INTERNATIONAL STANDARD

ISO 14186

First edition
2013-08-15

Air cargo — Fire containment covers — Design, performance and testing requirements

Fret aérien — Couvertures anti-feu — Exigences de conception, performances et essais

STANDARDSISO.COM : Click to view the full PDF of ISO 14186:2013

Reference number
ISO 14186:2013(E)

© ISO 2013

STANDARDSISO.COM : Click to view the full PDF of ISO 14186:2013

COPYRIGHT PROTECTED DOCUMENT

© ISO 2013

All rights reserved. Unless otherwise specified, no part of this publication may be reproduced or utilized otherwise in any form or by any means, electronic or mechanical, including photocopying, or posting on the internet or an intranet, without prior written permission. Permission can be requested from either ISO at the address below or ISO's member body in the country of the requester.

ISO copyright office
Case postale 56 • CH-1211 Geneva 20
Tel. + 41 22 749 01 11
Fax + 41 22 749 09 47
E-mail copyright@iso.org
Web www.iso.org

Published in Switzerland

© ISO 2013 – All rights reserved

Contents

Page

STANDARDSISO.COM : Click to view the full PDF of ISO 14186:2013

© ISO 2013 – All rights reserved

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. www.iso.org/directives

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. ISO shall not be held responsible for identifying any or all such patent rights. Details of any patent rights identified during the development of the document will be in the Introduction and/or on the ISO list of patent declarations received. www.iso.org/patents

Any trade name used in this document is information given for the convenience of users and does not constitute an endorsement.

The committee responsible for this document is ISO/TC 20, *Aircraft and space vehicles*, Subcommittee SC 9, *Air cargo and ground equipment*.

STANDARDSISO.COM : Click to view the full PDF of ISO 14186:2013

 © ISO 2013 – All rights reserved

Introduction

This International Standard specifies the design and performance criteria and testing methods applicable to fire containment covers intended to be used in conjunction with air cargo unit load devices in order to meet through oxygen depletion the fire containment regulations in certain civil transport aircraft cargo compartments.

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 fire containment covers meeting the applicable regulatory requirements and ensuring effective protection against fires. Deviation from recommended criteria should only occur after careful consideration, extensive testing, and thorough service evaluation have shown alternate methods to be satisfactory.

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.

STANDARDSISO.COM : Click to view the full PDF of ISO 14186:2013

© ISO 2013 – All rights reserved

STANDARDSISO.COM : Click to view the full PDF of ISO 14186:2013

Air cargo — Fire containment covers — Design, performance and testing requirements

1 Scope

1.1 This International Standard specifies the minimum design and performance criteria and testing methods of fire containment covers (FCCs) used:

a) either in those cargo compartments of civil transport aircraft where they constitute one means of complying with applicable airworthiness regulations,

b) or on a voluntary basis, when deemed appropriate by operators to improve fire protection in aircraft cargo compartments where airworthiness regulations do not mandate their use.

1.2 The FCCs specified by this International Standard are intended to be used to cover unitized cargo contained/restrained in an air cargo pallet and net assembly, for loading into aircraft main deck cargo compartments:

a) either class F aircraft cargo compartments according to CS-25 § 25.857(f) and AMC to CS-25.855 and 25.857, in accordance with 1.1 a) above,

b) or class B aircraft cargo compartments according to CS-25, CCAR-25, JAS Part 3 or 14 CFR Part 25 § 25.857 (b), in accordance with 1.1 a) or 1.1 b) above,

c) or class E aircraft cargo compartments according to CS-25, CCAR-25, JAS Part 3 or 14 CFR Part 25 § 25.857 (e), in accordance with 1.1 b) above.

NOTE Though nothing prevents an FCC from being carried in a lower deck class C aircraft cargo compartment, it is not intended for this use since its fire containment capability would be redundant with that of the aircraft's fire detection and suppression system, which it could hamper.

1.3 The FCCs specified by this International Standard may be of two types:

a) type I: separate devices to be installed over a pallet's load below a net approved for this purpose; or

b) type II: devices permanently attached to a pallet net approved for this purpose.

1.4 The unit load devices (pallet and net) used in conjunction with the fire containment cover are specified in this International Standard only insofar as their flammability requirements are concerned. They are not otherwise specified in this International Standard.

NOTE See Bibliography for applicable ULD airworthiness approval and general design standards.

1.5 This International Standard is not intended to cover fire containment of loose baggage or loose cargo loaded in bulk cargo compartments.

1.6 This International Standard does not cover requirements for fire detection or suppression devices. The specified FCCs are passive devices.

1.7 The use of fire containment covers meeting the requirements of this International Standard is not sufficient alone to ensure flight safety: this International Standard is based on the assumption that the approved fire containment covers will be installed and checked prior to aircraft loading in accordance with appropriate operating instructions, by competent, suitably trained personnel as defined, for example, in ISO 9001:2008[9], 6.2.2 (see 9.3 hereafter).

STANDARDSISO.COM : Click to view the full PDF of ISO 14186:2013

© ISO 2013 – All rights reserved

2 Normative references

The following documents, in whole or in part, are normatively referenced in this document and are indispensable for its application. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

ISO 4892-1, *Plastics — Methods of exposure to laboratory light sources — Part 1: General guidance*

ISO 4892-3, *Plastics — Methods of exposure to laboratory light sources — Part 3: Fluorescent UV lamps*

ISO 7137, *Aircraft — Environmental conditions and test procedures for airborne equipment*[1)]

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 12236, *Geosynthetics — Static puncture test (CBR test)*

CAAC CCAR-25, *Airworthiness Standards – Transport Category Airplanes*[2)]

CAAC Chinese Technical Standard Order CTSO C90d, *Cargo pallets, nets and containers*

EASA CS-25, *Certification Specifications for Large Aeroplanes*[2)3)]

EASA Acceptable Means of Compliance (AMC) to CS-25.855/25.857 *Cargo or baggage compartments*[3)]

EASA Technical Standard Order ETSO C90d, *Cargo pallets, nets and containers (Unit Load Devices)*[3)]

Japanese Airworthiness Standard Part 3 (Civil Aeronautics Law Article 10 § 4)[2) 4)]

U.S.A. Code of Federal Regulations (CFR) Title 14 Part 25 – *Airworthiness Standards : Transport Category Airplanes* ("14 CFR Part 25")[2) 5)]

U.S. FAA Technical Standard Order TSO C90d, *Cargo pallets, nets and containers (Unit Load Devices)*[5)]

NOTE Also see ULD (TSO/ETSO) airworthiness approval standards under references[7] and[12] in Bibliography.

3 Terms and definitions

For the purposes of this document, the terms and definitions given in ISO 10254 and the following apply.

STANDARDSISO.COM : Click to view the full PDF of ISO 14186:2013

1) ISO 7137 is the de facto recognition of the latest revisions of EUROCAE ED-14 and RTCA DO-160 with the same title. EUROCAE ED-14G can be obtained from the European Organization for Civil Aviation Equipment, 102 rue Etienne Dolet, 92240 Malakoff, France, or its website at www.eurocae.eu. RTCA DO-160G can be obtained from RTCA Inc, 1828 L Street, NW, Suite 805, Washington, DC 20036, USA, or through its website at www.rtca.org.

2) See paragraphs 25.855, 25.857 and Appendix F.

3) EASA CS-25, abbreviated throughout this standard as "CS-25", constitutes the European governments' transport aircraft airworthiness approval Regulations. It can be obtained from the European Aviation Safety Agency (EASA), Otto Platz 1, Postfach 101253, D-50452 Cologne, Germany, or its website at www.easa.europa.eu

4) The 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, Tourism and Transport, Tokyo, Japan, or its website at www.mlit.go.jp/en

5) Code of Federal Regulations (CFR) Title 14 Part 25, abbreviated throughout this standard as "14 CFR Part 25", constitutes the USA government transport aircraft airworthiness approval Regulations, and can be obtained from the US. Government Printing Office, Mail Stop SSOP, Washington DC 20402-9328, USA, or its website at www.ecfr.gov

© ISO 2013 – All rights reserved

3.1
fire containment
fire control
ensuring that a fire does not grow to a state where damage to the aeroplane or harm to passengers or crew occurs during the time for which the fire containment system is demonstrated to be effective

3.2
fire containment cover
FCC
passive device used in conjunction with an air cargo pallet and net in order to contain a possible cargo fire beneath it for a rated period

Note 1 to entry: Guidance addressing the use of FCCs is provided in airworthiness regulatory guidance as one allowable means of compliance with fire containment requirements in certain classes of aircraft cargo compartment.

3.3
active fire protection unit load device
unit load device incorporating built-in fire detection and/or fire extinguishing systems

3.4
passive unit load device
unit load device or accessory thereto (e.g. FCC) that includes neither fire detection nor fire extinguishing systems, and ensures fire containment by its use of fire-resistant or fire-proof material and limiting the supply of air

3.5
unit load device
ULD
device for grouping, transferring and restraining cargo for transit

Note 1 to entry: It may consist of a pallet with a net or it may be a container.

3.6
class A fire
fire in ordinary combustible materials, such as wood, cloth, paper, rubber, and plastics for which the quenching and cooling effects of quantities of water, or of solutions containing a large percentage of water, are of prime importance

3.7
fire resistant
grade designating components, equipment and structures capable of withstanding application of heat by a defined flame for 5 min

Note 1 to entry: See ISO 2685 and EUROCAE ED-14G [ISO 7137] sect. 26.

Note 2 to entry: Compare with fire proof (3.8).

3.8
fire proof
grade designating components, equipment and structures capable of withstanding the application of heat by a defined flame for 15 min

Note 1 to entry: See ISO 2685 and EUROCAE ED-14G [ISO 7137] sect. 26.

Note 2 to entry: Compare with fire resistant (3.7).

3.9
burn length
distance from the original edge to the farthest evidence of damage on a test specimen due to flame impingement, including areas of partial or complete consumption, charring or embrittlement, but not including areas sooted, stained, warped, or discoloured, nor areas where material has shrunk or melted away from the heat source

STANDARDSISO.COM : Click to view the full PDF of ISO 14186:2013

© ISO 2013 – All rights reserved

4 General requirements

4.1 Approval

4.1.1 The fire containment cover type design shall be approved on the basis of demonstration of compliance with the present International Standard, and a Certificate of Conformity shall accordingly be delivered by the manufacturer. Where the fire containment cover is intended to constitute a means of complying with applicable airworthiness regulations per 1.1 a) and 1.2 a) above, type approval should be sought from the airworthiness Authority concerned, who may include additional requirements.

4.1.2 The fire containment cover may be an entirely separate device (type I), or it may be attached to or integrated with an approved air cargo pallet net (type II). In the latter case, both sets of airworthiness approval requirements shall simultaneously be met, and no feature of either the cover or the net shall compromise an applicable requirement for the other function. The pallet net used in conjunction with the cover (type I) or attached to it (type II) shall be airworthiness approved under TSO/ETSO C90 and meet the additional flammability requirements in 5.1.3 hereafter. The TSO/ETSO C90 ultimate load requirements for the net and the flammability requirements are not required to be met simultaneously, because it is highly improbable that a cargo fire and maximum flight load condition would simultaneously occur.

4.2 Dimensions

4.2.1 The fire containment cover shall completely enclose one of the standard ULD contours in Annexes A to C hereafter, down to its base pallet edges but not covering its surface (see Note 1).

NOTE 1 The absence of a floor covering requirement is based on the fact that all known modern approved pallets have aluminium alloy base sheets sufficient to meet regulatory requirements [CS-25 / 14 CFR Part 25 Appendix F Part I § (a) (2) (iii)] by themselves. FCCs built to the present International Standard may not be suitable for pallets constructed of other materials. See 5.1.2 hereafter: pallets not meeting this minimum performance requirement would at least require a cover with a bottom panel over the pallet's surface, not specified in the present standard.

NOTE 2 Industry standard ULD contours, applicable to pallets, are defined in the IATA ULD Regulations Standard Specification 50/0 (see[13] in Bibliography) Appendix E. Where the FCC is intended and approved for one aircraft type only, the specific maximum ULD contour for that aircraft is to be used. In all cases, maximum pallet load contour is 50 mm (2,0 in) inside the maximum ULD contour on all four sides (see ISO 10046).

NOTE 3 At the time of publication of this International Standard, there are no known aircraft lower deck cargo compartments where fire containment covers are allowed means of meeting the regulatory requirements. However, because pallets built-up to the lower deck contour can be carried on main deck, FCCs for this purpose may also be built to the lower deck P standard ULD contour (see Annex C).

4.2.2 The fire containment cover's size shall provide sufficient clearance over the allowable contour to allow installation, but also to enable minimizing the risk of air entry at the base edge after installation (see 9.2.4).

4.3 Materials

4.3.1 The fire containment cover shall be constructed of flexible fire-proof or fire-resistant material, or multi-layer composite material, meeting the fire resistance (flammability and flame penetration) requirements specified in 5.1 hereafter.

4.3.2 Any other elements of the fire containment cover's construction, e.g. sewing thread, any seams, welding, gluing, bonding, closure devices, seals, attachments, labels, placard holders, shall meet the same requirements once fitted on the FCC assembly.

4.3.3 Material selection shall ensure the highest possible wear, abrasion, shearing, tearing and puncture resistance. See 6.1.2 for puncture resistance testing and 6.1.4 for abrasion testing.

4.3.4 During material selection, preference shall be given to recyclable materials where this does not compromise best fire protection performance. Asbestos or asbestos compounds shall not be used. Other materials shall be assessed prior to selection as to potential detrimental effects on human health.

STANDARDSISO.COM : Click to view the full PDF of ISO 14186:2013

 © ISO 2013 – All rights reserved

4.3.5 Material heating should not produce hazardous amounts of toxic gases. See 5.2.4.

4.3.6 Material colour is open to purchaser's choice, but should be selected in order to be clearly different from and contrasting with that of any general purpose cargo covers (see 9.1.2 of ISO 16412:2005) used by the same operator in order to avoid mistakes. Where a composite material of a non-attached fire containment cover is such that one side must be the inner one to withstand fire, the inner and outer colours shall be different to prevent inverted installation (also see 7.4).

4.4 Weight

4.4.1 The fire containment cover's weight shall be kept to a minimum, consistent with fire and puncture resistance requirements. As a target, a type I fire containment cover's mass should not exceed 45 kg (100 lb), in order to allow installation by 2 persons, and a type II (with attached net) FCC's mass should not exceed 70 kg (150 lb), to allow installation by three persons where mechanical aids are not available.

4.4.2 If the 45 kg (100 lb) target mass is exceeded, consideration should be given to providing mechanical handling aids at pallet build-up sites, and the fire containment cover should have features and/or provisions for their use (see 4.5.7).

4.5 Design

4.5.1 The fire containment cover's design shall be such that any inner features provide the minimum required fire resistance.

4.5.2 Where cover installation/removal requires opening/closing, the closure devices shall provide the required minimum fire resistance, and be protected by a sealing feature to prevent air entry once closed.

4.5.3 The fire containment cover's outer surface should be as smooth as possible to avoid any interference with the aircraft's doors, compartment linings, and lights, and /or risk of snagging on adjacent ULDs hardware.

4.5.4 Where deemed necessary, the lower edges of the fire containment cover, if not attached to or integrated with an approved pallet net, may include attachment fittings to fix it to the pallet's outer seat track. Such fittings, if provided, shall meet ISO 7166 geometric requirements. No minimum ultimate load capability is required, but fittings shall withstand normal cargo handling without disengaging.

4.5.5 The cover's normal and emergency (rapid decompression) pressure equalization functions (see ISO 11242[10]) are to be ensured by there being no airtight closure between the bottom edges and the pallet edges. No specific feature is required.

4.5.6 For a type II fire containment cover attached to a pallet net, net attachment to the fire containment cover shall meet the flammability requirements for the net per 5.1.3.

4.5.7 The fire containment cover's design shall minimize installation and removal time. The target for installation over a full contour cargo pallet assembly built-up to the same maximum contour should not exceed 2 persons for a duration no longer than a standard net's, and installation should be possible without tools except means of access (e.g. ladder). Where a 45 kg (100 lb) target mass is exceeded, consideration should be given to providing mechanical handling aids at cargo terminals, and any provisions necessary for their use on the fire containment cover. If provisions for handling aids are fixed on the cover, they shall meet the requirements of 5.1.

4.5.8 The target time for removal should not exceed 2 persons for a duration no longer than a standard net's, preferably without mechanical handling aids.

4.5.9 Two placard holders shall be provided on opposite long sides of the outer surface of the fire containment cover at a height between 1 200 mm and 1 600 mm (48 in and 64 in) above the pallet edge. They shall receive a minimum ISO A5 format (148 × 210 mm, 8 1/4 × 5 7/8 in) standard pallet tag.

STANDARDSISO.COM : Click to view the full PDF of ISO 14186:2013

© ISO 2013 – All rights reserved

4.6 Environment

4.6.1 The fire containment cover shall be designed and its materials selected assuming it will be operated outdoors throughout temperature ranges of – 40 °C (– 40 °F) to 60 °C (140 °F) with relative humidity between 20 % and 85 %, including ice, snow and soaking in water.

4.6.2 The fire containment cover's materials shall be assessed for potential deterioration of their fire and puncture resistance due to weathering or other environmental factors, including U.V. and chemicals (e.g. kerosene, solvents, lubricants, aircraft hydraulic fluid, glycol-based de-icing or anti-icing fluid), temperature variations, humidity or fungus exposure, likely to be encountered in the course of worldwide air cargo operations. The manufacturer shall inform the purchaser about expected performance degradation and any identified chemical incompatibility.

4.6.3 The above shall be substantiated by at least the following tests performed on material specimens:

a) U.V. and humidity test (see 6.1.3 for methods and requirements);

b) puncture test (see 6.1.2 for methods and requirements);

c) abrasion test (see 6.1.4 for methods and requirements).

4.6.4 Where applicable, testing should take into account the requirements of the EUROCAE ED-14G [ISO 7137] standard, and be accordingly subject to an Environment Qualification Form identifying the performed tests.

NOTE See EUROCAE ED-14G Appendix A for Environment Qualification Form. RTCA DO-160G[20] is equivalent to EUROCAE ED-14G and may alternately be used.

4.6.5 An expiry date after which the rated performance may not be expected to be maintained shall be provided to the purchaser at or before the time of delivery of each production batch, and shall be marked on each cover as part of the required traceability code (see 7.2). The expiry date may take into account the expected storage duration, provided storage conditions which might affect performance degradation are identified and catered for.

4.6.6 If the fire containment cover's construction includes woven textile material or thread, the available data concerning degradation of woven textile fibre performance when exposed to environment factors should be taken into account for material and thread selection and treatment, commensurate with the expected storage and service life of the fire containment cover unit. See ISO/TR 8647.

NOTE SAE AIR 1490C[21] is equivalent to ISO/TR 8647 and may alternately be referred to.

4.6.7 In addition, the fire containment cover's components and materials should be selected in order to allow identified recycling methods when the unit is out of use or after its expiry date. Instructions for recycling shall be provided by the manufacturer (see 8.1).

4.7 Maintenance

4.7.1 The manufacturer should, where feasible, provide approved procedures and repair kits meeting the fire resistance (flammability and flame penetration) requirements specified in 5.1 to durably repair punctures or tears in excess of the allowable damage limits (see 5.3) in the fire containment covers.

4.7.2 The approved repair method(s) shall be defined in the Component Maintenance Manual (CMM, see 8.2 hereafter). Any approved repairs shall re-establish the unit's fire containment and air-tightness performance. This shall be substantiated by a repaired cover being subjected to a full scale FCC assembly test (see 6.2). For this test, the repaired part should be located adjacent to and over the ignition box (see 6.2.2 and Annex E).

4.7.3 Whenever possible, repairs should be achievable using field kits without returning the damaged unit to a specialized workshop. Any curing time for bonding or equivalent shall be specified, and should not exceed 2 h in the open in the defined weather conditions. The allowable minimum and maximum

STANDARDSISO.COM : Click to view the full PDF of ISO 14186:2013

 © ISO 2013 – All rights reserved

ambient conditions together with the associated curing time shall be specified in the Component Maintenance Manual (CMM).

5 Performance

5.1 Components

5.1.1 Cover

The fire containment cover's material(s) shall meet the flammability requirements of CS-25, CCAR-25, JAS Part 3 or 14 CFR Part 25 Appendix F, Part I, paragraphs (a)(2)(ii) and (a)(1)(ii), i.e. must be self-extinguishing when tested vertically in accordance with Part I paragraph (b)(4), and there must be no flame penetration during application of the specified flame source when subjected to the 45° angle test defined in Part I, paragraph (b)(6).

NOTE The 45° test may be replaced by the Appendix F Part III flame penetration test hereafter, deemed more critical.

In addition, it/they shall meet the flame penetration requirements of CS-25, CCAR-25, JAS Part 3 or 14 CFR Part 25 Appendix F, Part III, paragraph (a)(3), i.e. there must be no flame penetration within 5 min after application of the specified flame source, and the peak temperature measured at 100 mm (4,0 in) above the upper surface of the horizontal test sample must not exceed 204 °C (400 °F). See 6.1.1.1, materials flammability testing.

5.1.2 Pallet

The material(s) of any pallet used in conjunction with the fire containment cover shall meet the requirements of CS-25, CCAR-25, JAS Part 3 or 14 CFR Part 25 Appendix F, Part I, paragraphs (a)(1)(ii) and (a)(2)(iii), i.e. must be self-extinguishing when tested vertically in accordance with Part I paragraph (b)(4), and there must be no flame penetration during application of the specified flame source when subjected to the 45° angle test defined in Part I, paragraph (b)(6). See 6.1.1.2.

For pallets not meeting this requirement, see Note 1 under 4.2.1 above.

5.1.3 Net

The material of any pallet net used in conjunction with the fire containment cover, whether or not attached to it, shall, in addition to TSO/ETSO C90, meet the requirements of CS-25, CCAR-25, JAS Part 3 or 14 CFR Part 25 Appendix F, Part I, paragraph (a)(1)(ii), i.e. must be self-extinguishing when tested vertically in accordance with Part I paragraph (b)(4). See 6.1.1.3, and 7.5 for marking requirements of nets that satisfied the tests.

Pallet nets not meeting this requirement shall not be used on a fire containment cover.

5.2 FCC assembly

5.2.1 The fire containment cover assembly when properly installed onto a pallet shall effectively contain and control – see 3.1 – a fire beneath it.

5.2.2 The fire containment cover assembly when properly installed onto a pallet shall minimize heat generated outside it, to ensure that the adjacent aircraft systems and structure are not adversely affected.

Compliance with this requirement shall be demonstrated by successfully completing both 6.1.1 materials flammability tests and 6.2 FCC assembly tests, showing that the temperature measured at any point 100 mm (4,0 in) outside of the ULD contour or below the pallet at no time exceeds 204 °C (400 °F), in accordance with CS-25, CCAR-25, JAS Part 3 or 14 CFR Part 25 Appendix F, Part III, paragraph (a)(3) (Amendment 25-72) and no flame penetration occurs. See 6.2.

STANDARDSISO.COM : Click to view the full PDF of ISO 14186:2013

© ISO 2013 – All rights reserved

5.2.3 The temperatures recorded and heat loads calculated at locations above, around and below the FCC covered pallet shall be used to establish the length of protection time afforded by the system. Where the FCC is intended and approved for one aircraft type only, the so determined protection time shall not be less than the approved extended range operations (EROPS) or long range operations (LROPS) maximum diversion time for the intended aircraft type. For unlimited aircraft type use, the protection time should not be less than 360 min (6 h).

5.2.4 The fire containment cover assembly when properly installed onto a pallet should minimize the amount of contaminants such as smoke, fumes or noxious gases coming out of the covered pallet load. Smoke and gaseous contaminants emitted by the cover itself when heated should not exceed the levels specified in Annex D.

5.3 Allowable damage

5.3.1 Performance of the fire containment cover assembly shall be maintained in the presence of maximum allowable damage, to be determined and substantiated by the manufacturer. The maximum allowable damage shall be defined in the Component Maintenance Manual (see 8.2).

5.3.2 Manufacturers are encouraged to demonstrate the highest sustainable degree of in-service damage that maintains the highest degree of fire containment performance. However, in order to facilitate damage control in third-party handling operational conditions, the minimum required extent of maximum allowable damage shall be as follows:

a) two 50 mm × 200 mm (2 in × 8 in) punctures in the lower part of one side, corresponding to typical damage resulting from a forklift blades hit (see Figure 1), and simultaneously;

b) two 25 mm (1 in) diameter holes opposite to each other in the top part of opposite sides of the cover, corresponding to either tears from inappropriately used tools or cover handling mechanical aids, or impact from a high velocity projectile (see Figure 1).

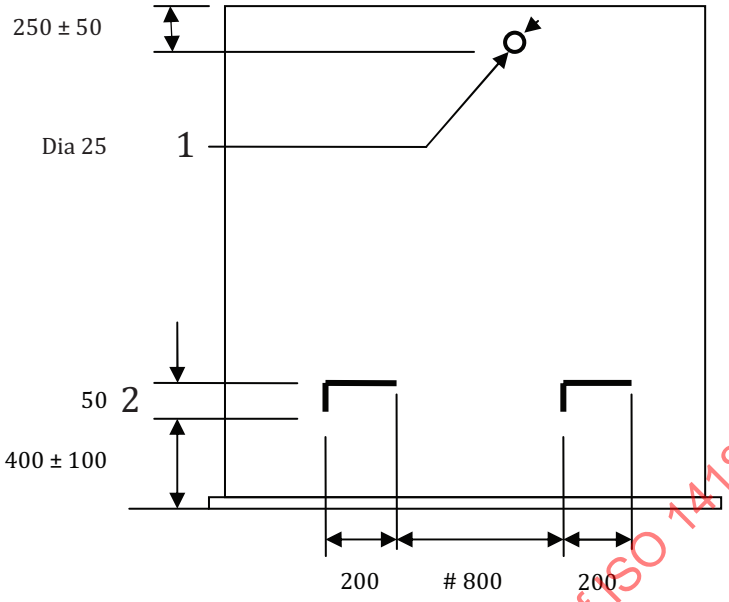
NOTE Impact from a high velocity projectile also is an event required to be withstood by cargo compartment components in accordance with CS-25.795, Security considerations, paragraph (b)(3)(i) and paragraph 8.a (2) (a) of FAA Advisory Circular (AC) 25.795–5 on Cargo compartment fire suppression, addressing the revision of 14 CFR 25.795 (b)(3), both based on ICAO Annex 8 Amendment 97 standards.

5.3.3 Intended maximum allowable damage shall be substantiated through a cover presenting that damage being subjected to the full scale FCC assembly test (see 6.2).

STANDARDSISO.COM : Click to view the full PDF of ISO 14186:2013

© ISO 2013 – All rights reserved

Dimensions in millimetres



Key

1 two opposite sides

2 simulated forklift hit (one side)

Figure 1 — Maximum allowable damage

STANDARDSISO.COM : Click to view the full PDF of ISO 14186:2013

6 Testing

6.1 Materials testing

6.1.1 Flammability and flame penetration tests

6.1.1.1 General

6.1.1.1.1 For fire containment cover's material qualification, at least three (406 ± 3) mm × (610 ± 3) mm [(16 ± 1/8) in × (24 ± 1/8) in) specimens of the fire containment cover's material shall be tested in accordance with CS-25, CCAR-25, JAS Part 3 or 14 CFR Part 25 Appendix F, Part III, using the test apparatus (mounting stand, kerosene test burner, thermocouples) specified in its paragraph (d) and the test procedure specified in its paragraph (g).

6.1.1.1.2 Each specimen shall be pre-conditioned prior to testing as follows:

a) Soak for 24 h in water, then dry at room temperature in a well ventilated place (weighing is recommended before and after pre-conditioning to confirm the specimen was fully dried).

NOTE The burning resistance of textile materials was empirically found to be negatively affected by previous soaking, which is a very common and hardly avoidable occurrence in air cargo.

b) Then apply the sample conditioning procedure of CS-25, CCAR-25, JAS Part 3 or 14 CFR Part 25 Appendix F, Part I, paragraph (b) (1), i.e. bring the specimens to (21 ± 3) °C [(70 ± 5) °F) and at 50 % ± 5 % relative humidity until moisture equilibrium is reached or for 24 h. Each specimen must remain in the conditioning environment until it is subjected to the flame.

© ISO 2013 – All rights reserved

6.1.1.1.3 Each specimen shall be tested in the horizontal position. Where the material is unsymmetrical, it shall be installed on the apparatus with the inner side of the FCC material down (exposed to the flame).

6.1.1.1.4 The tested specimens shall include any other elements part of the FCC's construction, e.g. sewing thread, seams, welding, gluing, bonding, closure devices, seals, any accessories, placard holders, labels, the failure of which would affect the capability of the cover to safely contain a fire.

6.1.1.1.5 On completion of the tests, there shall be no flame penetration of any specimen within 5 min after application of the flame source, and the peak temperature measured at 100 mm (4,0 in) above the upper surface of the horizontal test sample shall not exceed 204 °C (400 °F).

6.1.1.2 Pallet

Unless previously tested and demonstrated to meet flammability requirements, at least three specimens of the material(s) of any pallet to be used in conjunction with the fire containment cover shall be tested in accordance with CS-25, CCAR-25, JAS Part 3 or 14 CFR Part 25 Appendix F, Part I paragraphs (a)(1)(ii) and (a)(2)(iii) as follows.

a) Vertical test:

   1) Each specimen shall be tested in accordance with CS-25, CCAR-25, JAS Part 3 or 14 CFR Part 25 Appendix F, Part I, paragraph (a)(1)(ii), using specimen configuration specified in its paragraph (b)(2), a Bunsen burner, the test apparatus (draft-free cabinet) specified in its paragraph (b)(3) and the test procedure specified in its paragraph (b)(4).

   2) The minimum flame temperature measured by a thermocouple in its centre must be 840 °C (1 550 °F). The flame must be applied for 12 s and then removed. Subsequent flame time, burn length and flaming time of drippings, if any, are to be recorded.

   3) On completion of the tests, the average burn length may not exceed 203 mm (8 in), the average flame time after removal of the flame source may not exceed 15 s, and drippings from the test specimens, if any, may not continue to flame for more than an average of 5 s after falling.

b) 45° angle test:

   1) Each specimen shall be tested in accordance with CS-25, CCAR-25, JAS Part 3 or 14 CFR Part 25 Appendix F, Part I, paragraph (a)(2)(iii), using specimen configuration specified in its paragraph (b)(2), a Bunsen burner, the test apparatus (draft-free cabinet) specified in its paragraph (b)(3) and the test procedure specified in its paragraph (b)(6).

   2) The minimum flame temperature measured by a thermocouple in its centre must be 840 °C (1 550 °F). The flame must be applied for 30 s with one third contacting the material at the centre of the specimen, and then removed. Subsequent flame time, glow time, and whether the flame passes through the specimen are to be recorded.

   3) On completion of the tests, the flame may not have passed through the material during application of the flame or subsequent to its removal, the average flame time after removal of the flame source may not exceed 15 s, and the average glow time may not exceed 10 s.

6.1.1.3 Net

For material qualification of pallet nets for use in conjunction with the fire containment cover, at least three specimens of the net's material shall be tested vertically in accordance with CS-25, CCAR-25, JAS Part 3 or 14 CFR Part 25 Appendix F, Part I paragraphs (a)(1)(ii) and (b)(iv) as follows.

— Each specimen shall be tested in accordance with CS-25, CCAR-25, JAS Part 3 or 14 CFR Part 25 Appendix F, Part I, paragraph (a)(1)(ii), using specimen configuration specified in its paragraph (b)(2), the test apparatus (draft-free cabinet) specified in its paragraph (b)(3) and test procedure specified in its paragraph (b)(4);

STANDARDSISO.COM : Click to view the full PDF of ISO 14186:2013

 © ISO 2013 – All rights reserved

— The minimum flame temperature measured by a thermocouple in its centre must be 840 °C (1 550 °F). The flame must be applied for 12 s and then removed. Subsequent flame time, burn length and flaming time of drippings, if any, are to be recorded.

— On completion of the tests, the average burn length may not exceed 203 mm (8 in), the average flame time after removal of the flame source may not exceed 15 s, and drippings from the test specimens, if any, may not continue to flame for more than an average of 5 s after falling.

6.1.2 Puncture test

6.1.2.1 The cover's material shall be tested for puncture resistance in order to assess the likeliness of in-service puncture affecting the cover's capability to safely contain a fire. Five wetted specimens shall be tested using the apparatus, plunger and methodology of ISO 12236, at a pushing rate of (50 ± 10) mm/min [(2 ± 3/8) in/min].

6.1.2.2 The mean push-through force in kN (lbf) measured at full puncture through the material shall be recorded, and provided to the purchaser on request. It shall not be less than 3,3 kN (725 lbf).

6.1.2.3 The test shall be repeated with samples previously submitted to 6.1.3, accelerated U.V. and humidity test. See 6.1.3.4.

6.1.3 U.V. and humidity test

6.1.3.1 An accelerated U.V. and humidity test shall be conducted in accordance with ISO 4892-1 and ISO 4892-3, using laboratory equipment specified therein, for a minimum of 240 h consisting in test cycles including 16 h of U.V. A exposure (type 1A test of ISO 4892-3: "UVA-340" lamps with 340 nm peak irradiance) at (60 ± 2) °C [(140 ± 5) °F], alternating with 8 h of water condensation at 50 ± 2°C [(120 ± 5) °F] and 95 % ± 4 % RH in accordance with category A of EUROCAE ED-14G section 6.

NOTE Accelerated U.V. testing has no fixed relationship with actual weather conditions exposure, and can be used to obtain comparative results but does not allow to reliably anticipate in-service results. See 6.1.3.5 for additional recommended actual sun radiation exposure testing.

6.1.3.2 After completion of the required test cycles, the specimens shall be separately submitted to

a) the flammability and flame penetration test in 6.1.1, and

b) the puncture resistance test in 6.1.2,

in order to assess any performance degradation in these critical areas, in comparison with the original testing of new specimens.

6.1.3.3 All specimens exposed to U.V. and humidity testing shall be submitted to the flammability and flame penetration test and meet the acceptance criteria of 6.1.1.1.5.

6.1.3.4 After the puncture resistance test, the specimens exposed to U.V. and humidity testing should exhibit a mean push-through force in kN (lbf), measured at full puncture through the material, of at least 50 % of the mean value measured according to 6.1.2.2 on unexposed specimens.

6.1.3.5 Due to significant, material-dependent, unpredictable variations between in-service exposure and accelerated laboratory testing, it is strongly recommended that accelerated U.V. testing per the present clause be complemented by actual sun radiation exposure over a minimum period of 6 months. See ISO 877-1 and ISO/TR 8647 for guidance. Specimens shall then be tested to 6.1.3.2 to 6.1.3.4, and the results may be used to calibrate the accelerated testing method used for the same material, as well as better substantiate the cover expiry date per 4.5.6 above.

NOTE SAE AIR 1490C[21] is equivalent to ISO/TR 8647. For actual solar radiation exposure, areas in Southeast Asia and the USA Southwest were used for the series of tests in ISO/TR 8647 and SAE 1490C, and are recommended for results comparability.

STANDARDSISO.COM : Click to view the full PDF of ISO 14186:2013

© ISO 2013 – All rights reserved

6.1.4 Abrasion test

6.1.4.1 An abrasion test shall be performed on the fire containment cover material, commensurate with the expected service life of the cover. The test methods in Bibliography references [15] or [16], or any method shown to be equivalent, may be used.

6.1.4.2 At least three specimens of the fire containment cover's material shall be tested. After the tests, the specimens shall be tested for flammability and flame penetration accordance with 6.1.1. The acceptance criteria in 6.1.1.1.5 shall be met.

6.1.4.3 The mean abrasion measurement obtained shall be recorded, and provided to the purchaser on request together with the hypotheses concerning cover service life.

6.1.5 Fungus test

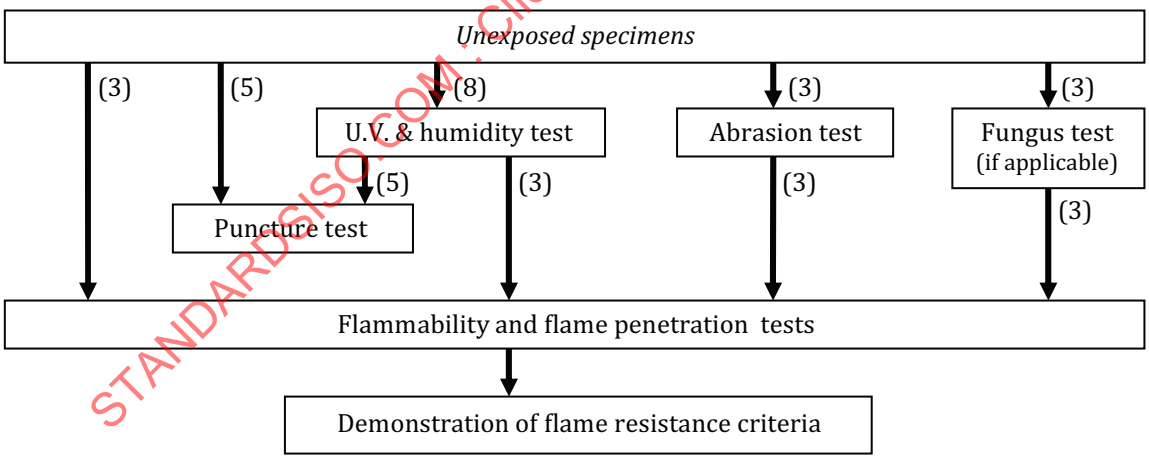
6.1.5.1 A fungus resistance test shall be performed on the fire containment cover material. However, if all materials used in the construction of the fire containment cover can be shown to be non-nutrient for the growth of fungi, either through composition or through previous testing, this testing is not required. If non-nutrient material certification is used, this fact shall be declared by the manufacturer on the Environment Qualification Form (Appendix A of EUROCAE ED-14G [ISO 7137], see 4.6.4).

6.1.5.2 Where testing is deemed necessary, at least three specimens of the material shall be used. Fungus conditioning of the specimens shall be conducted in accordance with EUROCAE ED-14G [ISO 7137] section 13, using the mineral salts solution and fungi spores cultures specified therein. Incubation shall be maintained at (30 ± 3) °C [(86 ± 5) °F] and 97 % ± 2 % RH for 28 days.

6.1.5.3 On completion of incubation, the specimens shall be tested for flammability and flame penetration resistance in accordance with 6.1.1. The acceptance criteria in 6.1.1.1.5 shall be met.

6.1.6 Materials testing schedule

6.1.6.1 A typical schedule to perform the successive tests should be as follows:



6.1.6.2 However, the number and sequence of tests may be altered in order to best fit testing arrangements, under condition that the requirements of each testing clause be complied with, and the actual numbers, sequence and results be recorded in the testing file.

6.2 FCC assembly test

6.2.1 In order to substantiate the fire containment cover model's approval, full scale tests of the fire containment cover assembly shall be performed: the type I or type II fire containment cover together with a pallet net meeting the flammability requirements, whether or not attached to it, constituting the assembly, shall be installed over a general cargo pallet built-up to the maximum contour, and a class

STANDARDSISO.COM : Click to view the full PDF of ISO 14186:2013

© ISO 2013 – All rights reserved

A fire as defined in 3.6 above lit within the cargo. The amount of fire materials shall be determined in order to sustain the fire for the minimum protection time defined in 5.2.3, and in accordance with paragraph 4.3.2 of U.S. DOT/FAA/AR-TN12/11[19]. Test recordings shall start on fire ignition.

6.2.2 Materials for the Class A fire shall be built-up on the pallet. The following arrangement is to be used for test repeatability purposes:

— Fill up corrugated cardboard boxes measuring approximately 450 × 450 × 450 mm (18 × 18 × 18 in) and weighing approximately 1 kg (2 lb) with approximately 1,2 kg (2,5 lb) of shredded paper (not confetti) each. Each box shall be filled at least 75 % in volume.

— Stack together, immediately adjacent to each other, as many of them as necessary to fill the ULD's maximum contour, and install the cover to be tested over the completed ULD. Position, calibrate and adjust any monitoring equipment.

— Fire ignition shall be obtained by remote control in one of the boxes at the lowest stacking level, immediately adjacent to one side of the fire containment cover (worst case), and adjacent to a stitching or bonding line if any is part of the design.

6.2.3 Thermocouple readings at locations above and around the fire containment cover and below the base shall be performed throughout the duration of the test to measure the temperature, at a distance of 100 mm (4,0 in) outside of the cover, using test apparatus (thermocouples) specified in CS-25, CCAR-25, JAS Part 3 or 14 CFR Part 25 Appendix F, Part III, paragraph (d), or equivalent. There shall be no flame penetration (burn-through) at any time, and the peak measured temperatures shall at no time exceed 204 °C (400 °F).

6.2.4 The pallet shall be supported at least 200 mm (8 in) over a non-heat-reflecting, e.g. concrete, floor. A minimum of 8 recording thermocouples shall be located 100 mm ± 10 mm (4 in ± 1/2 in) away from the initial pallet contour and under the pallet at the fixed locations defined in Annex E, not to be readjusted if the cover deforms either inside or outside its initial contour during the test.

NOTE 1 Additional thermocouples may be used, if deemed necessary according to previous testing results.

NOTE 2 Where the distance from a thermocouple significantly varies from 100 mm (4 in) during the test as a result of internal load shift, the concerned thermocouple's reading should not be taken into account from that moment.

6.2.5 These measurements shall be continuously recorded at appropriate time intervals for the duration required by aircraft extended range operations maximum diversion time (see 5.2.3), after fire ignition, and the time history data shall be used to determine the length of protection time afforded by the system. This will become part of the fire containment cover's approval, to be in turn used to determine an approved aircraft cargo compartment protection time.

6.2.6 The test in 6.2.1 shall be repeated with a fire containment cover presenting the maximum damage, such as defined punctures, intended to be allowed in operation (see 5.3), then with a repaired unit in order to substantiate the retained repair method. The test record files shall be used to substantiate the defined degree of damage as allowable operational serviceability limits, and repair method approval.

6.2.7 During each test, continuous attention shall be paid to behaviour of the pallet net, and any partial or complete melting, combustion, or drippings if any, shall be recorded together with the relative location and duration of each event. The duration of any flame may not exceed 15 s, and drippings, if any, may not continue to flame for more than an average of 5 s after falling. At no time should the lower parts of the net be degraded to the extent of allowing creation of openings between the fire containment cover and the pallet.

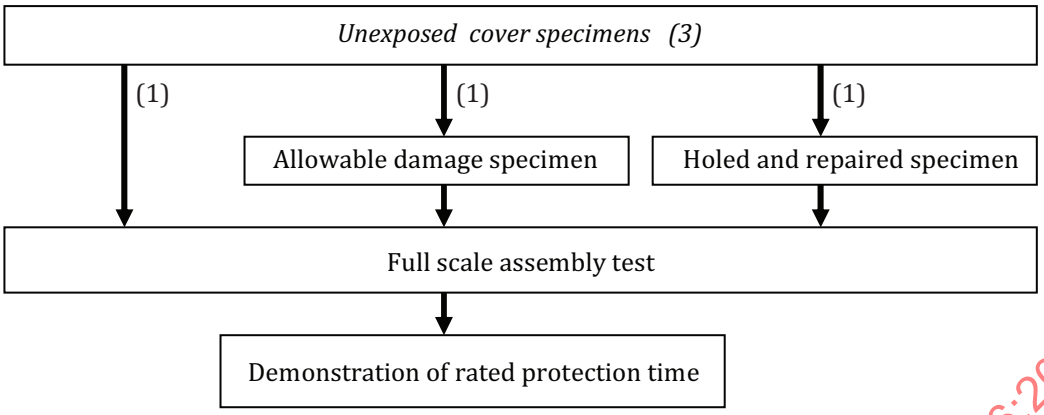
6.2.8 FCC assembly testing record files, including the thermocouple readings continuous recording, shall be maintained for all tests in 6.2.1 and 6.2.6, as well as 6.2.7 if the net is also tested for approval as part of the same test, and made available to the purchaser on request, and where applicable to the approval Authority.

NOTE In addition, it is recommended the files also include continuous video recording all around the unit during each test.

STANDARDSISO.COM : Click to view the full PDF of ISO 14186:2013

© ISO 2013 – All rights reserved

6.2.9 A typical schedule to perform the required series of FCC assembly tests should be as follows:



However, the number and sequence of tests may be altered in order to best fit testing arrangements, under condition that the requirements of each testing clause be complied with, and the actual numbers, sequence and results be recorded in the testing file.

7 Markings

7.1 Each fire containment cover conforming to this International Standard shall bear at least the following markings near the bottom edges on the two opposite long sides:

— "FIRE CONTAINMENT COVER", in bold characters at least 150 mm (6 in) high;

— "ISO 14186";

— Authority approval (e.g. "*EASA approved*", "*TSO X-XX*", etc., date), if applicable;

— Approved protection time (e.g. "*Minimum protection duration 6 hours*");

— Manufacturer's or supplier's name or identifiable logo;

— Type designation (Part number);

— Individual serial number (optional);

— Pallets and nets the unit may be used with (IATA size codes);

— Any aircraft type restrictions;

— Traceability code (see 7.2) including expiry date.

The indication "ISO 14186" shall be deemed to mean, under the manufacturer's or supplier's responsibility, that the unit complies with the mandatory requirements of this International Standard, and meets at least in an equivalent manner its recommended criteria.

7.2 The traceability code shall enable the unit's manufacturing and (if recorded by the user) in-service history to be retraced, and include, in line with TSO/ETSO C90d:

— Year (4 numerics) – month (2 numerics) of manufacture.

— Expiry date year (4 numerics) – month (2 numerics), preceded by "EXP", as defined with the purchaser (environmental degradation evaluation) in view of planned storage duration (see 4.6.3). Several expiry dates may be assigned in a same production batch, if planned for different storage durations. Characters shall be bold and at least 25 mm (1 in) high.

STANDARDSISO.COM : Click to view the full PDF of ISO 14186:2013

 © ISO 2013 – All rights reserved

— Code of production batch, assigned by the manufacturer. A new production batch code shall be assigned any time a change occurs in either materials nature, or procurement source, or fabrication process.

Example of a traceability code:

2012 - 10 / **EXP 2015 - 09** / A17

7.3 The markings shall be stencilled or otherwise printed in an indelible manner, in characters at least 12,5 mm (1/2 in) high except the "FIRE CONTAINMENT COVER" and "EXPIRY DATE" ones, onto the outer surface of the cover (ensuring the printing process does not deteriorate the material's fire containment performance) or a label permanently affixed to it. They should preferably remain legible after the assembly's fire test.

7.4 In addition, where the cover's material is such that one side must be the inner one to withstand fire, the outer side shall bear at mid height on each long side the words "THIS SIDE OUT" and, conversely, the words "THIS SIDE IN" at mid height on each inner long side, in contrasting colour bold characters at least 150 mm (6,0 in) high. Also see 4.3.6 for material colours.

7.5 Each pallet net conforming to this International Standard (see 5.1.3 and 6.1.1.7) shall bear at least the following markings in addition to those required by Clause 6 of ISO 4170:1995:

— "FIRE CONTAINMENT COMPATIBLE", in bold characters at least 40 mm (1,6 in) high;

— "ISO 14186", in characters at least 12,5 mm (½ in) high;

in black print on both sides of two dedicated one mesh size [minimum 250 mm × 250 mm (10 in × 10 in)] safety orange colour labels located immediately adjacent to the net's standard handling labels.

8 Manufacturer's instructions

8.1 The manufacturer shall deliver together with the first batch of fire containment covers a set of written instructions including at least:

a) Certificate of Conformity with the requirements of the present International Standard,

b) guaranteed protection time (see 5.2.3) to be used for flight operations,

c) Authority approval, where applicable,

d) appropriate instructions to the operators (see 8.2),

e) materials Environment Qualification Forms required (see 4.6.4),

f) recycling instructions (see 4.3.4).

The tests record file defined in 6.2.8 should be made available to the purchaser on request, and shall be provided to the approval Authority where applicable.

Document a) shall be renewed at each subsequent delivery.

8.2 Instructions to the operators under 8.1 c) should include at least:

a) storage conditions and inventory control requirements appropriate to ensure FCC's performance is maintained and expiry dates are complied with,

b) intended conditions of use, and any exclusions there from if applicable,

c) environmental assessment, health precautions, known chemical incompatibilities,

d) appropriate installation and removal instructions,

STANDARDSISO.COM : Click to view the full PDF of ISO 14186:2013

© ISO 2013 – All rights reserved

e) inspection requirements and serviceability limits (maximum allowable damage),

f) instructions for continuing airworthiness (ICA) and approved repair instructions with parts and materials procurement information (Component Maintenance Manual).

9 Operator requirements

9.1 General

Flight safety depends on effectiveness and dependability of fire containment covers installation on pallets prior to their being loaded aboard aircraft. Accordingly, it is essential that air carriers, as required by their operating certification, fully meet their responsibilities as follows.

9.2 Operating instructions

9.2.1 The air carrier shall ensure that the fire containment covers used meet the performance and testing requirements of this International Standard and, if applicable, were approved by an appropriate Authority for use on the aircraft type(s) concerned.

9.2.2 The air carrier shall establish and distribute to all concerned, including sub-contractors, fire containment covers operating instructions taking into account the requirements of the approved Weight and Balance Manual(s) for the intended aircraft type(s), as well as the recommendations of the present International Standard and any specific requirement from Authority approval, if applicable.

9.2.3 The air carrier shall take all necessary steps to ensure these operating instructions are fully understood and applied at each airport by at least one suitably trained and available competent person (see 9.3) or under their direct supervision, including the establishment and implementation of such procedure as can guarantee an aircraft will not be dispatched with fire containment covers in use on board unless each cover was inspected after installation and found satisfactory by such a competent person prior to release for loading aboard the aircraft.

9.2.4 Operating instructions should include installation procedures on either fully or partly loaded pallets, including:

— cover and net installation, lifting, handling and storage instructions;

— net adjustment or other precautions required to adapt the cover shape to actual pallet load in order to minimize empty volume within the cover (avoiding air pockets);

— procedure and practice for FCC bottom edge adjustment in order to limit inasmuch as possible air entry at the base edge. There should be no visible gap between the bottom edge of the FCC and the pallet base;

— since oxygen starvation is the key to safe use of FCCs, oxygen generating devices or oxygen containing devices should not be part of the load;

— any other pertinent procedure or precaution.

9.2.5 Operating instructions shall also include procedures for duly inspecting the condition of the fire containment cover after installation: checking for possible punctures or other damage vs approved serviceability limits and possible air entry points remaining at the interface with pallet base edges (to be minimized in order to ensure effective air starvation).

9.2.6 The air carrier shall ensure that the Flight Manual (AFM) for the relevant aircraft type(s) includes the maximum guaranteed protection time determined for each fire containment cover type used, and flights planning takes it into account for determination of routes.

STANDARDSISO.COM : Click to view the full PDF of ISO 14186:2013

 © ISO 2013 – All rights reserved

9.3 Training and qualification

9.3.1 The air carrier shall establish and implement recurrent training programmes to ensure their fire containment covers installation instructions are fully understood and practiced by a sufficient number of duly trained competent persons (see, for example, ISO 9001:2008[9], 6.2.2) throughout their organization and subcontractors responsible for preparing pallets for loading aboard aircraft.

9.3.2 The basic contents of such training programmes should include at least the contents of the present International Standard, and be taught using field training and practical installation demonstrations with actual pallets and covers. They should also include information on the limitations applicable to the specific aircraft type(s) intended.

9.3.3 It is recommended such training be individually recorded after a proficiency check was performed, both theoretical and practical (actual pallets build-up). Such individuals may be deemed qualified to perform fire containment covers inspection and release for loading aboard an aircraft.

NOTE A recommended practice consists in having the qualified individual who performed the inspection sign the pallet tag accordingly.

9.4 Quality control

9.4.1 As any activity with a potential impact on flight safety, fire containment cover installation and inspection processes shall be monitored and their quality and effectiveness be regularly assessed by an independent organization in the framework of the air carrier's internal evaluation and quality control programme (see 14 CFR Part 121 and FAA AC 120-59, EU-OPS 1.035 and its AMC and IEM).

9.4.2 Accordingly, each pallet build-up site installing fire containment covers should be subject to inspection, investigation or audit from the air carrier's quality control department, including when it is located at a sub-contractor's premises.

9.4.3 It is also recommended that airport cargo handling agencies facilities performing installation of fire containment covers for loading on board an air carrier's aircraft maintain their own continuous quality control programme meeting the requirements of, for example, ISO 9001[9] or an equivalent pertinent industry standard.

9.4.4 In addition, it is recommended that any significant incident, in flight or on the ground at aircraft loading or offloading, resulting from or related to improper performance, installation or inspection of (a) fire containment cover(s) be reported and subject to carrier's quality control department investigation, in order to be analysed and corrective action to be taken to avoid its reoccurrence.

9.4.5 Any occurrence of a fire on a pallet with a fire containment cover installed, whether on the ground or in flight, shall be immediately reported to the air carrier's quality control department to be investigated as a flight safety occurrence. The fire containment cover involved shall be kept aside for the investigation and shall not be returned to service after it.

STANDARDSISO.COM : Click to view the full PDF of ISO 14186:2013

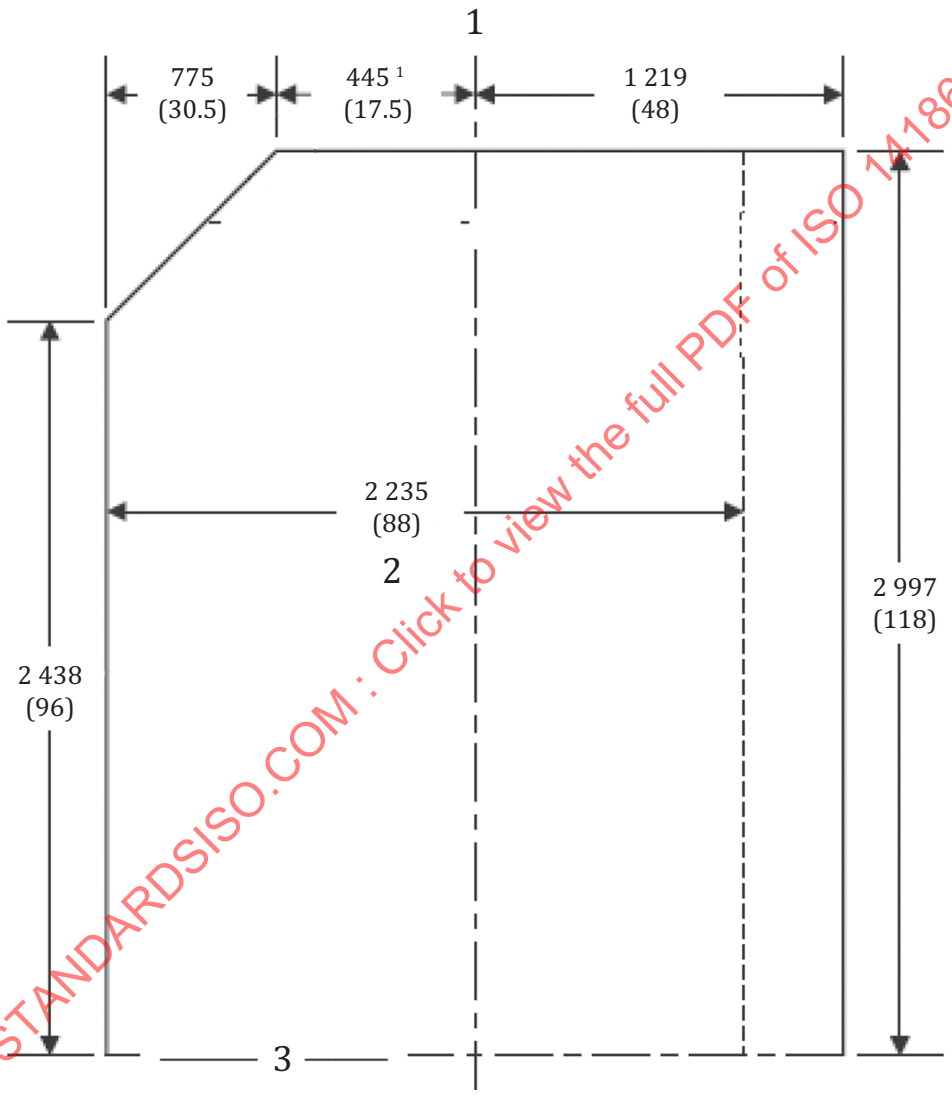
© ISO 2013 – All rights reserved

Annex A
(normative)

Code D wide-body aircraft main deck contour

See Figure A.1.

Dimensions in millimetres (inches)



STANDARDSISO.COM : Click to view the full PDF of ISO 14186:2013

Key

1 centre line
2 alternate width
3 top of conveyor plane

NOTE 1 Length dimension is 3 175 mm (125,0 in).

NOTE 2 Contour height may be limited to 2 438 mm (96,0 in) = code A contour.

© ISO 2013 – All rights reserved

NOTE 3 Certain pallets can have contoured part horizontal dimensions of 559 mm (22,0 in) and 660 mm (26,0 in) instead of 775 mm (30,5 in) and 445 mm (17,5 in), respectively.

NOTE 4 Maximum pallet load contour is 50 mm (2,0 in) inside the so defined maximum ULD contour on all four sides (see ISO 10046).

Figure A.1 — Code D wide-body aircraft main deck contour

STANDARDSISO.COM : Click to view the full PDF of ISO 14186:2013

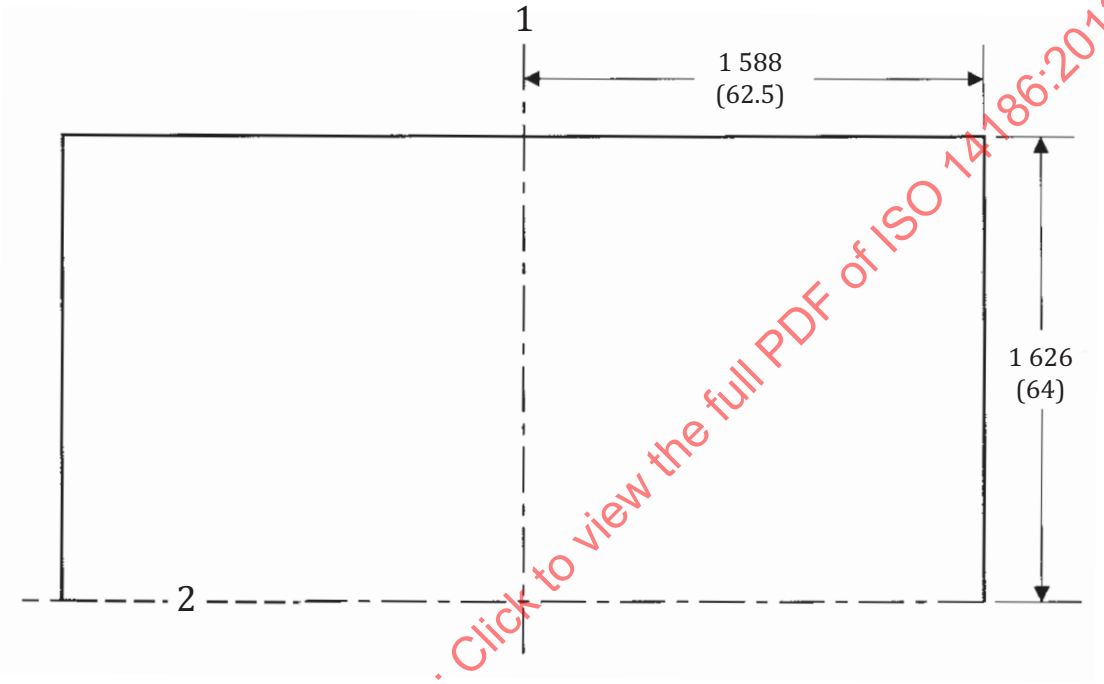
© ISO 2013 – All rights reserved

Annex B
(normative)

Code P wide-body aircraft lower deck contour

See Figure B.1.

Dimensions in millimetres (inches)



STANDARDSISO.COM : Click to view the full PDF of ISO 14186:2013

Key

1 centre line

2 top of conveyor plane

NOTE 1 Length dimension is 2 235 mm (88,0 in) or 2 438 mm (96,0 in).

NOTE 2 Applies to lower deck compatible units when carried on aircraft main deck.

NOTE 3 Maximum pallet load contour is 50 mm (2,0 in) inside the so defined maximum ULD contour on all four sides (see ISO 10046).

Figure B.1 — Code P wide-body aircraft lower deck contour

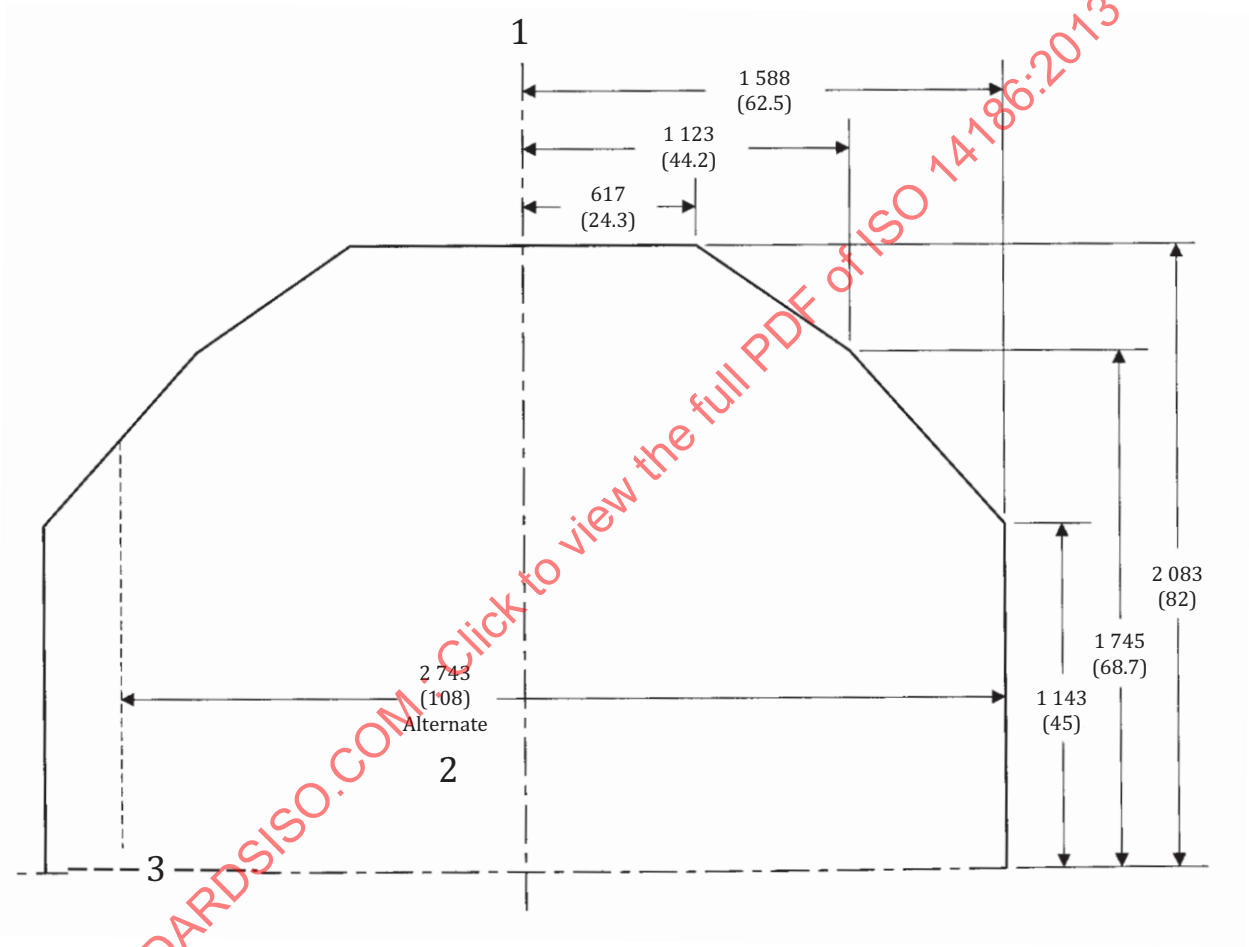
© ISO 2013 – All rights reserved

Annex C
(normative)

Code Y narrow-body aircraft main deck contour

See Figure C.1.

Dimensions in millimetres (inches)



STANDARDSISO.COM : Click to view the full PDF of ISO 14186:2013

Key

1 centre line

2 alternate width

3 top of conveyor plane

NOTE 1 Length dimension is 2 235 mm (88,0 in) or 2 438 mm (96,0 in).

NOTE 2 Contour height may be limited to 1 625 mm (64,0 in) for lower deck units capable of being loaded on aircraft main deck = code P contour.

NOTE 3 Maximum pallet load contour is 50 mm (2,0 in) inside the so defined maximum ULD contour on all four sides (see ISO 10046).

Figure C.1 — Code Y narrow-body aircraft main deck contour

© ISO 2013 – All rights reserved