
**Series 1 freight containers —
Specification and testing —**

**Part 5:
Platform and platform-based
containers**

*Conteneurs de la série 1 — Spécifications et essais —
Partie 5: Conteneurs plates-formes et type plate-forme*

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Foreword

ISO (the International Organization for Standardization) is a worldwide federation of national standards bodies (ISO member bodies). The work of preparing International Standards is normally carried out through ISO technical committees. Each member body interested in a subject for which a technical committee has been established has the right to be represented on that committee. International organizations, governmental and non-governmental, in liaison with ISO, also take part in the work. ISO collaborates closely with the International Electrotechnical Commission (IEC) on all matters of electrotechnical standardization.

The procedures used to develop this document and those intended for its further maintenance are described in the ISO/IEC Directives, Part 1. In particular, the different approval criteria needed for the different types of ISO documents should be noted. This document was drafted in accordance with the editorial rules of the ISO/IEC Directives, Part 2 (see www.iso.org/directives).

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For an explanation of the voluntary nature of standards, the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the World Trade Organization (WTO) principles in the Technical Barriers to Trade (TBT) see www.iso.org/iso/foreword.html.

This document was prepared by Technical Committee ISO/TC 104, *Freight containers*, Subcommittee SC 2, *Specific purpose containers*.

Any feedback or questions on this document should be directed to the user's national standards body. A complete listing of these bodies can be found at www.iso.org/members.html.

This third edition cancels and replaces the second edition (ISO 1496-5:1991), which has been technically revised. It also incorporates the Amendments ISO 1496-5:1991/Amd 1:1993 and ISO 1496-5:1991/Amd 2:1994. The main changes compared to the previous edition are as follows:

- in [5.9.1](#), “1CC, 1C and 1CX” have been deleted;
- old subclauses [5.9.2](#), [5.9.3](#) and [6.12](#) have been deleted and new subclause [7.4](#) added;
- in [Table 3](#), the stacking test loads have been changed according to ISO 1496-1:2013;
- in [6.8.2](#), the floor strength test load has been changed from 5 460 kg to 7 260 kg;
- old Annexes B, D and E have been deleted;

A list of all parts in the ISO 1496 series can be found on the ISO website.

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Series 1 freight containers — Specification and testing —

Part 5: Platform and platform-based containers

1 Scope

This document specifies the basic specifications and testing requirements for ISO series 1 freight containers of the platform and platform-based types designated 1AAA, 1AA, 1A, 1AX, 1BBB, 1BB, 1B, 1BX, 1CC, 1C and 1CX which are suitable for international exchange and for conveyance by road, rail and sea, including interchange between these forms of transport, with certain limitations (for example, when loaded, platforms cannot be stacked or top lifted by means of conventional spreaders).

The container types covered by this document are given in [Table 1](#).

Table 1 — Container types (in accordance with ISO 6346:1995/Amd 3:2012, Table E.1)

Code	Type designation	Type group code	Main characteristics	Detailed type code
P	Platform (container)	PL	Platform (container)	P0
P	Platform-based container with incomplete superstructure:			
P	-- Fixed	PF	-- Two complete and fixed ends	P1
P			-- Fixed posts, either free-standing or with removable top member	P2
P	-- Folding (collapsible)	PC	-- Folding complete end structure	P3
P			-- Folding posts, either free-standing or with removable top member	P4
P	Platform-based container with complete superstructure	PS	-- Open top, open ends (skeletal)	P5
P	-- Platform-based container for named cargo	PT	-- Ship's gear carrier	P6
P			-- Car carrier	P7
P			-- Timber/pipe carrier	P8
P			-- Coil carrier	P9

2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

ISO 668, *Series 1 freight containers — Classification, dimensions and ratings*

ISO 830, *Freight containers — Vocabulary*

ISO 1161, *Series 1 freight containers — Corner and intermediate fittings — Specifications*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in ISO 830 and the following apply.

ISO and IEC maintain terminological databases for use in standardization at the following addresses:

- ISO Online browsing platform: available at <https://www.iso.org/obp>
- IEC Electropedia: available at <http://www.electropedia.org/>

3.1 platform

flat structure having no superstructure

Note 1 to entry: The equipment covered by this document is defined as a loadable platform having no superstructure whatsoever but having the same length and width as the base of series 1 containers, and equipped with top and bottom corner fittings, located in plan view as on other series 1 containers, so that some securing and lifting devices used on other series 1 containers of the same length can also be used on platforms.

3.2 platform-based container

container which has no side walls but has a base similar to that of a platform container

3.3 incomplete superstructure

superstructure lacking any permanently fixed longitudinal load-carrying structure between the ends other than at the base

3.4 interlocked pile

number of platform containers or folding *platform-based containers* (3.2), with ends folded down, which are interlocked to form a unit (module)

Note 1 to entry: See 4.1.3.

4 Dimensions and ratings

4.1 External dimensions

4.1.1 The overall external dimensions and tolerances of the freight containers covered by this document shall be those established in ISO 668, except that the requirements for the overall top lengths, L , of platform-based containers with incomplete superstructure may be relaxed to the extreme limits specified in Table 2.

Table 2 — Overall top dimension, L

Container designation	Overall top dimension in tare condition T	Overall top dimension when loaded to R
	L_{\max} mm	L_{\min} mm
1AAA, 1AA, 1A and 1AX	12 202	12 172
1BBB, 1BB, 1B and 1BX	9 135	9 105
1CC, 1C and 1CX	6 068	6 042

Any movement of the corner posts resulting from the change from the empty to the fully loaded condition of the container should, as far as practicable, be equally disposed about the mean of the values of L_{\max} and L_{\min} .

Taking into account the fact that the mechanism of the folding end structures may introduce natural play, the values of L_{\max} and L_{\min} specified in [Table 2](#) shall be met. Failure to comply with this requirement is liable to lead to handling difficulties.

4.1.2 No part of the platform or platform-based container shall project beyond the envelope defined by the overall external dimensions specified in:

- ISO 668 for the plan dimensions of the base structure of all containers, the plan dimensions of the top part of container with complete superstructure, or the overall maximum height of all containers which may also be of reduced dimensions; or
- [Table 2](#) for the plan dimensions of the top part of containers with incomplete superstructure.

4.1.3 An interlocked pile of either platform or folded platform-based containers shall have the plan dimensions specified in ISO 668 and a pile height not exceeding 2 896 mm¹⁾.

4.2 Internal dimensions

Internal dimensions are not specified; however, minimum internal dimensions of existing 1CC, 1C and 1CX platform-based containers for the carriage of small containers are given in [Annex D](#). The values are given as a guide to the design of small intermodal containers.

4.3 Ratings

The values of the rating, R , the maximum gross mass of these containers, shall be those specified in ISO 668.

5 Design requirements

5.1 General

5.1.1 All containers shall be capable of fulfilling the requirements given in [5.1.2](#) to [5.1.5](#).

5.1.2 The strength requirements for containers are given in diagrammatic form in [Annex A](#) (these requirements are applicable to all containers except where otherwise stated). They apply to containers as complete units, i.e. those removable components in position as required for the intended operating conditions.

5.1.3 The strength requirements for corner fittings (see also [5.3](#)) are specified in ISO 1161.

5.1.4 All containers, except containers with folding ends (codes P3 and P4) in the folded condition, shall be capable of withstanding the loads and loadings specified in [Clause 6](#).

Containers with folding ends in the folded condition shall be capable of withstanding the loads and loadings specified in [Clause 7](#).

As the effects of loads encountered under any dynamic operating condition should only approach, but not exceed, the effects of the corresponding test loads, it is implicit that the capabilities of containers indicated in [Annex A](#), and demonstrated by the tests described in [Clauses 6](#) and [7](#), shall not be exceeded in any mode of operation.

Containers need not be weatherproof but, if designed to be weatherproof, they shall satisfy test No. 13 (see 7.13).

1) 2 896 mm = 9 ft 6 in.

5.1.5 Any movable part which, if unsecured, could lead to a hazardous situation, shall be provided with an adequate securing system having external indication of the positive securement of that part in the appropriate operating position.

5.2 Interlocked pile of folded containers

Horizontal free play shall be limited between individual folded containers forming an interlocked pile so that the pile is capable of complying with the dimensional requirements of [4.1.3](#).

The sum of the tare weights of the platform containers forming an interlocked pile, together with any required securing devices, shall not exceed the maximum gross mass (MGM) specified in ISO 668 for the size of container in question.

5.3 Corner fittings

5.3.1 All containers shall be equipped with top and bottom corner fittings (see Notes 1 and 2). The requirements and positioning of the corner fittings are given in ISO 1161, except for the case mentioned in [4.1.1](#).

NOTE 1 For 1CX platforms, the top and bottom corner fittings can be combined providing they comply with ISO 1161.

NOTE 2 Due to greater inherent flexibility of all sizes of platform-based containers with incomplete superstructure, the top aperture of top corner fittings can be increased by 10 mm in the direction of their end wall.

In such a case, the end aperture should be omitted in order to retain corner fitting strength.

5.3.2 Containers with folding ends shall be equipped with features such that, in the folded condition, they may be stacked and secured, lifted from the top by means of a spreader equipped with corner fitting locking devices (e.g. twistlocks), and interlocked with other containers having similar folding end structures.

The features shall have at least an equivalent to the upper face and internal cavity of the top corner fitting.

The positioning of the features in the folded condition shall meet the requirements of ISO 1161.

5.3.3 For all containers, including containers with folding ends folded down, the upper faces of the top corner fittings or equivalent features (performing some of the functions of top corner fittings, see [5.3.2](#)) shall protrude above the top of the container by a minimum of 6 mm²⁾ (see [5.4.3](#)). "Top of the container" is understood as the highest level of any part of the container, for example the level of the top of a soft cover.

However, if reinforced zones or doubler plates are provided to afford protection in the vicinity of the top corner fittings, such plates and their securements shall not protrude above the upper faces of the top corner fittings.

These plates shall not extend more than 750 mm²⁾ from either end of the container but may cover the full width.

5.4 Base structure

5.4.1 All containers shall be capable of being supported by their bottom corner fittings only.

2) $6 \text{ mm} = \frac{1}{4} \text{ in}$; $12,5 \text{ mm} \begin{matrix} +5 \\ -1,5 \end{matrix} \text{ mm} = \frac{1}{2} \text{ in}$; $\begin{matrix} +3/16 \\ -1/16 \end{matrix} \text{ in}$ 250 mm = 10 in; 750 mm = $29\frac{1}{2} \text{ in}$.

5.4.2 All containers shall be capable of being supported only by load-transfer areas in their base structure.

5.4.2.1 Consequently, these containers shall have end transverse members and sufficient intermediate load-transfer areas (or a flat underside) of sufficient strength to permit vertical load transfer to or from the longitudinal members of a carrying vehicle. Such longitudinal members are assumed to lie within the two 375 mm³⁾ wide zones defined by the broken lines in ISO 668:2013, Figure B.1.

5.4.2.2 The lower faces of the load-transfer areas in the container base structure, including those of the end transverse members, shall be in one plane located 12,5 mm $\begin{matrix} +5 \\ -1,5 \end{matrix}$ mm²⁾ above the plane of the lower faces of the bottom corner fittings of the container (base plane), except where camber is provided (see [5.4.5](#)).

Apart from the bottom corner fittings and bottom side rail, no part of the container shall project below this plane. However, doubler plates may be provided in the vicinity of the bottom corner fittings to afford protection to the understructure.

Such plates shall not extend more than 550 mm⁴⁾ from the outer end and not more than 470 mm⁴⁾ from the side faces of the bottom corner fittings and their lower faces shall be at least 5 mm⁴⁾ above the base plane of the container.

5.4.2.3 The transfer of load between the underside of the bottom side rails and carrying vehicles is not envisaged.

The transfer of load between bottom side rails and handling equipment should only occur when provision has been made in accordance with [5.9.1](#).

5.4.2.4 Containers having all their intermediate transverse members spaced 1 000 mm⁴⁾ apart or less (or having a flat underside) shall be deemed to comply with the requirements of [5.4.2.1](#).

5.4.2.5 Requirements for containers not having transverse members spaced 1 000 mm⁴⁾ apart or less (and not having a flat underside) are given in ISO 668:2013, Annex B.

5.4.3 For all containers under dynamic conditions, or the static equivalent of a container having a load uniformly distributed over the floor in such a way that the combined mass of the container and test load is equal to 1,8R, no part of the base of the container shall deflect more than 6 mm⁴⁾ below the base plane of the container.

5.4.4 The base structure shall be designed to withstand all forces, particularly lateral forces, induced by the cargo in service (see also [5.7.3](#), [5.7.4](#) and Figure A.7 and Figure A.8). This is particularly important where provisions are made for securement of cargo to the base structure of the container.

5.4.5 Camber may be provided with respect to the end transverse members, which shall be located at the height specified in [5.4.2.2](#).

When determining camber of a platform-based container, note should be taken of the relationship between the base deflections which occur under load and the longitudinal movement which is permitted at the top of the corner posts (for which the limit is specified in [4.1.1](#)).

When a container with camber is loaded to its rating R, the base should be approximately horizontal to facilitate the transport of the container when it is supported by its base structure only.

3) 6 mm = $\frac{1}{4}$ in; 12,5 mm $\begin{matrix} +5 \\ -1,5 \end{matrix}$ mm = $\frac{1}{2}$ in; $\begin{matrix} +3/16 \\ -1/16 \end{matrix}$ 375 mm = 15 in; 750 mm = $29\frac{1}{2}$ in.

4) 5 mm = $\frac{3}{16}$ in; 42 mm = $1\frac{3}{4}$ in; 60 mm = $2\frac{3}{8}$ in; 470 mm = $18\frac{1}{2}$ in; 550 mm = 22 in; 1 000 mm = $39\frac{3}{8}$ in.

5.5 End structure (platform-based containers only)

For all platform-based containers, the sideways deflection of the top of the container with respect to the bottom of the container, at the time it is under full transverse rigidity test conditions, shall not cause the sum of the changes in length of the two diagonals to exceed 60 mm⁴).

5.6 Side structure (platform-based containers only)

For all platform-based containers, the longitudinal deflection of the top of the container with respect to the bottom of the container, at the time it is under full longitudinal rigidity test conditions, shall not exceed 42 mm⁴).

5.7 Walls and securing devices

5.7.1 Where containers are provided with end walls, these shall be able to withstand the effects of test No. 5, except insofar as is implied in [5.7.3](#).

5.7.2 Where openings are provided in end walls, the ability of these walls to withstand test No. 5 shall not be impaired.

5.7.3 Where containers are provided with ends which are not able to withstand test No. 5, means shall be provided for securing the cargo to the base structure in such a manner that the cargo does not transmit longitudinal forces to the ends.

5.7.4 Since the containers do not have side walls, adequate means shall be provided to permit the securing of the cargo against lateral movement.

5.7.5 The design requirements for cargo-securing devices presented in [5.7.3](#) and [5.7.4](#) are specified in [Annex C](#).

5.8 Door openings

Door openings need not be provided.

5.9 Requirements — Optional features — Fork-lift pockets

5.9.1 Fork-lift pockets for handling containers in the loaded or unloaded condition may be provided as optional features.

5.9.2 Where a set of fork-lift pockets has been fitted as in [5.9.1](#), a second set of fork-lift pockets may, in addition, be provided on 1CC, 1C and 1CX containers for empty handling only.

5.9.3 Fork-lift pockets may be provided on 1AAA, 1AA, 1A, 1AX, 1BBB, 1BB, 1B, 1BX containers for empty handling only, and caution decals shall be applied near the pockets to indicate operators that these pockets are only for empty handling.

5.9.4 The fork-lift pockets, where provided, shall meet the dimensional requirements specified in [Annex B](#) and shall pass completely through the base structure of the container so that lifting devices may be inserted from either side. The base of the fork-lift pockets need not be the full width of the container but shall be provided near each end of the fork-lift pockets.

6 Testing

6.1 General

6.1.1 Unless otherwise stated, containers complying with the design requirements specified in [Clause 5](#) shall, in addition, be capable of withstanding the tests specified in [6.2](#) to [6.13](#), and [7.1](#) to [7.3](#), as applicable. Containers shall be tested in the condition for which they are designed to be operated. Containers equipped with removable structural items shall be tested with these items in position.

Although the tests are numbered in a certain order, they may be carried out in a different order if more appropriate to optimize utilization of the testing facilities or interpretation of the test results. However, the weatherproofness test (test No. 11), where appropriate, shall always be performed after all structural tests have been completed.

6.1.2 The symbol P denotes the maximum payload of the container to be tested calculated with Formula (1):

$$P = R - T \quad (1)$$

where

R is the rating;

T is the tare.

NOTE R , P and T , by definition, are in units of mass. Where test requirements are based on the gravitational forces derived from these values, these forces, which are inertial forces, are indicated as follows: R_g , P_g , T_g ; the units of which are in newtons or multiples thereof.

The word “load”, when used to describe a physical quantity to which units may be ascribed, implies mass.

The word “loading”, for example as in “internal loading”, implies force.

6.1.3 The test load or loading on the platform or platform-based container shall be uniformly distributed.

6.1.4 The test loads and loadings specified in all of the following tests are minimum requirements.

6.1.5 The dimensional requirements to which reference is made after each test are those specified in:

- a) the dimensional and design requirement clauses of this document, i.e. ISO 1496-5;
- b) ISO 668;
- c) ISO 1161.

6.2 Test No. 1 — Stacking

6.2.1 General

This test shall be carried out to prove the ability of a fully loaded container to support a superimposed mass of containers, taking into account conditions aboard ships at sea and the relative eccentricities between superimposed containers.

[Table 3](#) specifies the force to be applied as a test to each pair of corner fittings and the superimposed mass that the test force represents.

6.2.2 Procedure

6.2.2.1 Platform container

The container in the tare condition shall be placed on four level pads, one under each bottom corner fitting or equivalent corner structure. The pads shall be centralized under the fittings, and shall be substantially of the same plan dimensions as the fittings.

The container shall be subjected to vertical forces applied either to all four corner fittings simultaneously or to each pair of end fittings, at the appropriate level specified in [Table 3](#).

6.2.2.2 Platform-based container

The container shall be placed on four level pads, one under each bottom corner fitting. The pads shall be centralized under the fittings, and shall be substantially of the same plan dimensions as the fittings.

The container shall have a load uniformly distributed over the floor in such a way that the combined mass of the container and test load is equal to $1,8R$.

The container shall be subjected to vertical forces applied either to all four corner fittings simultaneously or to each pair of end fittings, at the appropriate level specified in [Table 3](#).

6.2.2.3 Application of force

For platform or platform-based containers, the forces shall be applied through a test fixture equipped with corner fittings as specified in ISO 1161, or equivalent fittings which have imprints of the same geometry (i.e. with the same external dimensions, chamfered aperture and rounded edges) as the lower face of the bottom corner fitting specified in ISO 1161. If equivalent fittings are used, they shall be designed to produce the same effect on the container under the test loads as when corner fittings are used.

In all cases, the forces shall be applied in such a manner that rotation of the planes through which the forces are applied and on which the container is supported is minimized.

Each corner fitting or equivalent fitting shall be offset in the same direction by 25,4 mm⁵⁾ laterally and 38 mm⁵⁾ longitudinally.

6.2.3 Requirements

On completion of the test, the container shall show neither permanent deformation nor abnormality which will render it unsuitable for use, and the dimensional requirements affecting handling, securing and interchange shall be satisfied.

6.3 Test No. 2 — Lifting from the four top corner fittings

6.3.1 General

This test shall be carried out to prove the ability of a container to withstand being lifted from the four top corner fittings with the lifting forces applied vertically. These are the only recognized ways of lifting these platform containers by the four top corner fittings.

Loaded platforms should be lifted by means of spreaders with extensions.

This test shall also be regarded as proving the ability of the floor and base structure to withstand the forces arising from acceleration of the payload in lifting operations.

5) 25,4 mm = 1 in; 38 mm = $1\frac{1}{2}$ in.

6.3.2 Procedure

The container shall have a load uniformly distributed over the floor in such a way that the combined mass of the container and test load is equal to $2R$, and it shall be carefully lifted from all four top corners in such a way that no significant acceleration or deceleration forces are applied.

For all platform containers, the lifting forces shall be applied vertically.

After lifting, the container shall be suspended for 5 min and then lowered to the ground.

6.3.3 Requirements

On completion of the test, the container shall show neither permanent deformation nor abnormality which will render it unsuitable for use, and the dimensional requirements affecting handling, securing and interchange shall be satisfied.

Table 3 — Forces to be applied in stacking test

Container designation	Test force per container (all four corners simultaneously)		Test force per pair of end fittings		Superimposed mass represented by test force	
	kN	lbf	kN	lbf	kg	lb
1AAA, 1AA, 1A and 1AX	3 767	846 854	1 883	423 317	213 360	470 380
1BBB, 1BB, 1B and 1BX	3 767	846 854	1 883	423 317	213 360	470 380
1CC, 1C and 1CX	3 767	846 854	1 883	423 317	213 360	470 380

NOTE The test force of 3 767 kN per container is derived from the superimposed mass of eight-high stacking, i.e. seven containers stacked on top of one container, all being rated to 30 480 kg, and an acceleration of 1,8 g. [The corner posts of such containers are known to have been tested to 96 012 kg (211 610 lb)].

6.4 Test No. 3 — Lifting from the four bottom corner fittings

6.4.1 General

This test shall be carried out to prove the ability of a container to withstand being lifted from its four bottom corner fittings by means of lifting devices bearing on the bottom corner fittings only and attached to a single transverse central spreader beam above the container.

6.4.2 Procedure

The container shall have a load uniformly distributed over the floor in such a way that the combined mass of container and test load is equal to $2R$, and shall be carefully lifted from the side apertures of all four bottom corner fittings in such a way that no significant acceleration or deceleration forces are applied.

Lifting forces shall be applied at an angle of:

- 30° to the horizontal for 1AAA, 1AA, 1A and 1AX containers;
- 37° to the horizontal for 1BBB, 1BB, 1B and 1BX containers;
- 45° to the horizontal for 1CC, 1C and 1CX.

In each case, the line of action of the lifting force and the outer face of the corner fitting shall be no further apart than 38 mm⁶⁾. The lifting shall be carried out in such a manner that the lifting devices bear on the four bottom corner fittings only.

After lifting, the container shall be suspended for 5 min and then lowered to the ground.

6) 38 mm = $1\frac{1}{2}$ in.

6.4.3 Requirements

On completion of the test, the container shall show neither permanent deformation nor abnormality which will render it unsuitable for use, and the dimensional requirements affecting handling, securing and interchange shall be satisfied.

6.5 Test No. 4 — External restraint (longitudinal)

6.5.1 General

This test shall be carried out to prove the ability of a container to withstand longitudinal external restraint under dynamic conditions of railway operations, which implies acceleration of 2 g.

6.5.2 Procedure

The container shall have a load uniformly distributed over the floor in such a way that the combined mass of the container and the uniformly distributed test load is equal to R , and it shall be secured longitudinally to rigid anchor points through the bottom aperture of the bottom corner fittings at one end of the container.

A force of $2R_g$ shall be applied horizontally to the container through the bottom apertures of the other bottom corner fittings, first towards and then away from the anchor points.

6.5.3 Requirements

On completion of the test, the container shall show neither permanent deformation nor abnormality which will render it unsuitable for use, and the dimensional requirements affecting handling, securing and interchange shall be satisfied.

6.6 Test No. 5 — Strength of end walls (where provided)⁷⁾

6.6.1 General

This test shall be carried out to prove the ability of a container to withstand forces under the dynamic conditions referred to in [6.5.1](#).

6.6.2 Procedure

The container shall have each end tested when one end is blind and the other equipped with special features. In the case of symmetrical construction, one end only need be tested. The container shall be subjected to an internal loading of $0,4Pg$. The internal loading shall be uniformly distributed over the wall under test and arranged to allow free deflection of the wall.

6.6.3 Requirements

On completion of the test, the container shall show neither permanent deformation nor abnormality which will render it unsuitable for use, and the dimensional requirements affecting handling, securing and interchange shall be satisfied.

⁷⁾ Tests No. 5 and No. 6 are applicable to only some types of platform-based containers. Test No. 6 of ISO 1496-1:2013 (strength of side walls) is not applicable.

6.7 Test No. 6 — Strength of the roof (where provided)⁷⁾

6.7.1 General

This test shall be carried out to prove the ability of the rigid roof of a container, where fitted, to withstand the loads imposed by persons working on the roof.

6.7.2 Procedure

A load of 300 kg⁸⁾ shall be uniformly distributed over an area of 600 mm × 300 mm⁸⁾ located at the weakest area of the rigid roof of the container.

6.7.3 Requirements

On completion of the test, the container shall show neither permanent deformation nor abnormality which will render it unsuitable for use, and the dimensional requirements affecting handling, securing and interchange shall be satisfied.

6.8 Test No. 7 — Floor strength

6.8.1 General

This test shall be carried out to prove the ability of a container floor to withstand the concentrated dynamic loading during cargo operations involving trucks or similar devices.

6.8.2 Procedure

The test shall be performed using a test vehicle equipped with tyres, with an axle load of 7 260 kg⁸⁾ [i.e. 3 630 kg⁸⁾ on each of two wheels]. It shall be so arranged that all points of contact between each wheel and a flat continuous surface lie within a rectangular envelope measuring 185 mm⁸⁾ (in a direction parallel to the axle of the wheel) by 100 mm⁸⁾ and that each wheel makes physical contact over an area within this envelope of not more than 142 cm² ⁸⁾. The wheel width shall be nominally 180 mm⁸⁾ and the wheel centres shall be nominally 760 mm⁸⁾. The test vehicle shall be manoeuvred over the entire floor area of the container both longitudinally and transversally. The test shall be made with the container resting on four level supports under its four bottom corner fittings, with its base structure free to deflect.

6.8.3 Requirements

On completion of the test, the container shall show neither permanent deformation nor abnormality which will render it unsuitable for use, and the dimensional requirements affecting handling, securing and interchange shall be satisfied.

6.9 Test No. 8 — Rigidity (transverse) (not applicable to platform containers)

6.9.1 General

This test shall be carried out to prove the ability of a container, other than a platform container, to withstand the transversal racking forces resulting from ship movement.

8) 142 cm² = 22 in²; 300 kg = 660 lb; 3 630 kg = 8 000 lb; 7 260 kg = 16 000 lb; 150 kN = 33 700 lbf; 100 mm = 4 in; 180 mm = 7 in; 185 mm = 7 $\frac{1}{4}$ in; 600 mm × 300 mm = 24 in × 12 in; 760 mm = 30 in.

6.9.2 Procedure

6.9.2.1 The container in tare condition, T , shall be placed on four level supports, one under each corner fitting, and shall be restrained against lateral and vertical movement by means of anchor devices acting through the bottom apertures of the bottom corner fittings. Lateral restraint shall be provided only at a bottom corner fitting diagonally opposite and in the same end frame as the top corner fitting to which forces are applied. When testing the two end frames separately, vertical restraint shall be applied only at the end frame under test.

6.9.2.2 In the case of containers of type code P2 or P4, in order to represent typical service conditions as closely as practicable, the top corner fittings at the end or ends of the container under test should be connected transversally by means of a member or members representing the lower transverse member(s) in the end frame(s) of a superimposed container. The representative member shall be securely attached to the corner fittings so that the loads will be equally applied to the two posts.

6.9.2.3 Forces of 150 kN⁹⁾ shall be applied either separately or simultaneously to each of the top corner fittings on one side of the container in lines parallel both to the base and to the planes of the ends of the container. The forces shall be applied first towards and then away from the top corner fittings.

In the case of a container with identical ends, only one end need be tested. Where an end is not essentially symmetrical about its own vertical centreline, both sides of that end shall be tested.

For allowable deflections under full test loading, see [5.5](#).

6.9.3 Requirements

On completion of the test, the container shall show neither permanent deformation nor abnormality which will render it unsuitable for use, and the dimensional requirements affecting handling, securing and interchange shall be satisfied.

NOTE 6 The satisfactory completion of this test by a container of type code P2 or P4 implies that each post can be subjected to a maximum transverse racking loading of 75 kN¹⁰⁾ in service.

6.10 Test No. 9 — Rigidity (longitudinal) (not applicable to platform containers)

6.10.1 General

This test shall be carried out to prove the ability of a container, other than a platform container, to withstand the longitudinal racking forces resulting from ship movement.

For a container which has incomplete superstructures, a total racking loading of 150 kN¹⁰⁾ is assumed to be shared between the two ends of the container in the ratio of 2 to 1, although there is uncertainty surrounding the precise division of loading. The test shall be applied in accordance with the procedure given in [6.10.2](#).

6.10.2 Procedure

6.10.2.1 The container in tare condition, T , shall be placed on four level supports, one under each corner fitting, and shall be restrained against longitudinal and vertical movement by means of anchor devices acting through the bottom apertures of the bottom corner fittings. Longitudinal restraint shall be provided only at a bottom corner fitting diagonally opposite and in the same side frame as the top corner fitting to which the force is applied.

9) 142 cm² = 22 in²; 300 kg = 660 lb; 150 kN = 33 700 lbf; 100 mm = 4 in; 180 mm = 7 in; 185 mm = $7\frac{1}{4}$ in; 600 mm × 300 mm = 24 in × 12 in; 760 mm = 30 in.

10) 50 kN = 11 200 lbf; 75 kN = 16 850 lbf; 150 kN = 33 700 lbf; 200 mm = 8 in; 1 828 mm ± 3 mm = 72 in ± $\frac{1}{8}$ in.

6.10.2.2 For containers with incomplete superstructure (types P1, P2, P3 and P4), forces of 50 kN¹⁰⁾ shall be applied either separately or simultaneously to each of the top corner fittings on one end of the container in lines parallel both to the base of the container and to the planes of the sides of the container. The forces shall be applied first towards and then away from the top corner fitting.

6.10.2.3 For containers with complete superstructure (types P5), forces of 75 kN¹⁰⁾ shall be applied either separately or simultaneously to each of the top corner fittings on one end of the container in lines parallel both to the base of the container and to the planes of the sides of the container. The forces shall be applied first towards and then away from the top corner fitting.

6.10.2.4 In the case of a container with identical sides, only one side need be tested. Where a side is not essentially symmetrical about its own vertical centreline, both ends of that side shall be tested.

For allowable deflections under full test loading, see [5.6](#).

NOTE The deflection is that produced by the test loading and does not include any natural play existing in the mechanism (see [4.1.1](#)).

6.10.3 Requirements

On completion of the test, the container shall show neither permanent deformation nor abnormality which will render it unsuitable for use, and the dimensional requirements affecting handling, securing and interchange shall be satisfied.

6.11 Test No. 10 — Lifting from fork-lift pockets (where provided)

6.11.1 General

This test shall be carried out on any container which is fitted with fork-lift pockets.

6.11.2 Procedure

6.11.2.1 Containers fitted with one set of fork-lift pockets

The container shall have a load uniformly distributed over the floor in such a way that the combined mass of container and test load is equal to $1,6R$ or $0,625R$ for those containers which fitted with empty handling fork-lift pockets. It shall be supported on two horizontal bars, each 200 mm¹¹⁾ wide, projecting $1\,828\text{ mm} \pm 3\text{ mm}$ ¹¹⁾ into the fork pocket, measured from the outside face of the side of the container. The bars shall be centred within the pockets.

After lifting, the container shall be supported for 5 min and then lowered to the ground.

6.11.2.2 Containers fitted with two sets of fork-lift pockets

The test specified in [6.11.2.1](#) shall be applied to the outer pockets.

A second test shall be applied to the (additional) inner pockets. The procedure for this second test shall be as required in [6.11.2.1](#) except that, in this case, the combined mass of the container and test load shall be equal to $0,625R$, and the bars shall be placed in the inner pockets.

6.11.3 Requirements

On completion of the test, the container shall show neither permanent deformation nor abnormality which will render it unsuitable for use, and the dimensional requirements affecting handling, securing and interchange shall be satisfied.

11) 50 kN = 11 200 lbf; 75 kN = 16 850 lbf; 150 kN = 33 700 lbf; 200 mm = 8 in; $1\,828\text{ mm} \pm 3\text{ mm} = 72\text{ in} \pm \frac{1}{8}\text{ in}$.

6.12 Test No. 11 — Weatherproofness (where appropriate)¹²⁾

6.12.1 Procedure

A stream of water shall be applied on all exterior joints and seams of the container from a nozzle of 12,5 mm¹³⁾ inside diameter, at a pressure of about 100 kPa¹³⁾ [corresponding to a head of about 10 m³⁾ of water] on the upstream side of the nozzle. The nozzle shall be held 1,5 m¹³⁾ from the container under test, and the stream shall be traversed at a velocity of 0,1 m/s¹³⁾.

Procedures involving the use of several nozzles are acceptable provided that each joint or seam is subjected to a water loading not less than that which would be given by a single nozzle.

6.12.2 Requirements

On completion of the test, the container shall be free from penetration of water.

7 Testing of platform-based containers with incomplete superstructure in the folded condition (type codes P3 and P4 only) and of an interlocked pile of such containers

7.1 General

7.1.1 The containers complying with the design requirements specified in 5.1.3 shall be capable of with-standing the tests specified in 7.2 and 7.3 as appropriate to their intended operation in the folded condition.

7.1.2 The definitions of terms given in 6.1.2 are equally applicable to this clause.

7.1.3 The symbol n denotes the maximum number of containers which form an interlocked pile as defined in 3.6 and 4.1.3.

7.1.4 The test loads specified in all the following tests are the minimum requirements.

7.2 Test No. 12 — Stacking (type codes P3 and P4 only)

7.2.1 General

This test shall be carried out to prove the ability of a folding container, in the folded condition, to support a superimposed mass of fully loaded containers, taking into account conditions aboard ships at sea and the relative eccentricities between superimposed containers.

Table 3 specifies the force to be applied as a test to each pair of corner fittings and the superimposed mass that the test force represents.

7.2.2 Procedure

The container in the tare and folded condition shall be placed on four level pads, one under each bottom corner fitting. The pads shall be centralized under the fittings and shall be substantially of the same plan dimensions as the fittings.

12) For example, type P5 containers equipped with side curtains.

13) 12,5 mm = 12 in; 100 kPa = 14,5 psi; 10 m = 33 ft; 1,5 m = 5 ft; 0,1 m/s = 4 in/s.

The container shall be subjected to vertical forces applied either to all four features provided for stacking (as in 5.3.2) simultaneously or to each pair of same features at the appropriate level specified in Table 3.

The forces shall be applied through a test fixture equipped with corner fittings as specified in ISO 1161 or equivalent fittings which have imprints of the same geometry (i.e. with the same external dimensions, chamfered aperture and rounded edges) as the bottom face of the bottom corner fitting specified in ISO 1161. If equivalent fittings are used they shall be designed to produce the same effect on the container under the test loads as when corner fittings are used.

In all cases, the forces shall be applied in such a manner that rotation of the planes through which the forces are applied and on which the container is supported is minimized. Each corner fitting or equivalent fitting shall be offset in the same direction by 25,4 mm¹⁴⁾ laterally and 38 mm¹⁴⁾ longitudinally.

7.2.3 Requirements

On completion of the test, the container shall show neither permanent deformation nor abnormality which will render it unsuitable for use, and the dimensional requirements affecting handling, securing and interchange shall be satisfied.

7.3 Test No. 13 — Lifting of an interlocked pile by the top

7.3.1 General

This test shall be carried out to prove the resistance of either a platform or a folded container connected to a interlocked pile when lifted from above using the features (see 5.3.2) provided, and with the lifting forces applied vertically.

7.3.2 Procedure

The container shall be connected by means of interlocking devices or by its integral interlocking devices (where fitted) to another container or to a test fixture which simulates a second container, so that the gross mass lifted by the container under test is $(2n - 1)T$, the mass being equally shared among the interlocking devices, where n is the largest number of interlocked units having a combined height of less than 2 896 mm¹⁴⁾.

The combined units shall be carefully lifted from all four top corners in such a way that no significant acceleration or deceleration forces are applied.

7.3.3 Requirements

On completion of the test, the container shall show neither permanent deformation nor abnormality which will render it unsuitable for use, and the dimensional requirements affecting handling, securing and interchange shall be satisfied.

7.4 Test No. 14 — Lifting of a flush folded container by the top

7.4.1 General

This test shall be carried out to prove the ability of a flush folded container (type P3 and type P4) to withstand being lifted from its four top corner fittings on stub posts with the lifting forces applied vertically.

14) 25,4 mm = 1 in; 38 mm = $1\frac{1}{2}$ in; 2 896 mm = 9 ft 6 in.

7.4.2 Procedure

The container shall be folded until the top surface is substantially flush to form a platform and shall have a load uniformly distributed over the floor in such a way that the combined mass of the container and test load is equal to $2R$, and it shall be carefully lifted from all four top corners in such a way that no significant acceleration or deceleration forces are applied.

For all platform containers, the lifting forces shall be applied vertically.

After lifting, the container shall be suspended for 5 min and then lowered to the ground.

7.4.3 Requirements

On completion of the test, the container shall show neither permanent deformation nor abnormality which will render it unsuitable for use, and the dimensional requirements affecting handling, securing and interchange shall be satisfied.

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Annex A (normative)

Diagrammatic representation of capabilities of platform and platform-based containers

NOTE 1 The externally applied forces shown below are for one end or one side only. The loads shown within the containers represent uniformly distributed internal loads only, and such loads are for the whole container.

NOTE 2 The figures in this annex correspond to the tests described in 6.2 to 6.12, and 7.2 to 7.4, only where marked.

NOTE 3 For definitions of R , P and T , see 6.1.1.

NOTE 4 When end and side elevations are represented by a complete square or rectangle, such figures apply to platform-based containers either with complete superstructure or with incomplete superstructure of type codes P1 and P3.

NOTE 5 When end and side elevations are represented by an incomplete square or rectangle, such figures apply to platform-based containers of type codes P2 and P4 (having no transverse and longitudinal top members).

Figure No.	End elevations	Side elevations
A.1	Platform container	
	Stacking Test No.1	
	Platform-based container	
Stacking Test No.1		

Figure No.	End elevations	Side elevations	
A.2	Platform container		
	Top lift		
	Platform-based container		
Top lift			

Figure No.	End elevations	Side elevations	
A.3	Platform container		
	Top lift Test No.2		
	Platform-based container		
Top lift Test No.2			

Figure No.	End elevations	Side elevations
A.4	Platform container	
	Bottom lift Test No.3 	
	Platform-based container	
	Bottom lift Test No.3 	

Figure No.	End elevations	Side elevations
A.5	Platform container	
	Restraint (longitudinal) Test No. 4 at bottom 	
	Platform-based container	
	Restraint (longitudinal) Test No. 4 	

Figure No.	End elevations	Side elevations
A.6	Platform container	
	Restraint (longitudinal) Test No. 4 at bottom 	
	Platform-based container	
	Restraint (longitudinal) Test No. 4 	

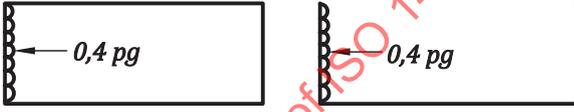
Figure No.	End elevations	Side elevations
A.7	Platform container	
	Effect of cargo loading	
		
Platform-based container		
Effect of cargo loading End loading (where provided) Test No. 5		
Not applicable to types P2 and P4		

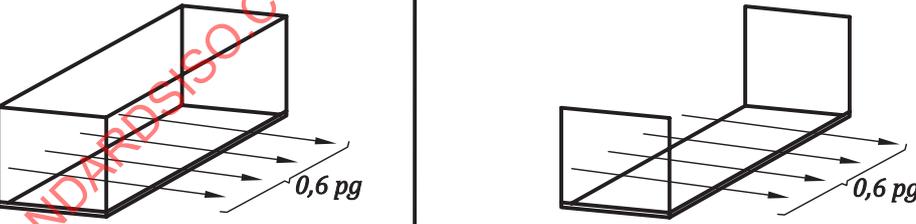
Figure No.	End elevations	Side elevations
A.8	Platform container	
	Effect of cargo loading	
		
Platform-based container		
Effect of cargo loading		

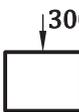
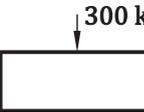
Figure No.	End elevations	Side elevations
A.9	Platform-based container	
	Roof load Test No.6	
		
Applicable where a rigid roof is provided: type P5 only		

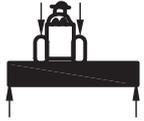
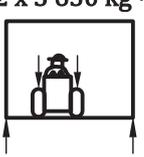
Figure No.	End elevations	Side elevations
A.10	Platform container	
	Wheel loads Test No.7 $2 \times 3 \text{ 630 kg}^{(1)}$ 	
	Platform-based container	
	Wheel loads Test No.7 $2 \times 3 \text{ 630 kg}^{(1)}$ 	

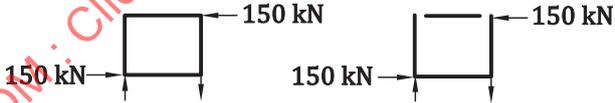
Figure No.	End elevations
A.11	Platform-based container
	Rigidity (transversal) Test No. 8 

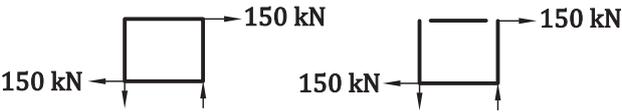
Figure No.	End elevations
A.12	Platform-based container
	Rigidity (transversal) Test No. 8 

Figure No.	End elevations
	Platform container
	Lashing / securement at bottom
	Platform-based container
A.13	Lashing / securement

Figure No.	End elevations
	Platform container
	Lashing / securement at top
	Platform-based container
A.14	Lashing / securement

Figure No.	End elevations
	Platform container
	Lashing / securement at top
	Platform-based container
A.15	Lashing / securement

Figure No.	End elevations
A.16	Platform container
	Lashing / securement at bottom
	Platform-based container
Lashing / securement	

Figure No.	Side elevations
A.17	Platform-based container
	Rigidity (longitudinal)

Figure No.	Side elevations
A.18	Platform-based container
	<div style="display: flex; justify-content: space-around; align-items: center;"> <div style="text-align: center;"> <p>Applicable to type P5</p> </div> <div style="text-align: center;"> <p>Applicable to types P1 to P4</p> </div> </div>

Figure No.	Side elevations
A.17A	Platform-based container
	Rigidity (longitudinal) Test No. 9

Figure No.	Side elevations
A.18A	Platform-based container
	Rigidity (longitudinal) Test No. 9

Figure No.	End elevations	Side elevations
A.19	Platform container	Platform-based container
	Lashing/securement at top	
		Not applicable

Figure No.	End elevations	Side elevations
A.20	Platform container	Platform-based container
	Lashing/securement at top	
		Not applicable

