3.3, special provision 654.				

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, and of adequate strength and design in relation to the packaging capacity and its intended use, shall be used. Where this packing instruction is used for the transport of articles or inner packagings of combination packagings, the packaging shall be designed and constructed to prevent inadvertent discharge of articles during normal conditions of carriage.		
<b>Special packing provisions</b>		
PP 16	For UN No. 2800, batteries shall be protected from short circuits and shall be securely packed in strong outer packagings.  <b>NOTE 1:</b> 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.  <b>2:</b> For used batteries (UN No. 2800), see P801a.	
PP 17	For UN No. 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	(Deleted)	
PP 88	(Deleted)	
PP 90	For UN No. 3506, sealed inner liners or bags of strong leakproof and puncture resistant material impervious to mercury which will prevent escape of the substance from the package irrespective of the position or the orientation of the package shall be used.	
PP 91	For UN 1044, large fire extinguishers may also be carried unpackaged provided that the requirements of 4.1.3.8.1 (a) to (e) are met, the valves are protected by one of the methods in accordance with 4.1.6.8 (a) to (d) and other equipment mounted on the fire extinguisher is protected to prevent accidental activation. For the purpose of this special packing provision, "large fire extinguishers" means fire extinguishers as described in indents (c) to (e) of special provision 225 of Chapter 3.3.	
<b>Special packing provisions specific to RID and ADR</b>		
RR 6	For UN No. 2037, in the case of carriage by 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.	
RR 9	For UN 3509, packagings are not required to meet the requirements of 4.1.1.3.  Packagings meeting the requirements of 6.1.4, made leak tight or fitted with a leak tight and puncture resistant sealed liner or bag, shall be used.  When the only residues contained are solids which are not liable to become liquid at temperatures likely to be encountered during carriage, flexible packagings may be used.  When liquid residues are present, rigid packagings that provide a means of retention (e.g. absorbent material) shall be used.  Before being filled and handed over for carriage, every packaging shall be inspected to ensure that it is free from corrosion, contamination or other damage. Any packaging showing signs of reduced strength shall no longer be used (minor dents and scratches are not considered as reducing the strength of the packaging).  Packagings intended for the carriage of packagings, discarded, empty, uncleared with residues of Class 5.1 shall be so constructed or adapted that the goods cannot come into contact with wood or any other combustible material.	

P 004	PACKING INSTRUCTION	P 004
<b>This instruction applies to UN Nos. 3473, 3476, 3477, 3478 and 3479.</b>		
The following packagings are authorized:		
(1) For fuel cell cartridges, provided that the general provisions of 4.1.1.1, 4.1.1.2, 4.1.1.3, 4.1.1.6 and 4.1.3 are met: Drums (1A2, 1B2, 1N2, 1H2, 1D, 1G); Boxes (4A, 4B, 4N, 4C1, 4C2, 4D, 4F, 4G, 4H1, 4H2); Jerricans (3A2, 3B2, 3H2). Packagings shall conform to the packing group II performance level.		
(2) For fuel cell cartridges packed with equipment: strong outer packagings which meet the general provisions of 4.1.1.1, 4.1.1.2, 4.1.1.6 and 4.1.3. When fuel cell cartridges are packed with equipment, they shall be packed in inner packagings or placed in the outer packaging with cushioning material or divider(s) so that the fuel cell cartridges are protected against damage that may be caused by the movement or placement of the contents within the outer packaging. The equipment shall be secured against movement within the outer packaging. For the purpose of this packing instruction, "equipment" means apparatus requiring the fuel cell cartridges with which it is packed for its operation.		
(3) For fuel cell cartridges contained in equipment: strong outer packagings which meet the general provisions of 4.1.1.1, 4.1.1.2, 4.1.1.6 and 4.1.3. Large robust equipment (see 4.1.3.8) containing fuel cell cartridges may be carried unpackaged. For fuel cell cartridges contained in equipment, the entire system shall be protected against short circuit and inadvertent operation.		

P 005	PACKING INSTRUCTION	P 005
<b>This instruction applies to UN Nos. 3528, 3529 and 3530.</b>		
If the engine or machinery is constructed and designed so that the means of containment containing the dangerous goods affords adequate protection, an outer packaging is not required.		
Dangerous goods in engines or machinery shall otherwise be packed in outer packagings constructed of suitable material, and of adequate strength and design in relation to the packaging capacity and its intended use, and meeting the applicable requirements of 4.1.1.1, or they shall be fixed in such a way that they will not become loose during normal conditions of carriage, e.g. in cradles or crates or other handling devices.		
In addition, the manner in which means of containment are contained within the engine or machinery, shall be such that under normal conditions of carriage, damage to the means of containment containing the dangerous goods is prevented; and in the event of damage to the means of containment containing liquid dangerous goods, no leakage of the dangerous goods from the engine or machinery is possible (a leakproof liner may be used to satisfy this requirement).		
Means of containment containing dangerous goods shall be so installed, secured or cushioned as to prevent their breakage or leakage and so as to control their movement within the engine or machinery during normal conditions of carriage. Cushioning material shall not react dangerously with the content of the means of containment. Any leakage of the contents shall not substantially impair the protective properties of the cushioning material.		
<b>Additional requirement</b>		
Other dangerous goods (e.g. batteries, fire extinguishers, compressed gas accumulators or safety devices) required for the functioning or safe operation of the engine or machinery shall be securely mounted in the engine or machine.		

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	<b>Drums</b> steel (1A1, 1A2)	400 kg	
Steel 40 l	plastics (1H1, 1H2) plywood (1D) fibre (1G)	400 kg 400 kg 400 kg 400 kg	
	<b>Boxes</b> 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)	
<b>Drums</b> steel, non-removable head (1A1)		450 l	
<b>Jerricans</b> steel, non-removable head (3A1)		60 l	
<b>Composite packagings</b> plastics receptacle in steel drums (6HA1)		250 l	
<b>Steel pressure receptacles</b> , provided that the general provisions of 4.1.3.6 are met.			

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
<p>Only packagings which are approved by the competent authority of the country of origin may be used. If the country of origin is not an RID Contracting State, the packaging shall be approved by the competent authority of the first RID Contracting State reached by the consignment.</p> <p><b>NOTE:</b> For the information in the transport document, see 5.4.1.2.1(e)</p>		

P 111	PACKING INSTRUCTION	P 111
<p>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:</p>		
Inner packagings	Intermediate packagings	Outer packagings
<b>Bags</b> paper, waterproofed plastics textile, rubberized	Not necessary	<b>Boxes</b> steel (4A) aluminium (4B) other metal (4N) natural wood, ordinary (4C1) natural wood, sift-proof (4C2) plywood (4D) reconstituted wood (4F) fibreboard (4G) plastics, expanded (4H1) plastics, solid (4H2)
<b>Receptacles</b> wood		<b>Drums</b> steel (1A1, 1A2) aluminium (1B1, 1B2) other metal (1N1, 1N2) plywood (1D) fibre (1G) plastics (1H1, 1H2)
<b>Sheets</b> plastics textile, rubberized		
<b>Special packing provision</b>		
PP 43	For UN No. 0159, inner packagings are not required when metal (1A1, 1A2, 1B1, 1B2, 1N1 or 1N2) or plastics (1H1 or 1H2) drums are used as outer packagings.	

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	Intermediate packagings	Outer packagings	
<b>Bags</b> paper, multiwall, water resistant plastics textile textile, rubberized woven plastics	<b>Bags</b> plastics textile, plastic coated or lined	<b>Boxes</b> steel (4A) aluminium (4B) other metal (4N) natural wood, ordinary (4C1) natural wood, sift-proof (4C2) plywood (4D) reconstituted wood (4F) fibreboard (4G) plastics, expanded (4H1) plastics, solid (4H2)	
<b>Receptacles</b> metal plastics wood	<b>Receptacles</b> metal plastics wood	<b>Drums</b> steel (1A1, 1A2) aluminium (1B1, 1B2) other metal (1N1, 1N2) plywood (1D) fibre (1G) plastics (1H1, 1H2)	
<b>Additional requirement</b>			
Intermediate packagings are not required if leakproof removable head drums are used as the outer packaging.			
<b>Special packing provisions</b>			
<b>PP 26</b>	For UN Nos. 0004, 0076, 0078, 0154, 0219 and 0394, packagings shall be lead free.		
<b>PP 45</b>	For UN Nos. 0072 and 0226, intermediate packagings are not required.		

<b>P 112b</b>		<b>PACKING INSTRUCTION</b> (Solid dry, other than powder 1.1D)	<b>P 112b</b>
<b>Inner packagings</b>	<b>Intermediate packagings</b>	<b>Outer packagings</b>	
<p>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:</p>			
<b>Bags</b> paper, kraft paper, multiwall, water resistant plastics textile textile, rubberized woven plastics	<b>Bags</b> (for UN No. 0150 only) plastics textile, plastic coated or lined	<b>Bags</b> 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)	<b>Boxes</b> steel (4A) aluminium (4B) other metal (4N) natural wood, ordinary (4C1) natural wood, sift-proof (4C2) plywood (4D) reconstituted wood (4F) fibreboard (4G) plastics, expanded (4H1) plastics, solid (4H2)
<b>Drums</b> steel (1A1, 1A2) aluminium (1B1, 1B2) other metal (1N1, 1N2) plywood (1D) fibre (1G) plastics (1H1, 1H2)			
<b>Special packing provisions</b>			
<b>PP 26</b>	For UN Nos. 0004, 0076, 0078, 0154, 0216, 0219 and 0386, packagings shall be lead free.		
<b>PP 46</b>	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.		
<b>PP 47</b>	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	Intermediate packagings	Outer packagings
<b>Bags</b> paper, multiwall, water resistant plastics woven plastics	<b>Bags</b> paper, multiwall, water resistant with inner lining plastics	<b>Boxes</b> steel (4A) aluminium (4B) other metal (4N) natural wood, ordinary (4C1) natural wood, sift-proof (4C2) plywood (4D) reconstituted wood (4F) fibreboard (4G) plastics, solid (4H2)
<b>Receptacles</b> fibreboard metal plastics wood	<b>Receptacles</b> metal plastics wood	<b>Drums</b> steel (1A1, 1A2) aluminium (1B1, 1B2) other metal (1N1, 1N2) plywood (1D) fibre (1G) plastics (1H1, 1H2)
<b>Additional requirements</b>		
1. Inner packagings are not required if drums are used as the outer packaging.		
2. The packaging shall be sift-proof.		
<b>Special packing provisions</b>		
<b>PP 26</b>	For UN Nos. 0004, 0076, 0078, 0154, 0216, 0219 and 0386, packagings shall be lead free.	
<b>PP 46</b>	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.	
<b>PP 48</b>	For UN No. 0504, metal packagings shall not be used. Packagings of other material with a small amount of metal, for example metal closures or other metal fittings such as those mentioned in 6.1.4, are not considered metal packagings.	

PACKING INSTRUCTION								
The following packagings are authorized, provided the general packing provisions of 4.1.1, 4.1.3 and special packing provisions of 4.1.5 are met:								
Inner packagings	Intermediate packagings	Outer packagings						
<b>Bags</b> paper plastics textile, rubberized	Not necessary	<b>Boxes</b> steel (4A) aluminium (4B) other metal (4N) natural wood, ordinary (4C1) natural wood, sift-proof walls (4C2) plywood (4D) reconstituted wood (4F) fibreboard (4G) plastics, solid (4H2)						
<b>Receptacles</b> fibreboard metal plastics wood		<b>Drums</b> steel (1A1, 1A2) aluminium (1B1, 1B2) other metal (1N1, 1N2) plywood (1D) fibre (1G) plastics (1H1, 1H2)						
<b>Additional requirement</b> The packaging shall be sift-proof.								
<b>Special packing provisions</b> <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 10%;"><b>PP 49</b></td><td>For UN Nos. 0094 and 0305, no more than 50 g of substance shall be packed in an inner packaging.</td></tr> <tr> <td><b>PP 50</b></td><td>For UN No. 0027, inner packagings are not necessary when drums are used as outer packagings.</td></tr> <tr> <td><b>PP 51</b></td><td>For UN No. 0028, paper kraft or waxed paper sheets may be used as inner packagings.</td></tr> </table>			<b>PP 49</b>	For UN Nos. 0094 and 0305, no more than 50 g of substance shall be packed in an inner packaging.	<b>PP 50</b>	For UN No. 0027, inner packagings are not necessary when drums are used as outer packagings.	<b>PP 51</b>	For UN No. 0028, paper kraft or waxed paper sheets may be used as inner packagings.
<b>PP 49</b>	For UN Nos. 0094 and 0305, no more than 50 g of substance shall be packed in an inner packaging.							
<b>PP 50</b>	For UN No. 0027, inner packagings are not necessary when drums are used as outer packagings.							
<b>PP 51</b>	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	Intermediate packagings	Outer packagings
<b>Bags</b> plastics textile woven plastics	<b>Bags</b> plastics textile, plastic coated or lined	<b>Boxes</b> steel (4A) metal, other than steel or aluminium (4N) natural wood, ordinary (4C1) natural wood, sift-proof walls (4C2) plywood (4D) reconstituted wood (4F) fibreboard (4G) plastics, solid (4H2)
<b>Receptacles</b> metal plastics wood	<b>Receptacles</b> metal plastics  <b>Dividing partitions</b> wood	<b>Drums</b> steel (1A1, 1A2) aluminium (1B1, 1B2) other metal (1N1, 1N2) plywood (1D) fibre (1G) plastics (1H1, 1H2)
<b>Additional requirement</b>		
Intermediate packagings are not required if leakproof removable head drums are used as outer packagings.		
<b>Special packing provisions</b>		
<b>PP 26</b>	For UN Nos. 0077, 0132, 0234, 0235 and 0236, packagings shall be lead free.	
<b>PP 43</b>	For UN No. 0342, inner packagings are not required when metal (1A1, 1A2, 1B1, 1B2, 1N1 or 1N2) or plastics (1H1 or 1H2) drums are used as outer packagings.	

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	Intermediate packagings	Outer packagings	
<b>Bags</b> paper, kraft plastics textile, sift-proof woven plastics, sift-proof	Not necessary	<b>Boxes</b> natural wood, ordinary (4C1) natural wood, sift-proof walls (4C2) plywood (4D) reconstituted wood (4F) fibreboard (4G)	
<b>Receptacles</b> fibreboard metal paper plastics woven plastics, sift-proof wood		<b>Drums</b> steel (1A1, 1A2) aluminium (1B1, 1B2) other metal (1N1, 1N2) plywood (1D) fibre (1G) plastics (1H1, 1H2)	
Special packing provisions			
<b>PP 26</b>	For UN Nos. 0077, 0132, 0234, 0235 and 0236, packagings shall be lead free.		
<b>PP 48</b>	For UN Nos. 0508 and 0509, metal packagings shall not be used. Packagings of other material with a small amount of metal, for example metal closures or other metal fittings such as those mentioned in 6.1.4, are not considered metal packagings.		
<b>PP 50</b>	For UN Nos. 0160, 0161 and 0508, inner packagings are not necessary if drums are used as outer packagings.		
<b>PP 52</b>	For UN Nos. 0160 and 0161, when metal drums (1A1, 1A2, 1B1, 1B2, 1N1 or 1N2) 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.		

PACKING INSTRUCTION		
P 115		
Inner packagings	Intermediate packagings	Outer packagings
<b>Receptacles</b> plastics wood	<b>Bags</b> plastics in metal receptacles  <b>Drums</b> metal  <b>Receptacles</b> wood	<b>Boxes</b> natural wood, ordinary (4C1) natural wood, sift-proof walls (4C2) plywood (4D) reconstituted wood (4F)  <b>Drums</b> steel (1A1, 1A2) aluminium (1B1, 1B2) other metal (1N1, 1N2) plywood (1D) fibre (1G) plastics (1H1, 1H2)
<b>Special packing provisions</b>		
<b>PP 45</b>	For UN No. 0144, intermediate packagings are not required.	
<b>PP 53</b>	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.	
<b>PP 54</b>	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.	
<b>PP 55</b>	For UN No. 0144, absorbent cushioning material shall be inserted.	
<b>PP 56</b>	For UN No. 0144, metal receptacles may be used as inner packagings.	
<b>PP 57</b>	For UN Nos. 0075, 0143, 0495 and 0497, bags shall be used as intermediate packagings when boxes are used as outer packagings.	
<b>PP 58</b>	For UN Nos. 0075, 0143, 0495 and 0497, drums shall be used as intermediate packagings when drums are used as outer packagings.	
<b>PP 59</b>	For UN No. 0144, fibreboard boxes (4G) may be used as outer packagings.	
<b>PP 60</b>	For UN No. 0144, aluminium drums (1B1 and 1B2) and metal, other than steel or aluminium, drums (1N1 and 1N2) shall not be used.	

PACKING INSTRUCTION		
P 116		
Inner packagings	Intermediate packagings	Outer packagings
<b>Bags</b> paper, water and oil resistant plastics textile, plastic coated or lined woven plastics, sift-proof	Not necessary	<b>Bags</b> woven plastics (5H1, 5H2, 5H3) paper, multiwall, water resistant (5M2) plastics, film (5H4) textile, sift-proof (5L2) textile, water resistant (5L3)
<b>Receptacles</b> fibreboard, water resistant metal plastics wood, sift-proof		<b>Boxes</b> steel (4A) aluminium (4B) other metal (4N) natural wood, ordinary (4C1) natural wood, sift-proof walls (4C2) plywood (4D) reconstituted wood (4F) fibreboard (4G) plastics, solid (4H2)
<b>Sheets</b> paper, water resistant paper, waxed plastics		<b>Drums</b> steel (1A1, 1A2) aluminium (1B1, 1B2) other metal (1N1, 1N2) plywood (1D) fibre (1G) plastics (1H1, 1H2)
		<b>Jerricans</b> steel (3A1, 3A2) plastics (3H1, 3H2)
<b>Special packing provisions</b>		
<b>PP 61</b>	For UN Nos. 0082, 0241, 0331 and 0332, inner packagings are not required if leakproof removable head drums are used as outer packagings.	
<b>PP 62</b>	For UN Nos. 0082, 0241, 0331 and 0332, inner packagings are not required when the explosive is contained in a material impervious to liquid.	
<b>PP 63</b>	For UN No. 0081, inner packagings are not required when contained in rigid plastic which is impervious to nitric esters.	
<b>PP 64</b>	For UN No. 0331, inner packagings are not required when bags (5H2), (5H3) or (5H4) are used as outer packagings.	
<b>PP 65</b>	(Deleted)	
<b>PP 66</b>	For UN No. 0081, bags shall not be used as outer packagings.	

PACKING INSTRUCTION		
The following packagings are authorized, provided the general packing provisions of 4.1.1, 4.1.3 and special packing provisions of 4.1.5 are met:		
Inner packagings	Intermediate packagings	Outer packagings
Not necessary	Not necessary	<b>Boxes</b> steel (4A) aluminium (4B) other metal (4N) natural wood, ordinary (4C1) natural wood, sift-proof walls (4C2) plywood (4D) reconstituted wood (4F) fibreboard (4G) plastics, expanded (4H1) plastics, solid (4H2)  <b>Drums</b> steel (1A1, 1A2) aluminium (1B1, 1B2) other metal (1N1, 1N2) plywood (1D) fibre (1G) plastics (1H1, 1H2)
<b>Special packing provision</b>		
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, 0502 and 0510: 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.	

PACKING INSTRUCTION		
The following packagings are authorized, provided the general packing provisions of 4.1.1, 4.1.3 and special packing provisions of 4.1.5 are met:		
Inner packagings	Intermediate packagings	Outer packagings
<b>Bags</b> paper plastics	Not necessary	<b>Boxes</b> steel (4A) aluminium (4B) other metal (4N) natural wood, ordinary (4C1) natural wood, sift-proof walls (4C2) plywood (4D) reconstituted wood (4F) fibreboard (4G) plastics, solid (4H2)
<b>Receptacles</b> fibreboard metal plastics wood		
<b>Reels</b>		<b>Drums</b> steel (1A1, 1A2) aluminium (1B1, 1B2) other metal (1N1, 1N2) plywood (1D) fibre (1G) plastics (1H1, 1H2)
<b>Special packing provision</b>		
<b>PP 68</b>   For UN Nos. 0029, 0267 and 0455, bags and reels shall not be used as inner packagings.		

PACKING INSTRUCTION		
(Articles consisting of closed metal, plastics or fibreboard casings that contain a detonating explosive, or consisting of plastics-bonded detonating explosives)		
Inner packagings	Intermediate packagings	Outer packagings
Not necessary	Not necessary	<b>Boxes</b> steel (4A) aluminium (4B) other metal (4N) 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
Inner packagings	Intermediate packagings	Outer packagings	
<b>Receptacles</b> fibreboard metal plastics wood			
	Not necessary		<b>Boxes</b> steel (4A) aluminium (4B) other metal (4N) natural wood, ordinary (4C1) natural wood, sift-proof walls (4C2) plywood (4D) reconstituted wood (4F) fibreboard (4G) plastics, solid (4H2)
<b>Sheets</b> paper plastics			

P 133		PACKING INSTRUCTION	P 133
Inner packagings	Intermediate packagings	Outer packagings	
<b>Receptacles</b> fibreboard metal plastics wood			
	<b>Receptacles</b> fibreboard metal plastics wood		<b>Boxes</b> steel (4A) aluminium (4B) other metal (4N) natural wood, ordinary (4C1) natural wood, sift-proof walls (4C2) plywood (4D) reconstituted wood (4F) fibreboard (4G) plastics, solid (4H2)
<b>Trays, fitted with dividing partitions</b> fibreboard plastics wood			
<b>Additional requirement</b>  Receptacles are only required as intermediate packagings when the inner packagings are trays.			
<b>Special packing provision</b>  PP 69   For UN Nos. 0043, 0212, 0225, 0268 and 0306, trays shall not be used as inner packagings.			

PACKING INSTRUCTION		
The following packagings are authorized, provided the general packing provisions of 4.1.1, 4.1.3 and special packing provisions of 4.1.5 are met:		
Inner packagings	Intermediate packagings	Outer packagings
<b>Bags</b> water resistant	Not necessary	<b>Boxes</b> steel (4A) aluminium (4B) other metal (4N) natural wood, ordinary (4C1) natural wood, sift-proof walls (4C2) plywood (4D) reconstituted wood (4F) fibreboard (4G) plastics, expanded (4H1) plastics, solid (4H2)
<b>Receptacles</b> fibreboard metal plastics wood		
<b>Sheets</b> fibreboard, corrugated		
<b>Tubes</b> fibreboard		<b>Drums</b> steel (1A1, 1A2) aluminium (1B1, 1B2) other metal (1N1, 1N2) plywood (1D) fibre (1G) plastics (1H1, 1H2)

PACKING INSTRUCTION		
The following packagings are authorized, provided the general packing provisions of 4.1.1, 4.1.3 and special packing provisions of 4.1.5 are met:		
Inner packagings	Intermediate packagings	Outer packagings
<b>Bags</b> paper plastics	Not necessary	<b>Boxes</b> steel (4A) aluminium (4B) other metal (4N) natural wood, ordinary (4C1) natural wood, sift-proof walls (4C2) plywood (4D) reconstituted wood (4F) fibreboard (4G) plastics, expanded (4H1) plastics, solid (4H2)
<b>Receptacles</b> fibreboard metal plastics wood		
<b>Sheets</b> paper plastics		<b>Drums</b> steel (1A1, 1A2) aluminium (1B1, 1B2) other metal (1N1, 1N2) plywood (1D) fibre (1G) plastics (1H1, 1H2)

PACKING INSTRUCTION		
The following packagings are authorized, provided the general packing provisions of 4.1.1, 4.1.3 and special packing provisions of 4.1.5 are met:		
Inner packagings	Intermediate packagings	Outer packagings
<b>Bags</b> plastics textile	Not necessary	<b>Boxes</b> steel (4A) aluminium (4B) other metal (4N) natural wood, ordinary (4C1) natural wood, sift-proof walls (4C2) plywood (4D) reconstituted wood (4F) fibreboard (4G) plastics, solid (4H2)
<b>Boxes</b> fibreboard plastics wood		<b>Drums</b> steel (1A1, 1A2) aluminium (1B1, 1B2) other metal (1N1, 1N2) plywood (1D) fibre (1G) plastics (1H1, 1H2)
<b>Dividing partitions in the outer packagings</b>		

PACKING INSTRUCTION		
The following packagings are authorized, provided the general packing provisions of 4.1.1, 4.1.3 and special packing provisions of 4.1.5 are met:		
Inner packagings	Intermediate packagings	Outer packagings
<b>Bags</b> plastics	Not necessary	<b>Boxes</b> steel (4A) aluminium (4B) other metal (4N) natural wood, ordinary (4C1) natural wood, sift-proof walls (4C2) plywood (4D) reconstituted wood (4F) fibreboard (4G) plastics, solid (4H2)
<b>Boxes</b> fibreboard wood		<b>Drums</b> steel (1A1, 1A2) aluminium (1B1, 1B2) other metal (1N1, 1N2) plywood (1D) fibre (1G) plastics (1H1, 1H2)
<b>Tubes</b> fibreboard metal plastics		
<b>Dividing partitions in the outer packagings</b>		
<b>Special packing provision</b>		
<b>PP 70</b>	For UN Nos. 0059, 0439, 0440 and 0441, when the shaped charges are packed singly, the conical cavity shall face downwards and the package shall be marked in accordance with 5.2.1.10.1. 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.	

PACKING INSTRUCTION		
The following packagings are authorized, provided the general packing provisions of 4.1.1, 4.1.3 and special packing provisions of 4.1.5 are met:		
Inner packagings	Intermediate packagings	Outer packagings
<b>Bags</b> plastics	Not necessary	<b>Boxes</b> steel (4A) aluminium (4B) other metal (4N) natural wood, ordinary (4C1) natural wood, sift-proof walls (4C2) plywood (4D) reconstituted wood (4F) fibreboard (4G) plastics, solid (4H2)  <b>Drums</b> steel (1A1, 1A2) aluminium (1B1, 1B2) other metal (1N1, 1N2) plywood (1D) fibre (1G) plastics (1H1, 1H2)
<b>Additional requirement</b> If the ends of the articles are sealed, inner packagings are not necessary.		

PACKING INSTRUCTION		
The following packagings are authorized, provided the general packing provisions of 4.1.1, 4.1.3 and special packing provisions of 4.1.5 are met:		
Inner packagings	Intermediate packagings	Outer packagings
<b>Bags</b> plastics	Not necessary	<b>Boxes</b> steel (4A) aluminium (4B) other metal (4N) natural wood, ordinary (4C1) natural wood, sift-proof walls (4C2) plywood (4D) reconstituted wood (4F) fibreboard (4G) plastics, solid (4H2)
<b>Receptacles</b> fibreboard metal plastics wood		
<b>Reels</b>		
<b>Sheets</b> paper plastics		<b>Drums</b> steel (1A1, 1A2) aluminium (1B1, 1B2) other metal (1N1, 1N2) plywood (1D) fibre (1G) plastics (1H1, 1H2)
<b>Special packing provisions</b>		
<b>PP 71</b>	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.	
<b>PP 72</b>	For UN Nos. 0065 and 0289, inner packagings are not required when they are in coils.	

PACKING INSTRUCTION		
The following packagings are authorized, provided the general packing provisions of 4.1.1, 4.1.3 and special packing provisions of 4.1.5 are met:		
Inner packagings	Intermediate packagings	Outer packagings
<b>Bags</b> plastics	Not necessary	<b>Boxes</b> steel (4A) aluminium (4B) other metal (4N) natural wood, ordinary (4C1) natural wood, sift-proof walls (4C2) plywood (4D) reconstituted wood (4F) fibreboard (4G) plastics, solid (4H2)
<b>Receptacles</b> wood		<b>Drums</b> steel (1A1, 1A2) aluminium (1B1, 1B2) other metal (1N1, 1N2) plywood (1D) fibre (1G) plastics (1H1, 1H2)
<b>Reels</b>		
<b>Sheets</b> paper, kraft plastics		
<b>Special packing provisions</b>		
<b>PP 73</b>	For UN No. 0105, no inner packagings are required if the ends are sealed.	
<b>PP 74</b>	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.	
<b>PP 75</b>	For UN No. 0101, steel, aluminium or other metal boxes or drums shall not be used.	

PACKING INSTRUCTION		
The following packagings are authorized, provided the general packing provisions of 4.1.1, 4.1.3 and special packing provisions of 4.1.5 are met:		
Inner packagings	Intermediate packagings	Outer packagings
<b>Receptacles</b> fibreboard metal plastics wood	Not necessary	<b>Boxes</b> steel (4A) aluminium (4B) other metal (4N) natural wood, ordinary (4C1) natural wood, sift-proof walls (4C2) plywood (4D) reconstituted wood (4F) fibreboard (4G) plastics, solid (4H2)
<b>Trays, fitted with dividing partitions</b> plastics wood		<b>Drums</b> steel (1A1, 1A2) aluminium (1B1, 1B2) other metal (1N1, 1N2) plywood (1D) fibre (1G) plastics (1H1, 1H2)
<b>Dividing partitions in the outer packagings</b>		

PACKING INSTRUCTION		
The following packagings are authorized, provided the general packing provisions of 4.1.1, 4.1.3 and special packing provisions of 4.1.5 are met:		
Inner packagings	Intermediate packagings	Outer packagings
<b>Bags</b> paper plastics	Not necessary	<b>Boxes</b> steel (4A) aluminium (4B) other metal (4N) natural wood, ordinary (4C1) natural wood, sift-proof walls (4C2) plywood (4D) reconstituted wood (4F) fibreboard (4G) plastics, solid (4H2)
<b>Receptacles</b> fibreboard metal plastics wood		
<b>Sheets</b> paper		<b>Drums</b> steel (1A1, 1A2) aluminium (1B1, 1B2) other metal (1N1, 1N2) plywood (1D) fibre (1G) plastics (1H1, 1H2)
<b>Trays, fitted with dividing partitions</b> plastics		

PACKING INSTRUCTION		
The following packagings are authorized, provided the general packing provisions of 4.1.1, 4.1.3 and special packing provisions of 4.1.5 are met:		
Inner packagings	Intermediate packagings	Outer packagings
<b>Bags</b> paper, kraft plastics textile textile, rubberized	Not necessary	<b>Boxes</b> steel (4A) aluminium (4B) other metal (4N) natural wood, ordinary (4C1) natural wood, sift-proof walls (4C2) plywood (4D) reconstituted wood (4F) fibreboard (4G) plastics, solid (4H2)
<b>Receptacles</b> fibreboard metal plastics wood		<b>Drums</b> steel (1A1, 1A2) aluminium (1B1, 1B2) other metal (1N1, 1N2) plywood (1D) fibre (1G) plastics (1H1, 1H2)
<b>Trays, fitted with dividing partitions</b> plastics wood		
<b>Additional requirement</b>		
Instead of the above inner and outer packagings, composite packagings (6HH2) (plastics receptacle with outer solid plastics box) may be used.		
<b>Special packing provision</b>		
<b>PP 76</b>	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.	

PACKING INSTRUCTION		
The following packagings are authorized, provided the general packing provisions of 4.1.1, 4.1.3 and special packing provisions of 4.1.5 are met:		
Inner packagings	Intermediate packagings	Outer packagings
<b>Receptacles</b> fibreboard metal plastics wood	Not necessary	<b>Boxes</b> steel (4A) aluminium (4B) other metal (4N) natural wood, ordinary with metal liner (4C1) plywood (4D) with metal liner reconstituted wood (4F) with metal liner plastics, expanded (4H1) plastics, solid (4H2)
<b>Dividing partitions in the outer packagings</b>		<b>Drums</b> steel (1A1, 1A2) aluminium (1B1, 1B2) other metal (1N1, 1N2) plastics (1H1, 1H2)
<b>Special packing provision</b>		
<b>PP 77</b>	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.	

P 200	PACKING INSTRUCTION	P 200
<b>Type of packagings</b>		
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, the provisions listed below under (1) to (9) and, when referred to in the column "Special packing provisions" of Tables 1, 2 or 3, the relevant special packing provisions listed below under (10), are met.		
<b>General</b>		
<p>(1) Pressure receptacles shall be so closed and leakproof as to prevent escape of the gases;</p> <p>(2) Pressure receptacles containing toxic substances with an LC<sub>50</sub> less than or equal to 200 ml/m<sup>3</sup> (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.</p> <p>(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:</p> <ul style="list-style-type: none"> <li>(a) the UN number, name and description, and the classification code of the substance;</li> <li>(b) the LC<sub>50</sub> for toxic substances;</li> <li>(c) the types of pressure receptacles authorised for the substance, shown by the letter "X";</li> <li>(d) the maximum test period for periodic inspection of the pressure receptacles;</li> </ul> <p><b>NOTE:</b> For pressure receptacles which make use of composite materials, the maximum test period shall be 5 years. The test period may be extended to that specified in Tables 1 and 2 (i.e. up to 10 years), if approved by the competent authority or body designated by this authority which issued the type approval.</p> <ul style="list-style-type: none"> <li>(e) the minimum test pressure of the pressure receptacles;</li> <li>(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;</li> <li>(g) special packing provisions that are specific to a substance.</li> </ul>		
<b>Test pressure, filling ratios and filling requirements</b>		
<p>(4) The minimum test pressure required for is 1 MPa (10 bar);</p> <p>(5) In no case shall pressure receptacles be filled in excess of the limit permitted in the following requirements:</p> <ul style="list-style-type: none"> <li>(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.</li> <li>(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.</li> </ul> <p>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:</p> <ul style="list-style-type: none"> <li>(i) the criterion of special packing provision "r" is met when applicable; or</li> <li>(ii) the above criterion is met in all other cases.</li> </ul> <p>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:</p>		
$FR = 8,5 \times 10^{-4} \times d_g \times P_h$ <p>where</p> <p>FR = maximum filling ratio</p> <p>d<sub>g</sub> = gas density (at 15 °C, 1 bar)(in kg/m<sup>3</sup>)</p> <p>P<sub>h</sub> = minimum test pressure (in bar).</p> <p>If the density of the gas is unknown, the maximum filling ratio shall be determined as follows:</p> $FR = \frac{P_h \times MM \times 10^{-3}}{R \times 338}$ <p>where</p> <p>FR = maximum filling ratio</p> <p>P<sub>h</sub> = minimum test pressure (in bar)</p>		

MM = molecular mass (in g/mol)

R =  $8.31451 \times 10^{-2}$  bar.l.mol<sup>-1</sup>.K<sup>-1</sup> (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 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:

$$FR = (0.0032 \times BP - 0.24) \times d_i$$

where

FR = maximum filling ratio

BP = boiling point (in Kelvin)

$d_i$  = 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".

(e) For liquefied gases charged with compressed gases, both components – the liquefied gas and the compressed gas – have to be taken into consideration in the calculation of the internal pressure in the pressure receptacle.

The maximum mass of contents per litre of water capacity shall not exceed 0.95 times the density of the liquid phase at 50 °C; in addition, the liquid phase shall not completely fill the pressure receptacle at any temperature up to 60 °C.

When filled, the internal pressure at 65 °C shall not exceed the test pressure of the pressure receptacles. The vapour pressures and volumetric expansions of all substances in the pressure receptacles shall be considered. When experimental data is not available, the following steps shall be carried out:

- (i) Calculation of the vapour pressure of the liquefied gas and of the partial pressure of the compressed gas at 15 °C (filling temperature);
- (ii) Calculation of the volumetric expansion of the liquid phase resulting from the heating from 15 °C to 65 °C and calculation of the remaining volume for the gaseous phase;
- (iii) Calculation of the partial pressure of the compressed gas at 65 °C considering the volumetric expansion of the liquid phase;

**NOTE:** The compressibility factor of the compressed gas at 15 °C and 65 °C shall be considered.

(iv) Calculation of the vapour pressure of the liquefied gas at 65 °C;

(v) The total pressure is the sum of the vapour pressure of the liquefied gas and the partial pressure of the compressed gas at 65 °C;

(vi) Consideration of the solubility of the compressed gas at 65 °C in the liquid phase;

The test pressure of the pressure receptacle shall not be less than the calculated total pressure minus 100 kPa (1 bar).

If the solubility of the compressed gas in the liquid phase is not known for the calculation, the test pressure can be calculated without taking the gas solubility (sub-paragraph (vi)) into account.

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

(7) (a) 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 of receptacles and accessories with RID;
- 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 marks and identification.

(b) LPG to be filled in cylinders shall be of high quality; this is deemed to be fulfilled if the LPG to be filled is in compliance with the limitations on corrosiveness as specified in ISO 9162:1989.

#### 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.

For pressure receptacles which make use of composite materials, the maximum test period shall be 5 years. The test period may be extended to that specified in Tables 1 and 2 (i.e. up to 10 years), if approved by the competent authority or body designated by this authority which issued the type approval.

#### Special packing provisions

(10) Material compatibility

- a: Aluminium alloy pressure receptacles shall not be used.
- b: Copper valves shall not be used.
- c: Metal parts in contact with the contents shall not contain more than 65% copper.
- d: When steel pressure receptacles are used, only those bearing the "H" mark in accordance with 6.2.2.7.4 (p) are permitted.

Requirements for toxic substances with an LC<sub>50</sub> less than or equal to 200 ml/m<sup>3</sup> (ppm)

k: Valve outlets shall be fitted with pressure retaining gas-tight plugs or caps having threads that match those of the valve outlets and 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 be capable of withstanding the test pressure of the pressure receptacle and be connected directly to the pressure receptacle by either a taper thread or other means which meets the requirements of ISO 10692-2:2001.

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

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 pack-

ing 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, ISO 3807-2:2000 or ISO 3807:2013, 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, ISO 3807-2:2000 or ISO 3807:2013, 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 fitted with a fusible plug.

- q: Valve outlets of pressure receptacles for pyrophoric gases or flammable mixtures of gases containing more than 1% of pyrophoric compounds shall be fitted with gas-tight plugs or caps 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 outlet of the manifold valve shall be fitted with a pressure retaining gas-tight plug or cap. Gas-tight plugs or caps shall have threads that match those of the valve outlets. 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: This gas may also be packed 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 7866:2012 + Cor 1:2014.
- ua: The interval between periodic tests may be extended to 15 years for aluminium alloy cylinders and bundles of such cylinders if the provisions of paragraph (13) of this packing instruction are applied. This shall not apply to cylinders made from aluminium alloy AA 6351. For mixtures, this provision "ua" may be applied provided all the individual gases in the mixture have been allocated "ua" in Table 1 or Table 2.
- v: (1) The interval between inspections for steel cylinders, other than refillable welded steel cylinders for UN Nos. 1011, 1075, 1965, 1969 or 1978, 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.
- (2) For refillable welded steel cylinders for UN Nos. 1011, 1075, 1965, 1969 or 1978, the interval may be extended to 15 years, if the provisions of paragraph (12) of this packing instruction are applied.
- va: For seamless steel cylinders which are equipped with residual pressure valves (RPVs) (see note below) that have been designed and tested in accordance with EN ISO 15996:2005 + A1:2007 and for bundles of seamless steel cylinders equipped with main valve(s) with a residual pressure device, tested in accordance with

EN ISO 15996:2005 + A1:2007, the interval between periodic tests may be extended to 15 years if the provisions of paragraph (13) of this packing instruction are applied. For mixtures, this provision "va" may be applied provided all the individual gases in the mixture have been allocated "va" in Table 1 or Table 2.

**NOTE:** "Residual Pressure Valve" (RPV) means a closure which incorporates a residual pressure device that prevents ingress of contaminants by maintaining a positive differential between the pressure within the cylinder and the valve outlet. In order to prevent back-flow of fluids into the cylinder from a higher pressure source a "Non-Return Valve" (NRV) function shall either be incorporated into the residual pressure device or be a discrete additional device in the cylinder valve, e.g. a regulator.

#### 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<sub>50</sub> less than or equal to 200 ml/m<sup>3</sup> 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 liquefied 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 13365:2002 + A1:2005	Transportable gas cylinders – Cylinder bundles for permanent and liquefied gases (excluding acetylene) – Inspection at the time of filling
(7) (a)	ISO 10691:2004	Gas cylinders – Refillable welded steel cylinders for liquefied petroleum gas (LPG) – Procedures for checking before, during and after filling

(7) (a)	ISO 11755:2005	Gas cylinders – Cylinder bundles for compressed and liquefied gases (excluding acetylene) – Inspection at time of filling
(7) (a)	ISO 24431:2006	Gas cylinders – Cylinders for compressed and liquefied gases (excluding acetylene) – Inspection at time of filling
(7) (a) and (10) p	ISO 11372:2011	Gas cylinders – Acetylene cylinders – Filling conditions and filling inspection NOTE: The EN version of this ISO standard fulfils the requirements and may also be used.
(7) (a) and (10) p	ISO 13088:2011	Gas cylinders – Acetylene cylinder bundles – Filling conditions and filling inspection NOTE: The EN version of this ISO standard fulfils the requirements and may also be used.
(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 12755:2000	Transportable gas cylinders – Filling conditions for acetylene bundles

(12) An interval of 15 years for the periodic inspection of refillable welded steel cylinders may be granted in accordance with special packing provision v (2) of paragraph (10), if the following provisions are applied.

#### 1. General provisions

1.1 For the application of this section, the competent authority shall not delegate its tasks and duties to Xb bodies (inspection bodies of type B) or IS bodies (in-house inspection services) (for the definitions of Xb and IS bodies, see 6.2.3.6.1).

1.2 The owner of the cylinders shall apply to the competent authority for granting the 15 year interval, and shall demonstrate that the requirements of sub-paragraphs 2, 3 and 4 are met.

1.3 Cylinders manufactured since 1 January 1999 shall have been manufactured in conformity with the following standards:

- EN 1442; or
- EN 13322-1; or
- Annex I, parts 1 to 3 to Council Directive 84/527/EEC<sup>a</sup>

as applicable according to the table in 6.2.4.

Other cylinders manufactured before 1 January 2009 in conformity with RID in accordance with a technical code accepted by the national competent authority may be accepted for a 15 year interval, if they are of equivalent safety to the provisions of RID as applicable at the time of application.

1.4 The owner shall submit documentary evidence to the competent authority demonstrating that the cylinders comply with the provisions of sub-paragraph 1.3. The competent authority shall verify that these conditions are met.

1.5 The competent authority shall check whether the provisions of sub-paragraphs 2 and 3 are fulfilled and correctly applied. If all provisions are fulfilled, it shall authorise the 15-year interval for the cylinders. In this authorisation, the type of cylinder (as specified in the type approval) or a group of cylinders (see Note) covered shall be clearly identified. The authorisation shall be delivered to the owner; the competent authority shall keep a copy. The owner shall keep the documents for as long as the cylinders are authorised for a 15 year interval.

**NOTE:** A group of cylinders is defined by the production dates of identical cylinders for a period, during which the applicable provisions of RID and of the technical code accepted by the competent authority have not changed in their technical content. Example: Cylinders of identical design and volume having been manufactured according to the provisions of RID as applicable between 1 January 1985 and 31 December 1988 in combination with a technical code accepted by the competent authority applicable for the same period, form one group in terms of the provisions of this paragraph.

1.6 The competent authority shall monitor the owner of the cylinders for compliance with the provisions of RID and the authorisation given as appropriate, but at least every three years or when changes to the procedures are introduced.

#### 2. Operational provisions

2.1 Cylinders having been granted a 15 year interval for periodic inspection shall only be filled in filling centres applying a documented quality system to ensure that all the provisions of paragraph (7) of this packing instruction and the requirements and responsibilities of EN 1439:2008 are fulfilled and correctly applied.

- 2.2 The competent authority shall verify that these requirements are fulfilled and check this as appropriate, but at least every three years or when changes to the procedures are introduced.
- 2.3 The owner shall provide documentary evidence to the competent authority that the filling centre complies with the provisions of sub-paragraph 2.1.
- 2.4 If a filling centre is situated in a different RID Contracting State, the owner shall provide additional documentary evidence that the filling centre is monitored accordingly by the competent authority of that RID Contracting State.
- 2.5 To prevent internal corrosion, only gases of high quality with very low potential contamination shall be filled into the cylinders. This is deemed to be fulfilled, if the gases conform to the limitations on corrosiveness as specified in ISO 9162:1989.

### 3. Provisions for qualification and periodic inspection

- 3.1 Cylinders of a type or group already in use, for which a 15 year interval has been granted and to which the 15 year interval has been applied, shall be subject to a periodic inspection according to 6.2.3.5.

**NOTE:** For the definition of a group of cylinders, see Note to sub-paragraph 1.5.

- 3.2 If a cylinder with a 15-year interval fails the hydraulic pressure test during a periodic inspection e.g. by bursting or leakage, the owner shall investigate and produce a report on the cause of the failure and if other cylinders (e.g. of the same type or group) are affected. In the latter case, the owner shall inform the competent authority. The competent authority shall then decide on appropriate measures and inform the competent authorities of all other RID Contracting States accordingly.
- 3.3 If internal corrosion as defined in the standard applied (see sub-paragraph 1.3) has been detected, the cylinder shall be withdrawn from use and shall not be granted any further period for filling and carriage.
- 3.4 Cylinders having been granted a 15 year interval shall only be fitted with valves designed and manufactured for a minimum 15 year period of use according to EN 13152:2001 + A1:2003, EN 13153:2001 + A1:2003, EN ISO 14245:2010 or EN ISO 15995:2010. After a periodic inspection, a new valve shall be fitted to the cylinder, except that manually operated valves, which have been refurbished or inspected according to EN 14912:2005 may be re-fitted, if they are suitable for another 15 year period of use. Refurbishment or inspection shall only be carried out by the manufacturer of the valves or according to his technical instruction by an enterprise qualified for such work and operating under a documented quality system.

### 4. Marking

Cylinders having been granted a 15 year interval for periodic inspection in accordance with this paragraph shall additionally be marked clearly and legibly with "P15Y". This mark shall be removed if the cylinder is no longer authorised for a 15 year interval.

**NOTE:** This mark shall not apply to cylinders subject to the transitional provision in 1.6.2.9, 1.6.2.10 or the provisions of special packing provision v (1) of paragraph (10) of this packing instruction.

- (13) An interval of 15 years for the periodic inspection of seamless steel and aluminium alloy cylinders and bundles of such cylinders may be granted in accordance with special packing provisions ua or va of paragraph (10), if the following provisions are applied:

#### 1. General provisions

- 1.1 For the application of this paragraph, the competent authority shall not delegate its tasks and duties to Xb bodies (inspection bodies of type B) or IS bodies (in-house inspection services) (for the definitions of Xb and IS bodies, see 6.2.3.6.1).
- 1.2 The owner of the cylinders or bundles of cylinders shall apply to the competent authority for granting the 15 year interval, and shall demonstrate that the requirements of sub-paragraphs 2, 3 and 4 are met.

1.3 Cylinders manufactured since 1 January 1999 shall have been manufactured in conformity with one of the following standards:

- EN 1964-1 or EN 1964-2; or
- EN 1975; or
- EN ISO 9809-1 or EN ISO 9809-2; or
- EN ISO 7866; or
- Annex I, parts 1 to 3 to Council Directive 84/525/EEC<sup>b</sup> and 84/526/EEC<sup>c</sup>

as applicable at the time of manufacture (see also the Table in 6.2.4.1).

Other cylinders manufactured before 1 January 2009 in conformity with RID in accordance with a technical code accepted by the national competent authority may be accepted for a 15 year interval for periodic inspection, if they are of equivalent safety to the provisions of RID as applicable at the time of application.

**NOTE:** This provision is considered to be fulfilled if the cylinder has been reassessed according to the procedure for the reassessment of conformity described in Annex III of Directive 2010/35/EU of 16 June 2010 or Annex IV, Part II, of Directive 1999/36/EC of 29 April 1999.

Cylinders and bundles of cylinders marked with the United Nations packaging symbol specified in 6.2.2.7.2 (a) shall not be granted a 15 year interval for periodic inspection.

1.4 Bundles of cylinders shall be constructed such that contact between cylinders along the longitudinal axis of the cylinders does not result in external corrosion. The supports and restraining straps shall be such as to minimise the risk of corrosion to the cylinders. Shock absorbent materials used in supports shall only be allowed if they have been treated to eliminate water absorption. Examples of suitable materials are water resistant belting and rubber.

1.5 The owner shall submit documentary evidence to the competent authority demonstrating that the cylinders comply with the provisions of sub-paragraph 1.3. The competent authority shall verify that these conditions are met.

1.6 The competent authority shall check whether the provisions of sub-paragraphs 2 and 3 are fulfilled and correctly applied. If all provisions are fulfilled, it shall authorise the 15 year interval for periodic inspection for the cylinders or bundles of cylinders. In this authorisation a group of cylinders (see Note below) covered shall be clearly identified. The authorisation shall be delivered to the owner; the competent authority shall keep a copy. The owner shall keep the documents for as long as the cylinders are authorised for a 15 year interval.

**NOTE:** A group of cylinders is defined by the production dates of identical cylinders for a period, during which the applicable provisions of RID and of the technical code accepted by the competent authority have not changed in their technical content. Example: Cylinders of identical design and volume having been manufactured according to the provisions of RID applicable between 1 January 1985 and 31 December 1988 in combination with a technical code accepted by the competent authority applicable for the same period form one group in terms of the provisions of this paragraph.

1.7 The owner shall ensure compliance with the provisions of RID and the authorisation given as appropriate and shall demonstrate this to the competent authority on request but at least every three years or when significant changes to the procedures are introduced.

## 2. Operational provisions

2.1 Cylinders or bundles of cylinders having been granted a 15 year interval for periodic inspection shall only be filled in filling centres applying a documented and certified quality system to ensure that all the provisions of paragraph (7) of this packing instruction and the requirements and responsibilities of EN 1919:2000, EN 1920:2000 or EN 13365:2002 as applicable are fulfilled and correctly applied. The quality system, according to the ISO 9000 (series) or equivalent, shall be certified by an accredited independent body recognized by the competent authority. This includes procedures for pre- and post-fill inspections and the filling process for cylinders, bundles of cylinders and valves.

2.2 Aluminium alloy cylinders and bundles of such cylinders without RPVs having been granted a 15 year interval for periodic inspection shall be checked prior to every fill in accordance with a documented procedure which shall at least include the following:

- Open the cylinder valve or the main valve of the bundle of cylinders main valve to check for residual pressure;
- If gas is emitted, the cylinder or bundle of cylinders may be filled;
- If no gas is emitted, the internal condition of the cylinder or bundle of cylinders shall be checked for contamination;
- If no contamination is detected, the cylinder or bundle of cylinders may be filled.
- If contamination is detected, corrective action shall be carried out.

2.3 Seamless steel cylinders fitted with RPVs and bundles of seamless steel cylinders equipped with main valve(s) with a residual pressure device having been granted a 15 year interval for periodic inspection shall be checked prior to every fill in accordance with a documented procedure which shall at least include the following:

- Open the cylinder valve or bundle of cylinders main valve to check for residual pressure;
- If gas is emitted, the cylinder or bundle of cylinders may be filled;
- If no gas is emitted the functioning of the residual pressure device shall be checked;
- If the check shows that the residual pressure device has retained pressure the cylinder or bundle of cylinders may be filled;
- If the check shows that the residual pressure device has not retained pressure, the internal condition of the cylinder or bundle of cylinders shall be checked for contamination:
  - If no contamination is detected, the cylinder or bundle of cylinders may be filled following repair or replacement of the residual pressure device;
  - If contamination is detected, corrective action shall be carried out.

2.4 To prevent internal corrosion, only gases of high quality with very low potential contamination shall be filled into cylinders or bundles of cylinders. This is deemed to be fulfilled, if the compatibility of gases/material is acceptable in accordance with EN ISO 11114-1:2012 and EN 11114-2:2013, and the gas quality meets the specifications in EN ISO 14175:2008 or, for gases not covered in the standard, a minimum purity of 99.5% by volume and a maximum moisture content of 40 ml/m<sup>3</sup>(ppm). For nitrous oxide the values shall be a minimum purity of 98% by volume and a maximum moisture content of 70 ml/m<sup>3</sup> (ppm).

2.5 The owner shall ensure that the requirements of 2.1 to 2.4 are fulfilled and provide documentary evidence of this to the competent authority on request, but at least every three years or when significant changes to the procedures are introduced.

2.6 If a filling centre is situated in a different Contracting State to RID, the owner shall provide to the competent authority, on request, additional documentary evidence that the filling centre is monitored accordingly by the competent authority of that Contracting State to RID. See also 1.2.

### 3. Provisions for qualification and periodic inspection

3.1 Cylinders and bundles of cylinders already in use, for which the conditions of sub-paragraph 2 have been met from the date of the last periodic inspection to the satisfaction of the competent authority, may have their inspection period extended to 15 years from the date of the last periodic inspection. Otherwise the change of test period from ten to fifteen years shall be made at the time of periodic inspection. The periodic inspection report shall indicate that this cylinder or bundle of cylinders shall be fitted with a residual pressure device as appropriate. Other documentary evidence may be accepted by the competent authority.

3.2 If a cylinder with a 15 year interval fails the pressure test by bursting or leakage or if a severe defect is detected by a non-destructive test (NDT) during a periodic inspection the owner shall investigate and produce a report on the cause of the failure and if other cylinders (e.g. of the same type or group) are affected. In the latter case, the owner shall inform the competent authority. The competent authority shall then decide on appropriate measures and inform the competent authorities of all other RID Contracting States accordingly.

3.3 If internal corrosion and other defects as defined in the periodic inspection standards referenced in 6.2.4 have been detected, the cylinder shall be withdrawn from use and shall not be granted any further period for filling and carriage.

3.4 Cylinders or bundles of cylinders having been granted a 15 year interval for periodic inspection shall only be fitted with valves designed and tested according to EN 849 or EN ISO 10297 as applicable at the time of manufacture (see also the Table in 6.2.4.1). After a periodic inspection a new valve shall be fitted, except that valves which have been refurbished or inspected according to EN ISO 22434:2011 may be re-fitted.

### 4. Marking

Cylinders and bundles of cylinders having been granted a 15 year interval for periodic inspection in accordance with this paragraph shall have the date (year) of the next periodic inspection as required in section 5.2.1.6 (c) and at the same time additionally be marked clearly and legibly with "P15Y". This mark shall be removed if the cylinder or bundle of cylinders is no longer authorised for a 15 year interval for periodic inspection.

<sup>a</sup> Council directive on the approximation of the laws of the Member States relating to welded unalloyed steel gas cylinders, published in the Official Journal of the European Communities No. L 300 of 19 November 1984.

<sup>b</sup> Council directive on the approximation of the laws of the Member States relating to seamless, steel gas cylinders, published in the Official Journal of the European Communities No. L 300 of 19.11.1984.

<sup>c</sup> Council Directive on the approximation of the laws of the Member States relating to seamless, unalloyed aluminium and aluminium alloy gas cylinders, published in the Official Journal of the European Communities No. L 300 of 19.11.1984.

Table 1: Compressed gases

UN No.	Name and description	Classification code	LC <sub>50</sub> ml/m <sup>3</sup>	Cylinders	Tubes	Pressure drums	Bundles of cylinders	Test period, years <sup>(a)</sup>	Test pressure, bar <sup>(b)</sup>	Maximum working pressure, bar <sup>(b)</sup>	Special packing provisions
1002	AIR, COMPRESSED	1 A		X	X	X	X	10			ua, va
1006	ARGON, COMPRESSED	1 A		X	X	X	X	10			ua, va
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				5	200	30	a, k, n, o
1046	HELIUM, COMPRESSED	1 A		X	X	X	X	10			ua, va
1049	HYDROGEN, COMPRESSED	1 F		X	X	X	X	10			d, ua, va
1056	KRYPTON, COMPRESSED	1 A		X	X	X	X	10			ua, va
1065	NEON, COMPRESSED	1 A		X	X	X	X	10			ua, va
1066	NITROGEN, COMPRESSED	1 A		X	X	X	X	10			ua, va
1071	OIL GAS, COMPRESSED	1 TF		X	X	X	X	5			
1072	OXYGEN, COMPRESSED	1 O		X	X	X	X	10			s, ua, va
1612	HEXAETHYL TETRAPOSPHATE AND COMPRESSED GAS MIXTURE	1 T		X	X	X	X	5			z
1660	NITRIC OXIDE, COMPRESSED	1 TOC	115	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, ua, va
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, ua, va
1957	DEUTERIUM, COMPRESSED	1 F		X	X	X	X	10			d, ua, va
1964	HYDROCARBON GAS MIXTURE, COMPRESSED, N.O.S.	1 F		X	X	X	X	10			z, ua, va
1971	METHANE, COMPRESSED or NATURAL GAS, COMPRESSED with high methane content	1 F		X	X	X	X	10			ua, va
2034	HYDROGEN AND METHANE MIXTURE, COMPRESSED	1 F		X	X	X	X	10			d, ua, va
2190	OXYGEN DIFLUORIDE, COMPRESSED	1 TOC	2,6	X				5	200	30	a, k, n, o
3156	COMPRESSED GAS, OXIDIZING, N.O.S.	1 O		X	X	X	X	10			z, ua, va
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

<sup>a</sup> Not applicable for pressure receptacles made of composite materials.

<sup>b</sup> 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 <sub>50</sub> ml/m <sup>3</sup>	Cylinders	Tubes	Pressure drums	Bundles of cylinders	Test period, years <sup>(a)</sup>	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	a
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, ua, va ra, ua, va
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
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	ETHYLENE OXIDE, or	2 TF	2900	X	X	X	X	5	15	0.78	i, ra
1040	ETHYLENE OXIDE WITH NITROGEN up to a total pressure of 1MPa (10 bar) at 50 °C										
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

UN No.	Name and description	Classification code	LC <sub>50</sub> ml/m <sup>3</sup>	Cylinders	Tubes	Pressure drums	Bundles of cylinders	Test period, years <sup>(a)</sup>	Test pressure, bar	Filling ratio	Special packing provisions
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			ra, z
1060	METHYLACETYLENE AND PROPAADIENE MIXTURE, STABILIZED Propadiene with 1% to 4% methylacetylene Mixture P1 Mixture P2	2 F		X	X	X	X	10			c, ra, z
				X	X	X	X	10	22 30 24	0.52 0.49 0.47	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	ua, va ua, va ua, va
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	a, 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	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, ua, va ra, ua, va ra, ua, va
1081	TETRAFLUOROETHYLENE, STABILIZED	2 F		X	X	X	X	10	200		m, o, ra
1082	TRIFLUOROCHLOROETHYLENE, STABILIZED (REFRIGERANT GAS R 1113)	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
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	<sup>(d)</sup>	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	a, 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	a
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

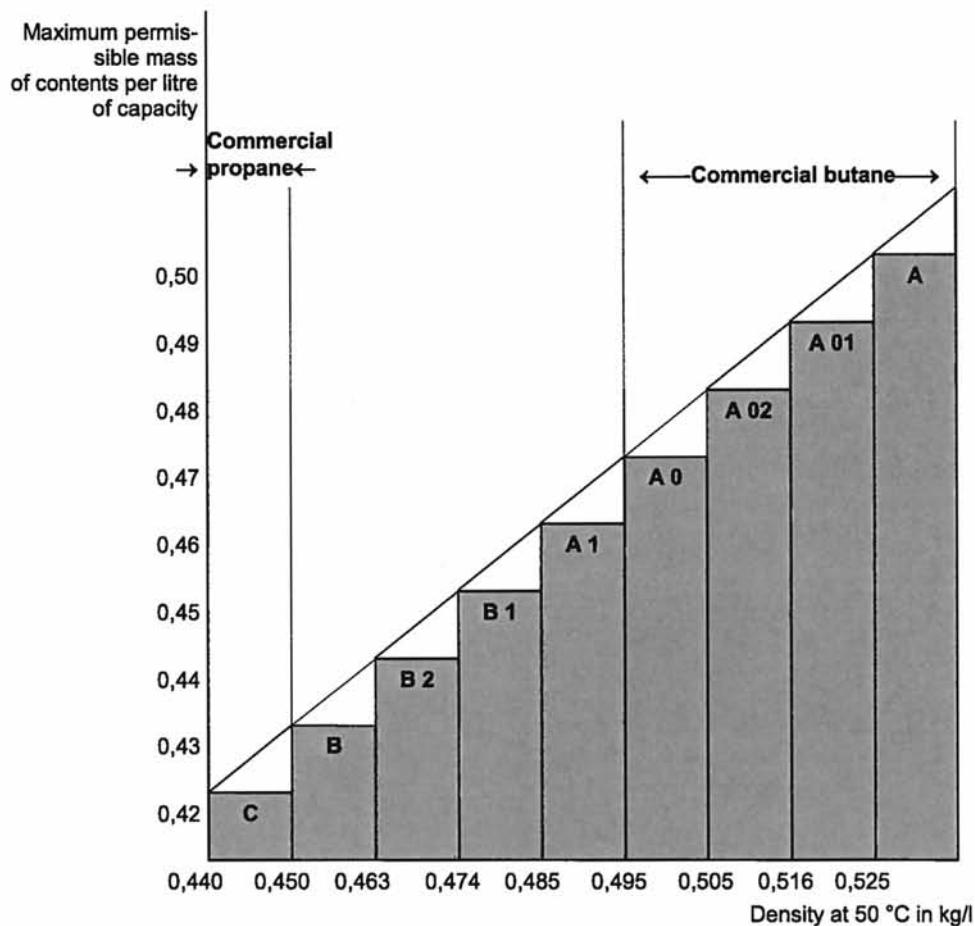
UN No.	Name and description	Classification code	LC <sub>50</sub> ml/m <sup>3</sup>	Cylinders	Tubes	Pressure drums	Bundles of cylinders	Test period, years <sup>(a)</sup>	Test pressure, bar	Filling ratio	Special packing provisions
1952	ETHYLENE OXIDE AND CARBON DIOXIDE MIXTURE with not more than 9% ethylene 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		(b)	ra, v, z
									10	10	0.50
									10	15	0.49
									10	15	0.48
									10	15	0.47
									10	20	0.46
									10	25	0.45
									10	25	0.44
									10	25	0.43
									10	30	0.42
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	OCTAFLUOROCYLOBUTANE (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
2035	1,1,1-TRIFLUOROETHANE (REFRIGERANT GAS R 143a)	2 F		X	X	X	X	10	35	0.73	ra
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	5	10	0.80	b
					X	X	X	5	12	0.77	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	a
2191	SULPHURYL FLUORIDE	2 T	3020	X	X	X	X	5	50	1.10	u
2192	GERMANE <sup>(c)</sup>	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

UN No.	Name and description	Classification code	LC <sub>50</sub> ml/m <sup>3</sup>	Cylinders	Tubes	Pressure drums	Bundles of cylinders	Test period, years <sup>(a)</sup>	Test pressure, bar	Filling ratio	Special packing provisions
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 <sup>(c)</sup>	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 <sup>(c)</sup>	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	a, 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
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
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

UN No.	Name and description	Classification code	LC <sub>50</sub> ml/m <sup>3</sup>	Cylinders	Tubes	Pressure drums	Bundles of cylinders	Test period, years <sup>(a)</sup>	Test pressure, bar	Filling ratio	Special packing provisions
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
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<sub>50</sub> value still to be determined.

Table 3: Substances not in class 2

UN No.	Name and description	Class	Classification Code	LC <sub>50</sub> ml/m <sup>3</sup>	Cylinders	Tubes	Pressure drums	Bundles of cylinders	Test period <sup>(a)</sup> years	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	a, 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
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
<b>This instruction applies to UN Nos. 3167, 3168 and 3169.</b>		
The following packagings are authorized:		
(1) Cylinders and gas receptacles conforming to the construction, testing and filling requirements approved by the competent authority.		
(2) The following combination packagings provided that the general provisions of 4.1.1 and 4.1.3 are met:		
Outer packagings:		
Drums (1A1, 1A2, 1B1, 1B2, 1N1, 1N2, 1H1, 1H2, 1D, 1G);		
Boxes (4A, 4B, 4N, 4C1, 4C2, 4D, 4F, 4G, 4H1, 4H2);		
Jerricans (3A1, 3A2, 3B1, 3B2, 3H1, 3H2).		
Inner packagings:		
(a) For non-toxic gases, hermetically sealed inner packagings of glass or metal with a maximum capacity of 5 litres per package;		
(b) For toxic gases, hermetically sealed inner packagings of glass or metal with a maximum capacity of 1 litre per package.		
Packagings shall conform to the packing group III performance level.		

P 202	PACKING INSTRUCTION	P 202
(Reserved)		

P 203	PACKING INSTRUCTION	P 203
This instruction applies to Class 2 refrigerated liquefied gases.		
<b>Requirements for closed cryogenic receptacles</b>		
(1) The special packing provisions of 4.1.6 shall be met.		
(2) The requirements of Chapter 6.2 shall be met.		
(3) The closed cryogenic receptacles shall be so insulated that they do not become coated with frost.		
(4) Test pressure		
Refrigerated liquids shall be filled in closed cryogenic receptacles with the following minimum test pressures:		
(a) For closed cryogenic receptacles with vacuum insulation, the test pressure shall not be less than 1.3 times the sum of the maximum internal pressure of the filled receptacle, including during filling and discharge, plus 100 kPa (1 bar);		
(b) For other closed cryogenic receptacles, the test pressure shall be not less than 1.3 times the maximum internal pressure of the filled receptacle, taking into account the pressure developed during filling and discharge.		
(5) Degree of filling		
For non-flammable, non-toxic refrigerated liquefied gases (classification codes 3 A and 3 O) 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 3 F) the degree of filling shall remain below the level at which, if the contents were raised to the temperature at which the vapour pressure equalled the opening pressure of the relief valve, the volume of the liquid phase would reach 98% of the water capacity at that temperature.		
(6) Pressure-relief devices		
Closed cryogenic receptacles shall be fitted with at least one pressure-relief device.		
(7) Compatibility		
Materials used to ensure the leakproofness of the joints or for the maintenance of the closures shall be compatible with the contents. In the case of receptacles intended for the carriage of oxidizing gases (classification code 3 O), these materials shall not react with these gases in a dangerous manner.		
(8) Periodic inspection		
(a) The periodic inspection and test frequencies of pressure relief valves in accordance with 6.2.1.6.3 shall not exceed five years.		
(b) The periodic inspection and test frequencies of non-UN closed cryogenic receptacles in accordance with 6.2.3.5.2 shall not exceed 10 years.		
<b>Requirements for open cryogenic receptacles</b>		
Only the following non oxidizing refrigerated liquefied gases of classification code 3 A may be carried in open cryogenic receptacles: UN Nos. 1913, 1951, 1963, 1970, 1977, 2591, 3136 and 3158.		
Open cryogenic receptacles shall be constructed to meet the following requirements:		
(1) The receptacles shall be designed, manufactured, tested and equipped in such a way as to withstand all conditions, including fatigue, to which they will be subjected during their normal use and during normal conditions of carriage.		
(2) The capacity shall be not more than 450 litres.		
(3) The receptacle shall have a double wall construction with the space between the inner and outer wall being evacuated (vacuum insulation). The insulation shall prevent the formation of hoar frost on the exterior of the receptacle.		
(4) The materials of construction shall have suitable mechanical properties at the service temperature.		
(5) Materials which are in direct contact with the dangerous goods shall not be affected or weakened by the dangerous goods intended to be carried and shall not cause a dangerous effect, e.g. catalysing a reaction or reacting with the dangerous goods.		

- (6) Receptacles of glass double wall construction shall have an outer packaging with suitable cushioning or absorbent materials which withstand the pressures and impacts liable to occur under normal conditions of carriage.
- (7) The receptacle shall be designed to remain in an upright position during carriage, e.g. have a base whose smaller horizontal dimension is greater than the height of the centre of gravity when filled to capacity or be mounted on gimbals.
- (8) The openings of the receptacles shall be fitted with devices allowing gases to escape, preventing any splashing out of liquid, and so configured that they remain in place during carriage.
- (9) Open cryogenic receptacles shall bear the following marks permanently affixed e.g. by stamping, engraving or etching:
  - The manufacturer's name and address;
  - The model number or name;
  - The serial or batch number;
  - The UN number and proper shipping name of gases for which the receptacle is intended;
  - The capacity of the receptacle in litres.

P 204	PACKING INSTRUCTION	P 204
(Deleted)		

P 205	PACKING INSTRUCTION	P 205
This instruction applies to UN No. 3468.		
<ul style="list-style-type: none"> <li>(1) For metal hydride storage systems, the special packing provisions of 4.1.6 shall be met.</li> <li>(2) Only pressure receptacles not exceeding 150 litres in water capacity and having a maximum developed pressure not exceeding 25 MPa are covered by this packing instruction.</li> <li>(3) Metal hydride storage systems meeting the applicable requirements for the construction and testing of pressure receptacles containing gas of Chapter 6.2 are authorised for the carriage of hydrogen only.</li> <li>(4) When steel pressure receptacles or composite pressure receptacles with steel liners are used, only those bearing the "H" mark, in accordance with 6.2.2.9.2 (j) shall be used.</li> <li>(5) Metal hydride storage systems shall meet the service conditions, design criteria, rated capacity, type tests, batch tests, routine tests, test pressure, rated charging pressure and provisions for pressure relief devices for transportable metal hydride storage systems specified in ISO 16111:2008 (Transportable gas storage devices – Hydrogen absorbed in reversible metal hydride) and their conformity and approval shall be assessed in accordance with 6.2.2.5.</li> <li>(6) Metal hydride storage systems shall be filled with hydrogen at a pressure not exceeding the rated charging pressure shown in the permanent mark on the system as specified by ISO 16111:2008.</li> <li>(7) The periodic test requirements for a metal hydride storage system shall be in accordance with ISO 16111:2008 and carried out in accordance with 6.2.2.6, and the interval between periodic inspections shall not exceed five years.</li> </ul>		

<b>PACKING INSTRUCTION</b>		<b>P 206</b>		
This instruction applies to UN Nos. 3500, 3501, 3502, 3503, 3504 and 3505.				
Unless otherwise indicated in RID, cylinders and pressure drums conforming to the applicable requirements of Chapter 6.2 are authorized.				
<p>(1) The special packing provisions of 4.1.6 shall be met.</p> <p>(2) The maximum test period for periodic inspection shall be 5 years.</p> <p>(3) Cylinders and pressure drums shall be so filled that at 50 °C the non-gaseous phase does not exceed 95% of their water capacity and they are not completely filled at 60 °C. When filled, the internal pressure at 65 °C shall not exceed the test pressure of the cylinders and pressure drums. The vapour pressures and volumetric expansion of all substances in the cylinders and pressure drums shall be taken into account.</p>				
<p>For liquids charged with a compressed gas both components – the liquid and the compressed gas – have to be taken into consideration in the calculation of the internal pressure in the pressure receptacle. When experimental data is not available, the following steps shall be carried out:</p> <p>(a) Calculation of the vapour pressure of the liquid and of the partial pressure of the compressed gas at 15 °C (filling temperature);</p> <p>(b) Calculation of the volumetric expansion of the liquid phase resulting from the heating from 15 °C to 65 °C and calculation of the remaining volume for the gaseous phase;</p> <p>(c) Calculation of the partial pressure of the compressed gas at 65 °C considering the volumetric expansion of the liquid phase;</p> <p><b>NOTE:</b> The compressibility factor of the compressed gas at 15 °C and 65 °C shall be considered.</p> <p>(d) Calculation of the vapour pressure of the liquid at 65 °C;</p> <p>(e) The total pressure is the sum of the vapour pressure of the liquid and the partial pressure of the compressed gas at 65 °C;</p> <p>(f) Consideration of the solubility of the compressed gas at 65 °C in the liquid phase.</p>				
<p>The test pressure of the cylinders or pressure drums shall not be less than the calculated total pressure minus 100 kPa (1 bar).</p> <p>If the solubility of the compressed gas in the liquid phase is not known for the calculation, the test pressure can be calculated without taking the gas solubility (sub-paragraph (f)) into account.</p> <p>(4) The minimum test pressure shall be in accordance with packing instruction P 200 for the propellant but shall not be less than 20 bar.</p>				
<p><b>Additional requirement</b></p> <p>Cylinders and pressure drums shall not be offered for carriage when connected with spray application equipment such as a hose and wand assembly.</p>				
<p><b>Special packing provision</b></p> <table border="1"> <tr> <td><b>PP 89</b></td><td>For UN Nos. 3501, 3502, 3503, 3504 and 3505, notwithstanding 4.1.6.9 (b), non-refillable cylinders used may have a water capacity not exceeding 1 000 litres divided by the test pressure expressed in bars provided capacity and pressure restrictions of the construction standard comply with ISO 11118:1999, which limits the maximum capacity to 50 litres.</td></tr> </table>			<b>PP 89</b>	For UN Nos. 3501, 3502, 3503, 3504 and 3505, notwithstanding 4.1.6.9 (b), non-refillable cylinders used may have a water capacity not exceeding 1 000 litres divided by the test pressure expressed in bars provided capacity and pressure restrictions of the construction standard comply with ISO 11118:1999, which limits the maximum capacity to 50 litres.
<b>PP 89</b>	For UN Nos. 3501, 3502, 3503, 3504 and 3505, notwithstanding 4.1.6.9 (b), non-refillable cylinders used may have a water capacity not exceeding 1 000 litres divided by the test pressure expressed in bars provided capacity and pressure restrictions of the construction standard comply with ISO 11118:1999, which limits the maximum capacity to 50 litres.			

<b>PACKING INSTRUCTION</b>	
<b>P 207</b>	
<b>This instruction applies to UN No. 1950.</b>	
The following packagings are authorized, provided that the general provisions of 4.1.1 and 4.1.3 are met:	
(a) Drums (1A1, 1A2, 1B1, 1B2, 1N1, 1N2, 1H1, 1H2, 1D, 1G); Boxes (4A, 4B, 4N, 4C1, 4C2, 4D, 4F, 4G, 4H1, 4H2). Packagings shall conform to the packing group II performance level.	
(b) Rigid outer packagings with a maximum net mass as follows: Fibreboard 55 kg Other than fibreboard 125 kg The provisions of 4.1.1.3 need not be met.	
The packagings shall be designed and constructed to prevent excessive movement of the aerosols and inadvertent discharge during normal conditions of carriage.	
<b>Special packing provision</b>	
<b>PP 87</b>	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 packagings shall be adequately ventilated to prevent the creation of flammable atmosphere and the build-up of pressure.
<b>Special packing provision specific to RID and ADR</b>	
<b>RR 6</b>	For UN 1950, in the case of carriage by 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 208	PACKING INSTRUCTION	P 208
<b>This instruction applies to Class 2 adsorbed gases.</b>		
(1) The following packagings are authorized provided the general packing requirements of 4.1.6.1 are met: Cylinders specified in Chapter 6.2 and in accordance with ISO 11513:2011 or ISO 9809-1:2010.		
(2) The pressure of each filled cylinder shall be less than 101.3 kPa at 20 °C and less than 300 kPa at 50 °C.		
(3) The minimum test pressure of the cylinder shall be 21 bar.		
(4) The minimum burst pressure of the cylinder shall be 94.5 bar.		
(5) The internal pressure at 65 °C of the filled cylinder shall not exceed the test pressure of the cylinder.		
(6) The adsorbent material shall be compatible with the cylinder and shall not form harmful or dangerous compounds with the gas to be adsorbed. The gas in combination with the adsorbent material shall not affect or weaken the cylinder or cause a dangerous reaction (e.g. a catalyzing reaction).		
(7) The quality of the adsorbent material shall be verified at the time of each fill to ensure that the pressure and chemical stability requirements of this packing instruction are met each time an adsorbed gas package is offered for carriage.		
(8) The adsorbent material shall not meet the criteria of any of the classes in RID.		
(9) Requirements for cylinders and closures containing toxic gases with an LC <sub>50</sub> less than or equal to 200 ml/m <sup>3</sup> (ppm) (see Table 1) shall be as follows: (a) Valve outlets shall be fitted with pressure retaining gas-tight plugs or caps having threads matching those of the valve outlets. (b) Each valve shall either be of the packless type with non-perforated diaphragm, or be of a type which prevents leakage through or past the packing. (c) Each cylinder and closure shall be tested for leakage after filling. (d) Each valve shall be capable of withstanding the test pressure of the cylinder and be directly connected to the cylinder by either a taper-thread or other means which meets the requirements of ISO 10692-2:2001. (e) Cylinders and valves shall not be fitted with a pressure relief device.		
(10) Valve outlets for cylinders containing pyrophoric gases shall be fitted with gas-tight plugs or caps having threads matching those of the valve outlets.		
(11) The filling procedure shall be in accordance with Annex A of ISO 11513:2011.		
(12) The maximum period for periodic inspections shall be 5 years.		
(13) Special packing provisions that are specific to a substance (see Table 1).		
<i>Material compatibility</i>		
a: Aluminium alloy cylinders shall not be used.		
d: When steel cylinders are used, only those bearing the "H" mark in accordance with 6.2.2.7.4 (p) are permitted.		
<i>Gas specific provisions</i>		
r: The filling of this gas shall be limited such that, if complete decomposition occurs, the pressure does not exceed two thirds of the test pressure of the cylinder.		
<i>Material compatibility for n.o.s. adsorbed gas entries</i>		
z: The construction materials of the cylinders and their accessories shall be compatible with the contents and shall not react to form harmful or dangerous compounds therewith.		

**Table 1: Adsorbed gases**

UN No.	Name and description	Classification code	LC <sub>50</sub> ml/m <sup>3</sup>	Special packing provisions
3510	ADSORBED GAS, FLAMMABLE, N.O.S.	9F		z
3511	ADSORBED GAS, N.O.S.	9A		z
3512	ADSORBED GAS, TOXIC, N.O.S.	9T	≤ 5000	z
3513	ADSORBED GAS, OXIDIZING, N.O.S.	9O		z
3514	ADSORBED GAS, TOXIC, FLAMMABLE, N.O.S.	9TF	≤ 5000	z
3515	ADSORBED GAS, TOXIC, OXIDIZING, N.O.S.	9TO	≤ 5000	z
3516	ADSORBED GAS, TOXIC, CORROSIVE, N.O.S.	9TC	≤ 5000	z
3517	ADSORBED GAS, TOXIC, FLAMMABLE, CORROSIVE, N.O.S.	9TFC	≤ 5000	z
3518	ADSORBED GAS, TOXIC, OXIDIZING, CORROSIVE, N.O.S.	9TOC	≤ 5000	z
3519	BORON TRIFLUORIDE, ADSORBED	9TC	387	a
3520	CHLORINE, ADSORBED	9TOC	293	a
3521	SILICON TETRAFLUORIDE, ADSORBED	9TC	450	a
3522	ARSINE, ADSORBED	9TF	20	d
3523	GERMANE, ADSORBED	9TF	620	d, r
3524	PHOSPHORUS PENTAFLUORIDE, ADSORBED	9TC	190	
3525	PHOSPHINE, ADSORBED	9TF	20	d
3526	HYDROGEN SELENIDE, ADSORBED	9TF	2	

P 209	PACKING INSTRUCTION	P 209
This packing instruction applies to UN No. 3150 devices, small, hydrocarbon gas powered or hydrocarbon gas refills for small devices		
<p>(1) The special packing provisions of 4.1.6 when applicable shall be met.</p> <p>(2) The articles shall comply with the provisions of the country in which they were filled.</p> <p>(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>		

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.		
<b>Additional requirements</b>		
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 receptacle made from tubing and having welded heads.		
Primary containment of the fuel within this receptacle shall consist of a welded aluminium bladder having a maximum internal volume of 46 litres.		
The outer receptacle shall have a minimum design gauge pressure of 1 275 kPa and a minimum burst gauge pressure of 2 755 kPa.		
Each receptacle shall be leak checked during manufacture and before 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 receptacle.		
Primary containment of the fuel within this receptacle shall consist of a welded vapour tight fuel compartment with an elastomeric bladder having a maximum internal volume of 46 litres.		
The pressure receptacle shall have a minimum design gauge pressure of 2 860 kPa and a minimum burst gauge pressure of 5 170 kPa.		
Each receptacle 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 combination packagings are authorized, provided that the general provisions of 4.1.1 and 4.1.3 are met:		
Outer packagings:		
Drums (1A1, 1A2, 1B1, 1B2, 1N1, 1N2, 1H1, 1H2, 1D, 1G);		
Boxes (4A, 4B, 4N, 4C1, 4C2, 4D, 4F, 4G, 4H1, 4H2);		
Jerricans (3A1, 3A2, 3B1, 3B2, 3H1, 3H2).		
Inner packagings:		
The activator (organic peroxide) shall have a maximum quantity of 125 ml per inner packaging if liquid, and 500 g per inner packaging if solid.		
The base material and the activator shall each be separately packed in inner packagings.		
The components may be placed in the same outer packaging provided that they will not interact dangerously in the event of a leakage.		
Packagings shall conform to the packing group II or III performance level according to the criteria for Class 3 applied to the base material.		

P 400	PACKING INSTRUCTION	P 400
<p>The following packagings are authorized, provided that the general provisions of 4.1.1 and 4.1.3 are met:</p> <p>(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);</p> <p>(2) Boxes (4A, 4B, 4N, 4C1, 4C2, 4D, 4F or 4G), drums (1A1, 1A2, 1B1, 1B2, 1N1, 1N2, 1D or 1G) or jerricans (3A1, 3A2, 3B1 or 3B2) enclosing hermetically sealed metal cans with inner packagings of glass or metal, with a capacity of not more than 1 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;</p> <p>(3) Steel, aluminium or metal drums (1A1, 1A2, 1B1, 1B2, 1N1 or 1N2), jerricans (3A1, 3A2, 3B1 or 3B2) or boxes (4A, 4B or 4N) with a maximum net mass of 150 kg each with hermetically sealed inner metal cans 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.</p>		
<p><b>Special packing provision</b></p>		
PP 86	<p>For UN Nos. 3392 and 3394, air shall be eliminated from the vapour space by nitrogen or other means.</p>	

P 401	PACKING INSTRUCTION	P 401
<p>The following packagings are authorized, provided that the general provisions of 4.1.1 and 4.1.3 are met:</p> <p>(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);</p> <p>(2) Combination packagings:</p> <p>Outer packagings:</p> <p>Drums (1A1, 1A2, 1B1, 1B2, 1N1, 1N2, 1H1, 1H2, 1D, 1G); Boxes (4A, 4B, 4N, 4C1, 4C2, 4D, 4F, 4G, 4H1, 4H2); Jerricans (3A1, 3A2, 3B1, 3B2, 3H1, 3H2).</p> <p>Inner packagings:</p> <p>Glass, metal or plastics which have threaded closures with a maximum capacity of 1 litre.</p> <p>Each inner packaging shall be surrounded by inert cushioning and absorbent material in a quantity sufficient to absorb the entire contents.</p> <p>The maximum net mass per outer packaging shall not exceed 30 kg.</p>		
<p><b>Special packing provision specific to RID and ADR</b></p>		
PR 7	<p>For UN Nos. 1183, 1242, 1295 and 2988, the pressure receptacles shall however be subjected to the tests every five years.</p>	

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);		
(2) Combination packagings:		
Outer packagings:		
Drums (1A1, 1A2, 1B1, 1B2, 1N1, 1N2, 1H1, 1H2, 1D, 1G); Boxes (4A, 4B, 4N, 4C1, 4C2, 4D, 4F, 4G, 4H1, 4H2); Jerricans (3A1, 3A2, 3B1, 3B2, 3H1, 3H2).		
Inner packagings with a maximum net mass as follows:		
Glass 10 kg Metal or plastics 15 kg.		
Each inner packaging shall be fitted with threaded closures.		
Each inner packaging shall be surrounded by inert cushioning and absorbent material in a quantity sufficient to absorb the entire contents.		
The maximum net mass per outer packaging shall not exceed 125 kg.		
<b>Special packing provision specific to RID and ADR</b>		
<b>RR 4</b>	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.	
<b>RR 7</b>	For UN No. 3129, the pressure receptacles shall however be subjected to the tests every five years.	
<b>RR 8</b>	For UN Nos. 1389, 1391, 1411, 1421, 1928, 3129, 3130, 3148 and 3482, 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).	

PACKING INSTRUCTION		P 403	
The following packagings are authorized, provided that the general provisions of 4.1.1 and 4.1.3 are met:			
Inner packagings	Combination packagings	Maximum net mass	
Glass Plastics Metal	2 kg 15 kg 20 kg  Inner packagings shall be hermetically sealed (e.g. by taping or by threaded closures).	<b>Drums</b> steel (1A1, 1A2) aluminium (1B1, 1B2) other metal (1N1, 1N2) plastics (1H1, 1H2) plywood (1D) fibre (1G)  <b>Boxes</b> steel (4A) aluminium (4B) other metal (4N) natural wood (4C1) natural wood with sift proof walls (4C2) plywood (4D) reconstituted wood (4F) fibreboard (4G) expanded plastics (4H1) solid plastics (4H2)  <b>Jerricans</b> steel (3A1, 3A2) aluminium (3B1, 3B2) plastics (3H1, 3H2)	400 kg 400 kg 400 kg 400 kg 400 kg 400 kg 400 kg 400 kg 400 kg 400 kg 120 kg 120 kg 120 kg
<b>Single packagings</b>		Maximum net mass	
<b>Drums</b> steel (1A1, 1A2) aluminium (1B1, 1B2) metal other than steel or aluminium (1N1, 1N2) plastics (1H1, 1H2)		250 kg 250 kg 250 kg 250 kg	
<b>Jerricans</b> steel (3A1, 3A2) aluminium (3B1, 3B2) plastics (3H1, 3H2)		120 kg 120 kg 120 kg	
<b>Composite packagings</b> plastics receptacle with outer steel or aluminium drums (6HA1 or 6HB1) plastics receptacle with outer fibre, plastics or plywood drums (6HG1, 6HH1 or 6HD1)		250 kg 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 or 6HH2)		75 kg	
<b>Pressure receptacles</b> , provided that the general provisions of 4.1.3.6 are met.			
<b>Additional requirement</b>			
Packagings shall be hermetically sealed.			
<b>Special packing provision</b>			
<b>PP 83</b> (Deleted)			

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: (1A1, 1A2, 1B1, 1B2, 1N1, 1N2, 1H1, 1H2, 1D, 1G, 4A, 4B, 4N, 4C1, 4C2, 4D, 4F, 4G or 4H2)		
Inner packagings: Metal receptacles with a maximum net mass of 15 kg each. Inner packagings shall be hermetically sealed and have threaded closures;		
Glass receptacles, with a maximum net mass of 1 kg each, having threaded closures with gaskets, cushioned on all sides and contained in hermetically sealed metal cans.		
Outer packagings shall have a maximum net mass of 125 kg.		
(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.		
<b>Special packing provision</b>		
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, 4N, 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 or 3B1); maximum net mass: 120 kg.		
These packagings shall be capable of passing the leakproofness test specified in 6.1.5.4 at the packing group II performance level;		
(2) For UN 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, 1H1, 1H2, 3H1 or 3H2)	
inner packagings:	water-resistant packagings;	
(2) Plastics, plywood or fibreboard drums (1H2, 1D or 1G) or boxes (4A, 4B, 4N, 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).		
<b>Additional requirements</b>		
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).		
<b>Special packing provisions</b>		
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. Packagings of other material with a small amount of metal, for example metal closures or other metal fittings such as those mentioned in 6.1.4, are not considered metal packagings.	
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:		
Outer packagings:		
Drums (1A1, 1A2, 1B1, 1B2, 1N1, 1N2, 1H1, 1H2, 1D, 1G); Boxes (4A, 4B, 4N, 4C1, 4C2, 4D, 4F, 4G, 4H1, 4H2); Jerricans (3A1, 3A2, 3B1, 3B2, 3H1, 3H2).		
Inner packagings:		
Matches shall be tightly packed in securely closed inner packagings to prevent accidental ignition under normal conditions of carriage.		
The maximum gross mass of the package shall not exceed 45 kg except for fibreboard boxes which shall not exceed 30 kg.		
Packagings shall conform to the packing group III performance level.		
<b>Special packing provision</b>		
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
<p>This instruction applies to UN No. 3292.</p>		
<p>The following packagings are authorized, provided that the general provisions of 4.1.1 and 4.1.3 are met:</p>		
<p>(1) For cells:</p> <ul style="list-style-type: none"><li>Drums (1A2, 1B2, 1N2, 1H2, 1D, 1G);</li><li>Boxes (4A, 4B, 4N, 4C1, 4C2, 4D, 4F, 4G, 4H1, 4H2);</li><li>Jerricans (3A2, 3B2, 3H2).</li></ul> <p>There shall be sufficient cushioning material to prevent contact between cells and between cells and the internal surfaces of the outer packaging and to ensure that no dangerous movement of the cells within the outer packaging occurs in carriage.</p> <p>Packagings shall conform to the packing group II performance level.</p>		
<p>(2) Batteries may be carried unpacked or in protective enclosures (e.g. fully enclosed or wooden slatted crates). The terminals shall not support the weight of other batteries or materials packed with the batteries.</p> <p>Packagings need not meet the requirements of 4.1.1.3.</p>		
<p><b>Additional requirement</b></p> <p>Cells and batteries shall be protected against short circuit and shall be isolated in such a manner as to prevent short circuits.</p>		

P 409	PACKING INSTRUCTION	P 409
<p>This instruction applies to UN Nos. 2956, 3242 and 3251.</p>		
<p>The following packagings are authorized, provided that the general provisions of 4.1.1 and 4.1.3 are met:</p>		
<p>(1) Fibre drum (1G) which may be fitted with a liner or coating; maximum net mass: 50 kg;</p>		
<p>(2) Combination packagings: Fibreboard box (4G) with a single inner plastic bag; maximum net mass: 50 kg;</p>		
<p>(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>		

P 410		PACKING INSTRUCTION		P 410			
<b>The following packagings are authorized, provided that the general provisions of 4.1.1 and 4.1.3 are met:</b>							
<b>Combination packagings</b>		<b>Maximum net mass</b>					
Inner packagings	Outer packagings	Packing group II	Packing group III				
Glass 10 kg	<b>Drums</b>	400 kg	400 kg				
Plastics <sup>(a)</sup> 30 kg	steel (1A1, 1A2)	400 kg	400 kg				
Metal 40 kg	aluminium (1B1, 1B2)	400 kg	400 kg				
Paper <sup>(a),(b)</sup> 10 kg	other metal (1N1, 1N2)	400 kg	400 kg				
Fibre <sup>(a),(b)</sup> 10 kg	plastics (1H1, 1H2)	400 kg	400 kg				
(a) These packagings shall be sift-proof.		plywood (1D)	400 kg	400 kg			
(b) These inner packagings shall not be used when the substances being carried may become liquid during carriage.		fibre (1G) <sup>(a)</sup>	400 kg	400 kg			
<b>Boxes</b>							
steel (4A)		400 kg	400 kg				
aluminium (4B)		400 kg	400 kg				
other metal (4N)		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) <sup>(a)</sup>		400 kg	400 kg				
expanded plastics (4H1)		60 kg	60 kg				
solid plastics (4H2)		400 kg	400 kg				
<b>Jerricans</b>							
steel (3A1, 3A2)		120 kg	120 kg				
aluminium (3B1, 3B2)		120 kg	120 kg				
plastics (3H1, 3H2)		120 kg	120 kg				
<b>Single packagings</b>							
<b>Drums</b>							
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				
<b>Jerricans</b>							
steel (3A1 oder 3A2)		120 kg	120 kg				
aluminium (3B1 oder 3B2)		120 kg	120 kg				
plastics (3H1 oder 3H2)		120 kg	120 kg				
<b>Boxes</b>							
steel (4A) <sup>(c)</sup>		400 kg	400 kg				
aluminium (4B) <sup>(c)</sup>		400 kg	400 kg				
other metal (4N) <sup>(c)</sup>		400 kg	400 kg				
natural wood (4C1) <sup>(c)</sup>		400 kg	400 kg				
plywood (4D) <sup>(c)</sup>		400 kg	400 kg				
reconstituted wood (4F) <sup>(c)</sup>		400 kg	400 kg				
natural wood with sift-proof walls (4C2) <sup>(c)</sup>		400 kg	400 kg				
fibreboard (4G) <sup>(c)</sup>		400 kg	400 kg				
solid plastics (4H2) <sup>(c)</sup>		400 kg	400 kg				
<b>Bags</b>							
Bags (5H3, 5H4, 5L3, 5M2) <sup>(c),(d)</sup>		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 closed wagon or closed container.							
<b>Composite packagings</b>							
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	
<b>PP 39</b>	For UN No. 1378, for metal packagings a venting device is required.
<b>PP 40</b>	For UN Nos. 1326, 1352, 1358, 1395, 1396, 1436, 1437, 1871, 2805 and 3182, packing group II, bags are not allowed.
<b>PP 83</b>	(Deleted)

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:		
Drums (1A2, 1B2, 1N2, 1H2, 1D, 1G); Boxes (4A, 4B, 4N, 4C1, 4C2, 4D, 4F, 4G, 4H1, 4H2); Jerricans (3A2, 3B2, 3H2); provided that explosion is not possible by reason of increased internal pressure. The maximum net mass shall not exceed 30 kg.		

P 412	PACKING INSTRUCTION	P 412
This instruction applies to UN No. 3527.		
The following combination packagings are authorized, provided that the general provisions of 4.1.1 and 4.1.3 are met:		
(1) Outer packagings: Drums (1A1, 1A2, 1B1, 1B2, 1N1, 1N2, 1H1, 1H2, 1D, 1G); Boxes (4A, 4B, 4N, 4C1, 4C2, 4D, 4F, 4G, 4H1, 4H2); Jerricans (3A1, 3A2, 3B1, 3B2, 3H1, 3H2).		
(2) Inner packagings: (a) The activator (organic peroxide) shall have a maximum quantity of 125 ml per inner packaging if liquid, and 500 g per inner packaging if solid. (b) The base material and the activator shall each be separately packed in inner packagings.		
The components may be placed in the same outer packaging provided that they will not interact dangerously in the event of a leakage.		
Packagings shall conform to the packing group II or III performance level according to the criteria for Class 4.1 applied to the base material.		

P 500	PACKING INSTRUCTION	P 500
<b>This instruction applies to UN No. 3356.</b>		
The following packagings are authorized, provided that the general provisions of 4.1.1 and 4.1.3 are met:		
Drums (1A2, 1B2, 1N2, 1H2, 1D, 1G); Boxes (4A, 4B, 4N, 4C1, 4C2, 4D, 4F, 4G, 4H1, 4H2); Jerricans (3A2, 3B2, 3H2).		
Packagings shall conform to the packing group II performance level.		
The generator(s) shall be 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
<b>This instruction applies to UN No. 2015.</b>		
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, 4N, 4C1, 4C2, 4D, 4H2) or drums (1A1, 1A2, 1B1, 1B2, 1N1, 1N2, 1H1, 1H2, 1D) or jerricans (3A1, 3A2, 3B1, 3B2, 3H1, 3H2) with glass, plastics or metal inner packagings	5 l	125 kg
(2) Fibreboard box (4G) or fibre drum (1G) with plastics or metal inner packagings each in a plastics bag	2 l	50 kg
Single packagings	Maximum capacity	
<b>Drums</b>		
steel (1A1)	250 l	
aluminium (1B1)	250 l	
metal other than steel or aluminium (1N1)	250 l	
plastics (1H1)	250 l	
<b>Jerricans</b>		
steel (3A1)	60 l	
aluminium (3B1)	60 l	
plastics (3H1)	60 l	
<b>Composite packagings</b>		
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 or plywood drum (6PA1, 6PB1, 6PD1 or 6PG1) or with outer steel, aluminium, wooden or fibreboard box or with outer wicker-work hamper (6PA2, 6PB2, 6PC, 6PG2 or 6PD2) or with outer expanded or solid plastics packaging (6PH1 or 6PH2)	60 l	
<b>Additional requirements</b>		
1. Packagings shall have a maximum filling degree of 90%.		
2. Packagings shall be vented.		

<b>P 502</b>		<b>PACKING INSTRUCTION</b>	<b>P 502</b>		
The following packagings are authorized, provided that the general provisions of 4.1.1 and 4.1.3 are met:					
<b>Combination packagings</b>		<b>Maximum net mass</b>			
<b>Inner packagings</b>		<b>Outer packagings</b>			
Glass	5 l	<b>Drums</b>			
Metal	5 l	steel (1A1, 1A2)	125 kg		
Plastics	5 l	aluminium (1B1, 1B2)	125 kg		
		other metal (1N1, 1N2)	125 kg		
		plywood (1D)	125 kg		
		fibre (1G)	125 kg		
		plastics (1H1, 1H2)	125 kg		
		<b>Boxes</b>			
		steel (4A)	125 kg		
		aluminium (4B)	125 kg		
		other metal (4N)	125 kg		
		natural wood (4C1)	125 kg		
		natural wood with sift-proof walls (4C2)	125 kg		
		plywood (4D)	125 kg		
		reconstituted wood (4F)	125 kg		
		fibreboard (4G)	125 kg		
		expanded plastics (4H1)	60 kg		
		solid plastics (4H2)	125 kg		
<b>Single packagings</b>		<b>Maximum capacity</b>			
<b>Drums</b>					
steel (1A1)		250 l			
aluminium (1B1)		250 l			
plastics (1H1)		250 l			
<b>Jerricans</b>					
steel (3A1)		60 l			
aluminium (3B1)		60 l			
plastics (3H1)		60 l			
<b>Composite packagings</b>					
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 or plywood drum (6PA1, 6PB1, 6PD1 or 6PG1) or with outer steel, aluminium, wooden or fibreboard box or with outer wickerwork hamper (6PA2, 6PB2, 6PC, 6PG2 or 6PD2) or with outer expanded or solid plastics packaging (6PH1 or 6PH2)		60 l			
<b>Special packing provision</b>					
<b>PP 28</b>	For UN No. 1873, parts of packagings which are in direct contact with perchloric acid shall be constructed of glass or plastics.				

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	<b>Drums</b> steel (1A1, 1A2) aluminium (1B1, 1B2) other metal (1N1, 1N2) plywood (1D) fibre (1G) plastics (1H1, 1H2)	125 kg
Metal 5 kg	<b>Boxes</b> steel (4A) aluminium (4B) other metal (4N) natural wood (4C1) natural wood with sift-proof walls (4C2) plywood (4D) reconstituted wood (4F) fibreboard (4G) expanded plastics (4H1) solid plastics (4H2)	125 kg 125 kg 125 kg 125 kg 125 kg 125 kg 125 kg 40 kg 60 kg 125 kg
Plastics 5 kg		
<b>Single packagings</b>		
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.		

<b>PACKING INSTRUCTION</b>		<b>P 504</b>
The following packagings are authorized, provided that the general provisions of 4.1.1 and 4.1.3 are met:		
<b>Combination packagings</b>		<b>Maximum net mass</b>
(1) Glass receptacles with a maximum capacity of 5 litres in 1A1, 1A2, 1B1, 1B2, 1N1, 1N2, 1H1, 1H2, 1D, 1G, 4A, 4B, 4N, 4C1, 4C2, 4D, 4F, 4G, 4H2 outer packagings		75 kg
(2) Plastics receptacles with a maximum capacity of 30 litres in 1A1, 1A2, 1B1, 1B2, 1N1, 1N2, 1H1, 1H2, 1D, 1G, 4A, 4B, 4N, 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 1A1, 1A2, 1B1, 1B2, 1N1, 1N2, 1H1, 1H2, 1D, 4A, 4B, 4N, 4C1, 4C2, 4D, 4H2 outer packagings		225 kg
<b>Single packagings</b>		<b>Maximum capacity</b>
<b>Drums</b>		
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
<b>Jerrycans</b>		
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
<b>Composite packagings</b>		
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 or plywood drum (6PA1, 6PB1, 6PD1 or 6PG1) or with outer steel, aluminium, wooden or fibreboard box or with outer wickerwork hamper (6PA2, 6PB2, 6PC, 6PG2 or 6PD2) or with outer expanded or solid plastics packaging (6PH1 or 6PH2)		60 l
<b>Special packing provision</b>		
PP 10   For UN Nos. 2014, 2984 and 3149, the packaging shall be vented.		

<b>PACKING INSTRUCTION</b>		
<b>P 505</b>		
This instruction applies to UN No. 3375.		
The following packagings are authorized, provided that the general provisions of 4.1.1 and 4.1.3 are met:		
Combination packagings	Inner packaging maximum capacity	Outer packaging maximum net mass
Boxes (4B, 4C1, 4C2, 4D, 4G, 4H2) or drums (1B2, 1G, 1N2, 1H2, 1D) or jerricans (3B2, 3H2) with glass, plastics or metal inner packagings	5 l	125 kg
Single packagings	Maximum capacity	
<b>Drums</b>		
aluminium (1B1, 1B2)	250 l	
plastics (1H1, 1H2)	250 l	
<b>Jerricans</b>		
aluminium (3B1, 3B2)	60 l	
plastics (3H1, 3H2)	60 l	
<b>Composite packagings</b>		
plastics receptacle with outer aluminium drum (6HB1)	250 l	
plastics receptacle with outer fibre, plastics or plywood drum (6HG1, 6HH1, 6HD1)	250 l	
plastics receptacle with outer aluminium crate or box or plastics receptacle with outer wooden, plywood, fibreboard or solid plastics box (6HB2, 6HC, 6HD2, 6HG2 or 6HH2)	60 l	
glass receptacle with outer aluminium, fibre or plywood drum (6PB1, 6PG1, 6PD1) or with outer expanded or solid plastics receptacles (6PH1 or 6PH2) or with outer aluminium crate or box or with outer wooden or fibreboard box or with outer wickerwork hamper (6PB2, 6PC, 6PG2 or 6PD2)	60 l	

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 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, 4N, 4C1, 4C2, 4D, 4F, 4G, 4H1 and 4H2), drums (1A1, 1A2, 1B1, 1B2, 1G, 1H1, 1H2 and 1D), jerricans (3A1, 3A2, 3B1, 3B2, 3H1 and 3H2);											
(2) Single packagings consisting of drums (1A1, 1A2, 1B1, 1B2, 1G, 1H1, 1H2 and 1D) and jerricans (3A1, 3A2, 3B1, 3B2, 3H1 and 3H2);											
(3) Composite packagings with plastics inner receptacles (6HA1, 6HA2, 6HB1, 6HB2, 6HC, 6HD1, 6HD2, 6HG1, 6HG2, 6HH1 and 6HH2).											
Maximum quantity per packaging/package <sup>(a)</sup> for packing methods OP1 to OP8											
Maximum Quantity	Packing Method										
	OP1	OP2 <sup>(b)</sup>	OP3	OP4 <sup>(b)</sup>	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 <sup>(b)</sup>			
Maximum contents in litres for liquids <sup>(c)</sup>	0,5	-	5	-	30	60	60	225 <sup>(d)</sup>			
<p>(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.</p> <p>(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.</p> <p>(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.</p> <p>(d) 60 litres for jerricans.</p>											
<p><b>Additional requirements</b></p> <ol style="list-style-type: none"> <li>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.</li> <li>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.</li> <li>3. In combination packagings, cushioning materials shall not be readily combustible.</li> <li>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.</li> </ol>											
<p><b>Special packing provisions</b></p>											
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 (1A1, 1A2, 1B1, 1B2, 1N1, 1N2, 1H1, 1H2, 1D, 1G, 4A, 4B, 4N, 4C1, 4C2, 4D, 4F, 4G, 4H2) meeting the packing group II performance level. The articles shall be individually packaged and separated from each other using partitions, dividers, inner packagings or cushioning material to prevent inadvertent discharge during normal conditions of 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 <ul style="list-style-type: none"> <li>– one or more glass inner packaging(s) with a maximum quantity of 1 litre each and filled to not more than 90% of their capacity; the closure(s) of which shall be physically held in place by any means capable of preventing back-off or loosening by impact or vibration during carriage, individually placed in</li> <li>– metal receptacles together with cushioning and absorbent material sufficient to absorb the entire contents of the glass inner packaging(s), further packed in</li> <li>– 1A1, 1A2, 1B1, 1B2, 1N1, 1N2, 1H1, 1H2, 1D, 1G, 4A, 4B, 4N, 4C1, 4C2, 4D, 4F, 4G or 4H2 outer packagings;</li> </ul>		
(2) Combination packagings consisting of metal or plastics inner packagings not exceeding 5 litres in capacity individually packed with absorbent material sufficient to absorb the contents and inert cushioning material in 1A1, 1A2, 1B1, 1B2, 1N1, 1N2, 1H1, 1H2, 1D, 1G, 4A, 4B, 4N, 4C1, 4C2, 4D, 4F, 4G or 4H2 outer packagings with a maximum gross mass of 75 kg. Inner packagings shall not be filled to more than 90% of their capacity. The closure of each inner packaging shall be physically held in place by any means capable of preventing back-off or loosening of the closure by impact or vibration during carriage;		
(3) Packagings consisting of: <p>Outer packagings:</p> <p>Steel or plastics drums (1A1, 1A2, 1H1 or 1H2), tested in accordance with the test requirements in 6.1.5 at a mass corresponding to the mass of the assembled package either as a packaging intended to contain inner packagings, or as a single packaging intended to contain solids or liquids, and marked accordingly;</p> <p>Inner packagings:</p> <p>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:</p> <ul style="list-style-type: none"> <li>(a) The hydraulic pressure test shall be conducted at a pressure of at least 0.3 MPa (gauge pressure);</li> <li>(b) The design and production leakproofness tests shall be conducted at a test pressure of 30 kPa;</li> <li>(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;</li> <li>(d) Their capacity shall not exceed 125 litres;</li> <li>(e) Closures shall be of a screw cap type that are: <ul style="list-style-type: none"> <li>(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</li> <li>(ii) provided with a cap seal;</li> </ul> </li> <li>(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;</li> <li>(g) The complete packaging shall be visually inspected to the satisfaction of the competent authority at least every 3 years;</li> <li>(h) The outer and inner packaging shall bear in clearly legible and durable characters: <ul style="list-style-type: none"> <li>(i) the date (month, year) of the initial test and the latest periodic test and inspection;</li> <li>(ii) The stamp of the expert who carried out the test and inspection;</li> </ul> </li> </ul>		
(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 <sub>50</sub> less than or equal to 200 ml/m <sup>3</sup> (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

<b>RR 3</b>	(Deleted)
<b>RR 7</b>	For UN No. 1251, the pressure receptacles shall however be subjected to the tests every five years.
<b>RR 10</b>	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		
<ul style="list-style-type: none"> <li>– one or more glass inner packaging(s) with a maximum quantity of 1 litre each and filled to not more than 90% of their capacity; the closure(s) of which shall be physically held in place by any means capable of preventing back-off or loosening by impact or vibration during carriage, individually placed in</li> <li>– metal receptacles together with cushioning and absorbent material sufficient to absorb the entire contents of the glass inner packaging(s), further packed in</li> <li>– 1A1, 1A2, 1B1, 1B2, 1N1, 1N2, 1H1, 1H2, 1D, 1G, 4A, 4B, 4N, 4C1, 4C2, 4D, 4F, 4G or 4H2 outer packagings;</li> </ul>		
(2) Combination packagings consisting of metal or plastics inner packagings individually packed with absorbent material sufficient to absorb the entire contents and inert cushioning material in 1A1, 1A2, 1B1, 1B2, 1N1, 1N2, 1H1, 1H2, 1D, 1G, 4A, 4B, 4N, 4C1, 4C2, 4D, 4F, 4G or 4H2 outer packagings with a maximum gross mass of 75 kg. Inner packagings shall not be filled to more than 90% of their capacity. The closure of each inner packaging shall be physically held in place by any means capable of preventing back-off or loosening of the closure by impact or vibration during 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:		
<ul style="list-style-type: none"> <li>a) The hydraulic pressure test shall be conducted at a pressure of at least 0.3 MPa (gauge pressure);</li> <li>b) The design and production leakproofness tests shall be conducted at a test pressure of 30 kPa; and</li> <li>c) Closures shall be of a screw cap type that are: <ul style="list-style-type: none"> <li>(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</li> <li>(ii) provided with a cap seal;</li> </ul> </li> </ul>		
(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 <sub>50</sub> less than or equal to 200 ml/m <sup>3</sup> (ppm) shall be closed with a plug or valve conforming to the following:		
<ul style="list-style-type: none"> <li>(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;</li> <li>(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;</li> <li>(c) Each valve outlet shall be sealed by a threaded cap or threaded solid plug and inert gasket material;</li> <li>(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.</li> </ul>		
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 603	PACKING INSTRUCTION	P 603
<b>This instruction applies to UN 3507.</b>		
The following packagings are authorized provided that the general provisions of 4.1.1 and 4.1.3 and the special packing provisions of 4.1.9.1.2, 4.1.9.1.4 and 4.1.9.1.7 are met:		
Packagings consisting of:		
(a) Metal or plastics primary receptacle(s); in		
(b) Leakproof rigid secondary packaging(s); in		
(c) A rigid outer packaging: Drums (1A2, 1B2, 1N2, 1H2, 1D, 1G); Boxes (4A, 4B, 4C1, 4C2, 4D, 4F, 4G, 4H1, 4H2); Jerricans (3A2, 3B2, 3H2).		
<b>Additional requirements</b>		
1. Primary inner receptacles shall be packed in secondary packagings in 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 to prevent movement. If multiple primary receptacles are placed in a single secondary packaging, they shall be either individually wrapped or separated so as to prevent contact between them.		
2. The contents shall comply with the provisions of 2.2.7.2.4.5.2.		
3. The provisions of 6.4.4 shall be met.		
<b>Special packing provision</b>		
In the case of fissile-excepted material, limits specified in 2.2.7.2.3.5 shall be met.		

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:		
<p>(a) Inner packagings comprising:</p> <ul style="list-style-type: none"> <li>(i) leakproof primary receptacle(s);</li> <li>(ii) a leakproof secondary packaging;</li> <li>(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;</li> </ul> <p>(b) A rigid outer packaging:</p> <ul style="list-style-type: none"> <li>Drums (1A1, 1A2, 1B1, 1B2, 1N1, 1N2, 1H1, 1H2, 1D, 1G);</li> <li>Boxes (4A, 4B, 4N, 4C1, 4C2, 4D, 4F, 4G, 4H1, 4H2);</li> <li>Jerricans (3A1, 3A2, 3B1, 3B2, 3H1, 3H2).</li> </ul>		
The smallest external dimension shall be not less than 100 mm.		
<b>Additional requirements</b>		
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:		
<p>(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;</p> <p>(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;</p> <p>(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 carriage 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.</p> <p>(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.</p>		
3. Whatever the intended temperature of the consignment, the primary receptacle or the secondary packaging shall be capable of withstanding without leakage an internal pressure producing a pressure differential of not less than 95 kPa and temperatures in the range - 40 °C to + 55 °C.		
4. Other dangerous goods shall not be packed in the same packaging as Class 6.2 infectious substances unless they are necessary for maintaining the viability, stabilizing or preventing degradation or neutralizing the hazards of the infectious substances. A quantity of 30 ml or less of dangerous goods included in Classes 3, 8 or 9 may be packed in each primary receptacle containing infectious substances. These small quantities of dangerous goods of Classes 3, 8 or 9 are not subject to any additional requirements of RID when packed in accordance with this packing instruction.		
5. Alternative packagings for the carriage of animal material may be authorized by the competent authority of the country of origin <sup>(a)</sup> in accordance with the provisions of 4.1.8.7.		
<p><sup>(a)</sup> If the country of origin is not an RID Contracting State, the competent authority of the first RID Contracting State reached by the consignment.</p>		

P 621	PACKING INSTRUCTION	P 621
<p>This instruction applies to UN No. 3291.</p>		
<p>The following packagings are authorized provided that the general provisions of 4.1.1 except 4.1.1.15 and 4.1.3 are met:</p>		
<p>(1) Provided that there is sufficient absorbent material to absorb the entire amount of liquid present and the packaging is capable of retaining liquids:</p> <p>Drums (1A2, 1B2, 1N2, 1H2, 1D, 1G); Boxes (4A, 4B, 4N, 4C1, 4C2, 4D, 4F, 4G, 4H1, 4H2); Jerricans (3A2, 3B2, 3H2).</p> <p>Packagings shall conform to the packing group II performance level for solids.</p>		
<p>(2) For packages containing larger quantities of liquid:</p> <p>Drums (1A1, 1A2, 1B1, 1B2, 1N1, 1N2, 1H1, 1H2, 1D, 1G); Jerricans (3A1, 3A2, 3B1, 3B2, 3H1, 3H2); Composites (6HA1, 6HB1, 6HG1, 6HH1, 6HD1, 6HA2, 6HB2, 6HC, 6HD2, 6HG2, 6HH2, 6PA1, 6PB1, 6PG1, 6PD1, 6PH1, 6PH2, 6PA2, 6PB2, 6PC, 6PG2 or 6PD2).</p> <p>Packagings shall conform to the packing group II performance level for liquids.</p>		
<p><b>Additional requirement</b></p> <p>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.</p>		

P 650	PACKING INSTRUCTION	P 650
This packing instruction applies to UN No. 3373.		
<p>(1) The packaging shall be of good quality, strong enough to withstand the shocks and loadings normally encountered during carriage, including transhipment between cargo transport units and between cargo transport units and warehouses as well as any removal from a pallet or overpack for subsequent manual or mechanical handling. Packagings shall be constructed and closed to prevent any loss of contents that might be caused under normal conditions of carriage by vibration or by changes in temperature, humidity or pressure.</p> <p>(2) The packaging shall consist of at least three components:</p> <ul style="list-style-type: none"> <li>(a) a primary receptacle;</li> <li>(b) a secondary packaging; and</li> <li>(c) an outer packaging</li> </ul> <p>of which either the secondary or the outer packaging shall be rigid.</p> <p>(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.</p> <p>(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.</p>		
		
<p>(5) At least one surface of the outer packaging shall have a minimum dimension of 100 mm x 100 mm.</p> <p>(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.</p> <p>(7) For liquid substances:</p> <ul style="list-style-type: none"> <li>(a) The primary receptacle(s) shall be leakproof;</li> <li>(b) The secondary packaging shall be leakproof;</li> <li>(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;</li> <li>(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;</li> <li>(e) The primary receptacle or the secondary packaging shall be capable of withstanding, without leakage, an internal pressure of 95 kPa (0.95 bar).</li> </ul>		

(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 as a coolant, the requirements of 5.5.3 shall apply. When used, ice shall be placed outside the secondary packagings or in the outer packaging or an overpack. Interior supports shall be provided to secure the secondary packagings in the original position. If ice is used, the outside packaging or overpack shall be leakproof.
- (b) The primary receptacle and the secondary packaging shall maintain their integrity at the temperature of the refrigerant used as well as the temperatures and the pressures which could result if refrigeration were lost.

(10) When packages are placed in an overpack, the package marks 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 cargo transport unit, 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 cargo transport unit 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<sup>(a)</sup> in accordance with the provisions of 4.1.8.7.

<sup>(a)</sup> If the country of origin is not an RID Contracting State, the competent authority of the first RID Contracting State reached by the consignment.

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
<b>Drums</b> steel (1A1, 1A2) metal, other than steel or aluminium (1N1, 1N2) plastics (1H1, 1H2) plywood (1D) fibre (1G)		400 kg 400 kg 400 kg 400 kg 400 kg
<b>Boxes</b> steel (4A) metal, other than steel or aluminium (4N) natural wood (4C1) natural wood with sift-proof walls (4C2) plywood (4D) reconstituted wood (4F) fibreboard (4G) expanded plastics (4H1) solid plastics (4H2)		400 kg 400 kg 250 kg 250 kg 250 kg 125 kg 125 kg 60 kg 125 kg
<b>Special packing provision</b>		
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 overpacked in a strong, water-resistant outer packaging which contains dry ice or other means of refrigeration. If a refrigerant is used, all of the above materials used in the packaging of gallium shall be chemically and physically resistant to the refrigerant and shall have impact resistance at the low temperatures of the refrigerant employed. If dry ice is used, the outer packaging shall permit the release of carbon dioxide gas.	

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.		
<b>Additional requirements</b>		
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 <sup>3</sup> 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 wagons or in closed or sheeted 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: 1A1, 1A2, 1B1, 1B2, 1N1, 1N2, 1H1, 1H2, 1D, 1G, 4A, 4B, 4N, 4C1, 4C2, 4D, 4F, 4G or 4H2;		
maximum net mass: 75 kg;		
Inner packagings: glass or plastics; maximum capacity: 10 litres;		
(2) Combination packagings		
Outer packagings: 1A1, 1A2, 1B1, 1B2, 1N1, 1N2, 1H1, 1H2, 1D, 1G, 4A, 4B, 4N, 4C1, 4C2, 4D, 4F, 4G or 4H2;		
maximum net mass: 125 kg;		
Inner packagings: metal; maximum capacity: 40 litres;		
(3) Composite packagings: Glass receptacle with outer steel, aluminium or plywood drum (6PA1, 6PB1 or 6PD1) or with outer steel, aluminium or wooden box or with outer wickerwork hamper (6PA2, 6PB2, 6PC or 6PD2) or with outer solid plastics packaging (6PH2); 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, 4N, 4C1, 4C2, 4D, 4F, 4G, 4H2).		
Maximum net mass: 75 kg.		
The articles shall be individually packaged and separated from each other using partitions, dividers, inner packagings or cushioning material to prevent inadvertent discharge during normal conditions of 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:		
<p>(1) Combination packagings with a maximum gross mass of 25 kg, consisting of</p> <ul style="list-style-type: none"> <li>– 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</li> <li>– 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</li> <li>– 1A1, 1A2, 1B1, 1B2, 1N1, 1N2, 1H1, 1H2, 1D, 1G, 4A, 4B, 4N, 4C1, 4C2, 4D, 4F, 4G or 4H2 outer packagings.</li> </ul>		
<p>(2) Combination packagings consisting of metal or polyvinylidene fluoride (PVDF) inner packagings, not exceeding 5 litres in capacity individually packed with absorbent material sufficient to absorb the contents and inert cushioning material in 1A1, 1A2, 1B1, 1B2, 1N1, 1N2, 1H1, 1H2, 1D, 1G, 4A, 4B, 4N, 4C1, 4C2, 4D, 4F, 4G or 4H2 outer packagings with a maximum gross mass of 75 kg. Inner packagings shall not be filled to more than 90% of their capacity. The closure of each inner packaging shall be physically held in place by any means capable of preventing back-off or loosening of the closure by impact or vibration during carriage;</p>		
<p>(3) Packagings consisting of:</p> <p>Outer packagings:</p> <p>Steel or plastics drums (1A1, 1A2, 1H1 or 1H2) tested in accordance with the test requirements in 6.1.5 at a mass corresponding to the mass of the assembled package either as a packaging intended to contain inner packagings, or as a single packaging intended to contain solids or liquids, and marked accordingly;</p> <p>Inner packagings:</p> <p>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:</p> <ul style="list-style-type: none"> <li>(a) The hydraulic pressure test shall be conducted at a pressure of at least 300 kPa (3 bar) (gauge pressure);</li> <li>(b) The design and production leakproofness tests shall be conducted at a test pressure of 30 kPa (0.3 bar);</li> <li>(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;</li> <li>(d) Their capacity shall not exceed 125 litres;</li> <li>(e) Closures shall be of a screw type that are: <ul style="list-style-type: none"> <li>(i) Physically held in place by any means capable of preventing back-off or loosening of the closure by impact or vibration during carriage;</li> <li>(ii) Provided with a cap seal;</li> </ul> </li> <li>(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</li> <li>(g) The outer and inner packagings shall bear in clearly legible and durable characters: <ul style="list-style-type: none"> <li>(i) the date (month, year) of the initial test and the latest periodic test and inspection of the inner packaging; and</li> <li>(ii) the name or authorized symbol of the expert who carried out the tests and inspections;</li> </ul> </li> </ul>		
<p>(4) Pressure receptacles, provided that the general provisions of 4.1.3.6 are met.</p> <ul style="list-style-type: none"> <li>(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);</li> <li>(b) They shall be subjected periodically to an internal inspection and leakproofness test at intervals of not more than two and a half years;</li> <li>(c) They may not be equipped with any pressure relief device;</li> <li>(d) Each pressure receptacle shall be closed with a plug or valve(s) fitted with a secondary closure device; and</li> <li>(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.</li> </ul>		

P 900	PACKING INSTRUCTION	P 900
(Reserved)		

P 901	PACKING INSTRUCTION	P 901
<b>This instruction applies to UN No. 3316.</b>		
The following combination packagings are authorized provided the general provisions of 4.1.1 and 4.1.3 are met:		
Drums (1A1, 1A2, 1B1, 1B2, 1N1, 1N2, 1H1, 1H2, 1D, 1G);		
Boxes (4A, 4B, 4N, 4C1, 4C2, 4D, 4F, 4G, 4H1, 4H2);		
Jerricans (3A1, 3A2, 3B1, 3B2, 3H1, 3H2).		
Packagings shall conform to the performance level consistent with the packing group assigned to the kit as a whole (see special provision 251 of Chapter 3.3). Where the kit contains only dangerous goods to which no packing group is assigned, packagings shall meet the packing group II performance level.		
Maximum quantity of dangerous goods per outer packaging: 10 kg excluding the mass of any carbon dioxide, solid (dry ice) used as a refrigerant.		
<b>Additional requirement</b>		
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
<b>This instruction applies to UN No. 3268.</b>		
<b>Packaged articles:</b>		
The following packagings are authorized provided the general provisions of 4.1.1 and 4.1.3 are met:		
Drums (1A2, 1B2, 1N2, 1H2, 1D, 1G);		
Boxes (4A, 4B, 4N, 4C1, 4C2, 4D, 4F, 4G, 4H1, 4H2);		
Jerricans (3A2, 3B2, 3H2).		
Packagings shall conform to the packing group III performance level.		
The packagings shall be designed and constructed so as to prevent movement of the articles and inadvertent operation during normal conditions of carriage.		
<b>Unpackaged articles:</b>		
The articles may also be carried unpackaged in dedicated handling devices or cargo transport units when moved from where they are manufactured to an assembly plant.		
<b>Additional requirement</b>		
Any pressure receptacle shall be in accordance with the requirements of the competent authority for the substance(s) contained therein.		

P 903	PACKING INSTRUCTION	P 903
This instruction applies to UN Nos. 3090, 3091, 3480 and 3481.		
The following packagings are authorized provided that the general provisions of 4.1.1 and 4.1.3 are met:		
(1) For cells and batteries:		
Drums (1A2, 1B2, 1N2, 1H2, 1D, 1G); Boxes (4A, 4B, 4N, 4C1, 4C2, 4D, 4F, 4G, 4H1, 4H2); Jerricans (3A2, 3B2, 3H2).		
Cells or batteries shall be packed in packagings so that the cells or batteries are protected against damage that may be caused by the movement or placement of the cells or batteries within the packaging.		
Packagings shall conform to the packing group II performance level.		
(2) In addition for cells or batteries with a gross mass of 12 kg or more employing a strong, impact resistant outer casing, and assemblies of such cells or batteries:		
(a) Strong outer packagings; (b) Protective enclosures (e.g., fully enclosed or wooden slatted crates); or (c) Pallets or other handling devices.		
Cells or batteries shall be secured to prevent inadvertent movement, and the terminals shall not support the weight of other superimposed elements.		
Packagings need not meet the requirements of 4.1.1.3.		
(3) For cells or batteries packed with equipment:		
Packagings conforming to the requirements in paragraph (1) of this packing instruction, then placed with the equipment in an outer packaging; or		
Packagings that completely enclose the cells or batteries, then placed with equipment in a packaging conforming to the requirements in paragraph (1) of this packing instruction.		
The equipment shall be secured against movement within the outer packaging.		
For the purpose of this packing instruction, "equipment" means apparatus requiring the lithium metal or lithium ion cells or batteries with which it is packed for its operation.		
(4) For cells or batteries contained in equipment:		
Strong outer packagings constructed of suitable material, and of adequate strength and design in relation to the packaging capacity and its intended use. They shall be constructed in such a manner as to prevent accidental operation during carriage. Packagings need not meet the requirements of 4.1.1.3.		
Large equipment can be offered for carriage unpackaged or on pallets when the cells or batteries are afforded equivalent protection by the equipment in which they are contained.		
Devices such as radio frequency identification (RFID) tags, watches and temperature loggers, which are not capable of generating a dangerous evolution of heat, may be carried when intentionally active in strong outer packagings.		
<b>Additional requirement</b>		
Cells or batteries shall be protected against short circuit.		

P 903a	PACKING INSTRUCTION	P 903a
(Deleted)		

P 903b	PACKING INSTRUCTION	P 903b
(Deleted)		

P 904	PACKING INSTRUCTION	P 904
<b>This instruction applies to UN No. 3245.</b>		
The following packagings are authorized:		
<p>(1) Packagings meeting the provisions of 4.1.1.1, 4.1.1.2, 4.1.1.4, 4.1.1.8 and 4.1.3 and so designed that they meet the construction requirements of 6.1.4. Outer packagings constructed of suitable material, and of adequate strength and design in relation to the packaging capacity and its intended use, shall be used. Where this packing instruction is used for the carriage of inner packagings of combination packagings the packaging shall be designed and constructed to prevent inadvertent discharge during normal conditions of carriage.</p> <p>(2) Packagings, which need not conform to the packaging test requirements of Part 6, but conforming to the following:</p> <p>(a) An inner packaging comprising:</p> <ul style="list-style-type: none"> <li>(i) primary receptacle(s) and a secondary packaging, the primary receptacle(s) or the secondary packaging shall be leakproof for liquids or siftproof for solids;</li> <li>(ii) for liquids, absorbent material placed between the primary receptacle(s) and the secondary packaging. The absorbent material shall be in a quantity sufficient to absorb the entire contents of the primary receptacle(s) so that any release of the liquid substance will not compromise the integrity of the cushioning material or of the outer packaging;</li> <li>(iii) if multiple fragile primary receptacles are placed in a single secondary packaging they shall be individually wrapped or separated to prevent contact between them;</li> </ul> <p>(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.</p>		
<p>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 each side having a length of at least 50 mm; the width of the line shall be at least 2 mm and the letters and numbers shall be at least 6 mm high.</p> 		
<p><b>Additional requirement</b></p> <p><u>Ice, dry ice and liquid nitrogen</u></p> <p>When dry ice or liquid nitrogen is used as a coolant, the requirements of 5.5.3 shall apply. When used, ice shall be placed outside the secondary packagings or in the outer packaging or an overpack. Interior supports shall be provided to secure the secondary packaging in the original position. If ice is used, the outside packaging or overpack shall be leakproof.</p>		

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.		
<p><b>Additional requirements</b></p> <p>1. All dangerous substances and articles contained as equipment within the appliances shall be secured to prevent inadvertent movement and in addition:</p> <ul style="list-style-type: none"> <li>(a) Signal devices of Class 1 shall be packed in plastics or fibreboard inner packagings;</li> <li>(b) Non-flammable, non-toxic gases shall be contained in cylinders as specified by the competent authority, which may be connected to the appliance;</li> <li>(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</li> <li>(d) Small quantities of other dangerous substances (for example in Classes 3, 4.1 and 5.2) shall be packed in strong inner packagings.</li> </ul> <p>2. Preparation for transport and packaging shall include provisions to prevent any accidental inflation of the appliance.</p>		

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:		
<p>(1) For liquids and solids containing or contaminated with PCBs, polyhalogenated biphenyls, polyhalogenated terphenyls or halogenated monomethylidiphenylmethanes:</p> <p>Packagings in accordance with packing instructions P 001 or P 002, as appropriate.</p> <p>(2) For transformers and condensers and other articles:</p> <ul style="list-style-type: none"> <li>(a) Packagings in accordance with packing instructions P 001 or P 002. The articles shall be secured with suitable cushioning material to prevent inadvertent movement during normal conditions of carriage; or</li> <li>(b) Leakproof packagings which are capable of containing, in addition to the articles, at least 1.25 times the volume of the liquid PCBs, polyhalogenated biphenyls, polyhalogenated terphenyls or halogenated monomethylidiphenylmethanes 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 articles. 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.</li> </ul>		
Notwithstanding the above, liquids and solids not packaged in accordance with packing instructions P 001 and P 002 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.		
<p><b>Additional requirement</b></p> <p>Adequate provisions shall be taken to seal the transformers and condensers to prevent leakage during normal conditions of carriage.</p>		

P 908	PACKING INSTRUCTION	P 908
<p>This instruction applies to damaged or defective lithium ion cells and batteries and damaged or defective lithium metal cells and batteries, including those contained in equipment, of UN Nos. 3090, 3091, 3480 and 3481.</p>		
<p>The following packagings are authorized provided the general provisions of 4.1.1 and 4.1.3 are met:</p>		
<p>For cells and batteries and equipment containing cells and batteries:</p>		
<p>Drums (1A2, 1B2, 1N2, 1H2, 1D, 1G); Boxes (4A, 4B, 4N, 4C1, 4C2, 4D, 4F, 4G, 4H1, 4H2); Jerricans (3A2, 3B2, 3H2).</p>		
<p>Packagings shall conform to the packing group II performance level.</p>		
<ol style="list-style-type: none"><li>1. Each damaged or defective cell or battery or equipment containing such cells or batteries shall be individually packed in inner packaging and placed inside an outer packaging. The inner packaging or outer packaging shall be leak-proof to prevent the potential release of electrolyte.</li><li>2. Each inner packaging shall be surrounded by sufficient non-combustible and non-conductive thermal insulation material to protect against a dangerous evolution of heat.</li><li>3. Sealed packagings shall be fitted with a venting device when appropriate.</li><li>4. Appropriate measures shall be taken to minimize the effects of vibrations and shocks, prevent movement of the cells or batteries within the package that may lead to further damage and a dangerous condition during carriage. Cushioning material that is non-combustible and non-conductive may also be used to meet this requirement.</li><li>5. Non combustibility shall be assessed according to a standard recognized in the country where the packaging is designed or manufactured.</li></ol>		
<p>For leaking cells or batteries, sufficient inert absorbent material shall be added to the inner or outer packaging to absorb any release of electrolyte.</p>		
<p>A cell or battery with a net mass of more than 30 kg shall be limited to one cell or battery per outer packaging.</p>		
<p><b>Additional requirement</b></p>		
<p>Cells or batteries shall be protected against short circuit.</p>		

P 909	PACKING INSTRUCTION	P 909
<p>This instruction applies to UN Nos. 3090, 3091, 3480 and 3481 carried for disposal or recycling, either packed together with or packed without non-lithium batteries.</p>		
<p>(1) Cells and batteries shall be packed in accordance with the following:</p> <p>(a) The following packagings are authorized, provided that the general provisions of 4.1.1 and 4.1.3, are met: Drums (1A2, 1B2, 1N2, 1H2, 1D, 1G); Boxes (4A, 4B, 4N, 4C1, 4C2, 4D, 4F, 4G, 4H2); and Jerricans (3A2, 3B2, 3H2).</p> <p>(b) Packagings shall conform to the packing group II performance level.</p> <p>(c) Metal packagings shall be fitted with a non-conductive lining material (e.g. plastics) of adequate strength for the intended use.</p> <p>(2) However, lithium ion cells with a Watt-hour rating of not more than 20 Wh, lithium ion batteries with a Watt-hour rating of not more than 100 Wh, lithium metal cells with a lithium content of not more than 1 g and lithium metal batteries with an aggregate lithium content of not more than 2 g may be packed in accordance with the following:</p> <p>(a) In strong outer packaging up to 30 kg gross mass meeting the general provisions of 4.1.1, except 4.1.1.3, and 4.1.3.</p> <p>(b) Metal packagings shall be fitted with a non-conductive lining material (e.g. plastics) of adequate strength for the intended use.</p> <p>(3) For cells or batteries contained in equipment, strong outer packagings constructed of suitable material, and of adequate strength and design in relation to the packaging capacity and its intended use, may be used. Packagings need not meet the requirements of 4.1.1.3. Equipment may also be offered for carriage unpackaged or on pallets when the cells or batteries are afforded equivalent protection by the equipment in which they are contained.</p> <p>(4) In addition, for cells or batteries with a gross mass of 12 kg or more employing a strong, impact resistant outer casing, strong outer packagings constructed of suitable material and of adequate strength and design in relation to the packaging's capacity and its intended use, may be used. Packagings need not meet the requirements of 4.1.1.3.</p>		
<p><b>Additional requirements</b></p> <p>1. Cells and batteries shall be designed or packed to prevent short circuits and the dangerous evolution of heat.</p> <p>2. Protection against short circuits and the dangerous evolution of heat includes, but is not limited to:</p> <ul style="list-style-type: none"> <li>– individual protection of the battery terminals,</li> <li>– inner packaging to prevent contact between cells and batteries,</li> <li>– batteries with recessed terminals designed to protect against short circuits, or</li> <li>– the use of a non-conductive and non-combustible cushioning material to fill empty space between the cells or batteries in the packaging.</li> </ul> <p>3. Cells and batteries shall be secured within the outer packaging to prevent excessive movement during carriage (e.g. by using a non-combustible and non-conductive cushioning material or through the use of a tightly closed plastics bag).</p>		

P 910	PACKING INSTRUCTION	P 910
This instruction applies to UN Nos. 3090, 3091, 3480 and 3481 production runs consisting of not more than 100 cells and batteries and to pre-production prototypes of cells and batteries when these prototypes are carried for testing.		
The following packagings are authorized provided that the general provisions of 4.1.1 and 4.1.3 are met:		
<p>(1) For cells and batteries, including when packed with equipment:</p> <p>Drums (1A2, 1B2, 1N2, 1H2, 1D, 1G);      Boxes (4A, 4B, 4N, 4C1, 4C2, 4D, 4F, 4G, 4H1, 4H2);      Jerricans (3A2, 3B2, 3H2).</p> <p>Packagings shall conform to the packing group II performance level and shall meet the following requirements:</p> <ul style="list-style-type: none"> <li>(a) Batteries and cells, including equipment, of different sizes, shapes or masses shall be packaged in an outer packaging of a tested design type listed above provided the total gross mass of the package does not exceed the gross mass for which the design type has been tested;</li> <li>(b) Each cell or battery shall be individually packed in an inner packaging and placed inside an outer packaging;</li> <li>(c) Each inner packaging shall be completely surrounded by sufficient non-combustible and non-conductive thermal insulation material to protect against a dangerous evolution of heat;</li> <li>(d) Appropriate measures shall be taken to minimize the effects of vibration and shocks and prevent movement of the cells or batteries within the package that may lead to damage and a dangerous condition during carriage. Cushioning material that is non-combustible and non-conductive may be used to meet this requirement;</li> <li>(e) Non-combustibility shall be assessed according to a standard recognized in the country where the packaging is designed or manufactured;</li> <li>(f) A cell or battery with a net mass of more than 30 kg shall be limited to one cell or battery per outer packaging.</li> </ul>		
<p>(2) For cells and batteries contained in equipment:</p> <p>Drums (1A2, 1B2, 1N2, 1H2, 1D, 1G);      Boxes (4A, 4B, 4N, 4C1, 4C2, 4D, 4F, 4G, 4H1, 4H2);      Jerricans (3A2, 3B2, 3H2).</p> <p>Packagings shall conform to the packing group II performance level and shall meet the following requirements:</p> <ul style="list-style-type: none"> <li>(a) Equipment of different sizes, shapes or masses shall be packaged in an outer packaging of a tested design type listed above provided the total gross mass of the package does not exceed the gross mass for which the design type has been tested;</li> <li>(b) The equipment shall be constructed or packaged in such a manner as to prevent accidental operation during carriage;</li> <li>(c) Appropriate measures shall be taken to minimize the effects of vibration and shocks and prevent movement of the equipment within the package that may lead to damage and a dangerous condition during carriage. When cushioning material is used to meet this requirement it shall be non-combustible and non-conductive; and</li> <li>(d) Non-combustibility shall be assessed according to a standard recognized in the country where the packaging is designed or manufactured.</li> </ul>		
<p>(3) The equipment or the batteries may be carried unpackaged under conditions specified by the competent authority of any RID Contracting State, which may also recognize an approval granted by the competent authority of a country which is not an RID Contracting State, provided that this approval has been granted in accordance with the procedures applicable according to RID, ADR, ADN, the IMDG Code or the ICAO Technical Instructions. Additional conditions that may be considered in the approval process include, but are not limited to:</p> <ul style="list-style-type: none"> <li>(a) The equipment or the battery shall be strong enough to withstand the shocks and loadings normally encountered during carriage, including trans-shipment between cargo transport units and between cargo transport units and warehouses as well as any removal from a pallet for subsequent manual or mechanical handling; and</li> <li>(b) The equipment or the battery shall be fixed in cradles or crates or other handling devices in such a way that it will not become loose during normal conditions of carriage.</li> </ul>		
<p><b>Additional requirements</b></p> <p>The cells and batteries shall be protected against short circuit;</p> <p>Protection against short circuits includes, but is not limited to,</p> <ul style="list-style-type: none"> <li>– individual protection of the battery terminals,</li> <li>– inner packaging to prevent contact between cells and batteries,</li> </ul>		

- batteries with recessed terminals designed to protect against short circuits, or
- the use of a non-conductive and non-combustible cushioning material to fill empty space between the cells or batteries in the packaging.

PACKING INSTRUCTION		R 001	
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) <sup>(a)</sup>	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			
<b>NOTE 1:</b> This instruction applies to solids and liquids (provided the design type is tested and marked appropriately). <b>2:</b> 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).		
<b>Special packing provision specific to RID and ADR</b>		
<b>BB 1</b>	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).		
<b>Special packing provisions</b>		
<b>B 5</b>	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>B 7</b>	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>B 8</b>	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>B 15</b>	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.	
<b>B 16</b>	For UN No. 3375, IBCs of type 31A and 31N are not allowed without competent authority approval.	
<b>Special packing provisions specific to RID and ADR</b>		
<b>BB 2</b>	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.	
<b>BB 4</b>	For UN Nos. 1133, 1139, 1169, 1197, 1210, 1263, 1266, 1286, 1287, 1306, 1866, 1993 and 1999, assigned to packing group III in accordance with 2.2.3.1.4, IBCs with a capacity greater than 450 litres are not permitted.	

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).		
<b>Special packing provision</b>		
<b>B 8</b>	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.	
<b>B 19</b>	For UN No. 3532, IBCs shall be designed and constructed to permit the release of gas or vapour to prevent a build-up of pressure that could rupture the IBCs in the event of loss of stabilization.	

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 and 31HZ1).		
<b>Additional requirement</b>		
Where the solid may become liquid during carriage see 4.1.3.4.		
<b>Special packing provisions</b>		
<b>B 12</b>	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 and 31HZ1); (4) Wooden (11C, 11D and 11F).		
<b>Additional requirements</b>		
1. Where the solid may become liquid during carriage see 4.1.3.4. 2. Liners of wooden IBCs shall be siftproof.		
<b>Special packing provision</b>		
<b>B 18</b>	For UN No. 3531, IBCs shall be designed and constructed to permit the release of gas or vapour to prevent a build-up of pressure that could rupture the IBCs in the event of loss of stabilization.	

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 and 31HZ1);		
(4) Fibreboard (11G);		
(5) Wooden (11C, 11D and 11F);		
(6) Flexible (13H1, 13H2, 13H3, 13H4, 13H5, 13L1, 13L2, 13L3, 13L4, 13M1 and 13M2).		
<b>Additional requirement</b>		
Where the solid may become liquid during carriage see 4.1.3.4.		
<b>Special packing provisions</b>		
<b>B 3</b>	Flexible IBCs shall be sift-proof and water-resistant or shall be fitted with a sift-proof and water-resistant liner.	
<b>B 4</b>	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>B 6</b>	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>B 13</b>	NOTE: For UN Nos. 1748, 2208, 2880, 3485, 3486 and 3487, carriage by sea in IBCs is prohibited according to the IMDG Code.	
<b>Special packing provision specific to RID and ADR</b>		
<b>BB 3</b>	<p>For UN 3509, IBCs are not required to meet the requirements of 4.1.1.3.</p> <p>IBCs meeting the requirements of 6.5.5, made leak tight or fitted with a leak tight and puncture resistant sealed liner or bag, shall be used.</p> <p>When the only residues are solids which are not liable to become liquid at temperatures likely to be encountered during carriage, flexible IBCs may be used.</p> <p>When liquid residues are present, rigid IBCs that provide a means of retention (e.g. absorbent material) shall be used.</p> <p>Before being filled and handed over for carriage, every IBC shall be inspected to ensure that it is free from corrosion, contamination or other damage. Any IBC showing signs of reduced strength shall no longer be used (minor dents and scratches are not considered as reducing the strength of the IBC).</p> <p>IBCs intended for the carriage of packagings, discarded, empty, uncleared with residues of Class 5.1 shall be so constructed or adapted that the goods cannot come into contact with wood or any other combustible material.</p>	

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
<b>This instruction applies to UN Nos. 0082, 0222, 0241, 0331 and 0332.</b>		
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).		
<b>Additional requirements</b>		
1. IBCs shall only be used for free flowing substances. 2. Flexible IBCs shall only be used for solids.		
<b>Special packing provisions</b>		
<b>B 3</b>	For UN No. 0222, flexible IBCs shall be sift-proof and water resistant or shall be fitted with a sift-proof and water resistant liner.	
<b>B 9</b>	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>B 10</b>	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.	
<b>B 17</b>	For UN No. 0222, metal IBCs are not authorized.	

IBC 520		PACKING INSTRUCTION	IBC 520			
UN No.	Organic peroxide	Type of IBC	Maximum quantity (litres/kg)			
<b>3109 ORGANIC PEROXIDE, TYPE F, LIQUID</b>						
tert-BUTYL CUMYL PEROXIDE		31HA1	1000			
tert-BUTYL HYDROPEROXIDE, not more than 72% with water		31A	1250			
tert-BUTYL PEROXYACETATE, not more than 32% in diluent type A		31A	1250			
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	1250			
31HA1		31HA1	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	1250			
31HA1		31HA1	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	1500			
		31H2	1500			
		31HA1	1500			
		31A	1500			
<b>3110 ORGANIC PEROXIDE, TYPE F, SOLID</b>						
DICUMYL PEROXIDE		31A	2000			
31H1		31H1				
		31HA1				
<b>Additional requirements</b>						
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, except 4.1.1.15, 4.1.2 and 4.1.3 are met:						
Rigid, leakproof IBCs conforming to the packing group II performance level.						
<b>Additional requirements</b>						
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

PACKING INSTRUCTION (LIQUIDS)				
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	Steel (50A)	Not allowed	Not allowed	Maximum capacity: 3 m <sup>3</sup>
Plastics 30 litre	Aluminium (50B)			
Metal 40 litre	Metal other than steel or aluminium (50N)			
	Rigid plastics (50H)			
	Natural wood (50C)			
	Plywood (50D)			
	Reconstituted wood (50F)			
	Fibreboard (50G)			

PACKING INSTRUCTION (SOLIDS)				
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	Steel (50A)	Not allowed	Not allowed	Maximum capacity: 3 m <sup>3</sup>
Plastics <sup>(b)</sup> 50 kg	Aluminium (50B)			
Metal 50 kg	Metal other than steel or aluminium (50N)			
Paper <sup>(a),(b)</sup> 50 kg	Rigid plastics (50H)			
Fibre <sup>(a),(b)</sup> 50 kg	Natural wood (50C)			
	Plywood (50D)			
	Reconstituted wood (50F)			
	Fibreboard (50G)			
	Flexible plastics (51H) <sup>(c)</sup>			

(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 provisions

L 2	(Deleted)
L 3	NOTE: For UN Nos. 2208 and 3486, carriage by sea in large packagings is prohibited.

## Special packing provision specific to RID and ADR

LL 1	<p>For UN 3509, large packagings are not required to meet the requirements of 4.1.1.3.</p> <p>Large packagings meeting the requirements of 6.6.4, made leak tight or fitted with a leak tight and puncture resistant sealed liner or bag, shall be used.</p> <p>When the only residues are solids which are not liable to become liquid at temperatures likely to be encountered during carriage, flexible large packagings may be used.</p> <p>When liquid residues are present, rigid large packagings that provide a means of retention (e.g. absorbent material) shall be used.</p> <p>Before being filled and handed over for carriage, every large packaging shall be inspected to ensure that it is free from corrosion, contamination or other damage. Any large packaging showing signs of reduced strength shall no longer be used (minor dents and scratches are not considered as reducing the strength of the large packaging).</p> <p>Large packagings intended for the carriage of packagings, discarded, empty, uncleared with residues of Class 5.1 shall be so constructed or adapted that the goods cannot come into contact with wood or any other combustible material.</p>
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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)
<b>Special packing provision</b>		
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, 0502 and 0510: 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	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)
Receptacles fibreboard metal plastics wood		
Sheets fibreboard, corrugated		
Tubes fibreboard		

LP 200	PACKING INSTRUCTION	LP 200
<b>This instruction applies to UN No. 1950.</b>		
The following large packagings are authorized for aerosols, provided that the general provisions of 4.1.1 and 4.1.3 are met:		
<p>Rigid large packagings conforming to the packing group II performance level, made of:</p> <ul style="list-style-type: none"> <li>steel (50A);</li> <li>aluminium (50B);</li> <li>metal other than steel or aluminium (50N);</li> <li>rigid plastics (50H);</li> <li>natural wood (50C);</li> <li>plywood (50D);</li> <li>reconstituted wood (50F);</li> <li>rigid fibreboard (50G).</li> </ul>		
<b>Special packing provision</b>		
<b>L 2</b>	The large packagings shall be designed and constructed to prevent dangerous movement of the aerosols and inadvertent discharge during normal conditions of carriage. For waste aerosols carried in accordance with special provision 327, the large packagings shall have a means of retaining any free liquid that might escape during carriage, e.g. absorbent material. The large packagings shall be adequately ventilated to prevent the creation of a flammable atmosphere and the build-up of pressure.	

LP 621	PACKING INSTRUCTION	LP 621
<b>This instruction applies to UN No. 3291.</b>		
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.		
<b>Additional requirement</b>		
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
<b>This instruction applies to UN No. 3268.</b>		
<b>Packaged articles:</b>		
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.		
<b>Unpackaged articles:</b>		
The articles may also be carried unpackaged in dedicated handling devices or cargo transport units when moved from where they are manufactured to an assembly plant.		
<b>Additional requirement</b>		
Any pressure receptacle shall be in accordance with the requirements of the competent authority for the substance(s) contained in the pressure receptacle(s).		

LP 903	PACKING INSTRUCTION	LP 903
<b>This instruction applies to UN Nos. 3090, 3091, 3480 and 3481.</b>		
The following large packagings are authorized for a single battery, including for a battery contained in equipment, provided that the general provisions of 4.1.1 and 4.1.3 are met:		
Rigid large packagings conforming to the packing group II performance level, made of: steel (50A); aluminium (50B); metal other than steel or aluminium (50N); rigid plastics (50H); natural wood (50C); plywood (50D); reconstituted wood (50F); rigid fibreboard (50G).		
The battery shall be packed so that the battery is protected against damage that may be caused by its movement or placement within the large packaging.		
<b>Additional requirement</b>		
Batteries shall be protected against short circuit.		

LP 904	PACKING INSTRUCTION	LP 904
<p>This instruction applies to single damaged or defective batteries of UN Nos. 3090, 3091, 3480 and 3481, including those contained in equipment.</p>		
<p>The following large packagings are authorized for a single damaged or defective battery and for a single damaged or defective battery contained in equipment, provided the general provisions of 4.1.1 and 4.1.3 are met:</p>		
<p>For batteries and equipment containing batteries, large packagings made of:</p> <ul style="list-style-type: none"><li>steel (50A)</li><li>aluminium (50B)</li><li>metal other than steel or aluminium (50N)</li><li>rigid plastics (50H)</li><li>plywood (50D)</li></ul>		
<p>Packagings shall conform to the packing group II performance level.</p>		
<ol style="list-style-type: none"><li>1. Each damaged or defective battery or equipment containing such a battery shall be individually packed in an inner packaging and placed inside an outer packaging. The inner packaging or outer packaging shall be leak-proof to prevent the potential release of electrolyte.</li><li>2. Each inner packaging shall be surrounded by sufficient non-combustible and non-conductive thermal insulation material to protect against a dangerous evolution of heat.</li><li>3. Sealed packagings shall be fitted with a venting device when appropriate.</li><li>4. Appropriate measures shall be taken to minimize the effects of vibrations and shocks, prevent movement of the battery within the package that may lead to further damage and a dangerous condition during carriage. Cushioning material that is non-combustible and non-conductive may also be used to meet this requirement.</li><li>5. Non combustibility shall be assessed according to a standard recognized in the country where the packaging is designed or manufactured.</li></ol>		
<p>For leaking batteries, sufficient inert absorbent material shall be added to the inner or outer packaging to absorb any release of electrolyte.</p>		
<p><b>Additional requirement</b></p>		
<p>Batteries shall be protected against short circuit.</p>		

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 Unless otherwise specified in RID, packagings, including IBCs and large packagings, shall conform to the requirements of chapters 6.1, 6.5 or 6.6, as appropriate, and shall meet their test requirements for packing group II.

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

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

4.1.5.8 Packagings for water soluble substances shall be water resistant. Packagings for desensitized or phlegmatized substances shall be closed to prevent changes in concentration during 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 (1A1, 1A2, 1B1, 1B2, 1N1, 1N2, 4A, 4B, 4N 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 and, in case of a chemical under pressure, for the propellant 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 "a" 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<sub>50</sub> less than or equal to 200 ml/m<sup>3</sup>; and
- (d) not be repaired after being put into service.

**4.1.6.10** Refillable pressure receptacles, other than cryogenic receptacles, shall be periodically inspected according to the provisions of 6.2.1.6, or 6.2.3.5.1 for non UN receptacles, and packing instruction P 200, P 205 or P 206 as applicable. Pressure relief valves for closed cryogenic receptacles shall be subject to periodic inspections and tests according to the provisions of 6.2.1.6.3 and packing instruction P 203. 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 marks 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 marks are legible.

**4.1.6.14** Owners shall, on the basis of a reasoned request from the competent authority, provide it with all the information necessary to demonstrate the conformity of the pressure receptacle in a language easily understood by the competent authority. They shall cooperate with that authority, at its request, on any action taken to eliminate non-conformity of the pressure receptacles which they own.

**4.1.6.15** 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 11114-1:2012	Gas cylinders – Compatibility of cylinder and valve materials with gas contents – Part 1: Metallic Materials
	ISO 11114-2:2013	Transportable gas cylinders – Compatibility of cylinder and valve materials with gas contents – Part 2: Non-metallic Materials
4.1.6.4	ISO 11621:1997	Gas cylinders – Procedures for change of gas service <b>NOTE:</b> The EN version of this ISO standard fulfils the requirements and may also be used.
4.1.6.8 Valves with inherent protection	Annex A of ISO 10297:2006 or annex A of ISO 10297:2014	Gas cylinder – Refillable gas cylinder valves – Specification and type testing <b>NOTE:</b> The EN version of this ISO standard fulfils the requirements and may also be used.
	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

Applicable paragraphs	Reference	Document title
	EN ISO 14245:2010	Gas cylinders – Specifications and testing of LPG cylinder valves – Self closing (ISO 14245:2006)
	EN ISO 15995:2010	Gas cylinders – Specifications and testing of LPG cylinder valves – Manually operated (ISO 15995:2006)
4.1.6.8 (b) and (c)	either ISO 11117:1998 or ISO 11117:2008 + Cor 1:2009	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
	ISO 16111:2008	Transportable gas storage devices – Hydrogen absorbed in reversible metal hydride

**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 (except IBCs)**

**4.1.7.1.1** Packagings for organic peroxides and self-reactive substances shall conform to the requirements of Chapter 6.1 and shall meet its test requirements for packing group II.

**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. IBCs shall conform to the requirements of Chapter 6.5 and shall meet its test requirements for packing group II.

**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 an RID Contracting State, the classification and transport conditions shall be recognized by the competent authority of the first RID Contracting 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 4.1.1.17, except 4.1.1.10 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 mark 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<sup>3</sup> 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<sup>3</sup> 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.

#### 4.1.9 Special packing provisions for radioactive material

##### 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<sup>2</sup> for beta and gamma emitters and low toxicity alpha emitters; and
- (b) 0.4 Bq/cm<sup>2</sup> for all other alpha emitters.

These limits are applicable when averaged over any area of 300 cm<sup>2</sup> of any part of the surface.

4.1.9.1.3 A 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 For radioactive material having other dangerous properties the package design shall take into account those properties. Radioactive material with a subsidiary risk, packaged in packages that do not require competent authority approval, shall be carried in packagings, IBCs, tanks or bulk containers 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 a packaging is first used to carry radioactive material, it shall be confirmed that it has been manufactured in conformity with the design specifications to ensure compliance with the relevant provisions of RID and any applicable certificate of approval. The following requirements shall also be fulfilled, if applicable:

- (a) If the design pressure of the containment system exceeds 35 kPa (gauge), it shall be ensured that the containment system of each packaging conforms to the approved design requirements relating to the capability of that system to maintain its integrity under that pressure;
- (b) For each packaging intended for use as a Type B(U), Type B(M) or Type C package and for each packaging intended to contain fissile material, 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 each packaging intended to contain fissile material, it shall be ensured that the effectiveness of the criticality safety features is within the limits applicable to or specified for the design and in particular where, in order to comply with the requirements of 6.4.11.1 neutron poisons are specifically included, checks shall be performed to confirm the presence and distribution of those neutron poisons.

<sup>3</sup> If the country of origin is not an RID Contracting State, the competent authority of the first RID Contracting State reached by the consignment.

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

- (a) Radionuclides different from those specified for the package design; nor
- (b) Contents in a form, or physical or chemical state different from those specified for the package design.

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

- (a) 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;
- (b) 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;
- (c) 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;
- (d) For packages containing fissile material the measurement specified in 6.4.11.5 (b) and the tests to demonstrate closure of each package as specified in 6.4.11.8 shall be performed.

**4.1.9.1.9** 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.

**4.1.9.1.10** 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.

**4.1.9.1.11** 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.

**4.1.9.1.12** 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 are or contain fissile material, which is not excepted under 2.2.7.2.3.5, the applicable requirements of 7.5.11, CW 33 (4.1) and (4.2) shall be met.

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

**4.1.9.2.4** 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;
- (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;
- (d) Unpackaged fissile material shall meet the requirements of 2.2.7.2.3.5 (e).

**4.1.9.2.5** LSA material and SCO, except as otherwise specified in 4.1.9.2.4, shall be packaged in accordance with the table below:

**Table 4.1.9.2.5: Industrial package requirements for LSA material and SCO**

Radioactive contents	Industrial package type	
	Exclusive use	Not under exclusive use
LSA-I Solid <sup>(a)</sup> 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 <sup>(a)</sup>	Type IP-1	Type IP-1
SCO-II	Type IP-2	Type IP-2

(a) Under the conditions specified in 4.1.9.2.4, LSA-I material and SCO-I may be carried unpackaged.

#### 4.1.9.3 Packages containing fissile material

The contents of packages containing fissile material shall be as specified for the package design either directly in RID or in the certificate of approval.

#### 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 radioactive material, 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 packing instruction P 620. 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 packing instruction P 650 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 (Reserved)**

**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 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 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<sup>4</sup> 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.

<sup>4</sup> If the country of origin is not an RID Contracting State, the approval shall require validation by the competent authority of the first RID Contracting State reached by the consignment.

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 23** 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) 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			
0160			B	B	B			B														B	B	B	B	B	B	B	B		
0161			B	B	B		B															B	B	B	B	B	B	B	B		
0186					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			
0194					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			
0197					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			
0240					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			
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			
0405							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			
0429							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			
0431							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			
0505							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				
0507							B		B	B	B	B	B	B	B						B	B	B	B	B	B	B				

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

**NOTE 1:** For tank-wagons, demountable tanks, tank-containers and tank swap bodies, with shells made of metallic materials, and battery-wagons and multiple element gas containers (MEGCs), see Chapter 4.3; for fibre-reinforced plastics tank-containers, see Chapter 4.4; for vacuum-operated waste tanks, see Chapter 4.5.

**2:** Portable tanks and UN MEGCs marked in accordance with the requirements of Chapter 6.7, but which were approved in a State that is not an RID Contracting State, may nevertheless be used for carriage under RID.

### 4.2.1 General provisions for the use of portable tanks for the carriage of substances of Classes 1 and 3 to 9

**4.2.1.1** This section provides general provisions applicable to the use of portable tanks for the carriage of substances of Classes 1, 3, 4.1, 4.2, 4.3, 5.1, 5.2, 6.1, 6.2, 7, 8 and 9. In addition to these general provisions, portable tanks shall conform to the design, construction, inspection and testing requirements detailed in 6.7.2. Substances shall be carried in portable tanks conforming to the applicable portable tank instruction identified in Column (10) of the Table A of Chapter 3.2 and described in 4.2.5.2.6 (T1 to T23) and the portable tank special provisions assigned to each substance in Column (11) of Table A of Chapter 3.2 and described in 4.2.5.3.

**4.2.1.2** During carriage, portable tanks shall be adequately protected against damage to the shell and service equipment resulting from lateral and longitudinal impact and overturning. If the shell and service equipment are so constructed as to withstand impact or overturning it need not be protected in this way. Examples of such protection are given in 6.7.2.17.5.

**4.2.1.3** Certain substances are chemically unstable. They are accepted for carriage only when the necessary steps have been taken to prevent their dangerous decomposition, transformation or polymerization during carriage. To this end, care shall in particular be taken to ensure that shells do not contain any substances liable to promote these reactions.

**4.2.1.4** The temperature of the outer surface of the shell excluding openings and their closures or of the thermal insulation shall not exceed 70 °C during carriage. When necessary, the shell shall be thermally insulated.

**4.2.1.5** Empty portable tanks not cleaned and not gas-free shall comply with the same provisions as portable tanks filled with the previous substance.

**4.2.1.6** Substances shall not be carried in the same or in adjoining compartments of shells when they may react dangerously with each other (see definition for "dangerous reaction" in 1.2.1).

**4.2.1.7** The design approval certificate, the test report and the certificate showing the results of the initial inspection and test for each portable tank issued by the competent authority or its authorized body shall be retained by the authority or body and the owner. Owners shall be able to provide this documentation upon the request of any competent authority.

**4.2.1.8** Unless the name of the substance(s) being carried appears on the metal plate described in 6.7.2.20.2 a copy of the certificate specified in 6.7.2.18.1 shall be made available upon the request of a competent authority or its authorized body and readily provided by the consignor, consignee or agent, as appropriate.

### 4.2.1.9 Degree of filling

**4.2.1.9.1** Prior to filling, the filler shall ensure that the appropriate portable tank is used and that the portable tank is not filled with substances which in contact with the materials of the shell, gaskets, service equipment and any protective linings, are likely to react dangerously with them to form dangerous products or appreciably weaken these materials. The consignor may need to consult the manufacturer of the substance in conjunction with the competent authority for guidance on the compatibility of the substance with the portable tank materials.

**4.2.1.9.1.1** Portable tanks shall not be filled above the extent provided in 4.2.1.9.2 to 4.2.1.9.6. The applicability of 4.2.1.9.2, 4.2.1.9.3 or 4.2.1.9.5.1 to individual substances is specified in the applicable portable tank instruction or special provisions in 4.2.5.2.6 or 4.2.5.3 and Column (10) or (11) of Table A of Chapter 3.2.

**4.2.1.9.2** The maximum degree of filling (in %) for general use is determined by the formula:

$$\text{Degree of filling} = \frac{97}{1 + \alpha (t_r - t_f)}.$$

**4.2.1.9.3** The maximum degree of filling (in %) for liquids of Class 6.1 and Class 8, in packing groups I and II, and liquids with an absolute vapour pressure of more than 175 kPa (1.75 bar) at 65 °C, is determined by the formula:

$$\text{Degree of filling} = \frac{95}{1 + \alpha (t_r - t_f)}.$$

**4.2.1.9.4** In these formulae,  $\alpha$  is the mean coefficient of cubical expansion of the liquid between the mean temperature of the liquid during filling ( $t_f$ ) and the maximum mean bulk temperature during carriage ( $t_r$ ) (both in °C). For liquids carried under ambient conditions  $\alpha$  could be calculated by the formula:

$$\alpha = \frac{d_{15} - d_{50}}{35 d_{50}}$$

in which  $d_{15}$  and  $d_{50}$  are the densities of the liquid at 15 °C and 50 °C, respectively.

**4.2.1.9.4.1** The maximum mean bulk temperature ( $t_r$ ) shall be taken as 50 °C except that, for journeys under temperate or extreme climatic conditions, the competent authorities concerned may agree to a lower or require a higher temperature, as appropriate.

**4.2.1.9.5** The provisions of 4.2.1.9.2 to 4.2.1.9.4.1 do not apply to portable tanks which contain substances maintained at a temperature above 50 °C during carriage (e.g. by means of a heating device). For portable tanks equipped with a heating device, a temperature regulator shall be used to ensure the maximum degree of filling is not more than 95% full at any time during carriage.

**4.2.1.9.5.1** The maximum degree of filling (in %) for solids carried above their melting points and for elevated temperature liquids shall be determined by the following formula:

$$\text{Degree of filling} = 95 \frac{d_r}{d_f}$$

in which  $d_r$  and  $d_f$  are the densities of the liquid at the mean temperature of the liquid during filling and the maximum mean bulk temperature during carriage respectively.

**4.2.1.9.6** Portable tanks shall not be offered for carriage:

- (a) With a degree of filling, for liquids having a viscosity less than 2 680 mm<sup>2</sup>/s at 20 °C or maximum temperature of the substance during carriage in the case of the heated substance, of more than 20% but less than 80% unless the shells of portable tanks are divided, by partitions or surge plates, into sections of not more than 7 500 litres capacity;
- (b) With residue of substances previously carried adhering to the outside of the shell or service equipment;
- (c) When leaking or damaged to such an extent that the integrity of the portable tank or its lifting or securing arrangements may be affected; and
- (d) Unless the service equipment has been examined and found to be in good working order.

**4.2.1.9.7** Forklift pockets of portable tanks shall be closed off when the tank is filled. This provision does not apply to portable tanks which according to 6.7.2.17.4 need not be provided with a means of closing off the forklift pockets.

**4.2.1.10 Additional provisions applicable to the carriage of Class 3 substances in portable tanks**

**4.2.1.10.1** All portable tanks intended for the carriage of flammable liquids shall be closed and be fitted with relief devices in accordance with 6.7.2.8 to 6.7.2.15.

**4.2.1.10.1.1** For portable tanks intended for use only on land, open venting systems may be used if allowed according to Chapter 4.3.

**4.2.1.11 Additional provisions applicable to the carriage of Classes 4.1, 4.2 or 4.3 substances (other than Class 4.1 self-reactive substances) in portable tanks**

(Reserved)

NOTE: For Class 4.1 self-reactive substances, see 4.2.1.13.1.

**4.2.1.12 Additional provisions applicable to the carriage of Class 5.1 substances in portable tanks**

(Reserved)

**4.2.1.13 Additional provisions applicable to the carriage of Class 5.2 substances and Class 4.1 self-reactive substances in portable tanks**

**4.2.1.13.1** Each substance shall have been tested and a report submitted to the competent authority of the country of origin for approval. Notification thereof shall be sent to the competent authority of the country of destination. The notification shall contain relevant transport information and the report with test results. The tests undertaken shall include those necessary:

- (a) To prove the compatibility of all materials normally in contact with the substance during carriage;
- (b) To provide data for the design of the pressure and emergency relief devices taking into account the design characteristics of the portable tank.

Any additional provision necessary for safe carriage of the substance shall be clearly described in the report.

**4.2.1.13.2** The following provisions apply to portable tanks intended for the carriage of Type F organic peroxides or Type F self-reactive substances with a Self-Accelerating Decomposition Temperature (SADT) of 55 °C or more. In case of conflict these provisions prevail over those specified in Section 6.7.2. Emergencies to be taken into account are self-accelerating decomposition of the substance and fire-engulfment as described in 4.2.1.13.8.

**4.2.1.13.3** The additional provisions for carriage of organic peroxides or self-reactive substances with a SADT less than 55 °C in portable tanks shall be specified by the competent authority of the country of origin. Notification thereof shall be sent to the competent authority of the country of destination.

**4.2.1.13.4** The portable tank shall be designed for a test pressure of at least 0.4 MPa (4 bar).

**4.2.1.13.5** Portable tanks shall be fitted with temperature sensing devices.

**4.2.1.13.6** Portable tanks shall be fitted with pressure-relief devices and emergency-relief devices. Vacuum-relief devices may also be used. Pressure-relief devices shall operate at pressures determined according to both the properties of the substance and the construction characteristics of the portable tank. Fusible elements are not allowed in the shell.

**4.2.1.13.7** The pressure-relief devices shall consist of spring-loaded valves fitted to prevent significant build-up within the portable tank of the decomposition products and vapours released at a temperature of 50 °C. The capacity and start-to-discharge pressure of the relief valves shall be based on the results of the tests specified in 4.2.1.13.1. The start-to-discharge pressure shall, however, in no case be such that liquid would escape from the valve(s) if the portable tank were overturned.

**4.2.1.13.8** The emergency-relief devices may be of the spring-loaded or frangible types, or a combination of the two, designed to vent all the decomposition products and vapours evolved during a period of not less than one hour of complete fire-engulfment as calculated by the following formula:

$$q = 70961 \cdot F \cdot A^{0.82}$$

where:

q = heat absorption [W]

A = wetted area [m<sup>2</sup>]

F = insulation factor

F = 1 for non-insulated shells, or

$$F = \frac{U(923 - T)}{47032} \text{ for insulated shells}$$

where:

K = heat conductivity of insulation layer [W·m<sup>-1</sup>·K<sup>-1</sup>]

L = thickness of insulation layer [m]

U = K/L = heat transfer coefficient of the insulation [W·m<sup>-2</sup>·K<sup>-1</sup>]

T = temperature of the substance at relieving conditions [K]

The start-to-discharge pressure of the emergency-relief device(s) shall be higher than that specified in 4.2.1.13.7 and based on the results of the tests referred to in 4.2.1.13.1. The emergency-relief devices shall be dimensioned in such a way that the maximum pressure in the portable tank never exceeds the test pressure of the tank.

**NOTE:** An example of a method to determine the size of emergency-relief devices is given in Appendix 5 of the "Manual of Tests and Criteria".

**4.2.1.13.9** For insulated portable tanks the capacity and setting of emergency-relief device(s) shall be determined assuming a loss of insulation from 1% of the surface area.

4.2.1.13.10 Vacuum-relief devices and spring-loaded valves shall be provided with flame arresters. Due attention shall be paid to the reduction of the relief capacity caused by the flame arrester.

4.2.1.13.11 Service equipment such as valves and external piping shall be so arranged that no substance remains in them after filling the portable tank.

4.2.1.13.12 Portable tanks may be either insulated or protected by a sun-shield. If the SADT of the substance in the portable tank is 55 °C or less, or the portable tank is constructed of aluminium, the portable tank shall be completely insulated. The outer surface shall be finished in white or bright metal.

4.2.1.13.13 The degree of filling shall not exceed 90% at 15 °C.

4.2.1.13.14 The mark as required in 6.7.2.20.2 shall include the UN number and the technical name with the approved concentration of the substance concerned.

4.2.1.13.15 Organic peroxides and self-reactive substances specifically listed in portable tank instruction T23 in 4.2.5.2.6 may be carried in portable tanks.

4.2.1.14 **Additional provisions applicable to the carriage of Class 6.1 substances in portable tanks**  
(Reserved)

4.2.1.15 **Additional provisions applicable to the carriage of Class 6.2 substances in portable tanks**  
(Reserved)

4.2.1.16 **Additional provisions applicable to the carriage of Class 7 substances in portable tanks**

4.2.1.16.1 Portable tanks used for the carriage of radioactive material shall not be used for the carriage of other goods.

4.2.1.16.2 The degree of filling for portable tanks shall not exceed 90% or, alternatively, any other value approved by the competent authority.

4.2.1.17 **Additional provisions applicable to the carriage of Class 8 substances in portable tanks**

4.2.1.17.1 Pressure-relief devices of portable tanks used for the carriage of Class 8 substances shall be inspected at intervals not exceeding one year.

4.2.1.18 **Additional provisions applicable to the carriage of Class 9 substances in portable tanks**  
(Reserved)

4.2.1.19 **Additional provisions applicable to the carriage of solid substances carried above their melting point**

4.2.1.19.1 Solid substances carried or offered for carriage above their melting point which are not assigned a portable tank instruction in column (10) of the Table A of Chapter 3.2 or when the assigned portable tank instruction does not apply to carriage at temperatures above their melting point may be carried in portable tanks provided that the solid substances are classified in classes 4.1, 4.2, 4.3, 5.1, 6.1, 8 or 9 and have no subsidiary risk other than that of Class 6.1 or Class 8 and are in packing group II or III.

4.2.1.19.2 Unless otherwise indicated in Table A of Chapter 3.2, portable tanks used for the carriage of these solid substances above their melting point shall conform to the provisions of portable tank instruction T4 for solid substances of packing group III or T7 for solid substances of packing group II. A portable tank which affords an equivalent or greater level of safety may be selected according to 4.2.5.2.5. The maximum degree of filling (in %) shall be determined according to 4.2.1.9.5 (TP3).

4.2.2 **General provisions for the use of portable tanks for the carriage of non-refrigerated liquefied gases and chemicals under pressure**

4.2.2.1 This section provides general provisions applicable to the use of portable tanks for the carriage of non-refrigerated liquefied gases and chemicals under pressure.

4.2.2.2 Portable tanks shall conform to the design, construction, inspection and testing requirements detailed in 6.7.3. Non-refrigerated liquefied gases and chemicals under pressure shall be carried in portable tanks conforming to portable tank instruction T50 as described in 4.2.5.2.6 and any portable tank special provisions assigned to specific non-refrigerated liquefied gases in Column (11) of Table A of Chapter 3.2 and described in 4.2.5.3.

**4.2.2.3** During carriage, portable tanks shall be adequately protected against damage to the shell and service equipment resulting from lateral and longitudinal impact and overturning. If the shell and service equipment are so constructed as to withstand impact or overturning it need not be protected in this way. Examples of such protection are given in 6.7.3.13.5.

**4.2.2.4** Certain non-refrigerated liquefied gases are chemically unstable. They are accepted for carriage only when the necessary steps have been taken to prevent their dangerous decomposition, transformation or polymerization during carriage. To this end, care shall in particular be taken to ensure that portable tanks do not contain any non-refrigerated liquefied gases liable to promote these reactions.

**4.2.2.5** Unless the name of the gas(es) being carried appears on the metal plate described in 6.7.3.16.2, a copy of the certificate specified in 6.7.3.14.1 shall be made available upon a competent authority request and readily provided by the consignor, consignee or agent, as appropriate.

**4.2.2.6** Empty portable tanks not cleaned and not gas-free shall comply with the same provisions as portable tanks filled with the previous non-refrigerated liquefied gas.

**4.2.2.7** **Filling**

**4.2.2.7.1** Prior to filling the portable tank shall be inspected to ensure that it is authorized for the non-refrigerated liquefied gas or the propellant of the chemical under pressure to be carried and that the portable tank is not loaded with non-refrigerated liquefied gases, or with chemicals under pressure which in contact with the materials of the shell, gaskets, service equipment and any protective linings, are likely to react dangerously with them to form dangerous products or appreciably weaken these materials. During filling, the temperature of the non-refrigerated liquefied gas or propellant of chemicals under pressure shall fall within the limits of the design temperature range.

**4.2.2.7.2** The maximum mass of non-refrigerated liquefied gas per litre of shell capacity (kg/l) shall not exceed the density of the non-refrigerated liquefied gas at 50 °C multiplied by 0.95. Furthermore, the shell shall not be liquid-full at 60 °C.

**4.2.2.7.3** Portable tanks shall not be filled above their maximum permissible gross mass and the maximum permissible load mass specified for each gas to be carried.

**4.2.2.8** Portable tanks shall not be offered for carriage:

- (a) in an ullage condition liable to produce an unacceptable hydraulic force due to surge within the shell;
- (b) When leaking;
- (c) When damaged to such an extent that the integrity of the tank or its lifting or securing arrangements may be affected; and
- (d) Unless the service equipment has been examined and found to be in good working order.

**4.2.2.9** Forklift pockets of portable tanks shall be closed off when the tank is filled. This provision does not apply to portable tanks which according to 6.7.3.13.4 need not be provided with a means of closing off the forklift pockets.

**4.2.3** **General provisions for the use of portable tanks for the carriage of refrigerated liquefied gases**

**4.2.3.1** This section provides general provisions applicable to the use of portable tanks for the carriage of refrigerated liquefied gases.

**4.2.3.2** Portable tanks shall conform to the design, construction, inspection and testing requirements detailed in 6.7.4. Refrigerated liquefied gases shall be carried in portable tanks conforming to portable tank instruction T75 as described in 4.2.5.2.6 and the portable tank special provisions assigned to each substance in Column (11) of Table A of Chapter 3.2 and described in 4.2.5.3.

**4.2.3.3** During carriage, portable tanks shall be adequately protected against damage to the shell and service equipment resulting from lateral and longitudinal impact and overturning. If the shell and service equipment are so constructed as to withstand impact or overturning it need not be protected in this way. Examples of such protection are provided in 6.7.4.12.5.

**4.2.3.4** Unless the name of the gas(es) being carried appears on the metal plate described in 6.7.4.15.2, a copy of the certificate specified in 6.7.4.13.1 shall be made available upon a competent authority request and readily provided by the consignor, consignee or agent, as appropriate.

**4.2.3.5** Empty portable tanks not cleaned and not gas-free shall comply with the same provisions as portable tanks filled with the previous substance.

**4.2.3.6 Filling**

**4.2.3.6.1** Prior to filling the portable tank shall be inspected to ensure that it is authorized for the refrigerated liquefied gas to be carried and that the portable tank is not loaded with refrigerated liquefied gases which in contact with the materials of the shell, gaskets, service equipment and any protective linings, are likely to react dangerously with them to form dangerous products or appreciably weaken these materials. During filling, the temperature of the refrigerated liquefied gas shall be within the limits of the design temperature range.

**4.2.3.6.2** In estimating the initial degree of filling the necessary holding time for the intended journey including any delays which might be encountered shall be taken into consideration. The initial degree of filling of the shell, except as provided for in 4.2.3.6.3 and 4.2.3.6.4, shall be such that if the contents, except helium, were to be raised to a temperature at which the vapour pressure is equal to the maximum allowable working pressure (MAWP) the volume occupied by liquid would not exceed 98%.

**4.2.3.6.3** Shells intended for the carriage of helium can be filled up to but not above the inlet of the pressure-relief device.

**4.2.3.6.4** A higher initial degree of filling may be allowed, subject to approval by the competent authority, when the intended duration of carriage is considerably shorter than the holding time.

**4.2.3.7 Actual holding time**

**4.2.3.7.1** The actual holding time shall be calculated for each journey in accordance with a procedure recognized by the competent authority, on the basis of the following:

- (a) The reference holding time for the refrigerated liquefied gas to be carried (see 6.7.4.2.8.1) (as indicated on the plate referred to in 6.7.4.15.1);
- (b) The actual filling density;
- (c) The actual filling pressure;
- (d) The lowest set pressure of the pressure limiting device(s).

**4.2.3.7.2** The actual holding time shall be marked either on the portable tank itself or on a metal plate firmly secured to the portable tank, in accordance with 6.7.4.15.2.

**4.2.3.8** Portable tanks shall not be offered for carriage:

- (a) In an ullage condition liable to produce an unacceptable hydraulic force due to surge within the shell;
- (b) When leaking;
- (c) When damaged to such an extent that the integrity of the portable tank or its lifting or securing arrangements may be affected;
- (d) Unless the service equipment has been examined and found to be in good working order;
- (e) Unless the actual holding time for the refrigerated liquefied gas being carried has been determined in accordance with 4.2.3.7 and the portable tank is marked in accordance with 6.7.4.15.2; and
- (f) Unless the duration of carriage, after taking into consideration any delays which might be encountered, does not exceed the actual holding time.

**4.2.3.9** Forklift pockets of portable tanks shall be closed off when the tank is filled. This provision does not apply to portable tanks which according to 6.7.4.12.4, need not be provided with a means of closing off the forklift pockets.

**4.2.4 General provisions for the use of UN multiple-element gas containers (MEGCs)**

**4.2.4.1** This section provides general requirements applicable to the use of multiple-element gas containers (MEGCs) for the carriage of non-refrigerated gases referred to in 6.7.5.

**4.2.4.2** MEGCs shall conform to the design, construction, inspection and testing requirements detailed in 6.7.5. The elements of MEGCs shall be periodically inspected according to the provisions set out in packing instruction P200 of 4.1.4.1 and in 6.2.1.6.

**4.2.4.3** During carriage, MEGCs shall be protected against damage to the elements and service equipment resulting from lateral and longitudinal impact and overturning. If the elements and service equipment are so constructed as to withstand impact or overturning, they need not be protected in this way. Examples of such protection are given in 6.7.5.10.4.

**4.2.4.4** The periodic testing and inspection requirements for MEGCs are specified in 6.7.5.12. MEGCs or their elements shall not be charged or filled after they become due for periodic inspection but may be carried after the expiry of the time limit.

**4.2.4.5 Filling**

**4.2.4.5.1** Prior to filling, the MEGC shall be inspected to ensure that it is authorized for the gas to be carried and that the applicable provisions of RID have been met.

**4.2.4.5.2** Elements of MEGCs shall be filled according to the working pressures, filling ratios and filling provisions specified in packing instruction P200 of 4.1.4.1 for the specific gas being filled into each element. In no case shall an MEGC or group of elements be filled as a unit in excess of the lowest working pressure of any given element.

**4.2.4.5.3** MEGCs shall not be filled above their maximum permissible gross mass.

**4.2.4.5.4** Isolation valves shall be closed after filling and remain closed during carriage. Toxic gases (gases of groups T, TF, TC, TO, TFC and TOC) shall only be carried in MEGCs where each element is equipped with an isolation valve.

**4.2.4.5.5** The opening(s) for filling shall be closed by caps or plugs. The leakproofness of the closures and equipment shall be verified by the filler after filling.

**4.2.4.5.6** MEGCs shall not be offered for filling:

- (a) when damaged to such an extent that the integrity of the pressure receptacles or its structural or service equipment may be affected;
- (b) unless the pressure receptacles and its structural and service equipment has been examined and found to be in good working order; and
- (c) unless the required certification, retest, and filling marks are legible.

**4.2.4.6** Charged MEGCs shall not be offered for carriage;

- (a) when leaking;
- (b) when damaged to such an extent that the integrity of the pressure receptacles or its structural or service equipment may be affected;
- (c) unless the pressure receptacles and its structural and service equipment have been examined and found to be in good working order; and
- (d) unless the required certification, retest, and filling marks are legible.

**4.2.4.7** Empty MEGCs that have not been cleaned and purged shall comply with the same requirements as MEGCs filled with the previous substance.

**4.2.5 Portable tank instructions and special provisions****4.2.5.1 General**

**4.2.5.1.1** This section includes the portable tank instructions and special provisions applicable to dangerous goods authorized to be carried in portable tanks. Each portable tank instruction is identified by an alpha-numeric code (e.g. T1). Column (10) of Table A of Chapter 3.2 indicates the portable tank instruction that shall be used for each substance permitted for carriage in a portable tank. When no portable tank instruction appears in Column (10) for a specific dangerous goods entry then carriage of the substance in portable tanks is not permitted unless a competent authority approval is granted as detailed in 6.7.1.3. Portable tank special provisions are assigned to specific dangerous goods in Column (11) of Table A of Chapter 3.2. Each portable tank special provision is identified by an alpha-numeric code (e.g. TP1). A listing of the portable tank special provisions is provided in 4.2.5.3.

**NOTE:** The gases authorized for carriage in MEGCs are indicated with the letter "(M)" in Column (10) of Table A of Chapter 3.2.

**4.2.5.2 Portable tank instructions**

**4.2.5.2.1** Portable tank instructions apply to dangerous goods of Classes 1 to 9. Portable tank instructions provide specific information relevant to portable tanks provisions applicable to specific substances. These provisions shall be met in addition to the general provisions in this Chapter and the general requirements in Chapter 6.7.

**4.2.5.2.2** For substances of Classes 1 and 3 to 9, the portable tank instructions indicate the applicable minimum test pressure, the minimum shell thickness (in reference steel), bottom opening requirements and pressure relief requirements. In portable tank instruction T23, self-reactive substances of Class 4.1 and Class 5.2 or organic peroxides permitted to be carried in portable tanks are listed.

**4.2.5.2.3** Non-refrigerated liquefied gases are assigned to portable tank instruction T50. T50 provides the maximum allowable working pressures, the requirements for the openings below liquid level, pressure-relief requirements and maximum filling density requirements for non-refrigerated liquefied gases permitted for carriage in portable tanks.

**4.2.5.2.4** Refrigerated liquefied gases are assigned to portable tank instruction T75.

**4.2.5.2.5** Determination of the appropriate portable tank instructions

When a specific portable tank instruction is specified in Column (10) of Table A of Chapter 3.2 for a specific dangerous goods entry additional portable tanks which possess higher minimum test pressures, greater shell thicknesses, more stringent bottom opening and pressure-relief device arrangements may be used. The following guidelines apply to determining the appropriate portable tanks which may be used for carriage of particular substances:

Portable tank instruction specified	Portable tank instructions also permitted
T 1	T 2, T 3, T 4, T 5, T 6, T 7, T 8, T 9, T 10, T 11, T 12, T 13, T 14, T 15, T 16, T 17, T 18, T 19, T 20, T 21, T 22
T 2	T 4, T 5, T 7, T 8, T 9, T 10, T 11, T 12, T 13, T 14, T 15, T 16, T 17, T 18, T 19, T 20, T 21, T 22
T 3	T 4, T 5, T 6, T 7, T 8, T 9, T 10, T 11, T 12, T 13, T 14, T 15, T 16, T 17, T 18, T 19, T 20, T 21, T 22
T 4	T 5, T 7, T 8, T 9, T 10, T 11, T 12, T 13, T 14, T 15, T 16, T 17, T 18, T 19, T 20, T 21, T 22
T 5	T 10, T 14, T 19, T 20, T 22
T 6	T 7, T 8, T 9, T 10, T 11, T 12, T 13, T 14, T 15, T 16, T 17, T 18, T 19, T 20, T 21, T 22
T 7	T 8, T 9, T 10, T 11, T 12, T 13, T 14, T 15, T 16, T 17, T 18, T 19, T 20, T 21, T 22
T 8	T 9, T 10, T 13, T 14, T 19, T 20, T 21, T 22
T 9	T 10, T 13, T 14, T 19, T 20, T 21, T 22
T 10	T 14, T 19, T 20, T 22
T 11	T 12, T 13, T 14, T 15, T 16, T 17, T 18, T 19, T 20, T 21, T 22
T 12	T 14, T 16, T 18, T 19, T 20, T 22
T 13	T 14, T 19, T 20, T 21, T 22
T 14	T 19, T 20, T 22
T 15	T 16, T 17, T 18, T 19, T 20, T 21, T 22
T 16	T 18, T 19, T 20, T 22
T 17	T 18, T 19, T 20, T 21, T 22
T 18	T 19, T 20, T 22
T 19	T 20, T 22
T 20	T 22
T 21	T 22
T 22	None
T 23	None

#### 4.2.5.2.6 Portable tank instructions

Portable tank instructions specify the requirements applicable to a portable tank when used for the carriage of specific substances. Portable tank instructions T1 to T22 specify the applicable minimum test pressure, the minimum shell thickness (in mm reference steel), and the pressure-relief and bottom-opening requirements.

T 1 – T 22		Portable tank instructions			T 1 – T 22
These portable tank instructions apply to liquid and solid substances of Class 1 and Classes 3 to 9. The general provisions of Section 4.2.1 and the requirements of Section 6.7.2 shall be met.					
Portable tank instruction	Minimum test pressure (bar)	Minimum shell thickness (in mm-reference steel) (see 6.7.2.4)	Pressure-relief requirements (see 6.7.2.8) <sup>(a)</sup>	Bottom opening requirements (see 6.7.2.6) <sup>(b)</sup>	
T 1	1,5	See 6.7.2.4.2	Normal	See 6.7.2.6.2	
T 2	1,5	See 6.7.2.4.2	Normal	See 6.7.2.6.3	
T 3	2,65	See 6.7.2.4.2	Normal	See 6.7.2.6.2	
T 4	2,65	See 6.7.2.4.2	Normal	See 6.7.2.6.3	
T 5	2,65	See 6.7.2.4.2	See 6.7.2.8.3	Not allowed	
T 6	4	See 6.7.2.4.2	Normal	See 6.7.2.6.2	
T 7	4	See 6.7.2.4.2	Normal	See 6.7.2.6.3	
T 8	4	See 6.7.2.4.2	Normal	Not allowed	
T 9	4	6 mm	Normal	Not allowed	
T 10	4	6 mm	See 6.7.2.8.3	Not allowed	
T 11	6	See 6.7.2.4.2	Normal	See 6.7.2.6.3	
T 12	6	See 6.7.2.4.2	See 6.7.2.8.3	See 6.7.2.6.3	
T 13	6	6 mm	Normal	Not allowed	
T 14	6	6 mm	See 6.7.2.8.3	Not allowed	
T 15	10	See 6.7.2.4.2	Normal	See 6.7.2.6.3	
T 16	10	See 6.7.2.4.2	See 6.7.2.8.3	See 6.7.2.6.3	
T 17	10	6 mm	Normal	See 6.7.2.6.3	
T 18	10	6 mm	See 6.7.2.8.3	See 6.7.2.6.3	
T 19	10	6 mm	See 6.7.2.8.3	Not allowed	
T 20	10	8 mm	See 6.7.2.8.3	Not allowed	
T 21	10	10 mm	Normal	Not allowed	
T 22	10	10 mm	See 6.7.2.8.3	Not allowed	

(a) When the word "Normal" is indicated, all the requirements of 6.7.2.8 apply except for 6.7.2.8.3.

(b) When this column indicates "Not allowed", bottom openings are not permitted when the substance to be carried is a liquid (see 6.7.2.6.1). When the substance to be carried is a solid at all temperatures encountered under normal conditions of carriage, bottom openings conforming to the requirements of 6.7.2.6.2 are authorized.

T 23 Portable tank instructions T 23						
This portable tank instruction applies to self-reactive substances of Class 4.1 and organic peroxides of Class 5.2. The general provisions of Section 4.2.1 and the requirements of Section 6.7.2 shall be met. The additional provisions specific to self-reactive substances of Class 4.1 and organic peroxides of Class 5.2 in 4.2.1.13 shall also be met.						
UN No.	Substance	Minimum test pressure (bar)	Minimum shell thickness (mm-reference steel)	Bottom opening requirements	Pressure-relief requirements	Degree of filling
3109	ORGANIC PEROXIDE, TYPE F, LIQUID  tert-Butyl hydroperoxide <sup>(a)</sup> , not more than 72% with water  Cumyl hydroperoxide, not more than 90% in diluent type A  Di-tert-butyl peroxide, not more than 32% in diluent type A  Isopropyl cumyl hydroperoxide, not more than 72% in diluent type A  p-Menthyl hydroperoxide, not more than 72% in diluent type A  Pinanyl hydroperoxide, not more than 56% in diluent type A	4	See 6.7.2.4.2	See 6.7.2.6.3	See 6.7.2.8.2, 4.2.1.13.6, 4.2.1.13.7, 4.2.1.13.8	See 4.2.1.13.13
3110	ORGANIC PEROXIDE TYPE F, SOLID  Dicumyl peroxide <sup>(b)</sup>	4	See 6.7.2.4.2	See 6.7.2.6.3	See 6.7.2.8.2, 4.2.1.13.6, 4.2.1.13.7, 4.2.1.13.8	See 4.2.1.13.13
3229	SELF-REACTIVE LIQUID TYPE F	4	See 6.7.2.4.2	See 6.7.2.6.3	See 6.7.2.8.2, 4.2.1.13.6, 4.2.1.13.7, 4.2.1.13.8	See 4.2.1.13.13
3230	SELF-REACTIVE SOLID TYPE F	4	See 6.7.2.4.2	See 6.7.2.6.3	See 6.7.2.8.2, 4.2.1.13.6, 4.2.1.13.7, 4.2.1.13.8	See 4.2.1.13.13

(a) Provided that steps have been taken to achieve the safety equivalence of 65% tert-Butyl hydroperoxide and 35% water.

(b) Maximum quantity per portable tank: 2000 kg.

Portable tank instructions					
T 50	Portable tank instructions				T 50
This portable tank instruction applies to non-refrigerated liquefied gases and chemicals under pressure (UN Nos. 3500, 3501, 3502, 3503, 3504 and 3505). The general provisions of Section 4.2.2 and the requirements of Section 6.7.3 shall be met.					
UN No.	Non-refrigerated liquefied gases	Max. allowable working pressure (bar) Small; Bare; Sun-shield; Insulated <sup>(a)</sup>	Openings below liquid level	Pressure-relief requirements (see 6.7.3.7) <sup>(b)</sup>	Maximum filling ratio
1005	AMMONIA, ANHYDROUS	29,0 25,7 22,0 19,7	Allowed	See 6.7.3.7.3	0,53
1009	BROMOTRIFLUOROMETHANE (REFRIGERANT GAS R 13B1)	38,0 34,0 30,0 27,5	Allowed	Normal	1,13
1010	BUTADIENES, STABILIZED	7,5 7,0 7,0 7,0	Allowed	Normal	0,55
1010	BUTADIENES AND HYDROCARBON MIXTURE, STABILIZED	See MAWP definition in 6.7.3.1	Allowed	Normal	see 4.2.2.7
1011	BUTAN	7,0 7,0 7,0 7,0	Allowed	Normal	0,51
1012	BUTYLENE	8,0 7,0 7,0 7,0	Allowed	Normal	0,53
1017	CHLORINE	19,0 17,0 15,0 13,5	Not Allowed	See 6.7.3.7.3	1,25
1018	CHLORODIFLUOROMETHANE (REFRIGERANT GAS R 22)	26,0 24,0 21,0 19,0	Allowed	Normal	1,03
1020	CHLOROPENTAFLUOROETHANE (REFRIGERANT GAS R 115)	23,0 20,0 18,0 16,0	Allowed	Normal	1,06
1021	1-CHLORO-1,2,2,2-TETRAFLUOROETHANE (REFRIGERANT GAS R 124)	10,3 9,8 7,9 7,0	Allowed	Normal	1,20
1027	CYCLOPROPANE	18,0 16,0 14,5 13,0	Allowed	Normal	0,53
1028	DICHLORODIFLUOROMETHANE (REFRIGERANT GAS R 12)	16,0 15,0 13,0 11,5	Allowed	Normal	1,15
1029	DICHLOROFLUOROMETHANE (REFRIGERANT GAS R 21)	7,0 7,0 7,0 7,0	Allowed	Normal	1,23

UN No.	Non-refrigerated liquefied gases	Max. allowable working pressure (bar) Small; Bare; Sun-shield; Insulated <sup>(a)</sup>	Openings below liquid level	Pressure-relief requirements (see 6.7.3.7) <sup>(b)</sup>	Maximum filling ratio
1030	1,1-DIFLUOROETHANE (REFRIGERANT GAS R 152A)	16,0 14,0 12,4 11,0	Allowed	Normal	0,79
1032	DIMETHYLAMINE, ANHYDROUS	7,0 7,0 7,0 7,0	Allowed	Normal	0,59
1033	DIMETHYL ETHER	15,5 13,8 12,0 10,6	Allowed	Normal	0,58
1036	ETHYLAMINE	7,0 7,0 7,0 7,0	Allowed	Normal	0,61
1037	ETHYL CHLORIDE	7,0 7,0 7,0 7,0	Allowed	Normal	0,8
1040	ETHYLENE OXIDE WITH NITROGEN up to a total pressure of 1MPa (10 bar) at 50 °C	— — — 10,0	Not Allowed	See 6.7.3.7.3	0,78
1041	ETHYLENE OXIDE AND CARBON DIOXIDE MIXTURE with more than 9% but not more than 87% ethylene oxide	See MAWP definition in 6.7.3.1	Allowed	Normal	See 4.2.2.7
1055	ISOBUTYLENE	8,1 7,0 7,0 7,0	Allowed	Normal	0,52
1060	METHYLLACETYLENE AND PROPADIENE MIXTURE, STABILIZED	28,0 24,5 22,0 20,0	Allowed	Normal	0,43
1061	METHYLAMINE, ANHYDROUS	10,8 9,6 7,8 7,0	Allowed	Normal	0,58
1062	METHYL BROMIDE with not more than 2% chloropicrin	7,0 7,0 7,0 7,0	Not Allowed	See 6.7.3.7.3	1,51
1063	METHYL CHLORIDE (REFRIGERANT GAS R 40)	14,5 12,7 11,3 10,0	Allowed	Normal	0,81
1064	METHYL MERCAPTAN	7,0 7,0 7,0 7,0	Not Allowed	See 6.7.3.7.3	0,78
1067	DINITROGEN TETROXIDE	7,0 7,0 7,0 7,0	Not Allowed	See 6.7.3.7.3	1,30

UN No.	Non-refrigerated liquefied gases	Max. allowable working pressure (bar) Small; Bare; Sun-shield; Insulated <sup>(a)</sup>	Openings below liquid level	Pressure-relief requirements (see 6.7.3.7) <sup>(b)</sup>	Maximum filling ratio
1075	PETROLEUM GASES, LIQUEFIED	See MAWP definition in 6.7.3.1	Allowed	Normal	See 4.2.2.7
1077	PROPYLENE	28,0 24,5 22,0 20,0	Allowed	Normal	0,43
1078	REFRIGERANT GAS, N.O.S.	See MAWP definition in 6.7.3.1	Allowed	Normal	See 4.2.2.7
1079	SULPHUR DIOXIDE	11,6 10,3 8,5 7,6	Not Allowed	See 6.7.3.7.3	1,23
1082	TRIFLUOROCHLOROETHYLENE, STABILIZED (REFRIGERANT GAS R 1113)	17,0 15,0 13,1 11,6	Not Allowed	See 6.7.3.7.3	1,13
1083	TRIMETHYLAMINE, ANHYDROUS	7,0 7,0 7,0 7,0	Allowed	Normal	0,56
1085	VINYL BROMIDE, STABILIZED	7,0 7,0 7,0 7,0	Allowed	Normal	1,37
1086	VINYL CHLORIDE, STABILIZED	10,6 9,3 8,0 7,0	Allowed	Normal	0,81
1087	VINYL METHYL ETHER, STABILIZED	7,0 7,0 7,0 7,0	Allowed	Normal	0,67
1581	CHLOROPICRIN AND METHYL BROMIDE MIXTURE with more than 2% chloropicrin	7,0 7,0 7,0 7,0	Not Allowed	See 6.7.3.7.3	1,51
1582	CHLOROPICRIN AND METHYL CHLORIDE MIXTURE	19,2 16,9 15,1 13,1	Not Allowed	See 6.7.3.7.3	0,81
1858	HEXAFLUOROPROPYLENE (REFRIGERANT GAS R 1216)	19,2 16,9 15,1 13,1	Allowed	Normal	1,11
1912	METHYL CHLORIDE AND METHYLENE CHLORIDE MIXTURE	15,2 13,0 11,6 10,1	Allowed	Normal	0,81
1958	1,2-DICHLORO-1,1,2,2-TETRAFLUOROETHANE (REFRIGERANT GAS R 114)	7,0 7,0 7,0 7,0	Allowed	Normal	1,30

UN No.	Non-refrigerated liquefied gases	Max. allowable working pressure (bar) Small; Bare; Sun-shield; Insulated <sup>(a)</sup>	Openings below liquid level	Pressure-relief requirements (see 6.7.3.7) <sup>(b)</sup>	Maximum filling ratio
1965	HYDROCARBON GAS, MIXTURE LIQUEFIED, N.O.S.	See MAWP definition in 6.7.3.1	Allowed	Normal	See 4.2.2.7
1969	ISOBUTANE	8,5 7,5 7,0 7,0	Allowed	Normal	0,49
1973	CHLORODIFLUOROMETHANE AND CHLOROPENTAFLUORO-ETHANE MIXTURE with fixed boiling point, with approximately 49% chlorodifluoromethane (REFRIGERANT GAS R 502)	28,3 25,3 22,8 20,3	Allowed	Normal	1,05
1974	CHLORODIFLUORO-BROMOMETHANE (REFRIGERANT GAS R 12B1)	7,4 7,0 7,0 7,0	Allowed	Normal	1,61
1976	OCTAFLUOROCYCLOBUTANE (REFRIGERANT GAS RC 318)	8,8 7,8 7,0 7,0	Allowed	Normal	1,34
1978	PROPANE	22,5 20,4 18,0 16,5	Allowed	Normal	0,42
1983	1-CHLORO-2,2,2-TRIFLUOROETHANE (REFRIGERANT GAS R 133A)	7,0 7,0 7,0 7,0	Allowed	Normal	1,18
2035	1,1,1-TRIFLUOROETHANE (REFRIGERANT GAS R 143A)	31,0 27,5 24,2 21,8	Allowed	Normal	0,76
2424	OCTAFLUOROPROPANE (REFRIGERANT GAS R 218)	23,1 20,8 18,6 16,6	Allowed	Normal	1,07
2517	1-CHLORO-1,1-DIFLUOROETHANE (REFRIGERANT GAS R 142B)	8,9 7,8 7,0 7,0	Allowed	Normal	0,99
2602	DICHLORODIFLUOROMETHANE AND 1,1-DIFLUOROETHANE AZEOTROPIC MIXTURE with approximately 74% dichlorodifluoromethane (REFRIGERANT GAS R 500)	20,0 18,0 16,0 14,5	Allowed	Normal	1,01
3057	TRIFLUOROACETYL CHLORIDE	14,6 12,9 11,3 9,9	Not Allowed	See 6.7.3.7.3	1,17
3070	ETHYLENE OXIDE AND DICHLORODIFLUOROMETHANE MIXTURE with not more than 12,5% ethylene oxide	14,0 12,0 11,0 9,0	Allowed	See 6.7.3.7.3	1,09

UN No.	Non-refrigerated liquefied gases	Max. allowable working pressure (bar) Small; Bare; Sun-shield; Insulated <sup>(a)</sup>	Openings below liquid level	Pressure-relief requirements (see 6.7.3.7) <sup>(b)</sup>	Maximum filling ratio
3153	PERFLUORO (METHYL VINYL ETHER)	14,3 13,4 11,2 10,2	Allowed	Normal	1,14
3159	1,1,1,2-TETRAFLUOROETHANE (REFRIGERANT GAS R 134A)	17,7 15,7 13,8 12,1	Allowed	Normal	1,04
3161	LIQUEFIED GAS, FLAMMABLE, N.O.S.	See MAWP definition in 6.7.3.1	Allowed	Normal	See 4.2.2.7
3163	LIQUEFIED GAS, N.O.S.	See MAWP definition in 6.7.3.1	Allowed	Normal	See 4.2.2.7
3220	PENTAFLUOROETHANE (REFRIGERANT GAS R 125)	34,4 30,8 27,5 24,5	Allowed	Normal	0,87
3252	DIFLUOROMETHANE (REFRIGERANT GAS R 32)	43,0 39,0 34,4 30,5	Allowed	Normal	0,78
3296	HEPTAFLUOROPROPANE (REFRIGERANT GAS R 227)	16,0 14,0 12,5 11,0	Allowed	Normal	1,20
3297	ETHYLENE OXIDE AND CHLOROTETRAFLUOROETHANE MIXTURE, with not more than 8.8% ethylene oxide	8,1 7,0 7,0 7,0	Allowed	Normal	1,16
3298	ETHYLENE OXIDE AND PENTAFLUOROETHANE MIXTURE, with not more than 7.9% ethylene oxide	25,9 23,4 20,9 18,6	Allowed	Normal	1,02
3299	ETHYLENE OXIDE AND TETRAFLUOROETHANE MIXTURE, with not more than 5.6% ethylene oxide	16,7 14,7 12,9 11,2	Allowed	Normal	1,03
3318	AMMONIA SOLUTION, relative density less than 0.880 at 15 °C in water, with more than 50% ammonia	See MAWP definition in 6.7.3.1	Allowed	See 6.7.3.7.3	See 4.2.2.7
3337	REFRIGERANT GAS R 404A	31,6 28,3 25,3 22,5	Allowed	Normal	0,84
3338	REFRIGERANT GAS R 407A	31,3 28,1 25,1 22,4	Allowed	Normal	0,95
3339	REFRIGERANT GAS R 407B	33,0 29,6 26,5 23,6	Allowed	Normal	0,95

UN No.	Non-refrigerated liquefied gases	Max. allowable working pressure (bar) Small; Bare; Sunshield; Insulated <sup>(a)</sup>	Openings below liquid level	Pressure-relief requirements (see 6.7.3.7) <sup>(b)</sup>	Maximum filling ratio
3340	REFRIGERANT GAS R 407C	29,9 26,8 23,9 21,3	Allowed	Normal	0,95
3500	CHEMICAL UNDER PRESSURE, N.O.S.	See MAWP definition in 6.7.3.1	Allowed	See 6.7.3.7.3	TP 4 <sup>(c)</sup>
3501	CHEMICAL UNDER PRESSURE, FLAMMABLE, N.O.S.	See MAWP definition in 6.7.3.1	Allowed	See 6.7.3.7.3	TP 4 <sup>(c)</sup>
3502	CHEMICAL UNDER PRESSURE, TOXIC, N.O.S.	See MAWP definition in 6.7.3.1	Allowed	See 6.7.3.7.3	TP 4 <sup>(c)</sup>
3503	CHEMICAL UNDER PRESSURE, CORROSIVE, N.O.S.	See MAWP definition in 6.7.3.1	Allowed	See 6.7.3.7.3	TP 4 <sup>(c)</sup>
3504	CHEMICAL UNDER PRESSURE, FLAMMABLE, TOXIC, N.O.S.	See MAWP definition in 6.7.3.1	Allowed	See 6.7.3.7.3	TP 4 <sup>(c)</sup>
3505	CHEMICAL UNDER PRESSURE, FLAMMABLE, CORROSIVE, N.O.S.	See MAWP definition in 6.7.3.1	Allowed	See 6.7.3.7.3	TP 4 <sup>(c)</sup>

(a) "Small" means tanks having a shell with a diameter of 1.5 m or less; "Bare" means tanks having a shell with a diameter of more than 1.5 m without insulation or sun shield (see 6.7.3.2.12); "Sunshield" means tanks having a shell with a diameter of more than 1.5 m with sun shield (see 6.7.3.2.12); "Insulated" means tanks having a shell with a diameter of more than 1.5 m with insulation (see 6.7.3.2.12); (see definition of "Design reference temperature" in 6.7.3.1).

(b) The word "Normal" in the pressure relief requirements column indicates that a frangible disc as specified in 6.7.3.7.3 is not required.

(c) For UN Nos. 3500, 3501, 3502, 3503, 3504 and 3505, the degree of filling shall be considered instead of the maximum filling ratio.

T 75	Portable tank instruction	T 75
This portable tank instruction applies to refrigerated liquefied gases. The general provisions of Section 4.2.3 and the requirements of Section 6.7.4 shall be met.		

#### 4.2.5.3 Portable tank special provisions

Portable tank special provisions are assigned to certain substances to indicate provisions which are in addition to or in lieu of those provided by the portable tank instructions or the requirements in Chapter 6.7. Portable tank special provisions are identified by an alpha numeric code beginning with the letters "TP" (tank provision) and are assigned to specific substances in Column (11) of Table A of Chapter 3.2. The following is a list of the portable tank special provisions:

TP 1 The degree of filling prescribed in 4.2.1.9.2 shall not be exceeded.

$$\text{Degree of filling} = \frac{97}{1 + \alpha(t_r - t_f)}$$

TP 2 The degree of filling prescribed in 4.2.1.9.3 shall not be exceeded.

$$\text{Degree of filling} = \frac{95}{1 + \alpha(t_r - t_f)}$$

**TP 3** The maximum degree of filling (in %) for solids carried above their melting point and for elevated temperature liquids shall be determined in accordance with 4.2.1.9.5.

**TP 4** The degree of filling shall not exceed 90% or, alternatively, any other value approved by the competent authority (see 4.2.1.16.2).

**TP 5** The degree of filling prescribed in 4.2.3.6 shall be met.

**TP 6** To prevent the tank bursting in any event, including fire engulfment, it shall be provided with pressure-relief devices which are adequate in relation to the capacity of the tank and to the nature of the substance carried. The device shall also be compatible with the substance.

**TP 7** Air shall be eliminated from the vapour space by nitrogen or other means.

**TP 8** The test pressure may be reduced to 1.5 bar when the flash point of the substances carried is greater than 0 °C.

**TP 9** A substance under this description shall only be carried in a portable tank under an approval granted by the competent authority.

**TP 10** A lead lining, not less than 5 mm thick, which shall be tested annually, or another suitable lining material approved by the competent authority is required.

**TP 11** (Reserved)

**TP 12** (Deleted)

**TP 13** (Reserved)

**TP 14** (Reserved)

**TP 15** (Reserved)

**TP 16** The tank shall be fitted with a special device to prevent under-pressure and excess pressure during normal carriage conditions. This device shall be approved by the competent authority. Pressure-relief requirements are as indicated in 6.7.2.8.3 to prevent crystallization of the product in the pressure-relief valve.

**TP 17** Only inorganic non-combustible materials shall be used for thermal insulation of the tank.

**TP 18** Temperature shall be maintained between 18 °C and 40 °C. Portable tanks containing solidified methacrylic acid shall not be reheated during carriage.

**TP 19** The calculated shell thickness shall be increased by 3 mm. Shell thickness shall be verified ultrasonically at intervals midway between periodic hydraulic tests.

**TP 20** This substance shall only be carried in insulated tanks under a nitrogen blanket.

**TP 21** The shell thickness shall be not less than 8 mm. Tanks shall be hydraulically tested and internally inspected at intervals not exceeding 2.5 years.

**TP 22** Lubricant for joints or other devices shall be oxygen compatible.

**TP 23** (Deleted)

**TP 24** The portable tank may be fitted with a device located under maximum filling conditions in the vapour space of the shell to prevent the build up of excess pressure due to the slow decomposition of the substance carried. This device shall also prevent an unacceptable amount of leakage of liquid in the case of overturning or entry of foreign matter into the tank. This device shall be approved by the competent authority or its authorized body.

**TP 25** (Reserved)

**TP 26** When carried under heated conditions, the heating device shall be fitted outside the shell. For UN 3176 this requirement only applies when the substance reacts dangerously with water.

**TP 27** A portable tank having a minimum test pressure of 4 bar may be used if it is shown that a test pressure of 4 bar or less is acceptable according to the test pressure definition in 6.7.2.1.

**TP 28** A portable tank having a minimum test pressure of 2.65 bar may be used if it is shown that a test pressure of 2.65 bar or less is acceptable according to the test pressure definition in 6.7.2.1.

**TP 29** A portable tank having a minimum test pressure of 1.5 bar may be used if it is shown that a test pressure of 1.5 bar or less is acceptable according to the test pressure definition in 6.7.2.1.

**TP 30** This substance shall be carried in insulated tanks.

**TP 31** This substance may only be carried in tanks in the solid state.

**TP 32** For UN Nos. 0331, 0332 and 3375, portable tanks may be used subject to the following conditions:

- (a) To avoid unnecessary confinement, each portable tank constructed of metal shall be fitted with a pressure-relief device that may be of the reclosing spring-loaded type, a frangible disc or a fusible element. The set to discharge or burst pressure, as applicable, shall not be greater than 2.65 bar for portable tanks with minimum test pressures greater than 4 bar.
- (b) For UN 3375 only, the suitability for carriage in tanks shall be demonstrated. One method to evaluate this suitability is test 8 (d) in Test Series 8 (see Manual of Tests and Criteria, Part 1, Sub-section 18.7).
- (c) Substances shall not be allowed to remain in the portable tank for any period that could result in caking. Appropriate measures shall be taken to avoid accumulation and packing of substances in the tank (e.g. cleaning, etc.).

**TP 33** The portable tank instruction assigned for this substance applies to granular and powdered solids and to solids which are filled and discharged at temperatures above their melting point which are cooled and carried as a solid mass. For solids which are carried above their melting point, see 4.2.1.19.

**TP 34** Portable tanks need not be subjected to the impact test in 6.7.4.14.1 if the portable tank is marked "NOT FOR RAIL TRANSPORT" on the plate specified in 6.7.4.15.1 and also in letters of at least 10 cm high on both sides of the outer jacket.

**TP 35** (Deleted)

**TP 36** Fusible elements in the vapour space may be used on portable tanks.

**TP 37** (Deleted)

**TP 38** Portable tank instruction T 9 prescribed in RID applicable up to 31 December 2012 may continue to be applied until 31 December 2018.

**TP 39** Portable tank instruction T 4 prescribed in RID applicable up to 31 December 2012 may continue to be applied until 31 December 2018.

**TP 40** Portable tanks shall not be carried when connected with spray application equipment.

**TP 41** With the agreement of the competent authority, the 2.5 year internal examination may be waived or substituted by other test methods or inspection procedures, provided that the portable tank is dedicated to the carriage of the organometallic substances to which this tank special provision is assigned. However this examination is required when the conditions of 6.7.2.19.7 are met.

## **Chapter 4.3 Use of tank-wagons, demountable tanks, tank-containers and tank swap bodies with shells made of metallic materials, and battery-wagons and multiple-element gas containers (MEGCs)**

**NOTE:** For portable tanks and UN multiple-element gas containers (MEGCs) see Chapter 4.2; for fibre-reinforced plastics tank-containers, see Chapter 4.4; for vacuum-operated waste tanks, see Chapter 4.5.

### **4.3.1 Scope**

**4.3.1.1** Provisions which take up the whole width of the page apply both to tank-wagons, demountable tanks and battery-wagons, and to tank-containers, tank swap bodies and MEGCs. Provisions contained in a single column apply only to:

- tank-wagons, demountable tanks and battery-wagons (left-hand column);
- tank-containers, tank swap bodies and MEGCs (right-hand column).

**4.3.1.2** These provisions apply to tank-wagons, demountable tanks and battery-wagons | tank-containers, tank swap bodies and MEGCs used for the carriage of gaseous, liquid, powdery or granular substances.

**4.3.1.3** Section 4.3.2 lists the provisions applicable to tank-wagons, demountable tanks, tank-containers and tank swap bodies, intended for the carriage of substances of all classes, and to battery-wagons and MEGCs intended for the carriage of gases of Class 2. Sections 4.3.3 and 4.3.4 contain special provisions adding to or amending the provisions of Section 4.3.2.

**4.3.1.4** For requirements concerning the construction, equipment, type approval, tests and marking, see Chapter 6.8.

**4.3.1.5** For transitional measures concerning the application of this Chapter, see:  
1.6.3. | 1.6.4.

### **4.3.2 Provisions applicable to all classes**

#### **4.3.2.1 Use**

**4.3.2.1.1** A substance subject to RID may be carried in tank-wagons, demountable tanks, battery-wagons, tank-containers, tank swap bodies and MEGCs only when provision is made for a tank code according to 4.3.3.1.1 and 4.3.4.1.1 in Column (12) of Table A in Chapter 3.2.

**4.3.2.1.2** The required type of tank, battery-wagon and MEGC is given in code form in Column (12) of Table A in Chapter 3.2. The identification codes appearing there are made up of letters or numbers in a given order. The explanations for reading the four parts of the code are given in 4.3.3.1.1 (when the substance to be carried belongs to Class 2) and in 4.3.4.1.1 (when the substance to be carried belongs to Classes 3 to 9)<sup>1</sup>.

**4.3.2.1.3** The required type according to 4.3.2.1.2 corresponds to the least stringent construction requirements which are acceptable for the dangerous substance in question unless otherwise prescribed in this Chapter or in Chapter 6.8. It is possible to use tanks corresponding to codes prescribing a higher minimum calculation pressure, or more stringent requirements for filling or discharge openings or for safety valves/devices (see 4.3.3.1.1 for Class 2 and 4.3.4.1.1 for Classes 3 to 9).

**4.3.2.1.4** For certain substances, tanks, battery-wagons or MEGCs are subject to additional provisions which are included as special provisions in Column (13) of Table A in Chapter 3.2.

**4.3.2.1.5** Tanks, battery-wagons and MEGCs shall not be loaded with any dangerous substances other than those for the carriage of which they have been approved according to 6.8.2.3.1 and which, in contact with the materials of the shell, gaskets, equipment and protective linings, are not liable to react dangerously with them (see "dangerous reaction" in 1.2.1), to form dangerous products or appreciably to weaken these materials<sup>2</sup>.

**4.3.2.1.6** Foodstuffs shall not be carried in tanks used for dangerous substances unless the necessary steps have been taken to prevent any harm to public health.

<sup>1</sup> An exception is made for tanks intended for the carriage of substances of classes 5.2 or 7 (see 4.3.4.1.3).

<sup>2</sup> It may be necessary to consult the manufacturer of the substance and the competent authority for guidance on the compatibility of the substance with the materials of the tank, battery-wagon or MEGC.

**4.3.2.1.7** The tank record shall be retained by the owner or operator, who shall be able to provide this documentation at the request of the competent authority, and who shall ensure that it is available to the entity in charge of maintenance (ECM).

The tank record, including the relevant information concerning the activities of the ECM, shall be maintained throughout the life of the tank and retained for 15 months after the tank is taken out of service.

Should a change of owner or operator occur during the life of the tank, the tank record shall be transferred without delay to the new owner or operator.

Copies of the tank record or all necessary documents shall be made available to the expert for tests, inspections and checks on tanks in accordance with 6.8.2.4.5 or 6.8.3.4.18, on the occasion of periodic inspections or exceptional checks.

**4.3.2.2** **Degree of filling**

**4.3.2.2.1** The following degrees of filling shall not be exceeded in tanks intended for the carriage of liquids at ambient temperatures:

(a) for flammable substances, environmentally hazardous substances and flammable environmentally hazardous substances, without additional risks (e.g. toxicity or corrosivity), in tanks with a breather device or with safety valves (even where preceded by a bursting disc):

$$\text{Degree of filling} = \frac{100}{1 + \alpha(50 - t_F)} \% \text{ of capacity};$$

(b) for toxic or corrosive substances (whether flammable or environmentally hazardous or not) in tanks with a breather device or with safety valves (even where preceded by a bursting disc):

$$\text{Degree of filling} = \frac{98}{1 + \alpha(50 - t_F)} \% \text{ of capacity};$$

(c) for flammable substances, environmentally hazardous substances and slightly toxic or corrosive substances (whether flammable or environmentally hazardous or not) in hermetically closed tanks without a safety device:

$$\text{Degree of filling} = \frac{97}{1 + \alpha(50 - t_F)} \% \text{ of capacity};$$

(d) for highly toxic, toxic, highly corrosive or corrosive substances (whether flammable or environmentally hazardous or not) in hermetically closed tanks without a safety device:

$$\text{Degree of filling} = \frac{95}{1 + \alpha(50 - t_F)} \% \text{ of capacity}.$$

**4.3.2.2.2** In these formulae,  $\alpha$  is the mean coefficient of cubical expansion of the liquid between 15 °C and 50 °C, i.e. for a maximum variation in temperature of 35 °C.

$$\alpha \text{ is calculated by the formula: } \alpha = \frac{d_{15} - d_{50}}{35 \times d_{50}}$$

where  $d_{15}$  and  $d_{50}$  are the relative densities of the liquid at 15 °C and 50 °C respectively and  $t_F$  is the mean temperature of the liquid during filling.

**4.3.2.2.3** The provisions of 4.3.2.2.1 (a) to (d) above shall not apply to tanks whose contents are, by means of a heating device, maintained at a temperature above 50 °C during carriage. In this case the degree of filling at the outset shall be such, and the temperature so regulated, that the tank is not full to more than 95% of its capacity and that the filling temperature is not exceeded, at any time during carriage.

**4.3.2.2.4** (Reserved)

Shells intended for the carriage of substances in the liquid state or liquefied gases or refrigerated liquefied gases, which are not divided by partitions or surge plates into sections of not more than 7 500 litres capacity, shall be filled to not less than 80% or not more than 20% of their capacity.

This provision is not applicable to:

- liquids with a kinematic viscosity at 20 °C of at least 2 680 mm<sup>2</sup>/s;
- molten substances with a kinematic viscosity at

the temperature of filling of at least  $2\ 680\ mm^2/s$ ;

- UN 1963 HELIUM, REFRIGERATED, LIQUID and UN 1966 HYDROGEN, REFRIGERATED, LIQUID.

#### 4.3.2.3 Operation

4.3.2.3.1 The thickness of the walls of the shell shall not, throughout its use, fall below the minimum figure prescribed in:

6.8.2.1.17 and 6.8.2.1.18

6.8.2.1.17 to 6.8.2.1.20

#### 4.3.2.3.2 (Reserved)

During carriage tank-containers/MEGCs shall be loaded on the wagon in such a way as to be adequately protected by the fittings of the wagon or of the tank-container/MEGC itself against lateral and longitudinal impact and against overturning<sup>3</sup>. If the tank-containers/MEGCs, including the service equipment, are so constructed as to withstand impact or overturning they need not be protected in this way.

4.3.2.3.3 During filling and discharge of tanks, battery-wagons and MEGCs, appropriate measures shall be taken to prevent the release of dangerous quantities of gases and vapours. Tanks, battery-wagons and MEGCs shall be closed so that the contents cannot spill out uncontrolled. The openings of bottom-discharge tanks shall be closed by means of screw-threaded plugs, blank flanges or other equally effective devices. After filling, the filler shall ensure that all the closures of the tanks, battery-wagons and MEGCs are in the closed position and there is no leakage. This also applies to the upper part of the dip tube.

4.3.2.3.4 Where several closure systems are fitted in series, that nearest to the substance being carried shall be closed first.

4.3.2.3.5 No dangerous residue of the filling substance shall adhere to the outside of the tank during carriage.

4.3.2.3.6 Substances which may react dangerously with each other shall not be carried in adjoining compartments of tanks.

Substances which may react dangerously with each other may be carried in adjoining compartments of tanks, when these compartments are separated by a partition with a wall thickness equal to or greater than that of the tank itself. They may also be carried separated by an empty space or an empty compartment between loaded compartments.

4.3.2.3.7 Tank-wagons, demountable tanks, battery-wagons, tank-containers, tank swap bodies and MEGCs may not be filled or offered for carriage after the deadline for the test or inspection required by 6.8.2.4.2, 6.8.3.4.6 and 6.8.3.4.12 has expired.

However, tank-wagons, demountable tanks, battery-wagons, tank-containers, tank swap bodies and MEGCs filled prior to the date of expiry of the last periodic inspection may be carried:

- (a) for a period not to exceed one month after the expiry of these deadlines;
- (b) unless otherwise approved by the competent authority, for a period not to exceed three months after the expiry of these deadlines in order to allow the return of dangerous goods for proper disposal or recycling. Reference to this exemption shall be mentioned in the transport document.

#### 4.3.2.4 Empty tanks, battery-wagons and MEGCs, uncleaned

NOTE: For empty tanks, battery-wagons and MEGCs, uncleaned, special provisions TU 1, TU 2, TU 4, TU 16 and TU 35 of 4.3.5 may apply.

4.3.2.4.1 No dangerous residue of the filling substance shall adhere to the outside of the tank during carriage.

4.3.2.4.2 To be accepted for carriage, empty tanks, battery-wagons and MEGCs, uncleaned, shall be closed in the same manner and be leakproof to the same degree as if they were full.

<sup>3</sup> Examples of protection of shells:

- protection against lateral impact may, for example, consist of longitudinal bars protecting the shell on both sides at the level of the median line;
- protection against overturning may, for example, consist of reinforcing rings or bars fixed transversally in relation to the frame;
- protection against rear impact, may, for example, consist of a bumper or frame.

**4.3.2.4.3** Where empty tanks, battery-wagons and MEGCs, uncleared, are not closed in the same manner and are not leakproof to the same degree as if they were full and where the provisions of RID cannot be complied with, they shall be carried, with due regard to adequate safety, to the nearest suitable place where cleaning or repair can be carried out.

Carriage is adequately safe if suitable measures have been taken to ensure equivalent safety commensurate with the provisions of RID and to prevent the uncontrolled release of the dangerous goods.

**4.3.2.4.4** Empty tank-wagons, demountable tanks, battery-wagons, tank-containers, tank swap bodies and MEGCs, uncleared, may also be carried after the expiry of the periods established in 6.8.2.4.2 and 6.8.2.4.3 for undergoing the inspection.

**4.3.3 Special provisions applicable to Class 2**

**4.3.3.1 Coding and hierarchy of tanks**

**4.3.3.1.1 Coding of tanks, battery-wagons and MEGCs**

The four parts of the codes (tank codes) given in Column (12) of Table A in Chapter 3.2 have the following meanings:

Part	Description	Tank Code
1	Types of tank, battery-wagons or MEGC	C = tank, battery-wagon or MEGC for compressed gases; P = tank, battery-wagon or MEGC for liquefied gases or dissolved gases; R = tank for refrigerated liquefied gases.
2	Calculation pressure	X = value of the minimum relevant test pressure according to the table in 4.3.3.2.5; or 22 = minimum calculation pressure in bar.
3	Openings (see 6.8.2.2 and 6.8.3.2)	B = tank with bottom filling or discharge openings with 3 closures; or battery-wagon or MEGC with openings below the surface of the liquid or for compressed gases; C = tank with top filling or discharge openings with 3 closures with only cleaning openings below the surface of the liquid; D = tank with top filling or discharge openings with 3 closures; or battery-wagon or MEGC with no openings below the surface of the liquid.
4	Safety valves/devices	N = tank, battery-wagon or MEGC with safety valve according to 6.8.3.2.9 or 6.8.3.2.10 which is not hermetically closed; H = hermetically closed tank, battery-wagon or MEGC (see 1.2.1);

**NOTE 1:** The special provision TU 17 indicated in Column (13) of Table A in Chapter 3.2 for certain gases means that the gas may only be carried in a battery-wagon or MEGC, the elements of which are composed of receptacles.

- 2:** The special provision TU 40 indicated in Column (13) of Table A in Chapter 3.2 for certain gases means that the gas may only be carried in a battery-wagon or an MEGC, the elements of which are composed of seamless receptacles.
- 3:** The pressures indicated on the tank itself or on the panel shall be not less than the value of "X" or the minimum calculation pressure.

**4.3.3.1.2 Hierarchy of tanks**

Tank code	Other tank code(s) permitted for the substances under this code
C*BN	C#BN, C#CN, C#DN, C#BH, C#CH, C#DH
C*BH	C#BH, C#CH, C#DH
C*CN	C#CN, C#DN, C#CH, C#DH
C*CH	C#CH, C#DH
C*DN	C#DN, C#DH

C*DH	C#DH
P*BN	P#BN, P#CN, P#DN, P#BH, P#CH, P#DH
P*BH	P#BH, P#CH, P#DH
P*CN	P#CN, P#DN, P#CH, P#DH
P*CH	P#CH, P#DH
P*DN	P#DN, P#DH
P*DH	P#DH
R*BN	R#BN, R#CN, R#DN
R*CN	R#CN, R#DN
R*DN	R#DN

The figure represented by "#" shall be equal to or greater than the figure represented by "\*".

**NOTE:** This hierarchy does not take any special provisions into account (see 4.3.5 and 6.8.4) for each entry.

#### 4.3.3.2 Filling conditions and test pressures

**4.3.3.2.1** The test pressure for tanks intended for the carriage of compressed gases shall be at least 1.5 times the working pressure as defined in 1.2.1 for pressure receptacles.

**4.3.3.2.2** The test pressure for tanks intended for the carriage of:

- high pressure liquefied gases; and
- dissolved gases

shall be such that, when the shell is filled to the maximum filling ratio, the pressure reached in the shell by the substance at 55 °C for tanks with thermal insulation or 65 °C for tanks without thermal insulation does not exceed the test pressure.

**4.3.3.2.3** The test pressure for tanks intended for the carriage of low pressure liquefied gases will be:

- (a) If the tank is equipped with thermal insulation, at least equal to the vapour pressure, reduced by 0.1 MPa (1 bar) of the liquid at 60 °C, but not less than 1 MPa (10 bar);
- (b) If the tank is not equipped with thermal insulation, at least equal to the vapour pressure, reduced by 0.1 MPa (1 bar), of the liquid at 65 °C, but not less than 1 MPa (10 bar).

The maximum permissible mass of contents per litre of capacity is calculated as follows:

Maximum permissible mass of contents per litre of capacity =  $0.95 \times$  density of the liquid phase at 50 °C (in kg/l)

Moreover the vapour phase shall not disappear below 60 °C.

If the shells are not more than 1.5 m in diameter, the values of the test pressure and maximum filling ratio conforming to packing instruction P200 in 4.1.4.1 shall be applicable.

**4.3.3.2.4** The test pressure for tanks intended for the carriage of refrigerated liquefied gases shall be not less than 1.3 times the maximum allowable working pressure and indicated on the tank but not less than 300 kPa (3 bar) (gauge pressure); for tanks with vacuum insulation the test pressure shall be not less than 1.3 times the maximum allowable working pressure increased by 100 kPa (1 bar).

**4.3.3.2.5** **Table of gases and gas mixtures which may be carried in tank-wagons, battery-wagons, demountable tanks, tank-containers or MEGCs indicating the minimum test pressure for tanks and as far as applicable the filling ratio**

In the case of gases and gas mixtures classified under n.o.s. entries, the values of the test pressure and the filling ratio shall be prescribed by the expert approved by the competent authority.

When tanks for compressed or high pressure liquefied gases have been subjected to a test pressure lower than shown in the table, and the tanks are fitted with thermal insulation, a lower maximum load may be prescribed by the expert approved by the competent authority, provided that the pressure reached in the tank by the substance at 55 °C does not exceed the test pressure stamped on the tank.

UN No.	Name	Classification code	Minimum test pressure for tanks				Maximum permissible mass of contents per litre of capacity
			With thermal insula- tion		Without thermal insulation		
			MPa	bar	MPa	bar	kg
1001	ACETYLENE, DISSOLVED	4 F	only in battery-wagons and MEGCs composed of receptacles				
1002	AIR, COMPRESSED	1 A	see 4.3.3.2.1				
1003	AIR, REFRIGERATED LIQUID	3 O	see 4.3.3.2.4				
1005	AMMONIA, ANHYDROUS	2 TC	2.6	26	2.9	29	0.53
1006	ARGON, COMPRESSED	1 A	see 4.3.3.2.1				
1008	BORON TRIFLUORIDE	2 TC	22.5 30	225 300	22.5 30	225 300	0.715 0.86
1009	BROMOTRIFLUORO- METHANE (REFRIGER- ANT GAS R13B1)	2 A	12	120	4.2 12 25	42 120 250	1.50 1.13 1.44 1.60
1010	BUTADIENES, STABILIZED (1,2-butadiene) or	2 F	1	10	1	10	0.59
1010	BUTADIENES, STABILIZED (1,3-butadiene) or		1	10	1	10	0.55
1010	BUTADIENES AND HYDROCARBON MIXTURE, STABILIZED		1	10	1	10	0.50
1011	BUTANE	2 F	1	10	1	10	0.51
1012	1-BUTYLENE or	2 F	1	10	1	10	0.53
1012	TRANS-2-BUTYLENE or		1	10	1	10	0.54
1012	CIS-2-BUTYLENE or		1	10	1	10	0.55
1012	BUTYLENES MIXTURE		1	10	1	10	0.50
1013	CARBON DIOXIDE	2 A	19 22.5	190 225			0.73 0.78
					19 25	190 250	0.66 0.75
1016	CARBON MONOXIDE, COMPRESSED	1 TF	see 4.3.3.2.1				
1017	CHLORINE	2 TOC	1.7	17	1.9	19	1.25
1018	CHLORODIFLUORO- METHANE (REFRIGER- ANT GAS R22)	2 A	2.4	24	2.6	26	1.03
1020	CHLOROPENTAFLUORO- ETHANE (REFRIGERANT GAS R115)	2 A	2	20	2.3	23	1.08
1021	1-CHLORO-1,2,2,2- TETRAFLUOROETHANE (REFRIGERANT GAS R124)	2 A	1	10	1.1	11	1.2
1022	CHLOROTRIFLUORO- METHANE (REFRIGER- ANT GAS R13)	2 A	12 22.5	120 225			0.96 1.12
					10 12 19 25	100 120 190 250	0.83 0.90 1.04 1.10
1023	COAL GAS, COMPRESSED	1 TF	see 4.3.3.2.1				

UN No.	Name	Classification code	Minimum test pressure for tanks				Maximum permissible mass of contents per litre of capacity
			With thermal insula- tion		Without thermal insulation		
			MPa	bar	MPa	bar	kg
1026	CYANOGEN	2 TF	10	100	10	100	0.70
1027	CYCLOPROPANE	2 F	1.6	16	1.8	18	0.53
1028	DICHLORODIFLUORO- METHANE (REFRIGER- ANT GAS R12)	2 A	1.5	15	1.6	16	1.15
1029	DICHLOROFUORO- METHANE (REFRIGER- ANT GAS R21)	2 A	1	10	1	10	1.23
1030	1,1-DIFLUOROETHANE (REFRIGERANT GAS R152A)	2 F	1.4	14	1.6	16	0.79
1032	DIMETHYLAMINE, ANHYDROUS	2 F	1	10	1	10	0.59
1033	DIMETHYL ETHER	2 F	1.4	14	1.6	16	0.58
1035	ETHANE	2 F	12	120	9.5	95	0.32
					12	120	0.25
					30	300	0.29
							0.39
1036	ETHYLAMINE	2 F	1	10	1	10	0.61
1037	ETHYL CHLORIDE	2 F	1	10	1	10	0.8
1038	ETHYLENE, REFRIGERATED LIQUID	3 F	see 4.3.3.2.4				
1039	ETHYL METHYL ETHER	2 F	1	10	1	10	0.64
1040	ETHYLENE OXIDE WITH NITROGEN up to a total pressure of 1 MPa (10 bar) at 50 °C	2 TF	1.5	15	1.5	15	0.78
1041	ETHYLENE OXIDE AND CARBON DIOXIDE MIX- TURE, with more than 9% but not more than 87% ethylene oxide	2 F	2.4	24	2.6	26	0.73
1046	HELIUM, COMPRESSED	1 A	see 4.3.3.2.1				
1048	HYDROGEN BROMIDE, ANHYDROUS	2 TC	5	50	5.5	55	1.54
1049	HYDROGEN, COMPRESSED	1 F	see 4.3.3.2.1				
1050	HYDROGEN CHLORIDE, ANHYDROUS	2 TC	12	120	10	100	0.69
					12	120	0.30
					15	150	0.56
					20	200	0.67
							0.74
1053	HYDROGEN SULPHIDE	2 TF	4.5	45	5	50	0.67
1055	ISOBUTYLENE	2 F	1	10	1	10	0.52
1056	KRYPTON, COMPRESSED	1 A	see 4.3.3.2.1				
1058	LIQUEFIED GASES, non flammable, charged with nitrogen, carbon dioxide or air	2 A	1.5 x filling pressure see 4.3.3.2.2 or 4.3.3.2.3				

UN No.	Name	Classification code	Minimum test pressure for tanks				Maximum permissible mass of contents per litre of capacity kg
			With thermal insula- tion		Without thermal insulation		
			MPa	bar	MPa	bar	
1060	METHYLACETYLENE AND PROPADIENE MIX- TURE, STABILIZED:  Mixture P1 Mixture P2 Propadiene with 1% to 4% methylacety- lene	2 F	see 4.3.3.2.2 or 4.3.3.2.3				
			2.5	25	2.8	28	0.49
			2.2	22	2.3	23	0.47
			2.2	22	2.2	22	0.50
1061	METHYLAMINE, ANHY- DROUS	2 F	1	10	1.1	11	0.58
1062	METHYL BROMIDE with not more than 2% chloro- picrin	2 T	1	10	1	10	1.51
1063	METHYL CHLORIDE (RE- FRIGERANT GAS R40)	2 F	1.3	13	1.5	15	0.81
1064	METHYL MERCAPTAN	2 TF	1	10	1	10	0.78
1065	NEON, COMPRESSED	1 A	see 4.3.3.2.1				
1066	NITROGEN, COMPRESSED	1 A	see 4.3.3.2.1				
1067	DINITROGEN TETROXIDE (NITROGEN DIOXIDE)	2 TOC	only in battery-wagons and MEGCs composed of receptacles				
1070	NITROUS OXIDE	2 O	22.5	225	18	180	0.78
					22.52	225	0.68
					5	250	0.74
							0.75
1071	OIL GAS, COMPRESSED	1 TF	see 4.3.3.2.1				
1072	OXYGEN, COMPRESSED	1 O	see 4.3.3.2.1				
1073	OXYGEN, REFRIGER- ATED LIQUID	3 O	see 4.3.3.2.4				
1075	PETROLEUM GASES, LIQUEFIED	2 F	see 4.3.3.2.2 or 4.3.3.2.3				
1076	PHOSGENE	2 TC	only in battery-wagons and MEGCs composed of receptacles				
1077	PROPYLENE	2 F	2.5	25	2.7	27	0.43
1078	REFRIGERANT GASES, N.O.S. such as:  Mixture F1 Mixture F2 Mixture F3  Other mixtures	2 A	1	10	1.1	11	1.23
			1.5	15	1.6	16	1.15
			2.4	24	2.7	27	1.03
			see 4.3.3.2.2 or 4.3.3.2.3				
1079	SULPHUR DIOXIDE	2 TC	1	10	1.2	12	1.23
1080	SULPHUR HEXAFLUORIDE	2 A	12	120	7	70	1.34
					14	140	1.04
					16	160	1.33
							1.37
1081	TETRAFLUOROETHYL- ENE, STABILIZED	2 F	only in battery-wagons and MEGCs composed of seamless receptacles				

UN No.	Name	Classification code	Minimum test pressure for tanks				Maximum permissible mass of contents per litre of capacity
			With thermal insula- tion		Without thermal insulation		
			MPa	bar	MPa	bar	kg
1082	TRIFLUOROCHLORO- ETHYLENE, STABILIZED (REFRIGERANT GAS R 1113)	2 TF	1.5	15	1.7	17	1.13
1083	TRIMETHYLAMINE, ANHYDROUS	2 F	1	10	1	10	0.56
1085	VINYL BROMIDE, STABILIZED	2 F	1	10	1	10	1.37
1086	VINYL CHLORIDE, STABILIZED	2 F	1	10	1.1	11	0.81
1087	VINYL METHYL ETHER, STABILIZED	2 F	1	10	1	10	0.67
1581	CHLOROPICRIN AND METHYL BROMIDE MIXTURE with more than 2% chloropicrin	2 T	1	10	1	10	1.51
1582	CHLOROPICRIN AND METHYL CHLORIDE MIXTURE	2 T	1.3	13	1.5	15	0.81
1612	HEXAETHYL TETRA- PHOSPHATE AND COM- PRESSED GAS MIXTURE	1 T	see 4.3.3.2.1				
1749	CHLORINE TRIFLUORIDE	2 TOC	3	30	3	30	1.40
1858	HEXAFLUOROPROPYL- ENE (REFRIGERANT GAS R 1216)	2A	1.7	17	1.9	19	1.11
1859	SILICON TETRAFLUORIDE	2 TC	20 30	200 300	20 30	200 300	0.74 1.10
1860	VINYL FLUORIDE, STABILIZED	2 F	12 22.5	120 225	25	250	0.58 0.65 0.64
1912	METHYL CHLORIDE AND METHYLENE CHLORIDE MIXTURE	2 F	1.3	13	1.5	15	0.81
1913	NEON, REFRIGERATED LIQUID	3 A	see 4.3.3.2.4				
1951	ARGON, REFRIGERATED LIQUID	3 A	see 4.3.3.2.4				
1952	ETHYLENE OXIDE AND CARBON DIOXIDE MIX- TURE, with not more than 9% ethylene oxide	2 A	19 25	190 250	19 25	190 250	0.66 0.75
1953	COMPRESSED GAS, TOXIC, FLAMMABLE, N.O.S. <sup>(a)</sup>	1 TF	see 4.3.3.2.1 or 4.3.3.2.2				
1954	COMPRESSED GAS, FLAMMABLE N.O.S.	1 F	see 4.3.3.2.1 or 4.3.3.2.2				
1955	COMPRESSED GAS, TOXIC, N.O.S. <sup>(a)</sup>	1 T	see 4.3.3.2.1 or 4.3.3.2.2				
1956	COMPRESSED GAS, N.O.S.	1 A	see 4.3.3.2.1 or 4.3.3.2.2				

UN No.	Name	Classification code	Minimum test pressure for tanks				Maximum permissible mass of contents per litre of capacity
			With thermal insula- tion		Without thermal insulation		
			MPa	bar	MPa	bar	kg
1957	DEUTERIUM, COMPRESSED	1 F	see 4.3.3.2.1				
1958	1,2-DICHLORO-1,1,2,2- TETRAFLUOROETHANE (REFRIGERANT GAS R114)	2 A	1	10	1	10	1.3
1959	1,1-DIFLUOROETHYLENE (REFRIGERANT GAS R1132A)	2 F	12 22.5	120 225		25	0.66 0.78 0.77
1961	ETHANE, REFRIGERATED LIQUID	3 F	see 4.3.3.2.4				
1962	ETHYLENE	2 F	12 22.5	120 225		22.5 30	0.25 0.36 0.34 0.37
1963	HELIUM, REFRIGERATED LIQUID	3 A	see 4.3.3.2.4				
1964	HYDROCARBON GAS MIXTURE, COMPRESSED, N.O.S.	1 F	see 4.3.3.2.1 or 4.3.3.2.2				
1965	HYDROCARBON GAS MIXTURE, LIQUEFIED, N.O.S. such as:	2 F					
	Mixture A		1	10	1	10	0.50
	Mixture A01		1.2	12	1.4	14	0.49
	Mixture A02		1.2	12	1.4	14	0.48
	Mixture A0		1.2	12	1.4	14	0.47
	Mixture A1		1.6	16	1.8	18	0.46
	Mixture B1		2	20	2.3	23	0.45
	Mixture B2		2	20	2.3	23	0.44
	Mixture B		2	20	2.3	23	0.43
	Mixture C		2.5	25	2.7	27	0.42
	Other mixtures		see 4.3.3.2.2 or 4.3.3.2.3				
1966	HYDROGEN, REFRIGERATED LIQUID	3 F	see 4.3.3.2.4				
1967	INSECTICIDE GAS, TOXIC, N.O.S. <sup>(8)</sup>	2 T	see 4.3.3.2.2 or 4.3.3.2.3				
1968	INSECTICIDE GAS, N.O.S.	2 A	see 4.3.3.2.2 or 4.3.3.2.3				
1969	ISOBUTANE	2 F	1	10	1	10	0.49
1970	KRYPTON, REFRIGERATED LIQUID	3 A	see 4.3.3.2.4				
1971	METHANE, COMPRESSED or	1 F	see 4.3.3.2.1				
1971	NATURAL GAS, COMPRESSED with high methane content						
1972	METHANE, REFRIGER- ATED LIQUID or	3 F	see 4.3.3.2.4				
1972	NATURAL GAS, REFRIG- ERATED LIQUID with high methane content						

UN No.	Name	Classification code	Minimum test pressure for tanks				Maximum permissible mass of contents per litre of capacity
			With thermal insula- tion		Without thermal insulation		
			MPa	bar	MPa	bar	kg
1973	CHLORODIFLUORO-METHANE AND CHLOROPENTA-FLUOROETHANE MIXTURE with fixed boiling point, with approximately 49% chlorodifluoromethane (REFRIGERANT GAS R502)	2 A	2.5	25	2.8	28	1.05
1974	CHLORODIFLUORO-BROMOMETHANE (REFRIGERANT GAS R12B1)	2 A	1	10	1	10	1.61
1976	OCTAFLUORO-CYCLOBUTANE (REFRIGERANT GAS RC318)	2 A	1	10	1	10	1.34
1977	NITROGEN, REFRIGERATED LIQUID	3 A	see 4.3.3.2.4				
1978	PROPANE	2 F	2.1	21	2.3	23	0.42
1982	TETRAFLUORO-METHANE (REFRIGERANT GAS R14)	1 A	20 30	200 300	20 30	200 300	0.62 0.94
1983	1-CHLORO-2,2,2-TRIFLUOROETHANE (REFRIGERANT GAS R133A)	2 A	1	10	1	10	1.18
1984	TRIFLUOROMETHANE (REFRIGERANT GAS R23)	2 A	19 25	190 250	19 25	190 250	0.92 0.99 0.87 0.95
2034	HYDROGEN AND METHANE MIXTURE, COMPRESSED	1 F	see 4.3.3.2.1				
2035	1,1,1-TRIFLUOROETHANE (REFRIGERANT GAS R143A)	2 F	2.8	28	3.2	32	0.79
2036	XENON	2 A	12	120	13	130	1.30 1.24
2044	2,2-DIMETHYLPROPANE	2 F	1	10	1	10	0.53
2073	AMMONIA SOLUTION, relative density less than 0.880 at 15 °C in water, with more than 35% and not more than 40% ammonia with more than 40% and not more than 50% ammonia	4 A		1	10	1	10
				1.2	12	1.2	12
							0.80 0.77
2187	CARBON DIOXIDE, REFRIGERATED LIQUID	3 A	see 4.3.3.2.4				
2189	DICHLOROSILANE	2 TFC	1	10	1	10	0.90
2191	SULFURYL FLUORIDE	2 T	5	50	5	50	1.1

UN No.	Name	Classification code	Minimum test pressure for tanks				Maximum permissible mass of contents per litre of capacity
			With thermal insula- tion		Without thermal insulation		
			MPa	bar	MPa	bar	kg
2193	HEXAFLUOROETHANE (REFRIGERANT GAS R116)	2 A	16 20	160 200	20	200	1.28 1.34 1.10
2197	HYDROGEN IODIDE, ANHYDROUS	2 TC	1.9	19	2.1	21	2.25
2200	PROPADIENE, STABILIZED	2 F	1.8	18	2.0	20	0.50
2201	NITROUS OXIDE, REFRIGERATED LIQUID	3 O	see 4.3.3.2.4				
2203	SILANE <sup>(b)</sup>	2 F	22.5 25	225 250	22.5 25	225 250	0.32 0.36
2204	CARBONYL SULPHIDE	2 TF	2.7	27	3.0	30	0.84
2417	CARBONYL FLUORIDE	2 TC	20 30	200 300	20 30	200 300	0.47 0.70
2419	BROMOTRIFLUORO- ETHYLENE	2 F	1	10	1	10	1.19
2420	HEXAFLUOROACETONE	2 TC	1.6	16	1.8	18	1.08
2422	OCTAFLUOROBUT-2-ENE (REFRIGERANT GAS R1318)	2 A	1	10	1	10	1.34
2424	OCTAFLUOROPROPANE (REFRIGERANT GAS R218)	2 A	2.1	21	2.3	23	1.07
2451	NITROGEN TRIFLUORIDE	2 O	20 30	200 300	20 30	200 300	0.50 0.75
2452	ETHYLACETYLENE, STABILIZED	2 F	1	10	1	10	0.57
2453	ETHYL FLUORIDE (RE- FRIGERANT GAS R161)	2 F	2.1	21	2.5	25	0.57
2454	METHYL FLUORIDE (RE- FRIGERANT GAS R41)	2 F	30	300	30	300	0.36
2517	1-CHLORO-1,1- DIFLUOROETHANE (RE- FRIGERANT GAS R142B)	2 F	1	10	1	10	0.99
2591	XENON, REFRIGERATED LIQUID	3 A	see 4.3.3.2.4				
2599	CHLOROTRIFLUORO- METHANE AND TRIFLUOROMETHANE, AZEOTROPIC MIXTURE with approximately 60% chlorotrifluoromethane (REFRIGERANT GAS R503)	2 A	3.1 4.2 10	31 42 100	3.1 4.2 10	31 42 100	0.11 0.21 0.76 0.20 0.66
2601	CYCLOBUTANE	2 F	1	10	1	10	0.63

UN No.	Name	Classification code	Minimum test pressure for tanks				Maximum permissible mass of contents per litre of capacity
			With thermal insula- tion		Without thermal insulation		
			MPa	bar	MPa	bar	kg
2602	DICHLORODIFLUORO- METHANE AND DI- FLUORO-1,1 ETHANE, AZEOTROPIC MIXTURE with approximately 74% dichlorodifluoromethane (REFRIGERANT GAS R500)	2 A	1.8	18	2	20	1.01
2901	BROMINE CHLORIDE	2 TOC	1	10	1	10	1.50
3057	TRIFLUOROACETYL CHLORIDE	2 TC	1.3	13	1.5	15	1.17
3070	ETHYLENE OXIDE AND DICHLORODIFLUORO- METHANE MIXTURE with not more than 12.5% ethyl- ene oxide	2 A	1.5	15	1.6	16	1.09
3083	PERCHLORYL FLUORIDE	2 TO	2.7	27	3.0	30	1.21
3136	TRIFLUOROMETHANE, REFRIGERATED LIQUID	3 A	see 4.3.3.2.4				
3138	ETHYLENE, ACETYLENE PROPYLENE IN MIX- TURE, REFRIGERATED LIQUID, containing at least 71.5% ethylene with not more than 22.5% acetylene and not more than 6% propylene	3 F	see 4.3.3.2.4				
3153	PERFLUORO(METHYL VINYL ETHER)	2 F	1.4	14	1.5	15	1.14
3154	PERFLUORO(ETHYL VINYL ETHER)	2 F	1	10	1	10	0.98
3156	COMPRESSED GAS, OXIDIZING, N.O.S.	1 O	see 4.3.3.2.1 or 4.3.3.2.2				
3157	LIQUEFIED GAS, OXIDIZING, N.O.S.	2 O	see 4.3.3.2.2 or 4.3.3.2.3				
3158	GAS, REFRIGERATED LIQUID, N.O.S.	3 A	see 4.3.3.2.4				
3159	1,1,1,2- TETRAFLUOROETHANE (REFRIGERANT GAS R134A)	2 A	1.6	16	1.8	18	1.04
3160	LIQUEFIED GAS, TOXIC, FLAMMABLE, N.O.S. <sup>(a)</sup>	2 TF	see 4.3.3.2.2 or 4.3.3.2.3				
3161	LIQUEFIED GAS, FLAMMABLE, N.O.S.	2 F	see 4.3.3.2.2 or 4.3.3.2.3				
3162	LIQUEFIED GAS, TOXIC, N.O.S. <sup>(a)</sup>	2 T	see 4.3.3.2.2 or 4.3.3.2.3				
3163	LIQUEFIED GAS, N.O.S.	2 A	see 4.3.3.2.2 or 4.3.3.2.3				
3220	PENTAFLUOROETHANE (REFRIGERANT GAS R125)	2 A	4.1	41	4.9	49	0.95

UN No.	Name	Classification code	Minimum test pressure for tanks				Maximum permissible mass of contents per litre of capacity
			With thermal insula- tion		Without thermal insulation		
			MPa	bar	MPa	bar	kg
3252	DIFLUOROMETHANE (REFRIGERANT GAS R32)	2 F	3.9	39	4.3	43	0.78
3296	HEPTAFLUOROPRO- PANE (REFRIGERANT GAS R227)	2 A	1.4	14	1.6	16	1.20
3297	ETHYLENE OXIDE AND CHLOROTETRA- FLUOROETHANE MIXTURE, with not more than 8.8% ethylene oxide	2 A	1	10	1	10	1.16
3298	ETHYLENE OXIDE AND PENTAFLUOROETHANE MIXTURE, with not more than 7.9% ethylene oxide	2 A	2.4	24	2.6	26	1.02
3299	ETHYLENE OXIDE AND TETRAFLUOROETHANE MIXTURE, with not more than 5.6% ethylene oxide	2 A	1.5	15	1.7	17	1.03
3300	ETHYLENE OXIDE AND CARBON DIOXIDE MIX- TURE, with more than 87% ethylene oxide	2 TF	2.8	28	2.8	28	0.73
3303	COMPRESSED GAS, TOXIC, OXIDIZING, N.O.S. <sup>(a)</sup>	1 TO	see 4.3.3.2.1 or 4.3.3.2.2				
3304	COMPRESSED GAS, TOXIC, CORROSIVE, N.O.S. <sup>(a)</sup>	1 TC	see 4.3.3.2.1 or 4.3.3.2.2				
3305	COMPRESSED GAS, TOXIC, FLAMMABLE, CORROSIVE, N.O.S. <sup>(a)</sup>	1 TFC	see 4.3.3.2.1 or 4.3.3.2.2				
3306	COMPRESSED GAS, TOXIC, OXIDIZING, CORROSIVE, N.O.S. <sup>(a)</sup>	1 TOC	see 4.3.3.2.1 or 4.3.3.2.2				
3307	LIQUEFIED GAS, TOXIC, OXIDIZING, N.O.S. <sup>(a)</sup>	2 TO	see 4.3.3.2.2 or 4.3.3.2.3				
3308	LIQUEFIED GAS, TOXIC, CORROSIVE, N.O.S. <sup>(a)</sup>	2 TC	see 4.3.3.2.2 or 4.3.3.2.3				
3309	LIQUEFIED GAS, TOXIC, FLAMMABLE, CORRO- SIVE, N.O.S. <sup>(b)</sup>	2 TFC	see 4.3.3.2.2 or 4.3.3.2.3				
3310	LIQUEFIED GAS, TOXIC, OXIDIZING, CORROSIVE, N.O.S. <sup>(a)</sup>	2 TOC	see 4.3.3.2.2 or 4.3.3.2.3				
3311	GAS, REFRIGERATED LIQUID, OXIDIZING, N.O.S.	3 O	see 4.3.3.2.4				
3312	GAS, REFRIGERATED LIQUID, FLAMMABLE, N.O.S.	3 F	see 4.3.3.2.4				

UN No.	Name	Classification code	Minimum test pressure for tanks				Maximum permissible mass of contents per litre of capacity
			With thermal insula- tion		Without thermal insulation		
			MPa	bar	MPa	bar	kg
3318	AMMONIA SOLUTION, relative density less than 0.880 at 15 °C in water, with more than 50% am- monia	4 TC	see 4.3.3.2.2				
3337	REFRIGERANT GAS R404A	2 A	2.9	29	3.2	32	0.84
3338	REFRIGERANT GAS R407A	2 A	2.8	28	3.2	32	0.95
3339	REFRIGERANT GAS R407B	2 A	3.0	30	3.3	33	0.95
3340	REFRIGERANT GAS R407C	2 A	2.7	27	3.0	30	0.95
3354	INSECTICIDE GAS, FLAMMABLE, N.O.S.	2 F	see 4.3.3.2.2 or 4.3.3.2.3				
3355	INSECTICIDE GAS, TOXIC, FLAMMABLE, N.O.S. <sup>(a)</sup>	2 TF	see 4.3.3.2.2 or 4.3.3.2.3				

(a) Allowed if LC<sub>50</sub> equal to or greater than 200 ppm.

(b) Considered as pyrophoric.

#### 4.3.3.3 Operation

**4.3.3.3.1** When tanks, battery-wagons or MEGCs are approved for different gases, the change of use shall include emptying, purging and evacuation operations to the extent necessary for safe operation.

**4.3.3.3.2** When tanks, battery-wagons or MEGCs are handed over for carriage, only the particulars specified in 6.8.3.5.6 applicable to the gas loaded or just discharged shall be visible; all particulars concerning other gases shall be covered up (see standard EN 15877-1:2012 Railway applications – Marking on railway vehicles. Part 1: Freight wagons).

**4.3.3.3.3** All the elements of a battery-wagons or MEGC shall contain only one and the same gas.

**4.3.3.3.4** When the external overpressure could be greater than the tank resistance to external pressure (e.g. due to low ambient temperatures), adequate measures shall be taken to protect tanks carrying low pressure liquefied gases against the risk of deformation, e.g. by filling them with nitrogen or another inert gas in order to maintain sufficient pressure inside the tank.

**4.3.3.4** **Provisions for the filling of liquid gas tank-wagons** (Reserved)

**4.3.3.4.1** **Control measures before filling** (Reserved)

(a) For each gas to be carried, the details on the tank plate (see 6.8.2.5.1 and 6.8.3.5.1 to 6.8.3.5.5) shall be checked to agree with those on the wagon panel (see 6.8.2.5.2, 6.8.3.5.6 and 6.8.3.5.7).

Tank-wagons for multiple use shall especially be checked to ensure that the correct folding panels are visible and securely fixed by the means referred to in 6.8.3.5.7 on both sides of the wagon.

The load limits on the wagon panel shall not exceed the maximum permissible filling mass on the tank plate.

	<ul style="list-style-type: none"> <li>(b) The last load shall be determined, either from particulars in the transport document or by analysis. If necessary, the tank shall be cleaned.</li> <li>(c) The mass of the residue shall be determined (e.g. by weighing) and taken into account in determining the filling quantity.</li> <li>(d) The leakproofness of the shell and its items of equipment, and their ability to function, shall be checked.</li> </ul>	
4.3.3.4.2	<b>Filling procedure</b>	(Reserved)
	<p>For filling, the provisions of the operating instructions of the tank-wagon shall be complied with.</p>	
4.3.3.4.3	<b>Control measures after filling</b>	(Reserved)
	<ul style="list-style-type: none"> <li>(a) After filling, whether the wagon is overfilled or overloaded shall be checked by calibrated checking devices (e.g. by weighing on a calibrated weighbridge). Overfilled or overloaded tank-wagons shall be immediately discharged in a safe manner until the permitted filling quantity is reached.</li> <li>(b) The partial pressure of inert gases in the gas phase shall not exceed 0.2 MPa (2 bar), or the gauge pressure in the gas phase shall not exceed by more than 0.1 MPa (1 bar) the vapour pressure (absolute) of the liquid gas at the temperature of the liquid phase (however, for UN 1040 Ethylene oxide with nitrogen, the maximum allowable total pressure shall be 1 MPa (10 bar) at 50 °C).</li> <li>(c) After filling, bottom-discharge wagons shall be checked to ensure that the internal shut-off devices are closed so as to be leak-proof.</li> <li>(d) Before blank flanges or other equally effective devices are fitted, the vents shall be checked for leakproofness; any leaks shall be stopped by suitable means.</li> <li>(e) Blank flanges or other equally effective devices shall be fitted on the outlet of the vents. These closures shall be equipped with suitable seals. They shall be closed when using all elements provided for in their design types.</li> <li>(f) Lastly, a final visual check of the wagon, its equipment and marks shall be made to ensure that no filling substance is escaping.</li> </ul>	

4.3.3.5 The actual holding time shall be determined for each journey of a tank carrying a refrigerated liquefied gas on the basis of the following:

- (a) The reference holding time for the refrigerated liquefied gas to be carried (see 6.8.3.4.10) as indicated on the plate referred to in 6.8.3.5.4;
- (b) The actual filling density;
- (c) The actual filling pressure;
- (d) The lowest set pressure of the pressure limiting device(s);
- (e) The deterioration of the insulation<sup>4</sup>.

**NOTE:** ISO 21014:2006 "Cryogenic vessels – Cryogenic insulation performance" details methods of determining the insulation performance of cryogenic vessels and provides a method of calculating the holding time.

The date at which the actual holding time ends shall be entered in the transport document (see

<sup>4</sup> Guidance is provided in the European Industrial Gases Association (EIGA) document "Methods to prevent the premature activation of relief devices on tanks" available at [www.eiga.eu](http://www.eiga.eu).

## 5.4.1.2.2 (d)).

Tanks shall not be offered for carriage:

- (a) In an ullage condition liable to produce an unacceptable hydraulic force due to surge within the shell;
- (b) When leaking;
- (c) When damaged to such an extent that the integrity of the tank or its lifting or securing arrangements may be affected;
- (d) Unless the service equipment has been examined and found to be in good working order;
- (e) Unless the actual holding time for the refrigerated liquefied gas being carried has been determined;
- (f) Unless the duration of carriage, after taking into consideration any delays which might be encountered, does not exceed the actual holding time;
- (g) Unless the pressure is steady and has been lowered to a level such that the actual holding time may be achieved<sup>4</sup>.

## 4.3.4 Special provisions applicable to Classes 3 to 9

## 4.3.4.1 Coding, rationalized approach and hierarchy of tanks

## 4.3.4.1.1 Coding of tanks

The four parts of the codes (tank codes) given in Column (12) of Table A in Chapter 3.2 have the following meanings:

Part	Description	Tank code
1	Types of tank	L = tank for substances in the liquid state (liquids or solids handed over for carriage in the molten state); S = tank for substances in the solid state (powdery or granular).
2	Calculation pressure	G = minimum calculation pressure according to the general requirements of 6.8.2.1.14; 1,5; 2,65; 4; 10; 15 or 21 = minimum calculation pressure in bar (see 6.8.2.1.14).
3	Openings (see 6.8.2.2.2)	A = tank with bottom-filling or bottom-discharge openings with 2 closures; B = tank with bottom-filling or bottom-discharge openings with 3 closures; C = tank with top-filling and discharge openings with only cleaning openings below the surface of the liquid; D = tank with top-filling and discharge openings with no openings below the surface of the liquid.
4	Safety valves/devices	V = tank with a breather device, according to 6.8.2.2.6, but no device protecting against the propagation of a flame; or non-explosion pressure shock resistant tank; F = tank with a breather device, according to 6.8.2.2.6, fitted with a device protecting against the propagation of a flame; or explosion pressure shock resistant tank; N = tank without a breather device according to 6.8.2.2.6 and not hermetically closed; H = hermetically closed tank (see 1.2.1).

## 4.3.4.1.2 Rationalized approach for assignment of tank codes to groups of substances and hierarchy of tanks

NOTE: Certain substances and groups of substances are not included in the rationalized approach, see 4.3.4.1.3

Rationalized approach			
Tank code	Group of permitted substances		
	Class	Classification code	Packing group
<b>Liquids</b>			
<b>LGAV</b>	3	F2	III
	9	M9	III
<b>LGBV</b>	4.1	F2	II, III
	5.1	O1	III
	9	M6	III
	9	M11	III
and groups of permitted substances for tank code LGAV			
<b>LGBF</b>	3	F1	II vapour pressure at 50 °C ≤ 1.1 bar
	3	F1	III
	3	D	II vapour pressure at 50 °C ≤ 1.1 bar
	3	D	III
and groups of permitted substances for tank codes LGAV and LGBV			
<b>L1.5BN</b>	3	F1	II vapour pressure at 50 °C > 1.1 bar
	3	F1	III flashpoint < 23 °C, viscous, vapour pressure at 50 °C > 1.1 bar, boiling point > 35 °C
	3	D	II vapour pressure at 50 °C > 1.1 bar
	and groups of permitted substances for tank codes LGAV, LGBV and LGBF		
<b>L4BN</b>	3	F1	I III, boiling point ≤ 35 °C
	3	FC	III
	3	D	I
	5.1	O1	I, II
	5.1	OT1	I
	8	C1	II, III
	8	C3	II, III
	8	C4	II, III
	8	C5	II, III
	8	C7	II, III
	8	C8	II, III
	8	C9	II, III
	8	C10	II, III
	8	CF1	II
	8	CF2	II
	8	CS1	II
	8	CW1	II
	8	CW2	II
	8	CO1	II
	8	CO2	II
	8	CT1	II, III
	8	CT2	II, III

Rationalized approach			
Tank code	Group of permitted substances		
	Class	Classification code	Packing group
L4BN (cont'd)	8	CFT	II
	9	M11	III
and groups of permitted substances for tank codes LGAV, LGBV, LGBF and L1.5BN			
L4BH	3	FT1	II, III
	3	FT2	II
	3	FC	II
	3	FTC	II
	6.1	T1	II, III
	6.1	T2	II, III
	6.1	T3	II, III
	6.1	T4	II, III
	6.1	T5	II, III
	6.1	T6	II, III
	6.1	T7	II, III
	6.1	TF1	II
	6.1	TF2	II, III
	6.1	TF3	II
	6.1	TS	II
	6.1	TW1	II
	6.1	TW2	II
	6.1	TO1	II
	6.1	TO2	II
	6.1	TC1	II
	6.1	TC2	II
	6.1	TC3	II
	6.1	TC4	II
	6.1	TFC	II
	6.2	I4	
	9	M2	II
and groups of permitted substances for tank codes LGAV, LGBV, LGBF, L1.5BN and L4BN			
L4DH	4.2	S1	II, III
	4.2	S3	II, III
	4.2	ST1	II, III
	4.2	ST3	II, III
	4.2	SC1	II, III
	4.2	SC3	II, III
	4.3	W1	II, III
	4.3	WF1	II, III
	4.3	WT1	II, III
	4.3	WC1	II, III
	8	CT1	II, III
	and groups of permitted substances for tank codes LGAV, LGBV, LGBF, L1.5BN, L4BN and L4BH		
L10BH	8	C1	I
	8	C3	I
	8	C4	I

Rationalized approach			
Tank code	Group of permitted substances		
	Class	Classification code	Packing group
<b>L10BH</b> (cont'd)	8	C5	
	8	C7	
	8	C8	
	8	C9	
	8	C10	
	8	CF1	
	8	CF2	
	8	CS1	
	8	CW1	
	8	CW2	
	8	CO1	
	8	CO2	
	8	CT1	
	8	CT2	
	8	COT	
and groups of permitted substances for tank codes LGAV, LGBV, LGBF, L1.5BN, L4BN, and L4BH			
<b>L10CH</b>	3	FT1	
	3	FT2	
	3	FC	
	3	FTC	
	6.1 <sup>a</sup>	T1	
	6.1 <sup>a</sup>	T2	
	6.1 <sup>a</sup>	T3	
	6.1 <sup>a</sup>	T4	
	6.1 <sup>a</sup>	T5	
	6.1 <sup>a</sup>	T6	
	6.1 <sup>a</sup>	T7	
	6.1 <sup>a</sup>	TF1	
	6.1 <sup>a</sup>	TF2	
	6.1 <sup>a</sup>	TF3	
	6.1 <sup>a</sup>	TS	
	6.1 <sup>a</sup>	TW1	
	6.1 <sup>a</sup>	TO1	
	6.1 <sup>a</sup>	TC1	
	6.1 <sup>a</sup>	TC2	
	6.1 <sup>a</sup>	TC3	
	6.1 <sup>a</sup>	TC4	
	6.1 <sup>a</sup>	TFC	
	6.1 <sup>a</sup>	TFW	
and groups of permitted substances for tank codes LGAV, LGBV, LGBF, L1.5BN, L4BN, L4BH, and L10BH			
<sup>a</sup> Substances with an LC <sub>50</sub> lower than or equal to 200 ml/m <sup>3</sup> and saturated vapour concentration greater than or equal to 500 LC <sub>50</sub> shall be assigned to tank code L15CH.			
<b>L10DH</b>	4.3	W1	
	4.3	WF1	
	4.3	WT1	

Rationalized approach			
Tank code	Group of permitted substances		
	Class	Classification code	Packing group
<b>L10DH</b> (cont'd)	4.3	WC1	I
	4.3	WFC	I
	5.1	OTC	I
	8	CT1	I
and groups of permitted substances for tank codes LGAV, LGBV, LGBF, L1.5BN, L4BN, L4BH, L4DH, L10BH and L10CH			
<b>L15CH</b>	3	FT1	I
	6.1 <sup>b</sup>	T1	I
	6.1 <sup>b</sup>	T4	I
	6.1 <sup>b</sup>	TF1	I
	6.1 <sup>b</sup>	TW1	I
	6.1 <sup>b</sup>	TO1	I
	6.1 <sup>b</sup>	TC1	I
	6.1 <sup>b</sup>	TC3	I
	6.1 <sup>b</sup>	TFC	I
	6.1 <sup>b</sup>	TFW	I
and groups of permitted substances for tank codes LGAV, LGBV, LGBF, L1.5BN, L4BN, L4BH, L10BH and L10CH			
<sup>b</sup> Substances with an LC <sub>50</sub> lower than or equal to 200 ml/m <sup>3</sup> and saturated vapour concentration greater than or equal to 500 LC <sub>50</sub> shall be assigned to this tank code.			
<b>L21DH</b>	4.2	S1	I
	4.2	S3	I
	4.2	SW	I
	4.2	ST3	I
and groups of permitted substances for tank codes LGAV, LGBV, LGBF, L1.5BN, L4BN, L4BH, L4DH, L10BH, L10CH, L10DH and L15CH			
<b>Solids</b>			
<b>SGAV</b>	4.1	F1	III
	4.1	F3	III
	4.2	S2	II, III
	4.2	S4	III
	5.1	O2	II, III
	8	C2	II, III
	8	C4	III
	8	C6	III
	8	C8	III
	8	C10	II, III
	8	CT2	III
	9	M7	III
	9	M11	II, III
<b>SGAN</b>	4.1	F1	II
	4.1	F3	II
	4.1	FT1	II, III
	4.1	FT2	II, III
	4.1	FC1	II, III
	4.1	FC2	II, III

Rationalized approach			
Tank code	Group of permitted substances		
	Class	Classification code	Packing group
<b>SGAN</b> (cont'd)	4.2	S2	II
	4.2	S4	II, III
	4.2	ST2	II, III
	4.2	ST4	II, III
	4.2	SC2	II, III
	4.2	SC4	II, III
	4.3	W2	II, III
	4.3	WF2	II
	4.3	WS	II, III
	4.3	WT2	II, III
	4.3	WC2	II, III
	5.1	O2	II, III
	5.1	OT2	II, III
	5.1	OC2	II, III
	8	C2	II
	8	C4	II
	8	C6	II
	8	C8	II
	8	C10	II
	8	CF2	II
	8	CS2	II
	8	CW2	II
	8	CO2	II
	8	CT2	II
	9	M3	III
and groups of permitted substances for tank codes SGAV			
<b>SGAH</b>	6.1	T2	II, III
	6.1	T3	II, III
	6.1	T5	II, III
	6.1	T7	II, III
	6.1	T9	II
	6.1	TF3	II
	6.1	TS	II
	6.1	TW2	II
	6.1	TO2	II
	6.1	TC2	II
	6.1	TC4	II
	9	M1	II, III
and groups of permitted substances for tanks codes SGAV and SGAN			
<b>S4AH</b>	9	M2	II
and groups of permitted substances for tanks codes SGAV, SGAN and SGAH			
<b>S10AN</b>	8	C2	I
	8	C4	I
	8	C6	I
	8	C8	I
	8	C10	I

Rationalized approach			
Tank code	Group of permitted substances		
	Class	Classification code	Packing group
<b>S10AN</b> (cont'd)	8	CF2	I
	8	CS2	I
	8	CW2	I
	8	CO2	I
	8	CT2	I
and groups of permitted substances for tank codes SGAV and SGAN			
<b>S10AH</b>	6.1	T2	I
	6.1	T3	I
	6.1	T5	I
	6.1	T7	I
	6.1	TS	I
	6.1	TW2	I
	6.1	TO2	I
	6.1	TC2	I
	6.1	TC4	I
and groups of permitted substances for tank codes SGAV, SGAN, SGAH and S10AN			

#### Hierarchy of tanks

Tanks with tank codes different from those indicated in this table or in Table A of Chapter 3.2 may also be used provided that any element (number or letter) of parts 1 to 4 of these tank codes correspond to a level of safety at least equivalent to the corresponding element of the tank code indicated in Table A of Chapter 3.2, according to the following increasing order:

Part 1: Types of tanks

S → L

Part 2: Calculation pressure

G → 1.5 → 2.65 → 4 → 10 → 15 → 21 bar

Part 3: Openings

A → B → C → D

Part 4: Safety valves/devices

V → F → N → H.

For example:

- A tank with the tank code L10CN is authorized for the carriage of a substance to which the tank code L4BN has been assigned;
- A tank with the tank code L4BN is authorized for the carriage of a substance to which the tank code SGAN has been assigned.

**NOTE:** The hierarchy does not take account of any special provisions for each entry (see 4.3.5 and 6.8.4).

**4.3.4.1.3** The following substances and groups of substances in respect of which a "(+)" is given after the tank code in Column (12) of Table A in Chapter 3.2 are subject to special provisions. In that case the alternate use of the tanks for other substances and groups of substances is permitted only where this is specified in the certificate of type approval. Higher value tanks according to the provisions at the end of the table in 4.3.4.1.2 may be used with due regard to the special provisions indicated in Column (13) of Table A in Chapter 3.2.

The requirements for these tanks are given by the following tank codes supplemented by the relevant special provisions indicated in column (13) of table A in Chapter 3.2.

- (a) (Reserved)
- (b) Class 4.1

UN No. 2448 SULPHUR, MOLTEN: code LGBV;

UN No. 3531 POLYMERIZING SUBSTANCE, SOLID, STABILIZED, N.O.S.: code SGAN;  
 UN No. 3532 POLYMERIZING SUBSTANCE, LIQUID, STABILIZED, N.O.S.: code L4BN;

(c) Class 4.2  
 UN No. 1381 PHOSPHORUS, WHITE or YELLOW, DRY, or UNDER WATER or IN SOLUTION and  
 UN No. 2447 PHOSPHORUS, WHITE MOLTEN: code L10DH;

(d) Class 4.3  
 UN No. 1389 ALKALI METAL AMALGAM, LIQUID, UN No. 1391 ALKALI METAL DISPERSION or  
 ALKALINE EARTH METAL DISPERSION, UN No. 1392 ALKALINE EARTH METAL AMALGAM,  
 LIQUID, UN No. 1415 LITHIUM, UN No. 1420 POTASSIUM METAL ALLOYS, LIQUID, UN No. 1421  
 ALKALI METAL ALLOY, LIQUID, N.O.S., UN No. 1422 POTASSIUM SODIUM ALLOYS, LIQUID,  
 UN No. 1428 SODIUM, UN No. 2257 POTASSIUM, UN No. 3401 ALKALI METAL AMALGAM,  
 SOLID, UN No. 3402 ALKALINE EARTH METAL AMALGAM, SOLID, UN No. 3403 POTASSIUM  
 METAL ALLOYS, SOLID, UN No. 3404 POTASSIUM SODIUM ALLOYS, SOLID and UN No. 3482  
 ALKALI METAL DISPERSION, FLAMMABLE or UN No. 3482 ALKALINE EARTH METAL DISPER-  
 SION, FLAMMABLE: code L10BN;  
 UN No. 1407 CAESIUM and UN No. 1423 RUBIDIUM: code L10CH;  
 UN No. 1402 CALCIUM CARBIDE, packing group I: code S2.65AN;

(e) Class 5.1  
 UN No. 1873 PERCHLORIC ACID 50-72%: code L4DN;  
 UN No. 2015 HYDROGEN PEROXIDE, AQUEOUS SOLUTION, STABILIZED with more than 70%  
 hydrogen peroxide: code L4DV;  
 UN No. 2014 HYDROGEN PEROXIDE, AQUEOUS SOLUTION with 20-60% hydrogen peroxide,  
 UN No. 2015 HYDROGEN PEROXIDE, AQUEOUS SOLUTION, STABILIZED with 60-70% hydro-  
 gen peroxide, UN No. 2426 AMMONIUM NITRATE, LIQUID, hot concentrated solution with more  
 than 80% but not more than 93% and UN No. 3149 HYDROGEN PEROXIDE AND PEROXYACE-  
 TIC ACID MIXTURE, STABILIZED: code L4BV;  
 UN No. 3375 AMMONIUM NITRATE EMULSION, SUSPENSION or GEL, intermediate for blasting  
 explosives, liquid: code LGAV;  
 UN No. 3375 AMMONIUM NITRATE EMULSION, SUSPENSION or GEL, intermediate for blasting  
 explosives, solid: code SGAV.

(f) Class 5.2  
 UN No. 3109 ORGANIC PEROXIDE TYPE F, LIQUID: code L4BN;  
 UN No. 3110 ORGANIC PEROXIDE, TYPE F, SOLID: code S4AN;

(g) Class 6.1  
 UN No. 1613 HYDROGEN CYANIDE, AQUEOUS SOLUTION and UN No. 3294 HYDROGEN  
 CYANIDE SOLUTION IN ALCOHOL: code L15DH;

(h) Class 7  
 All substances: special tanks;  
 Minimum requirements for liquids: code L2.65CN; for solids: code S2.65AN  
 Notwithstanding the general requirements of this paragraph, tanks used for radioactive material may  
 also be used for the carriage of other goods provided the requirements of 5.1.3.2 are complied with.

(i) Class 8  
 UN No. 1052 HYDROGEN FLUORIDE, ANHYDROUS, UN No. 1744 BROMINE or BROMINE SO-  
 LUTION and UN No. 1790 HYDROFLUORIC ACID, SOLUTION, with more than 85% hydrofluoric  
 acid: code L21DH;  
 UN No. 1791 HYPOCHLORITE SOLUTION and UN No. 1908 CHLORITE SOLUTION: code L4BV.

**4.3.4.1.4 (Reserved)**

Tank-containers or tank swap bodies intended for the carriage of liquid waste, which are in accordance with the requirements of Chapter 6.10 and are fitted with two closures in accordance with 6.10.3.2, shall be assigned to tank code L4AH. If the tanks in question are equipped for the carriage of liquids and solids alternatively, they shall be assigned to combined codes L4AH and S4AH.

**4.3.4.2 General provisions**

**4.3.4.2.1** Where hot substances are loaded, the temperature of the outer surface of the tank or of the thermal insulation shall not exceed 70 °C during carriage.

4.3.4.2.2	The connecting pipes between the shells of several independent but interconnected tank-wagons (complete train, for example) shall be empty during carriage.	(Reserved)
4.3.4.2.3	When shells approved for liquefied gases of Class 2 are also approved for liquids of other classes, the orange band in accordance with 5.3.5 shall be covered or made unrecognisable by other means so that it is not visible during the carriage of these liquids.	(Reserved)
	During the carriage of these liquids, the particulars according to 6.8.3.5.6 (b) or (c) shall no longer be visible on the two sides of the tank-wagon or on the panels.	
4.3.5	<b>Special provisions</b>	
	When they are shown under an entry in Column (13) of Table of A in Chapter 3.2, the following special provisions apply:	
TU 1	The tanks shall not be handed over for carriage until the substance has solidified completely and been covered by an inert gas. Uncleaned empty tanks which have contained these substances shall be filled with an inert gas.	
TU 2	The substance shall be covered by an inert gas. Uncleaned empty tanks which have contained these substances shall be filled with an inert gas.	
TU 3	The inside of the shell and all parts liable to come into contact with the substance shall be kept clean. No lubricant capable of combining dangerously with the substance shall be used for pumps, valves or other devices.	
TU 4	During carriage, these substances shall be under a layer of inert gas, the gauge pressure of which shall not be less than 50 kPa (0.5 bar).  Uncleaned empty tanks which have contained these substances shall when handed over for carriage be filled with an inert gas at a gauge pressure of at least 50 kPa (0.5 bar).	
TU 5	(Reserved)	
TU 6	Not authorized for carriage in tanks, battery-wagons and MEGCs when having a LC <sub>50</sub> lower than 200 ppm.	
TU 7	The materials used to ensure leakproofness of the joints or for the maintenance of the closures shall be compatible with the contents.	
TU 8	An aluminium-alloy tank shall not be used for carriage unless the tank is reserved solely for such carriage and the acetaldehyde is free from acid.	
TU 9	UN No.1203 PETROL (GASOLINE) with a vapour pressure at 50 °C of more than 110 kPa (1.1 bar) but not above 150 kPa (1.5 bar) may also be carried in tanks designed according to 6.8.2.1.14 (a) and having equipment conforming to 6.8.2.2.6.	
TU 10	(Reserved)	
TU 11	During filling, the temperature of this substance shall not exceed 60 °C. A maximum filling temperature of 80 °C is allowed provided that smoulder spots are prevented and that the following conditions are met. After filling, the tanks shall be pressurized (e.g. with compressed air) to check tightness. It shall be ensured that no depressurization takes place during carriage. Before discharge, it shall be checked if pressure in the tanks is still above atmospheric. If this is not the case, an inert gas shall be introduced into the tanks prior to discharge.	
TU 12	In the event of a change of use, shells and equipment shall be thoroughly cleansed of all residues before and after the carriage of this substance.	
TU 13	Tanks shall be free from impurities at the time of filling.  Service equipment such as valves and external piping shall be emptied after filling or discharging.	
TU 14	The protective caps of closures shall be locked during carriage.	

**TU 15** Tanks shall not be used for the carriage of foodstuffs, articles of consumption or animal feeds.

**TU 16** When handed over for carriage, uncleaned empty tanks shall be filled with a protective agent fulfilling one of the following measures:

Protective agent	Degree of filling of water	Additional requirements for carriage at low ambient temperatures
Nitrogen <sup>a</sup>	–	–
Water and nitrogen <sup>a</sup>	–	–
Water	not less than 96 % and not more than 98 %	The water shall contain sufficient anti-freeze agent to prevent it from freezing. The anti-freeze agent shall be free from corrosive action and not liable to react with the substance.

<sup>a</sup> The tank shall be filled with nitrogen in such a way that, even after cooling, the pressure at no time falls below atmospheric pressure. The tank shall be closed in such a way that no leakage of gas occurs.

An additional entry shall be included in the transport document:

"TANK FILLED WITH \_\_\_\_\_<sup>5</sup> IN ACCORDANCE WITH SPECIAL PROVISION TU 16."

**TU 17** Only to be carried in battery-wagons or MEGCs the elements of which are composed of receptacles.

**TU 18** The degree of filling shall remain below the level at which, if the contents were raised to a temperature at which the vapour pressure equalled the opening pressure of the safety valve, the volume of the liquid would reach 95% of the tank's capacity at that temperature. The provision in 4.3.2.3.4 shall not apply.

**TU 19** Tanks may be filled to 98% at the filling temperature and pressure. The provision in 4.3.2.3.4 shall not apply.

**TU 20** (Reserved)

**TU 21** The substance shall be protected by a protective agent in the following ways:

Protective agent	A layer of water in the tank	Degree of filling of the substance (including water if any) at a temperature of 60° C shall not exceed	Additional requirements for carriage at low ambient temperatures
Nitrogen <sup>a</sup>	–	96 %	–
Water and nitrogen <sup>a</sup>	–	98 %	The water shall contain sufficient anti-freeze agent to prevent it from freezing. The anti-freeze agent shall be free from corrosive action and not liable to react with the substance.
Water	not less than 12 cm	98 %	

<sup>a</sup> The remaining space of the tank shall be filled with nitrogen in such a way that, even after cooling, the pressure at no time falls below atmospheric pressure. The tank shall be closed in such a way that no leakage of gas occurs.

**TU 22** Tanks shall be filled to not more than 90% of their capacity; for liquids, a space of 5% shall remain empty when the liquid is at an average temperature of 50 °C.

**TU 23** The degree of filling shall not exceed 0.93 kg per litre of capacity, if filling is by mass. If filling is by volume, the degree of filling shall not exceed 85%.

**TU 24** The degree of filling shall not exceed 0.95 kg per litre of capacity, if filling is by mass. If filling is by volume, the degree of filling shall not exceed 85%.

**TU 25** The degree of filling shall not exceed 1.14 kg per litre of capacity, if filling is by mass. If filling is by volume, the degree of filling shall not exceed 85%.

<sup>5</sup> Indicates the name(s) of the protective agent(s). Where the tank is filled with water, its mass shall be indicated in kg; in the case of nitrogen, its pressure shall be given in MPa or bar.

**TU 26** The degree of filling shall not exceed 85%.

**TU 27** Tanks shall not be filled to more than 98% of their capacity.

**TU 28** Tanks shall be filled to not more than 95% of their capacity at a reference temperature of 15 °C.

**TU 29** Tanks shall be filled to not more than 97% of their capacity and the maximum temperature after filling shall not exceed 140 °C.

**TU 30** Tanks shall be filled as set out in the test report for the type approval of the tank but shall be filled to not more than 90% of their capacity.

**TU 31** Tanks shall not be filled to more than 1 kg per litre of capacity.

**TU 32** Tanks shall not be filled to more than 88% of their capacity.

**TU 33** Tanks shall be filled to not less than 88% and not more than 92% of their capacity or to 2.86 kg per litre of capacity.

**TU 34** Tanks shall not be filled to more than 0.84 kg per litre of capacity.

**TU 35** Empty fixed tank-wagons, empty demountable tanks and empty tank-containers, uncleansed, which have contained these substances are not subject to the requirements of RID if adequate measures have been taken to nullify any hazard.

**TU 36** The degree of filling according to 4.3.2.2, at the reference temperature of 15 °C, shall not exceed 93% of the capacity.

**TU 37** Carriage in tanks is limited to substances containing pathogens which are unlikely to be a serious hazard, and for which, while capable of causing serious infection on exposure, effective treatment and preventive measures are available and the risk of spread of infection is limited (i.e. moderate individual risk and low community risk).

**TU 38** **Procedure following activation of energy absorption elements** (Reserved)

When energy absorption elements have undergone plastic deformation in accordance with 6.8.4, special provision TE 22, the tank-wagon or battery-wagon shall, after undergoing an inspection, be removed to a repair workshop immediately.

If the loaded tank-wagon or loaded battery-wagon is capable of absorbing the shocks of a collision that might occur in normal conditions of rail transport, e.g. after the energy absorption buffers fitted have been replaced with normal buffers or after the damaged energy absorption elements have been temporarily blocked off, the tank-wagon or battery wagon may, after undergoing an inspection, be moved for the purpose of emptying and finally to a repair workshop.

The information that the energy absorption elements are not working shall be made available with the tank-wagon or battery-wagon.

**TU 39** The suitability of the substance for carriage in tanks shall be demonstrated. The method to evaluate this suitability shall be approved by the competent authority. One method is test 8(d) in Test Series 8 (see Manual of Tests and Criteria, Part 1, sub-section 18.7).

Substances shall not be allowed to remain in the tank for any period that could result in caking. Appropriate measures shall be taken to avoid accumulation and packing of substances in the tank (e.g. cleaning etc.).

**TU 40** Only to be carried in battery-wagons or MEGCs, the elements of which are composed of seamless receptacles.

## **Chapter 4.4 Use of tank-containers including tank swap bodies with shells made of fibre-reinforced plastics (FRP)**

**NOTE:** For portable tanks and UN multiple-element gas containers (MEGCs), see Chapter 4.2; for tank-wagons, demountable tanks, tank-containers and tank swap bodies, with shells made of metallic materials, and battery-wagons and multiple elements gas containers (MEGCs) other than UN MEGCs, see Chapter 4.3; for vacuum-operated waste tanks, see Chapter 4.5.

### **4.4.1 General**

The carriage of dangerous substances in fibre-reinforced plastics (FRP) tank-containers, including tank swap bodies, is permitted only when the following conditions are met:

- (a) The substance is classified in Class 3, 5.1, 6.1, 6.2, 8 or 9;
- (b) The maximum vapour pressure (absolute pressure) at 50 °C of the substance does not exceed 110 kPa (1.1 bar);
- (c) The carriage of the substance in metallic tanks is authorized according to 4.3.2.1.1;
- (d) The calculation pressure specified for that substance in part 2 of the tank code given in Column (12) of Table A in Chapter 3.2 does not exceed 4 bar (see also 4.3.4.1.1) and,
- (e) The tank-container, including tank swap bodies, complies with the provisions of Chapter 6.9 applicable for the carriage of the substance.

### **4.4.2 Operation**

**4.4.2.1** The provisions of 4.3.2.1.5 to 4.3.2.2.4, 4.3.2.3.3 to 4.3.2.3.6, 4.3.2.4.1, 4.3.2.4.2, 4.3.4.1 and 4.3.4.2 shall apply.

**4.4.2.2** The temperature of the substance carried shall not exceed, at the time of filling, the maximum service temperature indicated on the tank plate referred to in 6.9.6.

**4.4.2.3** When applicable to carriage in metallic tanks, the special provisions (TU) of 4.3.5 shall also apply, as indicated in Column (13) of Table A in Chapter 3.2.

## Chapter 4.5 Use of vacuum-operated waste tanks

**NOTE:** For portable tanks and UN multiple elements gas containers (MEGCs), see Chapter 4.2; for tank-wagons, demountable tanks, tank-containers and tank swap bodies, with shells made of metallic materials, and battery-wagons and multiple elements gas containers (MEGCs) other than UN MEGCs, see Chapter 4.3; for fibre reinforced plastics tank-containers, see Chapter 4.4.

### 4.5.1 Use

4.5.1.1 Wastes consisting of substances in Classes 3, 4.1, 5.1, 6.1, 6.2, 8 and 9 may be carried in vacuum-operated waste tanks conforming to Chapter 6.10 if their carriage in tank-containers or tank swap bodies is permitted according to Chapter 4.3.

Wastes consisting of substances assigned to tank code L4BH in Column (12) of Table A of Chapter 3.2 or to another tank code permitted under the hierarchy in 4.3.4.1.2 may be carried in vacuum-operated waste tanks with the letter "A" or "B" in part 3 of the tank code.

4.5.1.2 Non waste substances may be carried in vacuum-operated waste tanks under the same conditions as mentioned under 4.5.1.1.

### 4.5.2 Operation

4.5.2.1 The requirements of Chapter 4.3 except those of 4.3.2.2.4 and 4.3.2.3.3 apply to the carriage in vacuum-operated waste tanks and are supplemented by the requirements of 4.5.2.2 to 4.5.2.6 below.

4.5.2.2 For carriage of liquids meeting the flash point criteria of Class 3, vacuum-operated waste tanks shall be filled through filling devices which discharge into the tank at a low level. Measures shall be taken to minimize the production of spray.

4.5.2.3 When discharging flammable liquids with a flash-point below 23 °C by using air pressure, the maximum working pressure shall be 100 kPa (1 bar).

4.5.2.4 The use of tanks fitted with an internal piston operating as a compartment wall is allowed only when the substances on either side of the wall (piston) do not react dangerously with each other (see 4.3.2.3.6).

4.5.2.5 It shall be ensured that the stationary position of an existing suction boom does not change during normal conditions of transport.

4.5.2.6 When a vacuum pump/exhauster unit which may provide a source of ignition is used to fill or discharge flammable liquids, precautions shall be taken to avoid ignition of the substance or to avoid the propagation of the effects of the ignition outside the tank itself.