

### 6.6.4.3 *Specific requirements for plastics large packagings*

#### 50H rigid plastics

6.6.4.3.1 The large packaging shall be manufactured from suitable plastics material of known specifications and be of adequate strength in relation to its capacity and its intended use. The material shall be adequately resistant to ageing and to degradation caused by the substance contained or, where relevant, by ultraviolet radiation. Low temperature performance shall be taken into account when appropriate. Any permeation of the substance contained shall not constitute a danger under normal conditions of carriage.

6.6.4.3.2 Where protection against ultraviolet radiation is required, it shall be provided by the addition of carbon black or other suitable pigments or inhibitors. These additives shall be compatible with the contents and remain effective throughout the life of the outer packaging. Where use is made of carbon black, pigments or inhibitors other than those used in the manufacture of the tested design type, re-testing may be waived if changes in the carbon black content, the pigment content or the inhibitor content do not adversely affect the physical properties of the material of construction.

6.6.4.3.3 Additives may be incorporated in the material of the large packaging to improve the resistance to ageing or to serve other purposes, provided that these do not adversely affect the physical or chemical properties of the material.

### 6.6.4.4 *Specific requirements for fibreboard large packagings*

#### 50G rigid fibreboard

6.6.4.4.1 Strong and good quality solid or double-faced corrugated fibreboard (single or multiwall) shall be used, appropriate to the capacity of the large packagings and to their intended use. The water resistance of the outer surface shall be such that the increase in mass, as determined in a test carried out over a period of 30 minutes by the Cobb method of determining water absorption, is not greater than 155 g/m<sup>2</sup> - see ISO 535:1991. It shall have proper bending qualities. Fibreboard shall be cut, creased without scoring, and slotted so as to permit assembly without cracking, surface breaks or undue bending. The fluting or corrugated fibreboard shall be firmly glued to the facings.

6.6.4.4.2 The walls, including top and bottom, shall have a minimum puncture resistance of 15 J measured according to ISO 3036:1975.

6.6.4.4.3 Manufacturing joins in the outer packaging of large packagings shall be made with an appropriate overlap and shall be taped, glued, stitched with metal staples or fastened by other means at least equally effective. Where joins are effected by gluing or taping, a water resistant adhesive shall be used. Metal staples shall pass completely through all pieces to be fastened and be formed or protected so that any inner liner cannot be abraded or punctured by them.

6.6.4.4.4 Any integral pallet base forming part of a large packaging or any detachable pallet shall be suitable for mechanical handling with the large packaging filled to its maximum permissible gross mass.

6.6.4.4.5 The pallet or integral base shall be designed so as to avoid any protrusion of the base of the large packaging that might be liable to damage in handling.

6.6.4.4.6 The body shall be secured to any detachable pallet to ensure stability in handling and carriage. Where a detachable pallet is used, its top surface shall be free from sharp protrusions that might damage the large packaging.

## **6.6.5 Test requirements for large packagings**

### **6.6.5.1 Performance and frequency of test**

6.6.5.1.1 The design type of each large packaging shall be tested as provided in 6.6.5.3 in accordance with procedures established and approved by the competent authority.

6.6.5.1.2 Tests shall be successfully performed on each large packaging design type before such a packaging is used. A large 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 large packagings which differ from the design type only in their lesser design height.

6.6.5.1.3 Tests shall be repeated on production samples at intervals established by the competent authority. For such tests on fibreboard large packagings, preparation at ambient conditions is considered equivalent to the provisions of 6.6.5.2.3.

6.6.5.1.4 Tests shall also be repeated after each modification which alters the design, material or manner of construction of large packagings.

6.6.5.1.5 The competent authority may permit the selective testing of large packagings that differ only in minor respects from a tested type, e.g. smaller sizes of inner packagings or inner packagings of lower net mass; and large packagings which are produced with small reductions in external dimension(s).

6.6.5.1.6 Where 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 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 large packagings 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.

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

6.6.5.1.8 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.

### **6.6.5.2** *Preparation for testing*

6.6.5.2.1 Tests shall be carried out on large packagings prepared as for carriage including the inner packagings or articles used. Inner packagings shall be filled to not less than 98% of their maximum capacity for liquids or 95% for solids. For large packagings where the inner packagings are designed to carry liquids and solids, separate testing is required for both liquid and solid contents. The substances in the inner packagings or the articles to be carried in the large packagings may be replaced by other material or articles except where this would invalidate the results of the tests. When other inner packagings or articles are used they shall have the same physical characteristics (mass, etc) as the inner packagings or articles to be carried. It is permissible to use additives, such as bags of lead shot, to achieve the requisite total package mass, so long as they are placed so that the test results are not affected.

6.6.5.2.2 Large packagings made of plastics materials and large packagings containing inner packagings of plastic materials - other than bags intended to contain solids or articles - shall be drop tested when the temperature of the test sample and its contents has been reduced to -18 °C or lower. This conditioning may be disregarded if the materials in question are of sufficient ductility and tensile strength at low temperatures. Where test sample are prepared in this way, the conditioning in 6.6.5.2.3 may be waived. Test liquids shall be kept in the liquid state by the addition of anti-freeze if necessary.

6.6.5.2.3 Large packagings of fibreboard shall be conditioned for at least 24 hours in an atmosphere having a controlled temperature and relative humidity (r.h.). There are three options, one of which shall be chosen.

The preferred atmosphere is 23 °C ± 2 °C and 50% ± 2% r.h. The two other options are: 20 °C ± 2 °C and 65% ± 2% r.h.; or 27 °C ± 2 °C and 65% ± 2% r.h.

*NOTE: Average values shall fall within these limits. Short term fluctuations and measurement limitations may cause individual measurements to vary by up to ± 5% relative humidity without significant impairment of test reproducibility.*

### **6.6.5.3** *Test requirements*

6.6.5.3.1 *Bottom lift test*

6.6.5.3.1.1 Applicability

For all types of large packagings which are fitted with means of lifting from the base, as a design type test.

6.6.5.3.1.2 Preparation of large packaging for test

The large packaging shall be loaded to 1.25 times its maximum permissible gross mass, the load being evenly distributed.

6.6.5.3.1.3 Method of testing

The large packaging shall be raised and lowered twice by a lift truck with the forks centrally positioned and spaced at three quarters of the dimension of the side of entry (unless the points of entry are fixed). The forks shall penetrate to three quarters of the direction of entry. The test shall be repeated from each possible direction of entry.

- 6.6.5.3.1.4 Criteria for passing the test
- No permanent deformation which renders the large packaging unsafe for carriage and no loss of contents.
- 6.6.5.3.2 *Top lift test*
- 6.6.5.3.2.1 Applicability
- For types of large packagings which are intended to be lifted from the top and fitted with means of lifting, as a design type test.
- 6.6.5.3.2.2 Preparation of large packaging for test
- The large packaging shall be loaded to twice its maximum permissible gross mass. A flexible large packaging shall be loaded to six times its maximum permissible gross mass, the load being evenly distributed.
- 6.6.5.3.2.3 Method of testing
- The large packaging shall be lifted in the manner for which it is designed until clear of the floor and maintained in that position for a period of five minutes.
- 6.6.5.3.2.4 Criteria for passing the test
- No permanent deformation which renders the large packaging unsafe for carriage and no loss of contents.
- 6.6.5.3.3 *Stacking test*
- 6.6.5.3.3.1 Applicability
- For all types of large packagings which are designed to be stacked on each other, as a design type test.
- 6.6.5.3.3.2 Preparation of large packaging for test
- The large packaging shall be filled to its maximum permissible gross mass.
- 6.6.5.3.3.3 Method of testing
- The large packaging shall be placed on its base on level hard ground and subjected to a uniformly distributed superimposed test load (see 6.6.5.3.3.4) for a period of at least five minutes, large packagings of wood, fibreboard and plastics materials for a period of 24 h.
- 6.6.5.3.3.4 Calculation of superimposed test load
- The load to be placed on the large packagings shall be 1.8 times the combined maximum permissible gross mass of the number of similar large packagings that may be stacked on top of the large packagings during carriage.
- 6.6.5.3.3.5 Criteria for passing the test
- No permanent deformation which renders the large packaging unsafe for carriage and no loss of contents.

#### 6.6.5.3.4 *Drop test*

##### 6.6.5.3.4.1 Applicability

For all types of large packagings as a design type test.

##### 6.6.5.3.4.2 Preparation of large packaging for testing

The large packaging shall be filled in accordance with 6.6.5.2.1

##### 6.6.5.3.4.3 Method of testing

The large packaging shall be dropped onto a rigid, non-resilient, smooth, flat and horizontal surface, in such a manner as to ensure that the point of impact is that part of the base of the large packaging considered to be the most vulnerable.

##### 6.6.5.3.4.4 Drop height

Packing group I	Packing group II	Packing group III
1.8 m	1.2 m	0.8 m

**NOTE:** Large packagings for substances and articles of Class 1, self-reactive substances of Class 4.1 and organic peroxides of Class 5.2 shall be tested at the packing group II performance level.

##### 6.6.5.3.4.5 Criteria for passing the test

6.6.5.3.4.5.1 The large packaging shall not exhibit any damage liable to affect safety during carriage. There shall be no leakage of the filling substance from inner packaging(s) or article(s).

6.6.5.3.4.5.2 No rupture is permitted in large packagings for articles of Class 1 which would permit the spillage of loose explosive substances or articles from the large packaging.

6.6.5.3.4.5.3 Where a large packaging undergoes a drop test, the sample passes the test if the entire contents are retained even if the closure is no longer sift-proof.

#### **6.6.5.4 *Certification and test report***

6.6.5.4.1 In respect of each design type of large packaging a certificate and mark (as in 6.6.3) shall be issued attesting that the design type including its equipment meets the test requirements.

6.6.5.4.2 A test report containing at least the following particulars shall be drawn up and shall be made available to the users of the large 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 report;
5. Manufacturer of the large packaging;
6. Description of the large packaging design type (e.g. dimensions, materials, closures, thickness, etc) and/or photograph(s);
7. Maximum capacity/maximum permissible gross mass;

8. Characteristics of test contents, e.g. types and descriptions of inner packagings or articles used;
9. Test descriptions and results;
10. The test report shall be signed with the name and status of the signatory.

#### 6.6.5.4.3

The test report shall contain statements that the large packaging prepared as for carriage was tested in accordance with the appropriate provisions 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.

4.1.4.3 *Packing instructions concerning the use of large packagings*

LP01 PACKING INSTRUCTION (LIQUIDS) LP01				
The following large packagings are authorized provided the general provision of 4.1.1 and 4.1.3 are met:				
Inner packagings	Large outer packagings	Packing group I	Packing group II	Packing group III
Glass 10 litre Plastics 30 litre Metal 40 litre	Steel (50A) Aluminium (50B) Metal other than steel or aluminium (50N) <b>Rigid plastics (50H)</b> Natural wood (50C) Plywood (50D) Reconstituted wood (50F) Fibreboard (50G)	Not allowed	Not allowed	Maximum capacity: 3 m <sup>3</sup>

LP02 PACKING INSTRUCTION (SOLIDS) LP02				
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 10kg Plastics <sup>b</sup> 50kg Metal 50 kg Paper <sup>a, b</sup> 50 kg Fibre <sup>a, b</sup> 50 kg	Steel (50A) Aluminium (50B) Metal other than steel or aluminium (50N) <b>Rigid plastics (50H)</b> Natural wood (50C) Plywood (50D) Reconstituted wood (50F) Fibreboard (50G) Flexible plastics (51H) <sup>c</sup>	Not allowed	Not allowed	Maximum capacity: 3 m <sup>3</sup>
<p><sup>a</sup> <i>These inner packagings shall not be used when the substances being carried may become liquid during carriage.</i></p> <p><sup>b</sup> <i>These inner packagings shall be sift-proof.</i></p> <p><sup>c</sup> <i>To be used with flexible inner packagings only.</i></p>				

LP99 PACKING INSTRUCTION LP99	
Only large packagings which are approved by the competent authority may be used (see 4.1.3.7).	

LP101	PACKING INSTRUCTION		LP101
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) <b>Rigid plastics (50H)</b> Natural wood (50C) Plywood (50D) Reconstituted wood (50F) Fibreboard (50G)	
<b>Special packing provision:</b>			
<p><b>L1</b> For UN Nos. 0006, 0009, 0010, 0015, 0016, 0018, 0019, 0034, 0035, 0038, 0039, 0048, 0056, 0137, 0138, 0168, 0169, 0171, 0181, 0182, 0183, 0186, 0221, 0243, 0244, 0245, 0246, 0254, 0280, 0281, 0286, 0287, 0297, 0299, 0300, 0301, 0303, 0321, 0328, 0329, 0344, 0345, 0346, 0347, 0362, 0363, 0370, 0412, 0424, 0425, 0434, 0435, 0436, 0437, 0438, 0451, 0488 and 0502:</p> <p>Large and robust explosives articles, normally intended for military use, without their means of initiation or with their means of initiation containing at least two effective protective features, may be carried unpackaged. When such articles have propelling charges or are self-propelled, their ignition systems shall be protected against stimuli encountered during normal conditions of carriage. A negative result in Test Series 4 on an unpackaged article indicates that the article can be considered for carriage unpackaged. Such unpackaged articles may be fixed to cradles or contained in crates or other suitable handling devices.</p>			

LP102	PACKING INSTRUCTION		LP102
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	Outer packagings	
<b>Bags</b> water resistant  <b>Receptacles</b> fibreboard metal plastics wood  <b>Sheets</b> fibreboard, corrugated  <b>Tubes</b> fibreboard	Not necessary	Steel (50A) Aluminium (50B) Metal other than steel or aluminium (50N) <b>Rigid plastics (50H)</b> Natural wood (50C) Plywood (50D) Reconstituted wood (50F) Fibreboard (50G)	