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## Air cargo — Non-certified lower deck containers — Specification and testing

*Fret aérien — Conteneurs non-certifiés de pont inférieur — Spécifications et essais*

[Revision of third edition (ISO 4118:2005)]

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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.

International Standards are drafted in accordance with the rules given in the ISO/IEC Directives, Part 2.

The main task of technical committees is to prepare International Standards. Draft International Standards adopted by the technical committees are circulated to the member bodies for voting. Publication as an International Standard requires approval by at least 75 % of the member bodies casting a vote.

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ISO 4118 was prepared by Technical Committee ISO/TC 20, *Aircraft and space vehicles*, Subcommittee SC 9, *Air cargo and ground equipment*.

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## Introduction

The basic functions of air cargo containers are:

- a) the unitization of baggage, cargo or mail during ground handling and transportation, and
- b) the restraint in accordance with aircraft Weight and Balance Manual requirements of their contents against accelerations encountered in flight.

Throughout this International Standard, the minimum essential criteria are identified by use of the key word "shall". Recommended criteria are identified by use of the key word "should" and, while not mandatory, are considered to be of primary importance in providing safe, economical and practical air transport containers. Deviation from recommended criteria should only occur after careful consideration and thorough service evaluation have shown alternate methods to provide an equivalent level of safety.

The requirements of this International Standard are expressed in the applicable SI units, with approximate inch-pound units conversion between brackets for convenience in those countries using that system. Where it is deemed necessary to use exact values, the SI unit ones are to be used, except for container base plan-view dimensions, whose exact values are those expressed in inches.

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# Air cargo — Non-certified lower deck containers — Specification and testing

## 1 Scope

This International Standard covers the design, performance and operational testing requirements for lower deck containers for use in main line aircraft which do not require airworthiness approval / certification when loaded under the conditions of compartment restraint and/or, where applicable according to the aircraft type's approved Weight and Balance Manual, ISO 8097 or ISO 21100 equivalent base plate restraint for these containers.

Most sizes of containers covered by this International Standard (base sizes K, L, P and Q) cannot physically be loaded and latched on aircraft main deck cargo systems. Base size A and M containers can, but are not allowed on aircraft main decks, which in general do not accept non-certified units. Accordingly, all containers covered by this International Standard are intended to be used / installed exclusively in aircraft lower deck compartments.

NOTE 1 The metric equivalents for dimensions have been rounded up or down to the nearest millimetre, except in critical dimensions. Masses have been rounded up to the nearest kilogram and forces have been rounded up to the nearest 10 N. See introduction where it is deemed necessary to use exact values.

## 2 Normative references

The following referenced documents are indispensable for the application 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 4116, *Aircraft ground equipment — Requirements for compatibility with aircraft Unit Load Devices*.

ISO 7166, *Aircraft — Rail and stud configuration for passenger equipment and cargo restraint*.

ISO 10046, *Aircraft — Methodology of calculating cargo compartment volumes*.

ISO 10254, *Air cargo and ground equipment — Vocabulary*.

ISO 11242, *Aircraft — Pressure equalization requirements for cargo containers*.

ISO 21100, *Air cargo unit load devices — Performance requirements and test parameters*.

CAAC CCAR-25, *Airworthiness Standards –Transport Category Airplanes*, paragraph 25.853, *Compartment interiors*.<sup>1)</sup>

U.S. Code of Federal Regulations 14CFR Part 25, *Airworthiness Standards: Transport category airplanes*, paragraph 25.853, *Compartment interiors*.<sup>2)</sup>

1) The Civil Aviation Administration of China (CAAC) CCAR-25 constitutes the Chinese government transport aircraft airworthiness approval Regulations.

2) 14 CFR Part 25 constitutes the U.S.A. Government transport aircraft airworthiness Regulations, and can be obtained from: US Government Printing Office, Mail Stop SSOP, Washington DC 20402-9328, U.S.A. or its web site [www.gpoaccess.gov](http://www.gpoaccess.gov).

European Aviation Safety Agency CS-25, *Certification Specifications for Large Aeroplanes, paragraph 25.853, Compartment interiors.* <sup>1)</sup>

Japanese Airworthiness Standard Part 3 (Civil Aeronautics Law Article 10 § 4). <sup>2)</sup>

NOTE 2 Also see informative references in Bibliography.

### 3 Dimensions and ratings

3.1 External contours, dimensions, and ratings of applicable containers are shown in Table 1.

**Table 1 — Ratings and contour dimensions of non-certified containers**

Name of containers and nominal dimensions in mm (in)	Rating (Maximum operational gross mass) kg (lb) <sup>a</sup>	Contours and external dimensions	IATA Identification Code (IATA 40/1) <sup>b</sup>
Half-width contoured container, 2 337 mm (92 in) wide, with base dimensions 1 534 mm × 1 562 mm (60,4 in × 61,5 in)	1 588 kg (3 500 lb)	Annex A	DKC
Half-width contoured container, 2 007 mm (79 in) wide, with base dimensions 1 534 mm × 1 562 mm (60,4 in × 61,5 in)	1 588 kg (3 500 lb)	Annex B	DKE/DKN
Half-width rectangular container, 1 562 mm (61,5 in) wide, with base dimensions 1 534 mm × 1 562 mm (60,4 in × 61,5 in)	1 588 kg (3 500 lb)	Annex C	DKP
Full-width contoured container, 4 064 mm (160 in) wide, with base dimensions 1 534 mm × 3 175 mm (60,4 in × 125 in)	3 175 kg (7 000 lb)	Annex D	DLF
Full-width rectangular container, 3 175 mm (125 in) wide, with base dimensions 1 534 mm × 3 175 mm (60,4 in × 125 in)	3 175 kg (7 000 lb)	Annex E	DLP
Half-width contoured container, 1 562 mm (61,5 in) wide, with base dimensions 1 534 mm × 1 194 mm (60,4 in × 47 in)	1 225 kg (2 700 lb)	Annex F	DPE/DPN
Full-width contoured container, 3 175 mm (125 in) wide, with base dimensions 1 534 mm × 2 438 mm (60,4 in × 96 in)	2 449 kg (5 400 lb)	Annex G	DQF
Full-width rectangular container, 2 438 mm (96 in) wide, with base dimensions 1 534 mm × 2 438 mm (60,4 in × 96 in)	2 449 kg (5 400 lb)	Annex H	DQP
Full-width contoured container, 4 064 mm (160 in) wide, with base dimensions 2 235 mm × 3 175 mm (88 in × 125 in)	4 627 kg (10 200 lb)	Annex I	DAF
Full-width contoured container, 4 064 mm (160 in) wide, with base dimensions 2 438 mm × 3 175 mm (96 in × 125 in)	5 103 kg (11 250 lb)	Annex J	DMF
Low-height, full-width contoured container, 2 438 mm (96 in) wide, with base dimensions 1 534 mm × 1 562 mm (60,4 in × 61,5 in)	1 134 kg (2 500 lb)	Annex K	DKH
Low-height, half-width contoured container, 2 007 mm (79 in) wide, with base dimensions 1 534 mm × 1 562 mm (60,4 in × 61,5 in)	1 134 kg (2 500 lb)	Annex L	DKG
<sup>a</sup> Actual maximum gross mass shall comply with the aircraft's Weight and Balance Manual. <sup>b</sup> Carriage of non-certified containers in any cargo compartment must be allowed by the aircraft type's Weight and Balance Manual.			

1) EASA CS-25 constitutes the European Governments transport aircraft airworthiness Regulations and can be obtained from : European Aviation Safety Agency (EASA), Postfach 101253, D-50452 Cologne, Germany, or its web site at [www.easa.europa.eu](http://www.easa.europa.eu).

2) Japanese Airworthiness Standard Part 3 (ISBN 4-89279-661-1) constitutes the Japanese government transport aircraft airworthiness approval Regulations, and can be obtained from the Civil Aviation Bureau (CAB) of the Ministry of Land, Infrastructure, Transportation and Tourism, Tokyo, Japan, or its website at [www.mlit.go.jp/en](http://www.mlit.go.jp/en).

NOTE 3 The maximum gross mass allowable for a non-certified container on any given position of an aircraft is determined by the aircraft type or sub-type's Authority approved Weight and Balance Manual. Because this value is aircraft type dependent, airlines through IATA have agreed, principally for interlining purposes, to define for each ULD size a container maximum operational gross mass independent from the aircraft type, shown in Table 1, which is often higher or sometimes lower than the maximum allowable one on a given aircraft type.

**3.2** Containers complying with this International Standard are identified by a type code composed of three letters: <sup>1)</sup>

- a) the first letter **D** denoting a non-certified aircraft container;
- b) the second letter denoting the base size as defined in ISO 21100;
- c) the third letter denoting the contour determined in accordance with ISO 10046 (see NOTE 3).

The identification code shall be prominently marked on two opposite sides of the container (see clause 5).

#### EXAMPLE

A non-certified aircraft container (D) of base size 3 175 mm x 1 534 mm (125 in x 60,4 in) (size L) and of nominal overall width 3 175 mm (125 in) (contour P) shall be designated as follows: **DLP**

NOTE 4 The containers type code's third (contour) digit is subject to change to accommodate evolving airline needs. Check the latest yearly edition of IATA Unit Load Devices Standard Specifications 40/1 and 50/0 Appendix E (references [4] and [5] in Bibliography) for any code changes.

## 4 Design requirements

### 4.1 General

**4.1.1** Non-certified lower-deck containers for aircraft shall meet the requirements of this International Standard and, in accordance with airworthiness Authority approved aircraft Weight and Balance Manuals, be constructed then loaded in such a manner that neither the container nor its contents can become a hazard or damage the aircraft structure under flight conditions.

**4.1.2** The container shall consist of a complete enclosure (base, top, four sides) with door.

**4.1.3** The structure shall be designed to provide the maximum usable internal volume available within the limits of structural design and the space required for latching, including door(s).

**4.1.4** Provisions shall be made for closing and sealing the container to meet customs clearance and security requirements (see clause 6).

**4.1.5** The tare weight of the container shall be kept to a minimum, consistent with the requirements and within the limits of sound design practice.

NOTE 5 A direct environmental impact of containers use is that their weight results in additional fuel burn by aircraft. Therefore, apart from economic advantages, reducing containers weight as much as possible to still meet performance objectives is a highly effective environmental contribution and must be pursued.

**4.1.6** If required (see sub-clause 4.8), means of fork-lifting the container shall be provided in accordance with the appropriate annexes.

**4.1.7** Stacking capability is not required but may be an option for forkliftable models (see sub-clause 4.8).

**4.1.8** Robustness, reliability and maintainability shall be major factors in the design, commensurate with planned service life.

1) The type code is, by industry consensus, under custody of and assigned by the International Air Transport Association (IATA), ULD Registrar, 800 Place Victoria, P.O. Box 113, Montréal, Québec H4Z 1M1, Canada, web site [www.iata.org](http://www.iata.org).