
INTERNATIONAL STANDARD 1496/VI c)

INTERNATIONAL ORGANIZATION FOR STANDARDIZATION • МЕЖДУНАРОДНАЯ ОРГАНИЗАЦИЯ ПО СТАНДАРТИЗАЦИИ • ORGANISATION INTERNATIONALE DE NORMALISATION

Series 1 freight containers — Specification and testing — Part VI c) : Platform based containers, open-sided, with complete superstructure

Conteneurs de la série 1 — Spécifications et essais —

Partie VI c) : Conteneurs type plate-forme, à parois ouvertes, avec superstructure complète

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FOREWORD

ISO (the International Organization for Standardization) is a worldwide federation of national standards institutes (ISO member bodies). The work of developing International Standards is carried out through ISO technical committees. Every member body interested in a subject for which a technical committee has been set up 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.

Draft International Standards adopted by the technical committees are circulated to the member bodies for approval before their acceptance as International Standards by the ISO Council.

International Standard ISO 1496/VI c) was developed by Technical Committee ISO/TC 104, *Freight containers*, and was circulated to the member bodies in July 1975.

It has been approved by the member bodies of the following countries :

Australia	Hungary	Romania
Austria	India	South Africa, Rep. of
Belgium	Iran	Spain
Brazil	Ireland	Sweden
Bulgaria	Israel	Switzerland
Canada	Italy	Turkey
Cuba	Japan	United Kingdom
Czechoslovakia*	Malaysia	U.S.A.
Denmark	Mexico	U.S.S.R.
Finland	Netherlands	Yugoslavia
France	New Zealand	
Germany	Norway	

* except the last paragraph of sub-clause 4.1.

The member body of the following country expressed disapproval of the document on technical grounds :

Poland

Series 1 freight containers — Specification and testing — Part VI c) : Platform based containers, open-sided, with complete superstructure

0 INTRODUCTION

Grouping of container types for specification purposes

Part I

General cargo 00 to 09, 50 to 53 and 56 to 59

Part II

Thermal 20 to 49

Part III

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Part IV

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Part V

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Part VI a)

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with incomplete
superstructure and
fixed ends 61 and 62

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Platform based
with incomplete
superstructure and
folding ends 63 and 64

Part VI c)

Platform based,
open-sided, with
complete super-
structure 54 and 55, 65 to 69

Part VII

Air mode 90 to 99

NOTE — Container groupings for Parts I to V, and VII will be set forth in detail in the relevant documents.

1 SCOPE AND FIELD OF APPLICATION

1.1 This International Standard sets out basic requirements for the specification and testing of ISO series 1, Part VI c) freight containers designated 1AA, 1A, 1BB, 1B, 1CC, 1C and 1D which are suitable for international exchange and for conveyance by road, rail and sea, including interchange between these forms of transport.

1.2 The container types covered by this International Standard are platform based containers, open-sided, with complete superstructure¹⁾ :

Type code designation*	Type
65	with roof
54	with open top
55	with open top, open ends (skeletal)

* In accordance with ISO 2716.

1.3 The marking requirements for these containers are to be in accordance with the principles embodied in ISO 790 and ISO 2716 for the marking and identification of series 1 containers.

2 REFERENCES

ISO 668, *Freight containers — External dimensions and ratings.*

ISO 790, *Marking of series 1 freight containers.*

ISO 1161, *Series 1 freight containers — Corner fittings — Specification.*

ISO 2716, *Identification marking code for freight containers.*

1) The term "complete superstructure" means presence of a permanently fixed longitudinal load-carrying structure between the ends at the top.

3 DIMENSIONS AND RATINGS

3.1 External dimensions

The overall external dimensions and tolerances of the containers covered by this International Standard are those established in ISO 668.

No part of the container shall project beyond these overall dimensions.

3.2 Internal dimensions

Internal dimensions are not specified.

3.3 Ratings

The values of the rating R , being the maximum operating gross weight of the container, are those given in ISO 668.

$$R = P + T$$

where P is the maximum operating payload and T is the tare weight.

4 DESIGN REQUIREMENTS

4.1 General

All containers shall be capable of fulfilling the following requirements.

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.

The strength requirements for corner fittings (see also 4.2) are given in annex C of ISO 1161.

The containers shall be capable of withstanding the loads and forces detailed in clause 5.

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 clause 5 shall not be exceeded in any mode of operation.

All containers fitted with the covers which were designed for them shall be weather-proof as required by test No. 12 (see 5.13).

4.2 Corner fittings

All containers covered by this International Standard shall be equipped with top and bottom corner fittings. The requirements and positioning of the corner fittings are given in ISO 1161.

The upper faces of the top corner fittings shall protrude above the top of the container by a minimum of 6 mm (1/4 in) (see 4.3.3). The "top of the container" means the highest level of the cover of the container, for example the level of the top of a soft cover.

4.3 Base structure

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

Containers 1AA, 1A, 1BB, 1B, 1CC and 1C shall also be capable of being supported on load transferring areas in their base structures only.

Consequently, these containers shall have end transverse members and sufficient intermediate load transferring areas (or a flat underside) of sufficient strength to permit vertical load transfer. These requirements are specified in annex B.

The maximum load to be transferred at the load transfer zones (shown in figure 23) shall not exceed the value R multiplied by a dynamic factor of 2.0.

For containers 1AA, 1A, 1BB, 1B, 1CC and 1C the lower faces of the load transferring areas in their bases including their end transverse members shall lie in a plane located :

$$12,5^{+5}_{-1,5} \text{ mm } \left(1/2^{+3/16}_{-1/16} \text{ in} \right)$$

above the base plane of the containers (bottom faces of lower corner fittings) except where camber is provided (see 4.3.2).

4.3.2 Camber may be provided in relation to the end transverse members which shall be located at the height required in 4.3.1.

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

4.3.3 Under dynamic conditions, or the static equivalent thereof, with the container having a load uniformly distributed over the floor in such a way that the combined weight of the container and test load is equal to $1,8 R$, no part of the base of the container shall deflect more than 6 mm (1/4 in) below the base plane (bottom faces of the lower corner fittings).

4.3.4 The base structure shall be designed to withstand all forces, particularly lateral forces, induced by the cargo in service (see also 4.6.3 and 4.6.4). This is particularly important where provisions are made for securement of cargo to the base structure of the container.

4.4 End structure

For containers 1AA, 1A, 1BB, 1B, 1CC and 1C, the side-ways 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 mm (2 3/8 in).

4.5 Side structure

For containers 1AA, 1A, 1BB, 1B, 1CC and 1C, the longitudinal deflection of the top of the container with

respect to the bottom of the container under full longitudinal rigidity test conditions shall not exceed 42 mm (1 21/32 in).

4.6 End walls and securing devices

4.6.1 Where containers are provided with end walls these should be able to withstand the effects of test No. 5, except in so far as it is implied in 4.6.3.

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

4.6.3 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.

4.6.4 As the containers covered by this International Standard do not have side walls, adequate means shall be provided to permit the securement of the cargo against lateral movement.

4.6.5 The securing devices described in 4.6.3 and 4.6.4 shall be designated and permanently fitted to the base structure of the container in such a way that :

- 1) the ropes or other means of lashing the cargo will not protrude beyond the overall dimensions given in 3.1;
- 2) no part of the lashing devices will protrude above the plane located 6 mm (1/4 in) below the upper surfaces of the top corner fittings.

4.7 Doors

Doors need not be provided.

OPTIONAL REQUIREMENTS

4.8 Fork lift pockets

Fork lift pockets may be provided as optional features for handling 1CC, 1C and 1D containers in the loaded or unloaded condition. The dimensional requirements for such pockets are specified in annex C.

Fork pockets, when provided, shall pass completely through the base structure of the container, so that lifting devices may be inserted from either side.

It is not necessary for the base of the fork lift pockets to be the full width of the container, but it should be provided in the vicinity of each end of the pockets.

4.9 Provision for handling at the base by means of grapples or similar devices

Provision for handling these containers by means of grapples or similar devices may be provided as optional features. The dimensional requirements for such provisions are specified in annex D.

4.10 Gooseneck tunnels

Gooseneck tunnels may be provided as optional features in containers 1AA and 1A. The dimensional requirements are specified in annex E and, in addition, all other parts of the base structure shall be as specified in 4.3.

NOTE — The requirements of 4.2, 4.8 and 4.9 do not preclude the provision of additional facilities for lifting, either from the top or at the bottom of the containers.

5 TESTING

5.1 General

Containers shall be tested in the condition in which they are designed to be operated.

Unless otherwise stated, containers complying with the design requirements specified in clause 4 shall, in addition, be capable of withstanding the tests specified in 5.2 to 5.13 inclusive, as applicable. It is recommended that the test for weatherproofness (test No. 12) be made last.

5.1.1 The symbol R denotes the maximum operating gross weight of the container and the symbol P denotes the maximum operating payload of the container to be tested, that is, the tare weight T subtracted from the maximum operating gross weight R :

$$P = R - T$$

5.1.2 The test load within the container shall be uniformly distributed.

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

5.1.4 The dimensional requirements to which reference is made in the requirements sub-clause after each test are those specified in :

- a) the dimensional and design requirement clause of this International Standard;
- b) ISO 668;
- c) ISO 1161.

5.2 Test No. 1 — Stacking

5.2.1 General

This test shall be carried out to prove the ability of a container to support five other fully loaded containers of the same length and rating under the acceleration conditions encountered in ships' cell structures, taking into account relative eccentricities between containers due to clearance.

5.2.2 Procedure

The container under test 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 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 weight of the container and the test load is equal to $1,8 R$.

The container under test shall be subjected to a vertical force equivalent to a load of $2,25 R$ on each of the top corner fittings simultaneously or $4,5 R$ on each pair of end fittings in such a manner that the planes of application of the forces and the supports of the container remain horizontal and unchanged during the test. The forces shall be applied through a corner fitting or a pad of the same plan area as a corner fitting. Each pad shall be offset in the same direction by 25,4 mm (1 in) laterally and 38 mm (1 1/2 in) longitudinally.

5.2.3 Requirements

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

5.3 Test No. 2 — Lifting from the top corner fittings

5.3.1 General

This test shall be carried out to prove the ability of 1AA, 1A, 1BB, 1B, 1CC and 1C containers to withstand being lifted from the top corner fittings with the lifting forces applied vertically, and the ability of 1D containers to withstand being lifted from the top corner fittings with the lifting forces applied at any angle between the vertical and 30° to the vertical, these being the only recognized methods of lifting these containers by the top corner fittings.

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.

5.3.2 Procedure

The container under test shall have a load uniformly distributed over the floor in such a way that the combined weight of the container and test load is equal to $2 R$, 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 1AA, 1A, 1BB, 1B, 1CC and 1C containers, the lifting forces shall be applied vertically.

For 1D containers, lifting shall be by means of slings, the angle of each leg being at 30° from the vertical.

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

5.3.3 Requirements

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

5.4 Test No. 3 — Lifting from the bottom corner fittings

5.4.1 General

This test shall be carried out to prove the ability of these containers to withstand being lifted from 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.

5.4.2 Procedure

The container under test shall have a load uniformly distributed over the floor in such a way that the combined weight of container and test load is equal to $2 R$, and it 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 :

- 30° to the horizontal for 1AA and 1A containers;
- 37° to the horizontal for 1BB and 1B containers;
- 45° to the horizontal for 1CC and 1C containers;
- 60° to the horizontal for 1D containers.

In each case the line of action of the lifting force and the outer face of the corner fitting shall be no farther apart than 38 mm (1 1/2 in). The lifting shall be carried out in such a manner that the lifting devices bear on the bottom corner fittings only.

The container shall be suspended for 5 min and then lowered to the ground.

5.4.3 Requirements

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

5.5 Test No. 4 — Restraint (longitudinal)

5.5.1 General

This test shall be carried out to prove the ability of these containers to withstand longitudinal external restraint under dynamic conditions of railway operations, which implies accelerations of $2 g$.