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TABLE 3.1.B
Scheme of Classification of Explosives, Combination of Hazard Division
with Compatibility Group (3.1.4.1)

Hazard	Compatibility Group													
	A	B	C	D	E	F	G	H	J	K	L	N	S	A-S Σ
1.1	1.1A	1.1B	1.1C	1.1D	1.1E	1.1F	1.1G		1.1J		1.1L			9
1.2		1.2B	1.2C	1.2D	1.2E	1.2F	1.2G	1.2H	1.2J	1.2K	1.2L			10
1.3			1.3C			1.3F	1.3G	1.3H	1.3J	1.3K	1.3L			7
1.4		1.4B	1.4C	1.4D	1.4E	1.4F	1.4G						1.4S	7
1.5				1.5D										1
1.6												1.6N		1
1.1–1.6 Σ	1	3	4	4	3	4	4	2	3	2	3	1	1	35

3.1.5 Classification of Explosives

3.1.5.0 For additional information regarding classification of explosives, see UN Recommendations, 2.1.3.1.4, 2.1.3.1.5 and 2.1.3.4.

3.1.5.1 Any article or substance having or suspected of having explosive characteristics must first be considered for classification in Class 1 in accordance with the procedures in 3.1.5.2 to 3.1.5.5. Goods are not classified in Class 1 when:

- (a) unless specially authorized, the transport of an explosive substance is forbidden because sensitivity of the substance is excessive;
- (b) the article or substance comes within the scope of those explosive articles and substances which are specifically excluded from Class 1 by the definition of this class; or
- (c) the article or substance has no explosive properties.

3.1.5.2 The classification of fireworks must be based on paragraph 2.1.3.5 of the UN Recommendations.

3.1.5.3 Any article or substance having or suspected of having explosive characteristics must be considered for classification in Class 1 in accordance with the tests, procedures and criteria prescribed in Section 2.1.3 of the *UN Recommendations on the Transport of Dangerous Goods*, and Part I of the *UN Manual of Tests and Criteria*. Articles and substances classified in Class 1 must be assigned to the appropriate division and compatibility group in accordance with the procedures and criteria in those documents.

3.1.5.4 Except for substances which are listed by their proper shipping name in Subsection 4.2–List of Dangerous Goods, goods must not be offered for transport as Class 1 until they have been subjected to the classification procedure prescribed in this Subsection. In addition, the classification procedure must be undertaken before a new product is offered for transport. In this context, a new product is one, which, in the opinion of the appropriate national authority, involves any of the following:

- (a) a new explosive substance, or a combination or a mixture of explosive substances, which is considered to be significantly different from other combinations or mixtures already classified;

- (b) a new design of an explosive article or an article containing a new explosive substance or a new combination or mixture of explosive substances;
- (c) a new design of package for an explosive article or substance including a new type of inner packaging.

Note:

The importance of this can be overlooked unless it is realized that a relatively minor change in an inner or outer packaging can be critical and can convert a lesser hazard into a mass explosion hazard.

3.1.5.5 The producer or other applicant for classification of the product must provide adequate information concerning the names and characteristics of all explosive substances in the product and must furnish the results of all relevant tests which have been done. It is assumed that all the explosive substances in a new article have been properly tested and then approved.

3.1.6 Nomenclature of Explosives

Definitions for the special terms used in describing explosives may be found in Appendix A.

3.1.7 Exclusion from Class 1

3.1.7.1 The appropriate national authority may exclude an article or substance from Class 1 by virtue of test results and the Class 1 definition.

3.1.7.2 Where a substance provisionally accepted into Class 1 is excluded from Class 1 by performing UN Test Series 6 on a specific type and size of package, this substance, when meeting the classification criteria or definition for another class or division, should be listed in the Subsection 4.2–List of Dangerous Goods in that class or division with a special provision restricting it to the type and size of package tested.

3.1.7.3 Where a substance is assigned to Class 1 but is diluted to be excluded from Class 1 by UN Test Series 6, this diluted substance (hereafter referred to as a desensitized explosive) should be listed in Subsection 4.2–List of Dangerous Goods with an indication of the highest concentration which excluded it from Class 1 (see 3.3.1.6 and 3.4.1.3) and if applicable, the concentration below which it is no longer deemed subject to these Regulations. New solid desensitized explosives subject to these Regulations should be listed in Division 4.1 and new liquid desensitized explosives should be listed in

Class 3. When the desensitized explosive meets the criteria or definition for another class or division, the corresponding subsidiary hazards(s) should be assigned to it.

3.1.7.4 An article may be excluded from Class 1 when three unpackaged articles, each individually activated by its own means of initiation or ignition or external means to function in the designed mode, meet the following test criteria:

- (a) no external surface has a temperature of more than 65°C. A momentary spike in temperature up to 200°C is acceptable;
- (b) no rupture or fragmentation of the external casing or movement of the article or detached parts thereof of more than 1 m in any direction;

Note:

Where the integrity of the article may be affected in the event of an external fire these criteria must be examined by a fire test, such as described in ISO 12097-3.

- (c) no audible report exceeding 135 dB(C) peak at a distance of 1 m;
- (d) no flash or flame capable of igniting a material such as a sheet of 80 ±10 g/m² paper in contact with the article; and
- (e) no production of smoke, fumes or dust in such quantities that the visibility in a 1 m³ chamber equipped with appropriately sized blow out panels is reduced more than 50% as measured by a calibrated light (lux) meter or radiometer located 1 m from a constant light source located at the midpoint on opposite walls. The general guidance on Optical Density Testing in ISO 5659-1 and the general guidance on the Photometric System described in Section 7.5 in ISO 5659-2 may be used or similar optical density measurement methods designed to accomplish the same purpose may also be employed. A suitable hood cover surrounding the back and sides of the light meter must be used to minimize effects of scattered or leaking light not emitted directly from the source.

Notes:

1. *If during the tests addressing criteria (a), (b), (c) and (d) no or very little smoke is observed the test described in (e) may be waived.*
2. *The appropriate national authority may require testing in packaged form if it is determined that, as packaged for transport, the article may pose a greater hazard.*

3.1.8 Classification Documentation

3.1.8.1 An appropriate national authority assigning an article or substance into Class 1 should confirm with the applicant that classification in writing.

3.1.8.2 An appropriate national authority classification document may be in any form and may consist of more than one page, provided pages are numbered consecutively. The document should have a unique reference.

3.1.8.3 The information provided must be easy to identify, legible and durable.

3.1.8.4 Examples of the information that may be provided in the classification documents are as follows:

- (a) the name of the appropriate national authority and the provisions in national legislation under which it is granted its authority;
- (b) the modal or national regulations for which the classification document is applicable;
- (c) confirmation that the classification has been approved, made or agreed in accordance with the UN Model Regulations or these Regulations;
- (d) the name and address of the person in law to which the classification has been assigned and any company registration which uniquely identifies a company or other body corporate under national legislation;
- (e) the name under which the explosives will be placed onto the market or otherwise supplied for transport;
- (f) the proper shipping name, UN number, class, hazard division and corresponding compatibility group of the explosives;
- (g) where appropriate, the maximum net explosive mass of the package or article;
- (h) the name, signature, stamp, seal or other identification of the person authorised by the appropriate national authority to issue the classification document is clearly visible;
- (i) where safety in transport or the hazard division is assessed as being dependent upon the packaging, the packaging mark or a description of the permitted:
 - inner packagings;
 - intermediate packagings;
 - outer packagings.
- (j) the classification document states the part number, stock number or other identifying reference under which the explosives will be placed onto the market or otherwise supplied for transport;
- (k) the name and address of the person in law who manufactured the explosives and any company registration which uniquely identifies a company or other body corporate under national legislation;
- (l) any additional information regarding the applicable packing instruction and special packing provisions where appropriate;
- (m) the basis for assigning the classification, i.e. whether on the basis of test results, default for fireworks, analogy with classified explosive, by definition from the List of Dangerous Goods, etc.;
- (n) any special conditions or limitations that the appropriate national authority has identified as relevant to the safety for transport of the explosives, the communication of the hazard and international transport;
- (o) the expiry date of the classification document is given where the appropriate national authority considers one to be appropriate.

or under what conditions, the shipper and/or operator must consult an appropriate national authority.

- (f) Hydrates may be included under the proper shipping name for the anhydrous substance.

4.1.2.2 Table 4.1.A lists all the n.o.s. entries and the main generic entries, grouped by hazard class or division. Within each hazard class or division the names are placed into three groups, where appropriate, as follows:

- (a) specific entries covering a group of substances or articles of a particular chemical or technical nature;

- (b) pesticide entries, for Class 3 and Division 6.1;

- (c) general entries covering a group of substances or articles having one or more general dangerous properties.

Generic or n.o.s. proper shipping names followed by a “★” symbol must be supplemented with the technical or chemical group name, see 4.1.2.1(d). The most specific proper shipping name must always be used.

TABLE 4.1.A
List of Generic and n.o.s. Proper Shipping Names (4.1.2.2)

Class or Division	Subsidiary Hazard	UN or ID No.	Proper Shipping Names <i>(Note: The ★ is not part of the proper shipping name.)</i>
Class 1			
1		0190	Samples, explosive★ other than initiating explosive
Division 1.1			
1.1L		0354	Articles, explosive, n.o.s.★
1.1C		0462	Articles, explosive, n.o.s.★
1.1D		0463	Articles, explosive, n.o.s.★
1.1E		0464	Articles, explosive, n.o.s.★
1.1F		0465	Articles, explosive, n.o.s.★
1.1.B		0461	Components, explosive train, n.o.s.★
1.1C		0497	Propellant, liquid
1.1C		0498	Propellant, solid
1.1.L		0357	Substances, explosive, n.o.s.★
1.1A		0473	Substances, explosive, n.o.s.★
1.1C		0474	Substances, explosive, n.o.s.★
1.1D		0475	Substances, explosive, n.o.s.★
1.1G		0476	Substances, explosive, n.o.s.★
Division 1.2			
1.2K	6.1	0020	Ammunition, toxic★ with burster, expelling charge or propelling charge
1.2L		0355	Articles, explosive, n.o.s.★
1.2C		0466	Articles, explosive, n.o.s.★
1.2D		0467	Articles, explosive, n.o.s.★
1.2E		0468	Articles, explosive, n.o.s.★
1.2F		0469	Articles, explosive, n.o.s.★
1.2B		0382	Components, explosive train, n.o.s.★
1.2L		0248	Contrivances, water-activated★ with burster, expelling charge or propelling charge
1.2L		0358	Substances, explosive, n.o.s.★
Division 1.3			
1.3K	6.1	0021	Ammunition, toxic★ with burster, expelling charge or propelling charge
1.3L		0356	Articles, explosive, n.o.s.★
1.3C		0470	Articles, explosive, n.o.s.★

TABLE 4.1.A
List of Generic and n.o.s. Proper Shipping Names (4.1.2.2) (continued)

Class or Division	Subsidiary Hazard	UN or ID No.	Proper Shipping Names (Note: The ★ is not part of the proper shipping name.)
1.3L		0249	Contrivances, water-activated★ with burster, expelling charge or propelling charge
1.3C		0132	Deflagrating metal salts of aromatic nitro-derivatives, n.o.s.
1.3C		0495	Propellant, liquid
1.3C		0499	Propellant, solid
1.3L		0359	Substances, explosive, n.o.s.★
1.3C		0477	Substances, explosive, n.o.s.★
1.3G		0478	Substances, explosive, n.o.s.★
Division 1.4			
1.4S		0349	Articles, explosive, n.o.s.★
1.4B		0350	Articles, explosive, n.o.s.★
1.4C		0351	Articles, explosive, n.o.s.★
1.4D		0352	Articles, explosive, n.o.s.★
1.4G		0353	Articles, explosive, n.o.s.★
1.4E		0471	Articles, explosive, n.o.s.★
1.4F		0472	Articles, explosive, n.o.s.★
1.4B		0383	Components, explosive train, n.o.s.★
1.4S		0384	Components, explosive train, n.o.s.★
1.4C		0501	Propellant, solid
1.4C		0479	Substances, explosive, n.o.s.★
1.4D		0480	Substances, explosive, n.o.s.★
1.4S		0481	Substances, explosive, n.o.s.★
1.4G		0485	Substances, explosive, n.o.s.★
Division 1.5			
1.5D		0482	Substances, E.V.I., n.o.s.★
1.5D		0482	Substances, explosive, very insensitive, n.o.s.★
Division 1.6			
1.6N		0486	Articles, E.E.I.
1.6N		0486	Articles, explosive, extremely insensitive
Class 2			
Division 2.1			
<i>Specific entries</i>			
2.1		1964	Hydrocarbon gas mixture, compressed, n.o.s.★
2.1		1965	Hydrocarbon gas mixture, liquefied, n.o.s.★
2.1		3354	Insecticide gas, flammable, n.o.s.★
<i>General entries</i>			
2.1		3510	Adsorbed gas, flammable, n.o.s.★
2.1		1950	Aerosols, flammable
2.1	See SP A806	3537	Articles containing flammable gas, n.o.s.★
2.1		3501	Chemical under pressure, flammable, n.o.s.★
2.1	8	3505	Chemical under pressure, flammable, corrosive, n.o.s.★
2.1	6.1	3504	Chemical under pressure, flammable, toxic, n.o.s.★

4.2 List of Dangerous Goods

UN/ ID no.	Proper Shipping Name/Description	Class or Div. (Sub Hazard)	Hazard Label(s)	PG	Passenger and Cargo Aircraft				Cargo Aircraft Only		S.P. see 4.4	ERG Code	
					EQ see 2.6	Ltd Qty		Pkg Inst	Max Net Qty/Pkg	Pkg Inst			Max Net Qty/Pkg
						Pkg Inst	Max Net Qty/Pkg						
A	B	C	D	E	F	G	H	I	J	K	L	M	N
	Accellerene, see p-Nitrosodimethylaniline (UN 1369)												
	Accumulators, electric, see Batteries, wet, filled with acid † (UN 2794) or Batteries, wet, filled with alkali † (UN 2795) or Batteries, wet, non-spillable † (UN 2800)												
	Accumulators, pressurized, hydraulic (containing non-flammable gas), see Articles, pressurized, hydraulic (UN 3164)												
	Accumulators, pressurized, pneumatic (containing non-flammable gas), see Articles, pressurized, pneumatic (UN 3164)												
1088	Acetal	3	Flamm. liquid	II	E2	Y341	1 L	353	5 L	364	60 L		3H
1089	Acetaldehyde	3	Flamm. liquid	I	E0	Forbidden		Forbidden		361	30 L	A1	3H
1841	Acetaldehyde ammonia	9	Miscellaneous	III	E1	Forbidden		956	200 kg	956	200 kg		9L
2332	Acetaldehyde oxime	3	Flamm. liquid	III	E1	Y344	10 L	355	60 L	366	220 L		3L
2789	Acetic acid, glacial	8 (3)	Corrosive & Flamm. liquid	II	E2	Y840	0.5 L	851	1 L	855	30 L		8F
2790	Acetic acid solution more than 10% but less than 50% acid, by weight	8	Corrosive	III	E1	Y841	1 L	852	5 L	856	60 L	A803	8L
2789	Acetic acid solution more than 80% acid, by weight	8 (3)	Corrosive & Flamm. liquid	II	E2	Y840	0.5 L	851	1 L	855	30 L		8F
2790	Acetic acid solution not less than 50% but not more than 80% acid, by weight	8	Corrosive	II	E2	Y840	0.5 L	851	1 L	855	30 L		8L
1715	Acetic anhydride	8 (3)	Corrosive & Flamm. liquid	II	E2	Y840	0.5 L	851	1 L	855	30 L		8F
	Acetic oxide, see Acetic anhydride (UN 1715)												
	Acetoin, see Acetyl methyl carbinol (UN 2621)												
1090	Acetone	3	Flamm. liquid	II	E2	Y341	1 L	353	5 L	364	60 L		3H
1541	Acetone cyanohydrin, stabilized	6.1				Forbidden		Forbidden		Forbidden		A2	6L
1091	Acetone oils	3	Flamm. liquid	II	E2	Y341	1 L	353	5 L	364	60 L		3L
1648	Acetonitrile	3	Flamm. liquid	II	E2	Y341	1 L	353	5 L	364	60 L		3L
1716	Acetyl bromide	8	Corrosive	II	E2	Y840	0.5 L	851	1 L	855	30 L		8L
1717	Acetyl chloride	3 (8)	Flamm. liquid & Corrosive	II	E2	Y340	0.5 L	352	1 L	363	5 L		3C
	Acetyl cyclohexanesulphonyl peroxide, more than 82%, wetted with less than 12% water					Forbidden		Forbidden		Forbidden			
	Acetylene dichloride, see 1,2-Dichloroethylene (UN 1150)												
1001	Acetylene, dissolved	2.1	Flamm. gas		E0	Forbidden		Forbidden		200	15 kg	A1	10L
	Acetylene (liquefied)					Forbidden		Forbidden		Forbidden			
	Acetylene silver nitrate					Forbidden		Forbidden		Forbidden			
3374	Acetylene, solvent free	2.1	Flamm. gas		E0	Forbidden		Forbidden		200	15 kg	A1	10L
	Acetylene tetrabromide, see Tetrabromoethane (UN 2504)												

UN/ ID no.	Proper Shipping Name/Description	Class or Div. (Sub Hazard)	Hazard Label(s)	PG	Passenger and Cargo Aircraft				Cargo Aircraft Only		S.P. see 4.4	ERG Code	
					EQ see 2.6	Ltd Qty		Pkg Inst	Max Net Qty/Pkg	Pkg Inst			Max Net Qty/Pkg
						Pkg Inst	Max Net Qty/Pkg						
A	B	C	D	E	F	G	H	I	J	K	L	M	N
1898	Acetylene tetrachloride, see 1,1,2,2-Tetrachloroethane (UN 1702)												
1898	Acetyl iodide	8	Corrosive	II	E2	Y840	0.5 L	851	1 L	855	30 L		8L
2621	Acetyl methyl carbinol	3	Flamm. liquid	III	E1	Y344	10 L	355	60 L	366	220 L		3L
	Acetyl oxide, see Acetic anhydride (UN 1715)												
	Acid butyl phosphate, see Butyl acid phosphate (UN 1718)												
	Acid, liquid, n.o.s., see Corrosive liquid, acidic, inorganic, n.o.s. ★ (UN 3264) or Corrosive liquid, acidic, organic, n.o.s. ★ (UN 3265)												
	Acid mixture, hydrofluoric and sulphuric, see Hydrofluoric acid and sulphuric acid mixture (UN 1786)												
	Acid mixture, nitrating acid, see Nitrating acid mixture † (UN 1796)												
	Acid mixture, spent, nitrating acid, see Nitrating acid mixture, spent (UN 1826)												
	Acid, picric, see Picric acid (UN 0154) or Trinitrophenol (UN 0154)												
	Acid potassium sulphate, see Potassium hydrogen sulphate (UN 2509)												
	Acid, sludge, see Sludge acid † (UN 1906)												
	Acraldehyde, stabilized, see Acrolein, stabilized (UN 1092)												
2713	Acridine	6.1	Toxic	III	E1	Y645	10 kg	670	100 kg	677	200 kg		6L
2607	Acrolein dimer, stabilized	3	Flamm. liquid	III	E1	Y344	10 L	355	60 L	366	220 L	A209	3L
	Acrolein dimer, unstabilized					Forbidden		Forbidden		Forbidden			
1092	Acrolein, stabilized	6.1 (3)				Forbidden		Forbidden		Forbidden		A209	6H
	Acrolein, unstabilized					Forbidden		Forbidden		Forbidden			
2074	Acrylamide, solid	6.1	Toxic	III	E1	Y645	10 kg	670	100 kg	677	200 kg		6L
3426	Acrylamide solution	6.1	Toxic	III	E1	Y642	2 L	655	60 L	663	220 L	A3	6L
2218	Acrylic acid, stabilized	8 (3)	Corrosive & Flamm. liquid	II	E2	Y840	0.5 L	851	1 L	855	30 L	A209	8F
	Acrylic acid, unstabilized					Forbidden		Forbidden		Forbidden			
1093	Acrylonitrile, stabilized	3 (6.1)	Flamm. liquid & Toxic	I	E0	Forbidden		Forbidden		361	30 L	A209	3P
	Acrylonitrile, unstabilized					Forbidden		Forbidden		Forbidden			
	Actinolite, see Asbestos amphibole † (UN 2212)												
	Activated carbon, see Carbon, activated (UN 1362)												
	Activated charcoal, see Carbon, activated (UN 1362)												
	Actuating cartridge, explosive, see Cartridges, power device † (UN 0275, UN 0276, UN 0323, UN 0381)												
1133	Adhesives containing flammable liquid	3	Flamm. liquid	I II III	E3 E2 E1	Forbidden Y341 Y344	1 L 1 L 10 L	351 353 355	1 L 5 L 60 L	361 364 366	30 L 60 L 220 L	A3	3L 3L 3L
2205	Adiponitrile	6.1	Toxic	III	E1	Y642	2 L	655	60 L	663	220 L		6L

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5.6 Packing Instructions—Class 6—Toxic and Infectious Substances

PACKING INSTRUCTION 603

OPERATOR VARIATIONS: FX-02, X5-04

This instruction applies to UN 3507 on passenger and Cargo Aircraft Only.

The General Packing Requirements of Subsection 5.0.2 and the requirements of 10.5.3.2, 10.5.3.3 and 10.5.7.2.1 must be met, including:

Compatibility Requirements

- substances must be compatible with their packagings as required by 5.0.2.6;
- metal packagings must be corrosion resistant or with protection against corrosion.

Closure Requirements

- closures must meet the requirements of 5.0.2.7.

Additional Packing Requirements

- substances must be packed in a metal or plastic primary receptacle in a leakproof rigid secondary packaging in a rigid outer packaging.
- primary inner receptacles must be packed in secondary packagings in a way that, under normal conditions of transport, they cannot break, be punctured or leak their contents into the secondary packaging. Secondary packagings must be secured in outer packagings with suitable cushioning material to prevent movement. If multiple primary receptacles are placed in a single secondary packaging, they must be either individually wrapped or separated so as to prevent contact between them;
- the contents must comply with the provisions of 10.3.11.5.2;
- the provisions of 10.6.0 and 10.6.1 must be met;
- in the case of fissile-excepted material, limits specified in 10.3.7.2 and 10.6.2.8.1.3 apply.

Single packagings are not permitted.

COMBINATION PACKAGINGS		
UN number	Net quantity per package Passenger Aircraft	Net quantity per package Cargo Aircraft Only
UN 3507 Uranium hexafluoride, radioactive material, excepted package , non-fissile or fissile-excepted	Less than 0.1 kg	Less than 0.1 kg

OUTER PACKAGINGS

Type	Drums						Jerricans			Boxes							
	Steel	Alu- minium	Ply- wood	Fibre	Plastic	Other metal	Steel	Alu- minium	Plastic	Steel	Alu- minium	Wood	Ply- wood	Recon- stituted wood	Fibre- board	Plastic	Other metal
Spec.	1A2	1B2	1D	1G	1H2	1N2	3A2	3B2	3H2	4A	4B	4C1 4C2	4D	4F	4G	4H1 4H2	4N

PACKING INSTRUCTION 620

STATE VARIATIONS: AUG-03, BHG-02, CAG-05/10/11, DQG-03, GBG-05, GHG-02, IDG-02, VCG-04, VUG-02

- △ OPERATOR VARIATIONS: 6O-02, 4C-04, 4M-04, AA-06, AM-06/10, AS-08, BR-14, BZ-07, CA-11, E9-03, FX-04, G3-02, HA-03, IP-03, JJ-04, KC-08, L7-04, LA-07, LH-05, LP-04, LU-04, M3-04, M7-04, MS-06, OU-12, PX-08, SN-08, SV-12, TK-07, UC-04, WR-03, WS-03, XL-04

This instruction applies to UN 2814 and UN 2900.

Packagings must meet the requirements of 6.5 and must be marked as required by 6.5.3.1.

General Requirements

Shippers of infectious substances must comply with these Regulations and must 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 transport.

PACKING INSTRUCTION 620 *(continued)*

The packagings must include:

(a) **inner packagings**, comprising of:

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

(b) an **itemized list of contents**, enclosed between the secondary packaging and the outer packaging; and

(c) a **rigid outer packaging**. The smallest external dimension must be not less than 100 mm.

Alternative packagings for the transport of animal material may be authorized by the competent authority in accordance with the provisions in 5.0.6.7.

Whatever the intended temperature of the consignment, the primary receptacle or the secondary packaging must be capable of withstanding, without leakage, an internal pressure producing a pressure differential of not less than 95 kPa (0.95 bar). This primary receptacle or secondary packaging must also be capable of withstanding temperatures in the range -40 °C to +55 °C.

Note:

The capability of a packaging to withstand an internal pressure without leakage that produces the specified pressure differential should be determined by testing samples of primary receptacles or secondary packagings. Pressure differential is the difference between the pressure exerted on the inside of the receptacle or packaging and the pressure on the outside. The appropriate test method should be selected based on receptacle or packaging type. Acceptable test methods include any method that produces the required pressure differential between the inside and outside of a primary receptacle or a secondary packaging. The test may be conducted using internal hydraulic or pneumatic pressure (gauge) or external vacuum test methods. Internal hydraulic or pneumatic pressure can be applied in most cases as the required pressure differential can be achieved under most circumstances. An external vacuum test is not acceptable if the specified pressure differential is not achieved and maintained. The external vacuum test is a generally acceptable method for rigid receptacles and packagings but is not normally acceptable for:

- flexible receptacles and flexible packagings;
- receptacles and packagings filled and closed under a absolute atmospheric pressure lower than 95 kPa.

Additional Requirements

Inner packagings containing infectious substances must not be consolidated with inner packagings containing unrelated types of goods. Complete packages may be overpacked in accordance with the provisions of 5.0.1.5.

Other dangerous goods must not be packed in the same packaging as Division 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 provided these substances meet the requirements of 2.6. When these small quantities of dangerous goods are packed with infectious substances in accordance with this packing instruction, no other requirements in these Regulations need be met.

When the infectious substances to be transported are unknown but suspected of meeting the criteria for inclusion in Category A, the words "Suspected Category A Infectious Substance" must be shown in parentheses following the proper shipping name on the itemized list of contents inside the outer packaging.

- ☞ All packages containing infectious substances must be marked durably and legibly on the outside of the package with the NAME and TELEPHONE NUMBER OF A PERSON RESPONSIBLE.

Specific Requirements

Other than for exceptional consignments, for example, large body parts and whole organs which require special packaging, the following specific requirements apply:

Substances consigned at ambient or higher temperatures: Primary receptacles must be of glass, metal or plastic. Positive means of ensuring a leak-proof seal must be provided, such as heat seal, skirted stopper or metal crimp seal. If screw caps are used, these must be secured by positive means, e.g. tape, paraffin sealing tape or manufactured locking closure.

Substances consigned refrigerated or frozen (wet ice, prefrozen packs, Carbon dioxide, solid [dry ice]): Ice, Carbon dioxide, solid (dry ice) or other refrigerant must be placed around the secondary packaging(s) or alternatively in an overpack with one or more complete packages marked in accordance with 6.5.3.1. Interior support must be provided to secure the secondary packaging(s) or packages in the original position after the ice or Carbon dioxide, solid (dry ice) has dissipated. If ice is used, the outer packaging or overpack must be leak-proof. If Carbon dioxide, solid (dry ice) is used,

PACKING INSTRUCTION 620 (continued)

the outer packaging or overpack must permit the release of carbon dioxide gas. The primary receptacle and the secondary packaging must maintain their integrity at the temperature of the refrigerant used.

Substances consigned in liquid nitrogen: Plastic primary receptacles capable of withstanding very low temperatures must be used. The secondary packaging must be capable of withstanding very low temperatures and in most cases will need to be fitted over the primary receptacle individually. Provisions for the consignment of liquid nitrogen must also be fulfilled. The primary receptacle and the secondary packaging must maintain their integrity at the temperature of the refrigerant used.

Lyophilized substances: Primary receptacles must be either flame-sealed glass ampoules or rubber-stoppered glass vials fitted with metal seals.

Before an empty packaging is returned to the consignor, or sent elsewhere, it must be disinfected or sterilised to nullify any hazard and any label or mark indicating that it contained an infectious substance must be removed or obliterated.

OUTER PACKAGINGS

Type	Drums						Jerricans			Boxes							
Desc.	Steel	Alu- minium	Ply- wood	Fibre	Plastic	Other metal	Steel	Alu- minium	Plastic	Steel	Alu- minium	Wood	Ply- wood	Recon- stituted wood	Fibre- board	Plastic	Other metal
Spec.	1A2	1B2	1D	1G	1H2	1N2	3A2	3B2	3H2	4A	4B	4C1 4C2	4D	4F	4G	4H1 4H2	4N

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to
622

PACKING INSTRUCTION 622

STATE VARIATIONS: AUG-03, BHG-02, CAG-05, DQG-03, GBG-05, GHG-02, IDG-02, USG-13, VCG-04, VUG-02

△ OPERATOR VARIATIONS: 7H-02, AA-02, AM-06/18, AS-07/08, BA-02, BR-14, C8-02, CV-02, EI-02, FX-04, HA-03, I2-02, IB-02, LA-07, ME-06, UX-08, WR-03, WS-03, X5-08

This instruction applies to UN 3291 on passenger and cargo aircraft and Cargo Aircraft Only.

The General Packing Requirements of 5.0.2 except 5.0.2.15 must be met.

Consignments must be packed in one of the outer packagings shown below, meeting Packing Group II performance Standards.

Consignments of clinical waste and medical waste must be prepared in such a manner that they arrive at their destination in good condition and present no hazard to persons or animals during transport.

The packaging tests may be those appropriate for solids when there is sufficient absorbent material to absorb the entire amount of liquid present and the packaging is capable of retaining liquids. In all other circumstances the packaging tests must be those appropriate for liquids.

Packagings intended to contain sharp objects, such as broken glass and needles must be resistant to puncture and retain liquids under the performance test conditions for the packaging.

6.4.4.3.4 Gas Cartridges and Fuel Cell Cartridges

6.4.4.3.4.1 Pressure Testing of Gas Cartridges and Fuel Cell Cartridges

6.4.4.3.4.1.1 Each gas cartridge or fuel cell cartridge must be subjected to a test pressure equal to or in excess of the maximum expected in the filled receptacle at 55°C (50°C if the liquid phase does not exceed 95% of the capacity of the receptacle at 50°C). This test pressure must be that specified for the gas cartridge or fuel cell cartridge and must not be less than two thirds the design pressure of the gas cartridge or fuel cell cartridge. If any gas cartridge or fuel cell cartridge shows evidence of leakage at a rate equal to or greater than 3.3×10^{-2} mbar.L.s⁻¹ at the test pressure or distortion or any other defect, it must be rejected.

6.4.4.3.4.2 Leak Testing Gas Cartridges and Fuel Cell Cartridges

6.4.4.3.4.2.1 Prior to filling and sealing, the filler must ensure that the closures (if any) and the associated sealing equipment are closed appropriately and the specified gas is used.

6.4.4.3.4.2.2 Each filled gas cartridge or fuel cell cartridge must be checked for the correct weight of gas and must be leak tested. The leak detection equipment must be sufficiently sensitive to detect at least a leak rate of 2.0×10^{-3} mbar.L.s⁻¹ at 20°C.

6.4.4.3.4.2.3 Any gas cartridge or fuel cell cartridge that has gas weights not in conformity with the declared weight limits or shows evidence of leakage or deformation, must be rejected.

6.4.4.4 Approved Water Bath Alternative

With the approval of the appropriate national authority, aerosols and receptacles, small, containing gas are not subject to 6.4.4.2 and 6.4.4.3 if they are required to be sterile, but may be adversely affected by water bath testing, provided:

- (a) they contain non-flammable gas and either;
 1. contain other substances that are constituent parts of pharmaceutical products for medical, veterinary or similar purposes;
 2. contain other substances used in the production process for pharmaceutical products; or
 3. are used in medical, veterinary or similar applications;
- (b) an equivalent level of safety is achieved by the manufacturer's use of alternative methods for leak

detection and pressure resistance, such as helium detection and water bathing a statistical sample of at least 1 in 2,000 from each production batch.

- (c) for pharmaceutical products according to (a)1. and 3. above, they are manufactured under the authority of a national health administration. If required by the appropriate national authority, the principles of Good Manufacturing Practice (GMP) established by the World Health Organization (WHO)* must be followed.

Note:

* WHO Publication: *Quality assurance of pharmaceuticals. A compendium of guidelines and related materials. Volume 2: Good manufacturing practices and inspection.*

6.5 Packagings for Infectious Substances of Category A

6.5.0 General

The requirements of this subsection apply to packagings intended for the transport of infectious substances of Category A.

6.5.1 Requirements for Packagings

6.5.1.1 The requirements for packagings in this subsection are based on packagings, as specified in 6.0.4, currently used. In order to take into account progress in science and technology, there is no objection to the use of packagings having specifications different from those in this Subsection provided that they are equally effective, acceptable to the competent authority and able successfully to withstand the tests described in 6.5.4. Methods of testing other than those described in these Regulations are acceptable provided they are equivalent.

6.5.1.2 Packagings must be manufactured and tested under a quality assurance programme that satisfies the competent authority in order to ensure that each packaging meets the requirements of this subsection.

6.5.1.3 Manufacturers and subsequent distributors of packagings must provide information regarding procedures to be followed (including closure instructions for inner packagings and receptacles), a description of the types and dimensions of the closures (including required gaskets) and any other components needed to ensure that packages, as presented for transport, are capable of passing the applicable performance tests of this subsection.

6.5.2 Code for Designating Types of Packagings

6.5.2.1 The codes for designating types of packagings are set out in 6.0.3.

6.5.2.2 The letters “U” or “W” may follow the packaging code. The letter “U” signifies a special packaging conforming to the requirements of 6.5.4.1.6. The letter “W” signifies that the packaging, although, of the same type indicated by the code is manufactured to a specification different from that in 6.2 and is considered equivalent under the requirements of 6.5.1.1.

6.5.3 Marking

6.5.3.0 Introduction

6.5.3.0.1 The marks indicate that the packaging which bears it corresponds to a successfully tested design type and that it complies with the provisions of this subsection, which are related to the manufacture, but not to the use, of the packaging.

6.5.3.0.2 The marks are intended to be of assistance to packaging manufacturers, reconditioners, packaging users, operators and appropriate authorities.

6.5.3.0.3 The marks do not always provide full details of the test levels, etc. and these may need to be taken further into account, e.g. by reference to a test certificate, test reports or register of successfully tested packagings.

6.5.3.1 Marking on Packagings for Infectious Substances

6.5.3.1.1 Each packaging intended for use according to these Regulations must bear marks which are durable, legible and placed in a location and of such size relative to the package as to be readily visible. For packages with a gross weight exceeding 30 kg the marks, or a duplicate thereof, must appear on the top or on the side of the

package. Letters, numbers and symbols must be at least 12 mm high, except for packages of 30 L or 30 kg capacity or less, when they must be at least 6 mm in height. For packages of 5 L or 5 kg or less the letters, numbers and symbols must be of an appropriate size.

6.5.3.1.2 A packaging that meets the requirements of this subsection must be marked with:



- (a) the United Nations packaging symbol (see Figure 6.0.A);
- (b) the code designating the type of packaging according to the provisions of 6.0.3;
- (c) the text “Class 6.2”;
- (d) the last two digits of the year of manufacture of the packagings;
- (e) the State authorizing the allocation of the mark, indicated by the international Vehicle Registration Code (VRI Code) as indicated in Appendix D.1;
- (f) the name of the manufacturer or other identification of the packaging specified by the appropriate national authority;
- (g) for packagings meeting the requirements of 6.5.4.1.6, the letter “U”, inserted immediately following the mark required in (b) above.

6.5.3.1.3 The marks illustrated in Table 6.5.A are shown in two lines, however the marks can be applied in a single or in multiple lines provided the information is given in the correct sequence. Additionally, the marks required in subsection 6.5.3.1 must be clearly separated, e.g. by a “/” symbol or a space so as to be easily identified. Any additional marks authorized by a competent authority must still enable the parts of the mark required by 6.5.3.1.1 to be correctly identified with reference.

Note:

For other required package or overpack marks see Subsection 7.1.

TABLE 6.5.A
Example of UN Specification Markings—Infectious Substances (6.5.3.1)

UN Symbol (a)	Code (b)	Text (c)	Year (d)	State (e)	Manufacturer (f)	Complete Code
	4G	CLASS 6.2	19	S	SP-9989-ERIKSSON	 4G/CLASS 6.2/19 S/SP-9989- ERIKSSON

7.3.6 Class 2—Gases: Non-flammable, non-toxic (Division 2.2)

STATE VARIATIONS: PKG-02, VCG-06, VUG-05

OPERATOR VARIATIONS: JW-01, PX-02

FIGURE 7.3.G
Class 2—Gases: Non-flammable, non-toxic
(Division 2.2)



Name: Non-flammable, non-toxic Gas
Cargo IMP Code: RNG or RCL for Cryogenic liquids subject to Packing Instruction 202 as applicable
Minimum dimensions: 100 × 100 mm
Symbol (gas cylinder): Black or White
Background: Green (Pantone Colour No. 335U)

Note: This label may also be printed with symbol (gas cylinder), text, numbers and borderline shown in black on green background.

7.3.7 Class 2—Gases: Toxic (Division 2.3)

STATE VARIATIONS: PKG-02, VCG-06, VUG-05

OPERATOR VARIATIONS: JW-01, PX-02

FIGURE 7.3.H
Class 2—Gases: Toxic (Division 2.3)



Name: Toxic Gas
Cargo IMP Code: RPG
Minimum dimensions: 100 × 100 mm
Symbol (skull and crossbones): Black
Background: White

7.3.14 Class 6—Toxic Substances (Division 6.1)

STATE VARIATIONS: PKG-02, VCG-06, VUG-05

OPERATOR VARIATIONS: JW-01, PX-02

FIGURE 7.3.O
Class 6—Toxic Substances (Division 6.1)



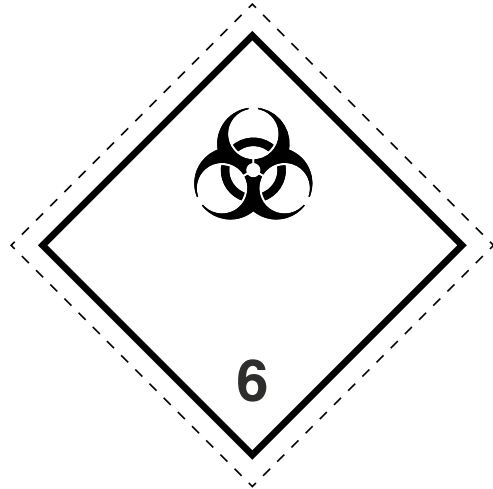
Name: Toxic
Cargo IMP Code: RPB
Minimum dimensions: 100 × 100 mm
Symbol (skull and crossbones): Black
Background: White

7.3.15 Class 6—Infectious Substances (Division 6.2)

STATE VARIATIONS: PKG-02, VCG-06, VUG-05

OPERATOR VARIATIONS: JW-01, PX-02

FIGURE 7.3.P
Class 6—Infectious Substances (Division 6.2)



The lower part of the label should bear the inscription:

INFECTIOUS SUBSTANCE
In case of Damage or Leakage
Immediately Notify
Public Health
Authority
Name: Infectious Substance
Cargo IMP Code: RIS
Minimum dimensions: 100 × 100 mm
For small packages the dimensions may be
50 × 50 mm
Symbol (three crescents superimposed on a circle)
and inscription: Black
Background: White

TABLE 9.1.A
Applicable Acceptance Procedures Summary (9.1.3.3)

Lithium Battery Mark (7.1.5.5)							
Statement on the air waybill, when air waybill used (8.2.3, 8.2.5 or applicable PI)							
Provision of information to pilot-in-command (NOTOC) (9.5.1.1)							
Identification of Unit Load Device - ULD (9.3.8)							
IATA Shipper's Declaration for Dangerous Goods (8.1)							
Formal Acceptance and Acceptance Checklist (9.1.2 & 9.1.3)							
UN No	Proper shipping name and/or description						
UN 3164	Articles, pressurized, hydraulic containing non-flammable gas when meeting the requirements of Packing Instruction 208(a)	NO	NO	NO	NO	YES	N/A
UN 3164	Articles, pressurized, pneumatic containing non-flammable gas when meeting the requirements of Packing Instruction 208(a)	NO	NO	NO	NO	YES	N/A
UN 3373	Biological substance, Category B	NO	NO	NO	NO	YES	N/A
N/A	Dangerous Goods in Excepted Quantities (2.6)	NO	NO	NO	NO	YES	N/A
UN 3245	Genetically modified micro-organisms or Genetically modified organisms	NO	NO	NO	NO	YES	N/A
UN 2807	Magnetized material (not subject to an approval)	NO	NO	NO	NO	YES	N/A
UN 3090	Lithium metal batteries (including lithium alloy batteries) in compliance with Section II of Packing Instruction 968	NO	NO	NO	NO	YES ¹	YES ²
UN 3091	Lithium metal batteries contained in equipment (including lithium alloy batteries) in compliance with Section II of Packing Instruction 970 with more than 4 cells or 2 batteries	NO	NO	NO	NO	YES ¹	YES
UN 3091	Lithium metal batteries contained in equipment (including lithium alloy batteries) in compliance with Section II of Packing Instruction 970 with no more than 4 cells or 2 batteries installed in equipment	NO	NO	NO	NO	NO	NO
UN 3091	Lithium metal batteries packed with equipment (including lithium alloy batteries) in compliance with Section II of Packing Instruction 969	NO	NO	NO	NO	YES ¹	YES
UN 3480	Lithium ion batteries (including lithium polymer batteries) in compliance with Section II of Packing Instruction 965	NO	NO	NO	NO	YES ¹	YES ²
UN 3481	Lithium ion batteries contained in equipment (including lithium polymer batteries) in compliance with Section II of Packing Instruction 967 with more than 4 cells or 2 batteries	NO	NO	NO	NO	YES ¹	YES
UN 3481	Lithium ion batteries contained in equipment (including lithium polymer batteries) in compliance with Section II of Packing Instruction 967 with no more than 4 cells or 2 batteries installed in equipment	NO	NO	NO	NO	NO	NO
UN 3481	Lithium ion batteries packed with equipment (including lithium polymer batteries) in compliance with Section II of Packing Instruction 966	NO	NO	NO	NO	YES ¹	YES
UN 2909	Radioactive material, excepted package - articles manufactured from depleted uranium or natural thorium or natural uranium	NO	NO	NO	NO	YES	N/A
UN 2908	Radioactive material, excepted package - empty packaging	NO	NO	NO	NO	YES	N/A
UN 2911	Radioactive material, excepted package - instruments or articles	NO	NO	NO	NO	YES	N/A
UN 2910	Radioactive material, excepted package - limited quantity of material	NO	NO	NO	NO	YES	N/A

¹ The air waybill statement is as shown in the applicable packing instruction.

² Cargo Aircraft Only Label required

9.1.4 Acceptance of Freight Containers and Unit Load Devices

△ OPERATOR VARIATIONS: 4C-09, 4M-09, 7L-02, AD-03, JJ-09, JL-01, L7-09, LA-09, LU-09, M3-09, MP-07, PZ-09, UC-09, XL-09

9.1.4.1 An operator must not accept from a shipper a unit load device or a freight container containing dangerous goods other than;

- (a) a freight container for radioactive material (see Appendix A);
- (b) ID 8000, Consumer commodities when prepared according to Packing Instruction Y963;
- (c) UN 1845, Carbon dioxide, solid (dry ice) provided that the unit load device does not contain dangerous goods other than UN 3373, **Biological substance, Category B** or ID 8000, **Consumer commodity** or goods not subject to these Regulations;
- (d) UN 2807, Magnetized material;
- (e) UN 3373, Biological substance, Category B prepared according to Packing Instruction 650;
- (f) UN 3245, Genetically modified organisms, Genetically modified microorganisms prepared according to Packing Instruction 959;
- (g) Lithium ion or lithium metal cells and batteries meeting the provisions of Section II of Packing Instructions 966, 967, 969, 970;
- (h) UN 3164, Articles, pressurized, hydraulic or Articles, pressurized, pneumatic prepared according to Packing Instruction 208 (a);
- (i) Dangerous goods in excepted quantity prepared according to Subsection 2.6.8;
- (j) Radioactive material, excepted packages, prepared according to Subsection 10.5.8.

9.1.4.2 With regard to freight containers containing radioactive material, the operator must ensure that all four sides of the container are correctly labelled.

9.1.4.3 When an operator accepts a unit load device containing consumer commodities or dry ice as permitted by 9.1.4.1(b) or (c), the operator must attach an identification tag to the unit load device as required by 9.3.8.

9.1.5 Acceptance of Infectious Substances

STATE VARIATIONS: AUG-03, CAG-05/08, VUG-02

△ OPERATOR VARIATIONS: AM-06/10, AS-08, BR-14, CM-05, FX-04, HA-03, IP-03, LA-07, MS-03, OU-12, TK-07

9.1.5.1 *Routing.* Whatever the mode used, transport must be made by the quickest possible routing. If transshipment is necessary, precautions must be taken to ensure special care, expeditious handling and monitoring of the substances in transit.

9.1.5.2 A live animal which has been intentionally infected and is known or suspected to contain an infectious substance must not be transported by air unless the infectious substance contained cannot be consigned by any other means. Infected animals may only be

transported under terms and conditions approved by the appropriate national authority.

9.1.6 Special Responsibilities in Accepting Self-Reactive Substances of Division 4.1 and Organic Peroxides of Division 5.2

During the course of transport, packages or unit load devices containing self-reactive substances of Division 4.1 or organic peroxides of Division 5.2 must be protected from direct sunlight and all sources of heat and be placed in adequately ventilated areas.

9.1.7 Consumer Product Warnings

An article or package may bear a warning symbol or consumer hazard labelling. The article or substance contained in the package may not necessarily meet the criteria for classification shown in Section 3. Clarification should be obtained from the shipper, if required, before accepting the package as "Not Restricted".

Note:

Diamond-shaped GHS pictograms on packages may indicate the presence of dangerous goods. While some pictograms identify substances that only pose a hazard for supply and use, other GHS pictograms contain symbols that are largely equivalent to the symbols contained in the hazard labels used in transport and which may therefore be classified as dangerous goods. For more information, see Appendix B, Table B.4.A and http://www.unece.org/trans/danger/publi/ghs/ghs_welcome_e.html.

9.1.8 Consolidations

△ OPERATOR VARIATIONS: 6O-03, AI-04, BR-06, CA-01, CI-03, CZ-02, E9-02, GA-02, H5-02, HX-05, IP-02, IR-02, JU-07, KE-01, KM-05, KQ-01, KZ-05, ME-02, MH-05, MU-02, OU-14, OZ-02, PX-03, RJ-02, RH-05, SV-03, SW-03, TK-03, UX-03, VN-12

9.1.8.1 Definition

A consolidation is a consignment of multi-packages which has been originated by more than one person each of whom has made an agreement for carriage by air with another person other than a scheduled air carrier. Conditions applied to that agreement may or may not be the same as conditions applied by the scheduled air carrier for the same carriage.

9.1.8.2 Acceptance

Dangerous Goods are accepted in consolidations under the conditions described in 9.1.8.2.1 to 9.1.8.2.5.

9.1.8.2.1 Dangerous goods may be consolidated with goods not subject to these Regulations. Dangerous goods in consolidations are subject to the acceptance check described in 9.1.3. Any delays caused by discrepancies found during the check may result in delay to the complete consolidation.

9.1.8.2.2 Dangerous goods in consolidations must be identified, classified, packed, marked, labelled and