

## Chapter 6.3

### △ *Provisions for the construction and testing of packagings for class 6.2 infectious substances of category A (UN 2814 and UN 2900)*

#### 6.3.1 General

- △ 6.3.1.1 The provisions of this chapter apply to packagings intended for the transport of infectious substances of category A, UN 2814 and UN 2900.

#### 6.3.2 Provisions for packagings

- 6.3.2.1 The provisions for packagings in this section are based on packagings, as specified in 6.1.4, 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 chapter provided that they are equally effective, acceptable to the competent authority and able successfully to withstand the tests described in 6.3.5. Methods of testing other than those described in the provisions of this Code are acceptable provided they are equivalent.

- 6.3.2.2 Packagings shall be manufactured and tested under a quality assurance programme which satisfies the competent authority in order to ensure that each packaging meets the provisions of this chapter.

**Note:** ISO 16106:2006, *Packaging – Transport packages for dangerous goods – Dangerous goods packagings, intermediate bulk containers (IBCs) and large packagings – Guidelines for the application of ISO 9001*, provides acceptable guidance on procedures which may be followed.

- 6.3.2.3 Manufacturers and subsequent distributors of packagings shall provide information regarding procedures to be followed and a description of the types and dimensions of 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 chapter.

#### 6.3.3 Code for designating types of packagings

- 6.3.3.1 The codes for designating types of packagings are set out in 6.1.2.7.

- 6.3.3.2 The letters “U” or “W” may follow the packaging code. The letter “U” signifies a special packaging conforming to the provisions of 6.3.5.1.6. The letter “W” signifies that the packaging, although of the same type as indicated by the code, is manufactured to a specification different from that in 6.1.4 and is considered equivalent under the provisions of 6.3.2.1.

#### 6.3.4 Marking

**Note 1:** The marks indicate that the packaging which bears them correspond to a successfully tested design type and that it complies with the provisions of this chapter which are related to the manufacture, but not to the use, of the packaging.


**Note 2:** The marks are intended to be of assistance to packaging manufacturers, reconditioners, packaging users, carriers and regulatory authorities.

**Note 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, to test reports or to a register of successfully tested packagings.

- △ 6.3.4.1 Each packaging intended for use according to the provisions of this Code shall bear marks which are durable, legible and placed in a location and of such a size relative to the packaging as to be readily visible. For packages with a gross mass of more than 30 kg, the marks or a duplicate thereof shall appear on the top or on a side of the packaging. Letters, numerals and symbols shall be at least 12 mm high, except for packagings of 30 L capacity

or less or of 30 kg maximum net mass, when they shall be at least 6 mm in height and except for packagings of 5 L capacity or less or of 5 kg maximum net mass when they shall be of an appropriate size.

6.3.4.2 A packaging that meets the provisions of this section and of 6.3.5 shall be marked with:

(a) the United Nations packaging symbol: 

This symbol shall not be used for any purpose other than certifying that a packaging, a flexible bulk container, a portable tank or a MEGC complies with the relevant requirements in chapters 6.1, 6.2, 6.3, 6.5, 6.6, 6.7 or 6.9;

- (b) the code designating the type of packaging according to the provisions of 6.1.2;
- (c) the text “CLASS 6.2”;
- (d) the last two digits of the year of manufacture of the packaging;
- (e) the State authorizing the allocation of the mark, the distinguishing sign used on vehicles in international road traffic\*;
- (f) the name of the manufacturer or other identification of the packaging specified by the competent authority; and
- (g) for packagings meeting the provisions of 6.3.5.1.6, the letter “U” shall be inserted immediately following the mark required in (b) above.

6.3.4.3 Marks shall be applied in the sequence shown in 6.3.4.2 (a) to (g); each mark required in these subparagraphs shall be clearly separated, e.g. by a slash or space, so as to be easily identifiable. For examples, see 6.3.4.4.

Any additional markings authorized by a competent authority shall still enable the marks required in 6.3.4.1 to be correctly identified.

6.3.4.4 Example of marking

	4G/CLASS 6.2/06	as in 6.3.4.2 (a), (b), (c) and (d)
	S/SP-9989-ERIKSSON	as in 6.3.4.2 (e) and (f)

## 6.3.5 Test provisions for packagings

6.3.5.1 Performance and frequency of tests

6.3.5.1.1 The design type of each packaging shall be tested as provided in this section in accordance with procedures established by the competent authority.

6.3.5.1.2 Each packaging design type shall successfully pass the tests prescribed in this chapter before being used. A packaging design type is defined by the design, size, material and thickness, manner of construction and packing, but may include various surface treatments. It also includes packagings which differ from the design type only in their lesser design height.

6.3.5.1.3 Tests shall be repeated on production samples at intervals established by the competent authority.

6.3.5.1.4 Tests shall also be repeated after each modification which alters the design, material or manner of construction of a packaging.

6.3.5.1.5 The competent authority may permit the selective testing of packagings that differ only in minor respects from a tested type, such as smaller sizes or lower net mass of primary receptacles; and packagings such as drums and boxes which are produced with small reductions in external dimension(s).

6.3.5.1.6 Primary receptacles of any type may be assembled within a secondary packaging and transported without testing in the rigid outer packaging under the following conditions:

- .1 the rigid outer packaging shall have been successfully tested in accordance with 6.3.5.2.2 with fragile (such as glass) primary receptacles;
- .2 the total combined gross mass of primary receptacles shall not exceed one half of the gross mass of primary receptacles used for the drop test in .1 above;

\* Distinguishing sign of the State of registration used on motor vehicles and trailers in international road traffic, e.g. in accordance with the Geneva Convention on Road Traffic of 1949 or the Vienna Convention on Road Traffic of 1968.

- .3 the thickness of cushioning between primary receptacles and between primary receptacles and the outside of the secondary packaging shall not be reduced below the corresponding thicknesses in the originally tested packaging; and if a single primary receptacle was used in the original test, the thickness of cushioning between primary receptacles shall not be less than the thickness of cushioning between the outside of the secondary packaging and the primary receptacle in the original test. When either fewer or smaller primary receptacles are used (as compared to the primary receptacles used in the drop test), sufficient additional cushioning material shall be used to take up the void spaces;
- .4 the rigid outer packaging shall have successfully passed the stacking test in 6.1.5.6 while empty. The total mass of identical packages shall be based on the combined mass of packagings used in the drop test in .1 above;
- .5 for primary receptacles containing liquids, an adequate quantity of absorbent material to absorb the entire liquid content of the primary receptacles shall be present;
- .6 if the rigid outer packaging is intended to contain primary receptacles for liquids and is not leakproof, or is intended to contain primary receptacles for solids and is not sift-proof, a means of containing any liquid or solid contents in the event of leakage shall be provided in the form of a leakproof liner, plastics bag or other equally effective means of containment; and
- .7 in addition to the marks prescribed in 6.3.4.2 (a) to (f), packagings shall be marked in accordance with 6.3.4.2(g).

6.3.5.1.7 The competent authority may at any time require proof, by tests in accordance with this section, that serially produced packagings meet the provisions of the design type tests.

6.3.5.1.8 Provided the validity of the test results is not affected and with the approval of the competent authority, several tests may be made on one sample.

6.3.5.2 Preparation of packagings for testing

6.3.5.2.1 Samples of each packaging shall be prepared as for transport except that a liquid or solid infectious substance shall be replaced by water or, where conditioning at –18°C is specified, by water containing antifreeze. Each primary receptacle shall be filled to not less than 98% of its capacity.

**Note:** The term “water” includes water/antifreeze solution with a minimum specific gravity of 0.95 for testing at –18°C.

6.3.5.2.2 Tests and number of samples required

Tests required for packaging types

Type of packaging <sup>a</sup>	Tests required							
	Primary receptacle		Water spray 6.3.5.3.5.1	Cold conditioning 6.3.5.3.5.2	Drop 6.3.5.3	Additional drop 6.3.5.3.5.3	Puncture 6.3.5.4	Stack 6.1.5.6
	Plastics	Other	Number of samples	Number of samples	Number of samples	Number of samples	Number of samples	Number of samples
Rigid outer packaging	Fibreboard box	x	5	5	10	Required on one sample when the packaging is intended to contain dry ice.	2	Required on three samples when testing a “U”-marked packaging as defined in 6.3.5.1.6 for specific provisions.
			x	5	0		5	
Fibreboard drum		x	3	3	6		2	
			x	3	0		3	
Plastics box		x	0	5	5		2	
			x	0	5		5	
Plastics drum/jerrican		x	0	3	3		2	
			x	0	3		3	
Boxes of other material		x	0	5	5		2	
			x	0	0		5	
Drums/jerricans of other material		x	0	3	3	2		
			x	0	0	3	2	

<sup>a</sup> “Type of packaging” categorizes packagings for test purposes according to the kind of packaging and its material characteristics.

**Note 1:** In instances where a primary receptacle is made of two or more materials, the material most liable to damage determines the appropriate test.

**Note 2:** The materials of the secondary packagings are not taken into consideration when selecting the test or conditioning for the test.



*Explanation for use of the table:*

- △ If the packaging to be tested consists of a fibreboard outer box with a plastics primary receptacle, five samples must undergo the water spray test (see 6.3.5.3.5.1) prior to dropping and another five must be conditioned to  $-18^{\circ}\text{C}$  (see 6.3.5.3.5.2) prior to dropping. If the packaging is to contain dry ice then one further single sample shall be dropped in accordance with 6.3.5.3.5.3.

Packagings prepared as for transport shall be subjected to the tests in 6.3.5.3 and 6.3.5.4. For outer packagings, the headings in the table relate to fibreboard or similar materials whose performance may be rapidly affected by moisture; plastics which may embrittle at low temperature; and other materials such as metal whose performance is not affected by moisture or temperature.

### 6.3.5.3 Drop test

#### △ 6.3.5.3.1 *Drop height and target*

Samples shall be subjected to free-fall drops from a height of 9 m onto a non-resilient, horizontal, flat, massive and rigid surface in conformity with 6.1.5.3.4.

#### △ 6.3.5.3.2 *Number of test samples and drop orientation*

6.3.5.3.2.1 Where the samples are in the shape of a box, five shall be dropped, one in each of the following orientations:

- .1 flat on the base;
- .2 flat on the top;
- .3 flat on the longest side;
- .4 flat on the shortest side; and
- .5 on a corner.

△ 6.3.5.3.2.2 Where the samples are in the shape of a drum or a jerrican, three shall be dropped, one in each of the following orientations:

- .1 diagonally on the top edge, with the centre of gravity directly above the point of impact;
- .2 diagonally on the base edge; and
- .3 flat on the body or side.

△ 6.3.5.3.3 While the sample shall be released in the required orientation, it is accepted that, for aerodynamic reasons, the impact may not take place in that orientation.

△ 6.3.5.3.4 Following the appropriate drop sequence, there shall be no leakage from the primary receptacle(s), which shall remain protected by cushioning/absorbent material in the secondary packaging.

#### △ 6.3.5.3.5 *Special preparation of test sample for the drop test*

##### △ 6.3.5.3.5.1 *Fibreboard – Water spray test*

Fibreboard outer packagings: The sample shall be subjected to a water spray that simulates exposure to rainfall of approximately 5 cm per hour for at least one hour. It shall then be subjected to the test described in 6.3.5.3.1.

##### △ 6.3.5.3.5.2 *Plastics material – Cold conditioning*

Plastics primary receptacles or outer packagings: The temperature of the test sample and its contents shall be reduced to  $-18^{\circ}\text{C}$  or lower for a period of at least 24 h and within 15 min of removal from that atmosphere the test sample shall be subjected to the test described in 6.3.5.3.1. Where the sample contains dry ice, the conditioning period shall be reduced to 4 hours.

##### △ 6.3.5.3.5.3 *Packagings intended to contain dry ice – Additional drop test*

Where the packaging is intended to contain dry ice, a test additional to that specified in 6.3.5.3.1 and, when appropriate, in 6.3.5.3.5.1 or 6.3.5.3.5.2 shall be carried out. One sample shall be stored so that all the dry ice dissipates and then that sample shall be dropped in one of the orientations described in 6.3.5.3.2.1 or in 6.3.5.3.2.2, as appropriate; which shall be that most likely to result in failure of the packaging.

### 6.3.5.4 Puncture test

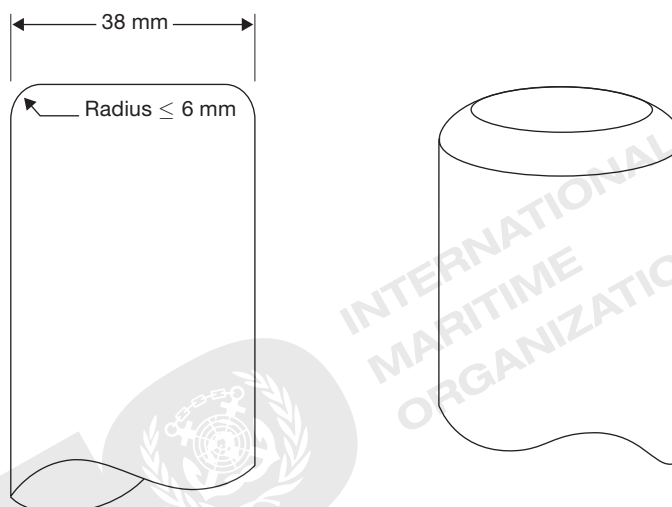
#### 6.3.5.4.1 *Packagings with a gross mass of 7 kg or less*

Samples shall be placed on a level hard surface. A cylindrical steel rod with a mass of at least 7 kg, a diameter of 38 mm and the impact end edges having a radius not exceeding 6 mm (see below) shall be dropped in a vertical free fall from a height of 1 m, measured from the impact end to the impact surface of a sample. One

sample shall be placed on its base. A second sample shall be placed in an orientation perpendicular to that used for the first. In each instance, the steel rod shall be aimed to impact the primary receptacle. Following each impact, penetration of the secondary packaging is acceptable, provided that there is no leakage from the primary receptacle(s).

#### 6.3.5.4.2 Packagings with a gross mass exceeding 7 kg

Samples shall be dropped on to the end of a cylindrical steel rod. The rod shall be set vertically in a level hard surface. It shall have a diameter of 38 mm and the edges of the upper end a radius not exceeding 6 mm (see below). The rod shall protrude from the surface a distance at least equal to that between the centre of the primary receptacle(s) and the outer surface of the outer packaging with a minimum of 200 mm. One sample shall be dropped with its top face lowermost in a vertical free fall from a height of 1 m, measured from the top of the steel rod. A second sample shall be dropped from the same height in an orientation perpendicular to that used for the first. In each instance, the packaging shall be so orientated that the steel rod would be capable of penetrating the primary receptacle(s). Following each impact, penetration of the secondary packaging is acceptable, provided that there is no leakage from the primary receptacle(s).



#### 6.3.5.5 Test report

6.3.5.5.1 A written test report containing at least the following particulars shall be drawn up and shall be available to the users of the packaging:

- .1 Name and address of the test facility;
- .2 Name and address of applicant (where appropriate);
- .3 A unique test report identification;
- .4 Date of the test and of the report;
- .5 Manufacturer of the packaging;
- .6 Description of the packaging design type (e.g. dimensions, materials, closures, thickness, etc.), including method of manufacture (e.g. blow moulding) and which may include drawing(s) and/or photograph(s);
- .7 Maximum capacity;
- .8 Test contents;
- .9 Test descriptions and results;
- .10 The test report shall be signed with the name and status of the signatory.

6.3.5.5.2 The test report shall contain statements that the packaging prepared as for transport was tested in accordance with the appropriate requirements of this chapter and that the use of other packaging methods or components may render it invalid. A copy of the test report shall be available to the competent authority.