



AEROSPACE STANDARD

AS5896™

Issued 2014-01
Reaffirmed 2018-10

Certified Containers for Lower Deck Compartments

RATIONALE

This Standard specifies the design criteria and testing methods applicable to certified base-restrained containers approved for use exclusively in lower-deck compartments of civil transport aircraft.

Throughout this 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 containers. Deviation from recommended criteria should only occur after careful consideration, extensive testing and thorough service evaluations have shown alternate methods to be satisfactory.

TABLE OF CONTENTS

1.	SCOPE	3
2.	REFERENCES	3
2.1	Applicable Documents	3
2.1.1	SAE Publications	3
2.1.2	U.S. Government Publications	3
2.1.3	ISO Publications	4
2.1.4	IATA Publications	4
2.1.5	RTCA Publications	4
2.2	Definitions	4
3.	CLASSIFICATION AND IDENTIFICATION	5
3.1	Type	5
3.2	Sizes	5
3.3	Contours	5
3.4	Identifier	5
4.	CONTAINER CONFIGURATION	10
5.	REQUIREMENTS	10
5.1	General	10
5.2	Materials	10
5.3	Construction	11
5.3.1	Base	11
5.3.2	Body	11
5.3.3	Doors	13
5.3.4	Shelves (Optional)	14
5.3.5	Internal Cargo Restraint	14
5.3.6	Pressure Equalization	14
5.3.7	Rapid Decompression	14

SAE Technical Standards Board Rules provide that: "This report is published by SAE to advance the state of technical and engineering sciences. The use of this report is entirely voluntary, and its applicability and suitability for any particular use, including any patent infringement arising therefrom, is the sole responsibility of the user."

SAE reviews each technical report at least every five years at which time it may be revised, reaffirmed, stabilized, or cancelled. SAE invites your written comments and suggestions.

Copyright © 2018 SAE International

All rights reserved. No part of this publication may be reproduced, stored in a retrieval system or transmitted, in any form or by any means, electronic, mechanical, photocopying, recording, or otherwise, without the prior written permission of SAE.

TO PLACE A DOCUMENT ORDER:
Tel: 877-606-7323 (inside USA and Canada)
Tel: +1 724-776-4970 (outside USA)
Fax: 724-776-0790
Email: CustomerService@sae.org
<http://www.sae.org>

SAE values your input. To provide feedback on this Technical Report, please visit <http://standards.sae.org/AS5896>

5.4	Performance.....	14
5.4.1	Base Indentation	14
5.4.2	Edge Indentation	14
5.4.3	Traverse Between Levels	14
5.5	Design Loads	15
5.6	Environmental Conditions	16
6.	TESTING.....	16
6.1	Ultimate Load Tests (AS36100A [ISO 21100])	16
6.2	Operational Load Tests.....	16
6.3	Test No. 1 - Horizontal Load Test.....	16
6.3.1	Procedure.....	16
6.3.2	Requirements.....	17
6.4	Test No. 2 - Upward Load Test.....	17
6.4.1	Procedure.....	17
6.4.2	Requirements.....	17
6.5	Test No. 3 - Bridging and Cresting	17
6.5.1	Procedure.....	17
6.5.2	Requirements.....	17
6.6	Test No. 4 - Cyclic Test.....	18
6.6.1	Procedure.....	18
6.6.2	Requirements.....	18
6.7	Test No. 5 - Racking Test	18
6.7.1	Procedure.....	18
6.7.2	Requirements.....	18
6.8	Test No. 6 - Water Tightness Test.....	18
6.8.1	Procedure.....	18
6.8.2	Requirements.....	18
7.	MARKINGS	19
8.	MANUFACTURER'S INSTRUCTIONS.....	19
9.	QUALITY CONTROL	20
10.	NOTES	20
FIGURE 1	AKE CONTAINER.....	6
FIGURE 2	AKC CONTAINER.....	6
FIGURE 3	ALF AND ALP CONTAINERS	7
FIGURE 4	ALU CONTAINER.....	8
FIGURE 5	AKG (TOP) AND AKH (BOTTOM) CONTAINERS.....	9
FIGURE 6	CONTAINER BASE DIMENSIONAL REQUIREMENTS (DIMENSIONS IN MILLIMETERS).....	12
FIGURE 7	LOCAL INDENTATION LOADING.....	15
TABLE 1		5
TABLE 2		15

1. SCOPE

This SAE Aerospace Standard (AS) covers the design, fabrication, performance, and testing requirements for general-purpose, base-restrained, containers requiring airworthiness approval for installation/use in aircraft lower deck compartments. See 10.1 and 10.2.

2. REFERENCES

2.1 Applicable Documents

The following publications form a part of this document to the extent specified herein. The latest issue of SAE publications shall apply. The applicable issue of other publications shall be the issue in effect on the date of the purchase order. In the event of conflict between the text of this document and references cited herein, the text of this document takes precedence. Nothing in this document, however, supersedes applicable laws and regulations unless a specific exemption has been obtained.

2.1.1 SAE Publications

Available from SAE International, 400 Commonwealth Drive, Warrendale, PA 15096-0001, Tel: 877-606-7323 (inside USA and Canada) or 724-776-4970 (outside USA), www.sae.org.

ARP1334	Ground Equipment Requirements for Compatibility with Aircraft Unit Load Devices
AIR1490	Environmental Degradation of Textiles
AS9100	Quality Management Systems - Requirements for Aviation, Space and Defense Organizations
AS9102	Aerospace First Article Inspection Requirement
AS33601	Track and Stud Fitting for Cargo Transport Aircraft, Standard Dimensions For
AS36100A	Air Cargo Unit Load Devices - Performance Requirements and Test Parameters
AS36101	Air Cargo Unit Load Devices - Load Distribution Model
AS36102	Air Cargo Unit Load Devices - Testing Devices
ARP36103	Air Cargo Unit Load Devices - Center of Gravity Control Methods

2.1.2 U.S. Government Publications

Available from DLA Document Services, Building 4/D, 700 Robbins Avenue, Philadelphia, PA 19111-5094, Tel: 215-697-6396, <http://quicksearch.dla.mil/>.

Federal Aviation Administration Technical Standard Order TSO C90d - Cargo Pallets, Nets and Containers

Federal Aviation Regulations 14 CFR Part 21 - Certification Procedures for Products and Parts

Federal Aviation Regulations 14 CFR Part 25 - Airworthiness Standards: Transport Category Airplanes

Advisory Circular 21.1B - Production Certificates (Quality Control Data Requirements)

Federal Aviation Administration Order 8120.2B - Production Approval and Surveillance Procedures

Federal Aviation Administration Order 8120.12 - Use of 'Other Parties' to Supplement Supplier Control Program

2.1.3 ISO Publications

Available from American National Standards Institute, 25 West 43rd Street, 4th Floor, New York, NY 10036, Tel: 212-642-4900, www.ansi.org.

International Standard ISO 4116 - Aircraft Ground Equipment - Requirements for compatibility with aircraft unit load devices

International Standard ISO 6517 - Air Cargo - Certified lower deck containers - Design and testing

International Standard ISO 7166 - Aircraft - Rail and stud configuration for passenger equipment and cargo restraint

ISO Technical Report TR 8647 - Environmental degradation of textiles

International Standard ISO 11242 - Aircraft - Pressure equalization requirements for cargo containers

International Standard ISO 21100 - Air cargo unit load devices - Performance requirements and test parameters

2.1.4 IATA Publications

Available from International Air Transport Association, Publications Assistant, 800 Place Victoria, P.O. Box 113, Montreal, Quebec H4Z 1M1, Canada, Tel: 1-514-874-0202, www.iata.org.

Unit Load Devices Regulations Standard Specification 40/1, IATA identification Code for Unit Load Devices

Unit Load Devices Regulations Standard Specification 50/4, Certified Aircraft Container

2.1.5 RTCA Publications

Available from RTCA, Inc., 1150 18th Street, NW, Suite 910, Washington, DC 20036, Tel: 202-833-9339, www.rtca.org.

Environmental Conditions and Test Procedures for Airborne Equipment, RTCA DO-160G,

2.2 Definitions

CONTAINER (AIR CARGO -): A rigid structure which interfaces directly with the aircraft cargo handling and restraint system and alone performs all the functions of a unit load device.

NUMERIC SIMULATION: Simulation (e.g., computer model) of physical test condition(s) and reaction(s) of container employing numeric analysis, computational geometry and computer graphics to obtain proof support and design verification, as validated by demonstration to other parties' and/or airworthiness authorities' satisfaction that parameters, algorithms and analytical methods used in such a simulation provide results of at least equivalent reliability to the outcome of a specified tangible test.

RESTRAINT SYSTEM: Equipment for supporting and restraining unit load devices in an aircraft against the ground/flight loads. It usually consists of such items as side guides and locks for securing unit load devices to the aircraft structure. It does not include unit load devices, barrier nets and tie-down straps.

UNIT LOAD DEVICE (ULD): Device for grouping, transferring and restraining cargo for transit. For the intent of this Aerospace Standard, it refers to a container.

3. CLASSIFICATION AND IDENTIFICATION

The containers covered by this Aerospace Standard shall be of the following types, sizes, and configurations:

3.1 Type

Containers are Type 2 as defined in AS36100A (ISO 21100), designed for use in compatible aircraft restraint systems.

3.2 Sizes

This Aerospace Standard provides for the following AS36100A (ISO 21100) defined container base sizes, expressed as nominal dimensions in the overall plan form of the container base, in mm (inches):

TABLE 1

ULD Configuration AS36100A	Nominal Dimension
K4	1562 mm X 1534 mm (61.5 inches X 60.4 inches)
L5	3175 mm X 1534 mm (125 inches X 60.4 inches)

3.3 Contours

This Aerospace Standard provides for seven (7) contours:

Contour C: overall width 2337 mm (92 inches) (see Figure 2)

Contour E: overall width 2007 mm (79 inches) (see Figure 1)

Contour F: overall width 4064 mm (160 inches) (see Figure 3)

Contour G: overall width 2007 mm (79 inches) (see Figure 5)

Contour H: overall width 2438 mm (96 inches) (see Figure 5)

Contour P: overall width 3175 mm (125 inches) (see Figure 3)

Contour U: overall width 4724 mm (186 inches) (see Figure 4)

3.4 Identifier

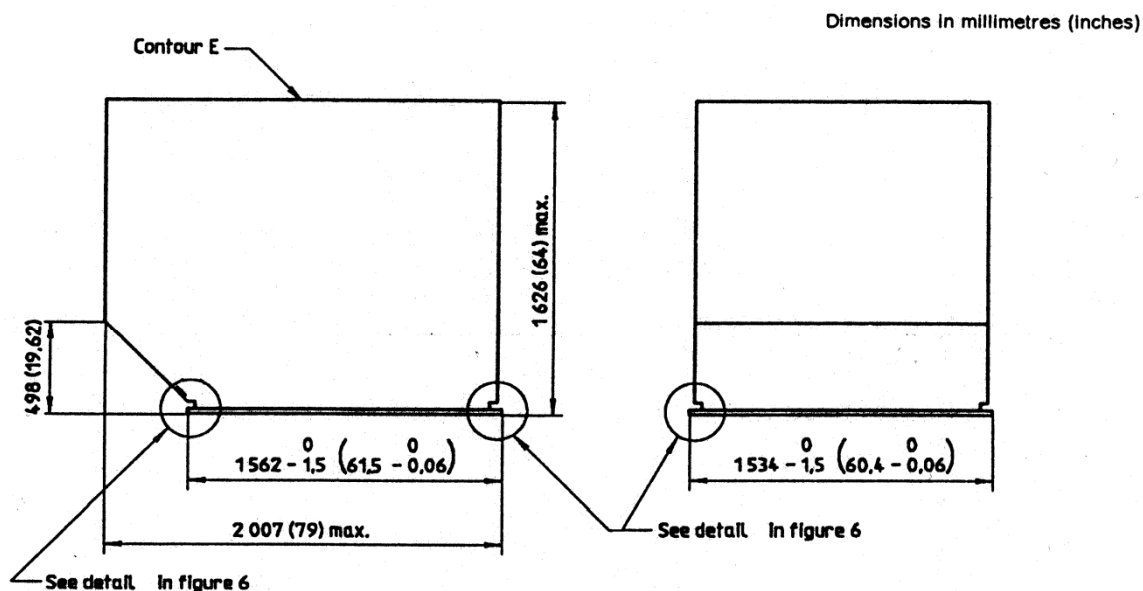
The container classification identifier shall reflect its AS36100A (ISO 21100) configuration and ultimate load rating. In addition, a container complying with this Aerospace Standard shall be identified by three characters:

- the first character 'A' denoting approved type 2 aircraft container complying with the requirements of AS36100A;
- the second character denoting the AS36100A base size (reference 3.2); and
- the third character denoting the contour (reference 3.3).

For example, an approved aircraft container (by definition, 'A') of base size 3175 mm X 1534 mm (125 inches X 60.4 inches) - i.e., size L - and of overall width 3175 mm (125 inches) - i.e., contour P - shall be designated as follows:

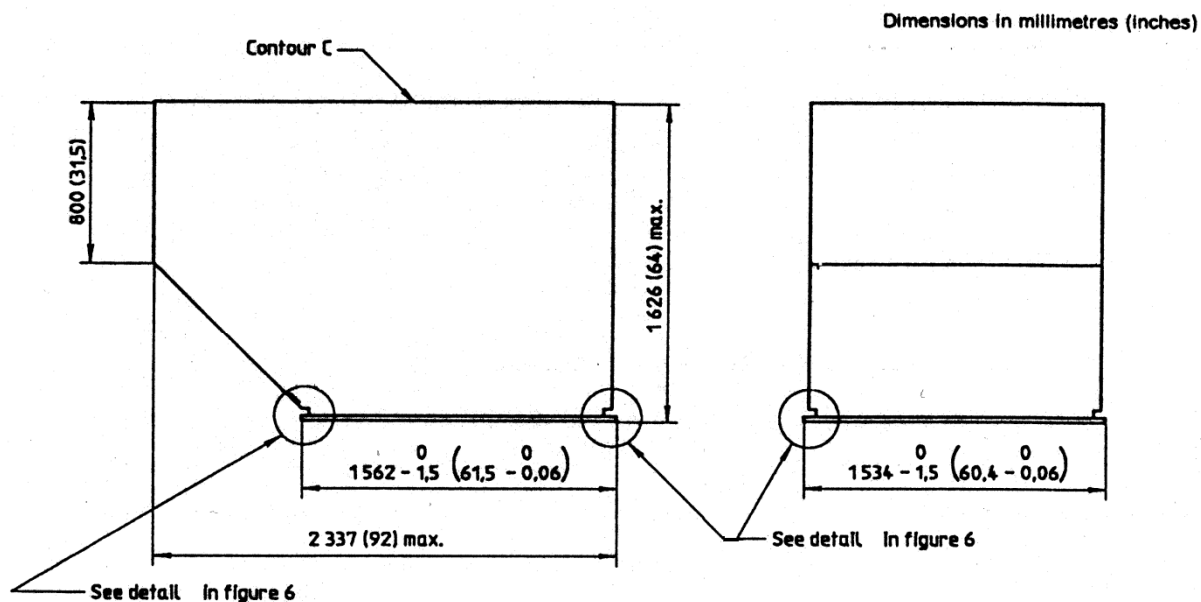
ALP

NOTE 1: The code letters used are those of the internationally agreed IATA ULD ID code system (see 2.1.4 and 10.3).



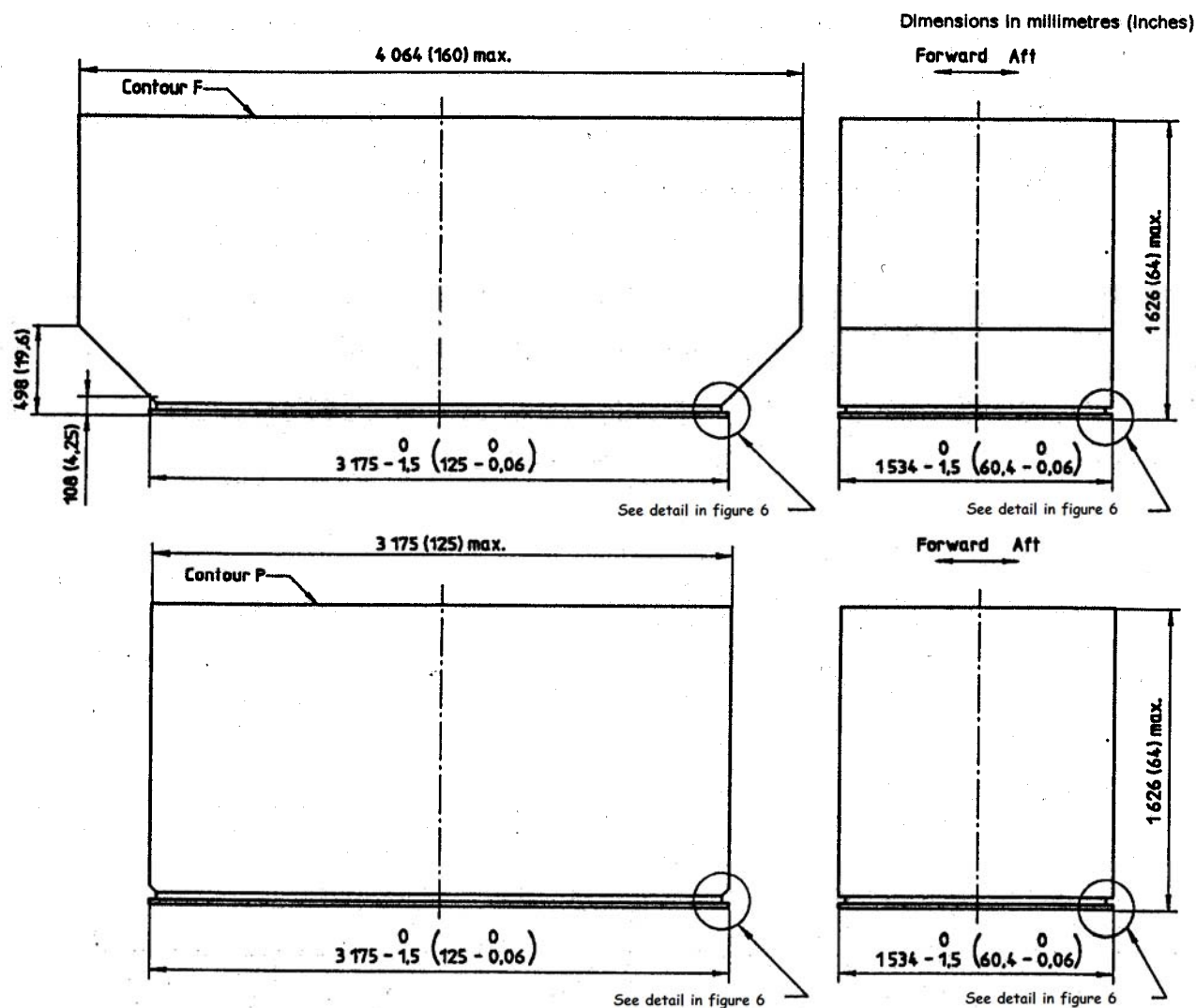
NOTE — Fork-liftable units shall be identified as AKN.

FIGURE 1 - AKE CONTAINER



NOTE — Tolerances on base dimensions are for reference only.

FIGURE 2 - AKC CONTAINER



NOTES

- 1 All 3 175 mm × 1 534 mm (125 in × 60,4 in) bases shall have a corner radius of 50,8 mm (2 in) in the plan view.
- 2 Tolerances on base dimensions are for reference only.

FIGURE 3 - ALF AND ALP CONTAINERS