Fireworthiness Requirements Pressurized Section of Fuselage

PURPOSE:

This document outlines the fireworthiness design criteria for use inside the pressurized section of the fuselage of Airbus commercial aircraft.

SCOPE:

Owner's Approval: (signed)

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1 General

This ABD contains the fireworthiness design criteria for use inside the pressurized section of the fuselage of Airbus commercial aircraft.

The fireworthiness design criteria are related to the burning behaviour of materials, components, sub-components and system parts and include both the relevant Airworthiness Authority requirements for certification and additional Airbus "Fire-Smoke-Toxicity" freworthiness-requirements.

Further requirements regarding aircraft fire safety are not covered by this ABD document. They are defined in the regulations developed and issued by the Airworthiness Authorities.

The fireworthiness design criteria and related requirements defined hereinafter shall be applied to interior component parts or sub-assemblies, equipment-, system- and structural parts, constructed in part or in whole of non-metallic materials, intended for use inside this area.

This ABD shall be used by Airbus to establish the detailed definition dossiers (drawings and associated documents such as Technical Specifications/Standards).

The fireworthiness design requirements shall be taken into consideration for preparation of future aircraft projects.

For existing aircraft projects and designs the requirements of the ABD0031 shall apply whenever a change of materials or part design is introduced.

No retroactive application (to earlier aircraft projects) is required. Requirements may be taken into consideration at the opportunity of a new system definition/important aircraft definition change.

This ABD supersedes the ATS 1000.001 which is still applicable to Airbus aircraft designed before the effective date of ABD0031 issue A.

This ABD document makes also reference to the new Certification Specification CS-25 for large aeroplanes introduced by the European Aviation Safety Authority (EASA) in October 2003.

The requirements of this ABD document may be amended in part or in whole by a related change to JAR/CSI/FAR Part 25, new regulation or special condition officially imposed to the type-certification of the respective aircraft by Airworthiness Authorities.

An exception from an Airbus fire worthiness-requirement requires an approval as stated in paragraphes 4.1 and 4.2. Airbus reserves the right to cancel, in part or in the whole, this limitation, e.g. prior to the introduction of a "non metallic design", replacing it by corresponding individual programme directives.

Materials and semi-finished products which are used for the construction of a part of the aircraft interior, equipment or structure shall be qualified against the relevant Material Specification or Individual Product Specification.

Referring to ABD0039 the area of application is:

- zone 100 and zone 200:

  → Fuselage, (forward pressure bulkhead to forward face of aft pressure bulkhead)

with exception of...

- zone 110:

  → Radome (nose cone to forward pressure bulkhead (FR1)

- and zone 140:

  → Wing center box, air conditioning units and hydraulic compartment (forward pressure bulkhead of wing centre box to forward pressure bulkhead of aft cargo compartment).

2 Objectives

Definition of all fireworthiness design criteria including both the relevant Airworthiness Authority requirements for certification and the additional Airbus fire worthiness-requirements related to the burning behaviour of materials, components, sub-components and system parts used inside the pressurized section of the fuselage.

Assure consideration of the relevant certification requirements.

Definition of the applicable test methods.

Detailing the proceeding, requirements and procurement concerning fire testing.

3 References

3.1 Airworthiness Standards

FAR Part 25, § 25.853	[1]
JAR 25, § 25.853	[2]
FAR Part 25, § 25.855	[3]
JAR 25, § 25.855	[4]
FAR 25, § 25.856	[5]
FAR Part 25, § 25.857	[6]
JAR 25, § 25.857	[7]
FAR Part 25, § 25.869	[8]
JAR 25, § 25.869 (d)	[9]
JAR 25, Appendix F	[10]
FAR Part 25, Appendix F	[11]

3.2 Joint Airworthiness Regulations, Section 2 (ACJ)

ACJ 25.853 (c)	[12]
ACJ 25.869	[13]

3.3 Federal Aviation Administration, Advisory Circular (AC)

AC 25.853-1	[14]

3.4 Airbus Test Methods (AITM)

AITM 2.0002	[15]	Flammability of Non-metallic Materials, -Small Burner Test vertical-
AITM 2.0003	[16]	Flammability of Non-metallic Materials, -Small Burner Test, horizontal-
AITM 2.0004	[17]	Flammability of Non-metallic Materials, -Small Burner Test, 45°-
AITM 2.0005	[18]	Flammability of Non-metallic Materials, -Small Burner Test, 60°-
AITM 2.0006	[19]	Determination of Heat Release and Heat Release Rate of Aircraft Materials
AITM 2.0007	[20]	Determination of the Specific Optical Smoke Density of Aircraft Interior Materials
AITM 2.0008	[21]	Determination of the Specific Optical Smoke Density of Wire/Cable Insulation
AITM 2.0009	[22]	Fire Resistance of Aircraft Seat Cushion Utilizing a High Intensity Open Flame

AITM 2.0010	[23]	Fire Resistance of Aircraft Cargo Compartment Lining Materials Utilizing a High Intensity Open Flame
AITM 3.0005	[24]	Determination of Specific Gas Components of Smoke Generated by non-metallic Aircraft Materials inside the pressurized section of fuselage
AITM 2.0038	[25]	Flammability of Heat Shrinkable Tubing's, -Small Burner Test, 60°-
AITM 2.0053	[26]	Determination of Flammability and Flame propagation of Thermal/ Acoustic Insulation Materials - Radiant Panel Test-
AITM 2.0056	[27]	Determination of Flame Penetration of Thermal/Acoustic Insulation Materials - Insulation Burn Through Test-

3.5 Airbus Procedural Documents

ABD0007	Equipment - General Technical Requirements
ABD0010	Equipment - Specification
ABD0025	Aircraft - Livery and External/Internal Markings
ABD0036	Numbering/Naming
ABD0039	Aircraft - Zoning/Access
ABD0046	Units of Measurement
ABD0100	Equipment - Design - General Requirements for Suppliers
ABD0200	Requirements and Guidelines for the System Designer
AP2080	Airbus Reference Language
ATS1000.001	Airbus Technical Specification "Fire - Smoke - Toxicity"

4 Responsibilities

4.1 Airbus Responsibilities

Materials & Processes of Cabin & Cargo Customisation is responsible for writing the ABD0031 and corresponding fire test methods specified in the Test Method Handbook. CoE-CCC is responsible for the approval of the ABD0031.

This ABD document used for a given aircraft project shall be recorded in the design engineering part of the applicable Quality Plan Specification with indication of corresponding means of compliance. It is the responsibility of Airbus to ensure application of this ABD by means of the corresponding Quality Plan.

The Design Engineering Departments of Airbus shall use this ABD document for the establishment of Technical Specifications by specifying the applicable fireworthiness-requirements and corresponding fire test methods.

The Design Engineering Departments of Airbus shall define the procurement procedure and requirements with reference to the applicable fireworthiness-requirements detailed in this document.

Airbus have to ensure by appropriate quality control means and testing that all parts comply with the fireworthiness requirements of relevant Technical Specification.

The responsible Chief Engineering Department may permit the use of a Seller Furnished Equipment (SFE)-interior component part, which complies with the applicable certification requirements but fails to meet the Airbus fireworthiness-requirements for a defined time, depending on the single conditions, only by way of exception.

In that particular case the supplier of the component part will be obliged to obtain complete compliance with requirements within a period of time defined by the responsible Chief Engineer.

4.2 Supplier's Responsibility

The supplier of a material or part affected by ABD0031 shall demonstrate in accordance with the procurement procedure defined by the Design Engineering Departments of Airbus that this material or part complies with the fireworthiness-requirements established within the relevant Technical Specification.

The use of customised equipment such as Buyer Furnished Equipment (BFE), which complies with the applicable certification requirements but fails to meet the Airbus fireworthiness-requirements, may be permitted, as long as national airworthiness requirements are not concerned. In this case, it is the responsibility and action of the supplier to inform the customer that there is a deviation to the ABD0031. The deviation shall be referenced in the respective test documentation and DDP for Airbus monitoring purposes only.

5 Abbreviations and Definitions

5.1 Abbreviations

AA	Airworthiness Authority
AC	Advisory Circular
ACJ	Advisory Circular - Joint "Acceptable Means of Compliance and Interpretations", → JAR 25, Section 2
A.E.C.M.A.	Association Européenne des Constructeurs de Matériel Aerospatiale
AITM	Airbus Industrie Test Method
BFE	Buyer Furnished Equipment
BoD	Bureau of Documentation
CEN	Comité Européen de Normalisation (European Committee for Standardization)
CoE	Center of Excellence
CS	Certification Specification
CSI	Certification Specification Instruction
DDP	Declaration of Design and Performance
EASA	European Aviation Safety Authority
ENNorme	European standard
JAA	Joint Airworthiness Authorities
JAR	Joint Airworthiness Requirements
FAA	Federal Aviation Administration
FAR	Federal Aviation Regulations
FST	Fire - Smoke - Toxicity
LDMCR	Lower Deck Mobile Crew Rest
LDF	Lower Deck Facilities
RF	Radio Frequencies
R - route	Audio/Video route
S - route	Sensitive route
SFE	Seller Furnished Equipment

5.2 Definitions

Certification requirement	A requirement established by an airworthiness authority for which compliance must be demonstrated in order to obtain certification approval for a part, component part or equipment
Component part	A fabricated finished part built up from one or more materials of the same or different type, e.g.: a partition, side wall, etc.
Design authority	Airbus or approved supplier who has design approval for parts subject to fireworthiness - requirements
Interior of the aircraft	Any area or compartment within the pressurized fuselage of the aircraft
Interior equipment	An equipment such as hoses, airducts, housings for electrical equipment, etc., used in the interior of an aircraft
Interior furnishing	The furnishment consists of component parts such as liners, class dividers, seats, walls, etc., used in the interior of an aircraft

6 Certification Requirements

The airworthiness standard JAR/FAR Part 25, applicable to "Transport Category Aeroplanes", contains performance requirements for the certification of aircraft. The fireworthiness requirements listed below, shall form a part of this document to extent indicated herein.

6.1 Flammability

6.1.1 JAR - 25, § 25.853 (a) and Appendix F, Part I, para. (a)(1)(i), Change 15

(i.e. conformance to the criteria of the 60-s-vertical Bunsen burner test).

Equivalent requirements are e.g.

- JAR-25, § 25.853 (a) and Appendix F, Part I, para. (a)(1)(i), Change 14
- JAR-25, § 25.853 (a) and Appendix F, Part I, Change 10 or 13
- FAR Part 25, § 25.853 (a) and Appendix F, Part I, para. (a)(1)(i), Amdt. 72 or 83 or 91
- FAR Part 25, § 25.853 (a) and Appendix F, Part I, Amdt. 32 or 66

Acceptance criteria:

- Burn length (average) shall not exceed 152 mm (6 inches).
- Flame time (average) shall not exceed 15 s.
- Flame time of drips (average) shall not exceed 3 s.

6.1.2 JAR - 25, § 25.853 (a) and Appendix F, Part I, para. (a)(1)(ii), Change 15

(i.e. conformance to the criteria of the 12-s-vertical Bunsen burner test).

Equivalent requirements are e.g.

- JAR-25, § 25.853 (a) and Appendix F, Part I, para. (a)(1)(ii), Change 14
- JAR-25, § 25.853 (b) and Appendix F, Part I, Change 10 or 13
- FAR Part 25, § 25.853 (a) and Appendix F, Part I, para. (a)(1)(ii), Amdt. 72 or 83 or 91
- FAR Part 25, § 2 5.853 (b) and Appendix F, Part I, Amdt. 32 or 66

Acceptance criteria:

- Burn length (average) shall not exceed 203 mm (8 inches).
- Flame time (average) shall not exceed 15 s.
- Flame time of drips (average) shall not exceed 5 s.

6.1.3 JAR - 25, § 25.853 (a) and Appendix F, Part I, para. (a)(1)(iv), Change 15

(i.e. conformance to the criteria of the 15-s-horizontal Bunsen burner test).

Equivalent requirements are e.g.

- JAR-25, § 25.853 (a) and Appendix F, Part I, para. (a)(1)(iv), Change 14
- JAR-25, § 25.853 (b-2) and Appendix F, Part I, Change 10 or 13
- FAR Part 25, § 25.853 (a) and Appendix F, Part I, para. (a)(1)(iv), Amdt. 72 or 83 or 91
- FAR Part 25, § 25.853 (b-2) and Appendix F, Part I, Amdt. 32 or 66

Acceptance criterion:

- Burn rate (average) shall not exceed 64 mm/min (2.5 inches per minute).

6.1.4 JAR - 25, § 25.853 (a) and Appendix F, Part I, para. (a)(1)(v), Change 15

(i.e. conformance to the criteria of the 15-s-horizontal Bunsen burner test).

Equivalent requirements are e.g.

- JAR-25, § 25.853 (a) and Appendix F, Part I, para. (a)(1)(v), Change 14
- JAR-25, § 25.853 (b-3) and Appendix F, Part I, Change 10 or 13
- FAR Part 25, § 25.853 (a) and Appendix F, Part I, para. (a)(1)(v), Amdt. 72 or 83 or 91
- FAR Part 25, § 25.853 (b-3) and Appendix F, Part I, Amdt. 32 or 66

Acceptance criterion:

- Burn rate (average) shall not exceed 102 mm/min (4 inches per minute).

6.1.5 JAR - 25, § 25.855 (d) and Appendix F, Part I, Change 15

(i.e. conformance to the criteria of the 30-s-45° Bunsen burner test).

Equivalent requirements are e.g.

- JAR-25, § 25.855 (a)(1)(ii) and Appendix F, Part I, Change 11 or 12
- FAR Part 25, § 25.855 (d) and Appendix F, Part I, Amdt. 72 or 83 or 91
- FAR Part 25, § 25.855 (a)(a-1)(2) and Appendix F, Part I, Amdt. 60

Acceptance criteria:

- The flame shall not penetrate (pass through) the material during application of the flame or subsequent to its removal.
- Flame time (average) shall not exceed 15 s.
- After glow time (average) shall not exceed 10 s.

6.1.6 JAR - 25, § 25.869 (a)(4) and Appendix F, Part I, Change 15

(i.e. conformance to the criteria of the 30-s-60° Bunsen burner test).

Equivalent requirements are e.g.

- JAR-25, § 25.1359 (d) and Appendix F, Part I, Change 14
- FAR Part 25, § 25.869 (a)(4) and Appendix F, Part I, Amdt. 72 or 83 or 91
- FAR Part 25, § 25.1359 (d) and Appendix F, Part I, Amdt. 32

Acceptance criteria:

- Burn length (average) shall not exceed 76 mm (3 inches).
- Flame time (average) shall not exceed 30 s.
- Flame time of drips (average) shall not exceed 3 s.

6.2 Heat Release

JAR- 25, § 25.853 (c) and Appendix F, Part IV, Change 15

Equivalent requirements are e.g.

- JAR-25, § 25.853 (a)(1) and Appendix F, Part IV, Change 13
- FAR Part 25, § 25.853 (c) and Appendix F, Part IV, Amdt. 72
- FAR Part 25, § 25.853 (d) and Appendix F, Part IV, Amdt. 83 or 91
- FAR Part 25, § 25.853 (a-1) and Appendix F, Part I, Amdt. 66

Acceptance criteria:

- The (average) total positive heat release (HR) over the first two minutes shall not exceed 65 kW min/m².
- The (average) maximum heat release rate (HRR) during the five minute test shall not exceed 65 kW/m².

6.3 Smoke Density

JAR - 25, § 25.853 (c) and Appendix F, Part V, Change 15

Equivalent requirements are e.g.

- JAR-25, § 25.853 (a)(1) and Appendix F, Part V, Change 13
- FAR Part 25, § 25.853 (c) and Appendix F, Part V, Amdt. 72
- FAR Part 25, § 25.853 (d) and Appendix F, Part V, Amdt. 83 or 91
- FAR Part 25, §25.853 (a-1) and Appendix F, Part I, Amdt. 66

Acceptance criterion:

- The (average) specific optical smoke density shall not exceed 200, tested under flaming mode conditions.

6.4 Flammability of Seat Cushions

JAR- 25, § 25.853 (b) and Appendix F, Part II, Change 15

(i.e. conformance to the criteria of the seat cushion oil burner test).

Equivalent requirements are e.g.

- JAR-25, § 25.853 (c) and Appendix F, Part II, Change 11
- FAR Part 25, § 25.853 (c) and Appendix F, Part II, Amdt. 72 or 83 or 91
- FAR Part 25, § 25.853 (c) and Appendix F, Part II, Amdt. 59

Acceptance criteria:

- For at least two-thirds of the total number of the specimen sets tested, the burn length shall not reach the side of the cushion opposite the burner.
- The burn length shall not exceed 432 mm (17 inches).
- The average percentage weight loss shall not exceed 10%.
- For at least two-thirds of the total number of the specimen sets tested the weight loss shall not exceed 10%.

6.5 Flame Penetration Resistance of Cargo Compartment Liners

JAR- 25, § 25.855 (c) and Appendix F, Part III, Change 15

(i.e. conformance to the criteria of the cargo compartment liner kerosene burner test).

Equivalent requirements are e.g.

- JAR-25, § 25.853 (a-1) and Appendix F, Part III, Change 12
- FAR Part 25, § 25.855 (c) and Appendix F, Part III, Amdt. 72 or 83 or 91
- FAR Part 25, § 25.855 (a-1) and Appendix F, Part III, Amdt. 60

Acceptance criteria:

- No flame penetration of any specimen within 5 minutes after application of the flame source.
- Maximum (peak) temperature measured 102 mm (4 inches) above the upper surface of the horizontal test sample shall not exceed 204°C (400°F).

6.6 Fire Containment of Waste Stowage Compartments

JAR - 25, § 25.853 (f), Change 15

Equivalent requirements are e.g.

- JAR-25, § 25.853 (e), Change 12 or 13
- FAR Part 25, § 25.853 (f), Amdt. 72
- FAR Part 25, § 25.853 (h), Amdt. 83

Acceptance criteria: See para 7.7.

6.7 Flammability and Flame Propagation of Thermal/Acoustic Insulation Materials

- FAR- 25, § 25.856 (a) and Appendix F, Part VI, Amdt. 110
  Effected date: 02 Sep 2005
  JAR - Up to the printing date of this ABD no JAR is available

Acceptance criteria:

- After flame time on any specimen tested shall not exceed 3 s
- Flame propagation less than 51 mm

6.8 Flame Penetration of Thermal/Acoustic Insulation Materials

- FAR- 25, § 25.856 (b) and Appendix F, Part VII, Amdt. 110
  Effected date: 03 Sep 2007
  JAR - Up to the printing date of this ABD no JAR is available

Acceptance criteria:

- No flame penetration of any specimen within 4 minutes after application of the flame source.
- Maximum peak heat release measured 300 mm behind the cold side of the insulation specimens shall not exceed 2,3 W/cm².

7 Fireworthiness Design Criteria

7.0 General
7.1 Flammability
7.2 Heat Release
7.3 Smoke Density
7.4 Toxicity
7.5 Flammability of Seat Cushions
7.6 Flame Penetration Resistance of Cargo Compartment Liners
7.7 Fire Containment of Waste Stowage Compartments
7.8 Flammability and Flame Propagation of Thermal/Acoustic Insulation Materials
7.9 Flame Penetration of Thermal/Acoustic Insulation

7.0 General

The fireworthiness design criteria include both the applicable certification requirements (chapter 6), and the additional Airbus FST - requirements.

In any case the relevant certification requirements are covered by the Airbus FST - requirements.

The fireworthiness requirements defined in 7.1, 7.2, 7.5 to 7.9 are identical with the corresponding certification requirements but with an extended application range.

Materials, interior-equipment and systems in hidden area shall also comply with the relevant flammability requirements of paragraph 7.1

Smoke density requirements for component parts and sub-assemblies defined in 7.3 are more severe compared with the smoke density certification requirements, due to the application range and the more stringent limits.

The smoke density of component parts or sub-assemblies defined in 7.3.2, the smoke density of insulation of electrical and non-electrical wire/cable, and the toxicity requirements of paragraph 7.4 shall be applied additionally to the certification requirements.

The paragraphs 7.8 and 7.9 are added in this issue. The certification requirements for the flame propagation shall be fulfilled for aircraft, manufactured after 01 Sep 2005, the certification requirements for the flame penetration shall be fulfilled for aircraft manufactured after 01 Sep 2007 and is addressed to the primary insulation of the lower half of the fuselage only.

7.1 Flammability

7.1.1 Resistance of Materials when Tested According to the 60 s Vertical Bunsen Burner Test

Component parts or sub-assemblies occupied by crew or passenger, as listed below, that are intended for use:

inside the pressurized section of the fuselage of Airbus commercial aircraft must comply with the requirements of JAR/FAR § 25.853 specified in paragraph 6.1 of this document.

Component parts used in compartments occupied by crew or passengers, e.g.

- Interior ceiling panels
- Interior wall panels
- Partitions
- Galley structures and panels
- Large cabinet walls
- Floor panels
- Dado panels
- Passenger service units
- Door linings incl. slide container
- Class dividers
- Door frame linings
- Light panels
- Linings for stowage compartments
- (other than under seat stowage compartments and compartments for stowing small items such as magazines and maps)

Non-metallic structural component parts inside the pressurized section of the fuselage, including all component parts and sub-assemblies of the airframe which form the pressurized portion of the fuselage[1], e.g.

- Floor beam struts
- Floor structure
- Pressure bulkheads
- Fuselage skin incl. stiffeners
- Fuselage frames
- Door structure

The applicable flammability test procedure specified in JAR/FAR Part 25, Appendix F - Part I, shall be performed as defined hereinafter.

Test method: AITM 2.0002 A

1 With the exception of the "Structural window panes" (see paragraph 7.1.3)

Test requirements:

- Compliance with "Guideline and Requirements for Manufacturing/Preparation of Fire Test Specimens, and Corresponding Quality Assurance Precautions" (APPENDIX B), and with the requirements of chapter 8 of this document.
- At least 4 specimens shall be provided for each test.
- A minimum of 3 specimens shall be tested.
- Thickness of specimens must be defined in the test plan by the responsible design authority with regard to the definitions in Part I [10, 11].
- For component parts that may have anisotropic flammability properties (i.e., different properties in different directions, such as machine and cross machine direction for extrusions, warp and weft for woven fabrics, etc.), the specimens shall be tested in both directions.

  In such cases at least 4 specimens of each different direction shall be provided for the tests.

  The values for each direction shall be averaged and reported separately.

Acceptance criteria[2]:

- Burn length (average) must not exceed 152 mm (6 inches).
- After flame time (average) must not exceed 15 s.
- After flame time of drips (average) must not exceed 3 s.

7.1.2 Resistance of Materials when Tested According to the 12 s Vertical Bunsen Burner Test

Component parts or sub-assemblies, as listed below, those are intended for use:

inside the pressurized section of the fuselage of Airbus commercial aircraft must comply with the requirements of JAR/FAR § 25.853 specified in paragraph 6.1.2 of this document.

- Floor Covering
- Textiles (incl. draperies and upholstery)
- Seat cushions
- Curtains
- Padding
- Leather
- Furnishings of trays and galleys
- Electrical conduit
- Thermal and acoustical insulation[3]
- Insulation covering[3]
- Insulation blankets[3]
- Air ducting
- Air ducting joints
- Joint and edge covering
- Transparencies[4]
- Molded and thermoformed parts
- Cargo floor panels and cargo liners
- Ducts (if paragraph 6.1.2 to be applied)
- Trim strips (decorative and chafing) that are constructed of materials not used for parts covered by para. 7.1.1

2 Equivalent to the certification requirement given in 6.1.1.
3 Not more relevant for aircraft manufactured after 02 Sep 2005
4 Without Acrylic window panes

The applicable flammability test procedure specified in JAR/FAR Part 25, Appendix F - Part I, shall be performed as defined hereinafter.

Test method: AITM 2.0002 B

Test requirements:

- Compliance with "Guideline and Requirements for Manufacturing/Preparation of Fire Test Specimens, and Corresponding Quality Assurance Precautions" (APPENDIX B), and with the requirements of chapter 8 of this document.
- At least 4 specimens shall be provided for each test.
- Thickness of specimens must be defined in the test plan by the responsible design authority with regard to the definitions in Part I [10, 11].
- A minimum of 3 specimens shall be tested.
- For component parts which may have anisotropic flammability properties (i.e., different properties in different directions, such as machine and crossmachine direction for extrusions, warp and weft for woven fabrics, etc.), the specimens shall be tested in both directions.

In such cases at least 4 specimens of each different direction shall be provided for the tests.

The values for each direction shall be averaged and reported separately.

Acceptance criteria[5]:

- Burn length (average) must not exceed 203 mm (8 inches).
- After flame time (average) must not exceed 15 s.
- After flame time of drips (average) must not exceed 5 s.

7.1.3 Resistance of Materials when Tested According to the 15 s Horizontal Bunsen Burner Test, Part A

Component parts or sub-assemblies, as listed below, that are intended for use inside the pressurized section of the fuselage of Airbus commercial aircraft must comply with the requirements of JAR/FAR § 25.853 specified in paragraph 6.1.3 of this document.

- Acrylic windows and signs
- Seat belts
- Shoulder harnesses
- Parts constructed in whole or in part of elastomeric materials
- Structural window panes
- Edge lighted instrument assemblies consisting of two or more instruments in a common housing
- Cargo and baggage tie down equipment, including containers,
- bins pallets, etc.

The applicable flammability test procedure specified in JAR/FAR Part 25, Appendix F - Part I, shall be performed as defined hereinafter.

Test method: AITM 2.0003

Test requirements:

5 Equivalent to the certification requirement given in 6.1.2

- Compliance with "Guideline and Requirements for Manufacturing/Preparation of Fire Test Specimens, and Corresponding Quality Assurance Precautions" (APPENDIX B), and with the requirements of chapter 8 of this document.
- At least 4 specimens shall be provided for each test.
- Thickness of specimens must be defined in the test plan by the responsible design authority with regard to the definitions in Part I [10, 11].
- A minimum of 3 specimens shall be tested.
- For component parts, which may have anisotropic flammability properties (i.e. different properties in different directions, such as machine and cross machine direction for extrusions, warp and weft for woven fabrics, etc.), the specimens shall be tested in both directions.

  In such cases at least 4 specimens of each different direction shall be provided for the tests.

  The values for each direction shall be averaged and reported separately.

Acceptance criterion[6]:

- Burn rate (average) must not exceed 64 mm/min (2,5 inches per minute).

7.1.4 Resistance of Materials when Tested According to the 15 s Horizontal Bunsen Burner Test, Part B

Materials and parts not specified in paragraph 7.1.1 to 7.1.3 must comply with the requirements of JAR/FAR § 25.853 specified in paragraph 6.1.4 of this document.

Excepted are:

Small parts (such as knobs, handles, rollers small electrical parts e.g.) that are intended for use inside the pressurized section of the fuselage of Airbus commercial aircraft, and that the responsible design authority, in accordance with the respective airworthiness authority, finds would not contribute significantly to the propagation of a fire.

The applicable flammability test procedure specified in JAR/FAR Part 25, Appendix F - Part I, shall be performed as defined hereinafter.

Test method: AITM 2.0003

Test requirements:

- Compliance with "Guideline and Requirements for Manufacturing/Preparation of Fire Test Specimens, and Corresponding Quality Assurance Precautions" (APPENDIX B), and with the requirements of chapter 8 of this document.
- At least 4 specimens shall be provided for each test.
- Thickness of specimens must be defined in the test plan by the responsible design authority with regard to the definitions in Part I [10, 11].
- A minimum of 3 specimens shall be tested.
- For component parts that may have anisotropic flammability properties (i.e., different properties in different directions, such as machine and crossmachine direction for extrusions, warp and weft for woven fabrics, etc.), the specimens shall be tested in both directions.

6 Equivalent to the certification requirement given in 6.1.3.

In such cases at least 4 specimens of each different direction shall be provided for the tests.

The values for each direction shall be averaged and reported separately.

Acceptance criterion[7]:

- Burn rate (average) must not exceed 102 mm/min (4 inches per minute).

7.1.5 Resistance of Materials when Tested According to the 30 s, 45° Bunsen Burner Test

Liners of class B or E cargo and baggage compartments and floor panels of class B, C, D or E cargo and baggage compartments of Airbus commercial aircraft must comply with the requirements of JAR/FAR § 25.855 specified in paragraph 6.1.5 of this document.

The applicable flammability test procedure specified in JAR/FAR Part 25, Appendix F - Part I, shall be performed as defined hereinafter.

Test method: AITM 2.0004

Test requirements:

- Compliance with "Guideline and Requirements for Manufacturing/Preparation of Fire Test Specimens, and Corresponding Quality Assurance Precautions" (APPENDIX B), and with the requirements of chapter 8 of this document.
- At least 4 specimens shall be provided for each test.
- Thickness of specimens must be defined in the test plan by the responsible design authority with regard to the definitions in Part I of [10, 11].
- A minimum of 3 specimens shall be tested.
- For component parts that may have anisotropic flammability properties (i.e. different properties in different directions, such as machine and crossmachine direction for extrusions, warp and weft for woven fabrics, etc.), the specimens shall be tested in both directions.

  In such cases at least 4 specimens of each different direction shall be provided for the tests.

  The values for each direction shall be averaged and reported separately.

Acceptance criteria[8]:

- The flame must not penetrate (pass through) the material during application of the flame or subsequent to its removal.
- After flame time (average) must not exceed 15 s.
- After glow time (average) must not exceed 10 s.

7.1.6 Resistance of Materials when Tested According to the 30 s, 60° Bunsen Burner Test

Electrical wire and cable and non-electrical cable installed in any pressurized area of the fuselage of Airbus commercial aircraft must comply with the requirements of JAR/FAR § 25.869 specified in paragraph 6.1.6 of this document.

7 Equivalent to the certification requirement given in 6.1.4
8 Equivalent to the certification requirement given in 6.1.5

The applicable flammability test procedure specified in JAR/FAR Part 25, Appendix F - Part I, shall be performed as defined hereinafter.

Test method: AITM 2.0005

Test requirements:

- Compliance with "Guideline and Requirements for Manufacturing/Preparation of Fire Test Specimens, and Corresponding Quality Assurance Precautions" (APPENDIX B), and with the requirements of chapter 8 of this document.
- At least 4 specimens shall be provided for each test.
- The wire and cable specimens must be of the same size as used in the aircraft [10, 11].
- A minimum of 3 specimens shall be tested.

Acceptance criteria[9]:

- Burn length (average) must not exceed 76 mm (3 inches).
- After flame time (average) must not exceed 30 s.
- After flame time of drips (average) must not exceed 3 s.

7.1.7 Flammability of Heat Shrinkable Tubing

Heat shrinkable tubing used in any area of the fuselage of Airbus commercial aircraft must fulfill the acceptance criteria when tested in accordance to AITM 2.0038.

Test method: AITM 2.0038

Test requirements:

- Compliance with "Guideline and Requirements for Manufacturing.
- Preparation of Fire Test Specimens, and Corresponding Quality Assurance Precautions" (APPENDIX B), and with the requirements of chapter 8 of this document.
- At least 4 specimens shall be provided for each test.
- The specimens must be of the same size as used in the aircraft.
- A minimum of 3 specimens shall be tested.

Acceptance criteria[10]:

- Burn length (average) must not exceed 76 mm (3 inches).
- After flame time (average) must not exceed 30 s.
- After flame time of drips (average) must not exceed 3 s.

7.2 Heat Release

Component parts or sub-assemblies, as listed below, that are intended for use inside the compartments of Airbus commercial aircraft occupied by crew or passengers must comply with the requirements of JAR/FAR § 25.853 specified in paragraph 6.2 of this document with exception of the interiors of compartments such as lavatories and cockpit areas if closed off by doors or equivalent.

9 Equivalent to the certification requirement given in 6.1.6

10 Equivalent to the certification requirement given in 6.1.6.

Large-area aircraft parts[11] in compartments occupied by crew or passengers, e.g.

- Ceiling panels
- Wall panels
- Partitions
- Galley
- Large cabinet walls
- Dado panels
- Door linings incl. slide container
- Passenger service units
- Class dividers
- Door frame linings
- Lavatories, outer surfaces of
- Stowage compartments

  (Other than underseat stowage compartments and compartments for stowing small items such as magazines and maps)

The heat release test procedure specified in JAR/FAR Part 25, Appendix F - Part IV, shall be performed as defined hereinafter.

Test method: AITM 2.0006

Test requirements:

- Compliance with "Guideline and Requirements for Manufacturing/Preparation of Fire Test Specimens, and Corresponding Quality Assurance Precautions" (APPENDIX B), and with the requirements of chapter 8 of this document.
- Thickness of specimens must be defined in the test plan by the responsible design authority with regard to the definitions in Part I [10, 11].
- At least 5 specimens shall be provided for each test.
- A minimum of 3 specimens shall be tested.
- For materials and component parts which have anisotropic fire properties e.g. textile covered component parts and thermoplastic component parts, two specimens shall be tested in the transverse orientation and two specimens shall be tested in the vertical orientation. The fifth one shall be tested in the direction that shows the highest values. The orientation with the highest values shall be averaged and reported.

Acceptance criteria[12]:

- The (average) total positive heat release (HR) over the first two minutes must not exceed 65 kW min/m².
- The (average) maximum heat release rate (HRR) during the five minutes test must not exceed 65 kW/m².

11 Or sub-assemblies used in large parts.
12 Equivalent to the certification requirement given in 6.2.

7.3 Smoke Density

Smoke density limits for all affected component parts are summarized in Table 1 (see page 27).

7.3.1 Specific Optical Smoke Density of Component Parts or Sub-Assemblies of the Aircraft Interior

Component parts or sub-assemblies, as listed below, that are intended for use inside the compartments of Airbus commercial aircraft occupied by crew or passenger must comply to the requirements of JAR/FAR § 25.853 specified in paragraph 6.3 of this document, and the Airbus acceptance criteria prescribed hereinafter. Airbus acceptance criteria prescribed in Table 1 ("Smoke Density Limits")[13].

Major Interior Panels [14] in compartments occupied by crew or passengers e.g.

- Ceiling panels
- Wall panels
- Partitions
- Galley
- Large cabinet walls
- Dado panels
- Door linings incl. slide container
- Door frame linings
- Passenger service units,
- Class dividers
- Lavatories, outer surfaces of
- Passenger floor panels
- Cargo floor panels and cargo linings
- Stowage compartments, outer surfaces of

  (Other than underseat stowage compartments and compartments for stowing small items such as magazines and maps)

Interiors of compartments which are closed off by doors (such as cockpit areas) are exempted from the requirement, if not otherwise specified in the relevant specification.

The smoke density test procedure specified in JAR/FAR Part 25, Appendix F - Part V, shall be performed as defined hereinafter.

Test method: AITM 2.0007 A (Flaming mode)

Test requirements:

- Compliance with "Guideline and Requirements for Manufacturing/Preparation of Fire Test Specimens, and Corresponding Quality Assurance Precautions" (APPENDIX B), and with the requirements of chapter 8 of this document.
- Thickness of specimens must be defined in the test plan by the responsible design authority with regard to the definitions in Part I [10, 11].
- At least 5 specimens shall be provided for each test.
- A minimum of 3 specimens shall be tested.

13 These component parts or sub-assemblies are the same, which are affected by the heat release requirements defined in para. 7.2.
14 Or sub-assemblies used in large parts.

– For component parts which may have anisotropic fire properties (i.e., different properties in different directions, such as machine and cross machine direction for extrusions, warp and weft for woven fabrics, etc.), the test procedure described in AITM 2.0007 shall be amended as follows: the second specimen shall be tested in the orientation that is perpendicular to the orientation used for the first specimen. All other specimens, at least two, shall be tested in the orientation that shows the highest values. Only the D_m - values for this orientation shall be averaged and reported.

Acceptance criterion:

– The maximum specific optical smoke density (average), D_m, must not exceed the applicable limits, listed in the Table 1 on page 27[15], within 4 minutes test duration under flaming conditions.

7.3.2 Specific Optical Smoke Density of Component Parts or Sub-Assemblies of the Aircraft Equipment, and of Non-Metallic Structural Parts

Component parts or sub-assemblies and Non-metallic structural parts, that are intended for use inside the pressurized section of the fuselage of Airbus commercial aircraft shall comply with the acceptance criteria prescribed here in after[16] under consideration of Table 1 ("Smoke Density Limits").

The following component parts or sub-assemblies shall be tested under both, flaming- and non-flaming conditions if not otherwise specified in Table 1.

– curtain
– seat cushion & mattress
– floor covering
– airducting with insulation
– insulation blankets/components
– insulation covering
– equipment parts
– elastomeric parts
– interiors of lavatories

Non-metallic structural component parts inside the pressurized section of the fuselage, e.g. as listed below, shall be tested under flaming-mode only:

– Floor beam struts[17]
– Floor structure
– Pressure bulkheads

Note: Areas and parts excepted from this requirement are:

– *cockpit areas,*
– *those affected by paragraph 7.3.1, 7.3.3, 7.3.4 and 7.3.5,*
– *small parts such as knops, handles, rollers, fasteners, clips, grommets, rub strips, pulleys and small electrical parts,*
– *component parts and sub-assemblies of the airframe which form the pressurized portion of the fuselage (stiffened skin, frames and door structure)[18].*

15 This acceptance criterion (D_m) is more severe and covers the certification requirement of para. 6.3.

16 Airbus reserves the right to cancel, in part or in whole, this limitation, e.g. prior to the introduction of a "non-metallic design, replacing it by corresponding individual programme directives.

17 With the exception of the "floor beam struts" designed before the effective date of issue B.

The smoke density test procedure shall be performed as defined here in after.

Test method: AITM 2.0007 B

Test requirements:

- Compliance with "Guideline and Requirements for Manufacturing/Preparation of Fire Test Specimens, and Corresponding Quality Assurance Precautions" (APPENDIX B), and with the requirements of chapter 8 of this document.
- At least 10 specimens should be provided for each test. 5 specimens for the flaming modus and 5 specimens for non flaming modus.
- The responsible design authority must define thickness of specimens.
- *Note: Unless otherwise defined by the responsible design authority foams with thickness greater than 13 mm shall be tested in 13 mm thickness.*
- A minimum of 3 specimens for each test mode (flaming and non-flaming condition) shall be tested.

- For component parts which may have anisotropic fire properties (i.e. different properties in different directions, such as machine and crossmachine direction for extrusions, warp and weft for woven fabrics, etc.), the test procedure described in AITM 2.0007 shall be amended as follows:
  - Start with the test under "flaming mode" condition.
  - The second specimen shall be tested in the orientation that is perpendicular to the orientation used for the first specimen. All other specimens, at least two, shall be tested in the orientation that shows the highest values. Only the D_m -values for this orientation shall be averaged and reported.

Acceptance criterion[19] :

- The maximum specific optical smoke density (average), D_m, measured in the specified condition shall not exceed the applicable limits, listed in the Table 1 on page 27, within 4 minutes test duration.

18 As far as the non-metallic structural parts are concerned, no "smoke requirements" had been received from the airworthiness authorities when this issue was published nor was there any evidence of an intention to introduce such requirements.

19 This acceptance criterion (D_m) are not covered by the certification requirement of para. 6.3.

Component parts *to be tested in acc. to paragraph 7.3.1*	D_m[20] (flaming)	D_m[20] (non-flaming)
Major Interior Panels • Ceiling and side wall panels • Dado panels • Door and door frame linings • Partitions • Overhead passenger service units • Cabin walls, e.g. outer surfaces of lavatories, stowage compartments (other than underseat stowage compartments and compartments stowing small items), galley	**150**	**Not required**
Component parts *to be tested in acc. to paragraph 7.3.2*	D_m[20] (flaming)	D_m[20] (non-flaming)
• Major panels (covered by other than decor-laminate or paint)	**200**	**Not required**
• Cargo linings	**100**	
• Cabin floor panels[21] • Cargo floor panels	**200**	
• Non-metallic structural parts	**200**	
• Transparencies, and thermoplastic parts	**200**	
• Seat cushion - & mattress	**200**	**200**
• Floor covering • Carpets	**250**	**150**
• Curtains	**200**	**200**
• Non-textile floor covering	**200**	**200**
Component parts *to be tested in acc. to paragraph 7.3.2*	D_m[22] (flaming)	D_m[22] (non-flaming)
• Thermal and acoustic insulation blankets/ components • Insulation Coverings • Airducting (without insulation)	**100**	**100**
• Airducting (with insulation)	**200**	**150**
• Equipment parts (incl. parts of seats, except wire/ cable) • Elastomeric parts (used within the passenger cabin and for air ducting)	**200**	**200**
• Other components		
• Wire/cable	See paragraph 7.3.3 to 7.3.5	

Table 1: Smoke Density Limits

20 D_m is the maximum specific optical smoke density (calculated by averaging the $D_{s\,max}$ - figures obtained from each test run).
21 Only applicable after Modification - No. 23643 (A320/A321) and Modification - No. 41792 (A330/A340). Applicability to new aircraft models which are given their "Type Certification" after the 31st Dec. '93 must be established by individual program directives.
22 D_m is the maximum specific optical smoke density (calculated by averaging the $D_{s\,max}$ - figures obtained from each test run).

7.3.3 Specific Optical Smoke Density of Electrical Wire/Cable

Electrical wire and electrical cable with the exception of electrical wire and cable for data transmission and RF-transmission lines (coaxial lines), installed as a single line or in harnesses in the pressurized section of the fuselage of Airbus commercial aircraft must comply with the Airbus acceptance criteria prescribed hereinafter.

The smoke density test procedure shall be performed as defined hereinafter.

Test method: AITM 2.0008 A/B

Test requirements:

- Compliance with "Guideline and Requirements for Manufacturing/Preparation of Fire Test Specimens, and Corresponding Quality Assurance Precautions" (APPENDIX B), and with the requirements of chapter 8 of this document.
- At least 8 specimens shall be provided for each test. 4 specimens for the flaming modus and 4 specimens for non flaming modus.
- Unless otherwise specified in the test plan the electrical wire and cable specimens must be the same size as used in the aircraft.
- A minimum of 3 specimens for each test mode (flaming and non-flaming condition) shall be tested.

Acceptance criterion:

- The specific optical smoke density (average), must not exceed $D_m = 20$ within 16 minutes test duration under both the flaming and non-flaming conditions

7.3.4 Specific Optical Smoke Density of Non-Electrical Cable Used for Optical Signal Transmission

Non-electrical cable used for optical signal installed in the pressurized section of the fuselage of Airbus commercial aircraft must comply with the Airbus acceptance criteria prescribed hereinafter.

The smoke density test procedure shall be performed as defined hereinafter.

Test method: AITM 2.0008 A/B

Test requirements:

- Compliance with "Guideline and Requirements for Manufacturing/Preparation of Fire Test Specimens, and Corresponding Quality Assurance Precautions" (APPENDIX B), and with the requirements of chapter 8 of this document.
- At least 8 specimens shall be provided for each test. 4 specimens for the flaming modus and 4 specimens for non flaming modus.
- Unless otherwise specified in the test plan the cable specimens must be the same size as used in the aeroplane.
- A minimum of 3 specimens for each test mode (flaming and non-flaming conditions) shall be tested.

Acceptance criterion:

- Non-electrical cable used for optical signal transmission installed as part of an electrical harness with power supplies > 15A shall be tested as an electrical wire/ cable acc. AITM 2.0008 A.

  The specific optical smoke density (average) must not exceed D_m = 20 within 16 minutes test duration under both the flaming and non-flaming conditions.

or

- Non-electrical cable used for optical signal transmission installed in routes without power supply ≤ 15 A shall be tested as an equipment part acc. AITM 2.0008 B.

  The specific optical smoke density (average) must not exceed D_m = 200 within 4 minutes test duration under both the flaming and non-flaming conditions.

7.3.5 Specific Optical Smoke Density of Electrical Wire and Cable Used Only for Data Transmission and RF Transmission Lines (Coaxial Lines)

Electrical wire and cable used for data transmission and RF transmission lines installed in the pressurized section of the fuselage of Airbus commercial aircraft must comply with the Airbus acceptance criteria prescribed hereinafter.

The smoke density test procedure shall be performed as defined hereinafter.

Test method: AITM 2.0008 A/B

Test requirements:

- Compliance with "Guideline and Requirements for Manufacturing/Preparation of Fire Test Specimens, and Corresponding Quality Assurance Precautions" (APPENDIX B), and with the requirements of chapter 8 of this document.
- At least 8 specimens shall be provided for each test. 4 specimens for the flaming modus and 4 specimens for non flaming modus.
- Unless otherwise specified in the test plan the wire and cable specimens must be the same size as used in the aeroplane.
- A minimum of 3 specimens for each test mode shall be tested.

Acceptance criterion:

- Electrical wire and cable used for data transmission - and RF transmission lines installed as part of an electrical harness with power supplies > 15A shall be tested as an electrical wire/cable acc. AITM 2.0008 A.

  The specific optical smoke density (average) must not exceed D_m = 20 within 16 minutes test duration under both the flaming and non-flaming conditions.

or

- Electrical wire and cable used for data transmission- and RF transmission lines installed in routes with low power supplies ≤ 15A (e.g. M- routes) shall be tested as an equipment part acc. AITM 2.0008 B.

  The specific optical smoke density (average) must not exceed D_m = 200 within 4 minutes test duration under both the flaming and non-flaming conditions.

	TEST METHOD	TEST TIME	D_M (FLAMING AND NON FLAMING)
Electrical wire and cable with the exception of electrical wire and cable for data transmission and RF-transmission lines installed as a single line or in harnesses	AITM 2.0008A	16 min	20
Non-electrical cable used for optical signal transmission installed in harnesses including power supply > 15 A	AITM 2.0008A	16 min	20
Non-electrical cable used for optical signal transmission installed as a single line or in harnesses without power supply ≤ 15 A	AITM 2.0008B	4 min	200
Electrical wire and cable used for data transmission and RF transmission lines installed in harnesses with a power supply >15 A	AITM 2.0008A	16 min	20
Electrical wire and cable used for data transmission and RF transmission lines installed as a single line or in harnesses with a power supply ≤ 15 A	AITM 2.0008B	4 min	200

Table 2: Smoke Density Limits for Electrical and Non Electrical Wire/Cable

7.4 Toxicity

Component parts, described in 7.3.1 and 7.3.2 and electrical component parts described in 7.3.3 to 7.3.5 or sub-assemblies and Non-metallic structural parts, that are intended for use inside the pressurized section of the fuselage of Airbus commercial aircraft, shall comply with the Airbus acceptance criteria prescribed hereinafter[23].

Major interior panels or sub-assemblies in compartments occupied by crew or passengers (as defined in paragraph 7.3.1) shall be tested under flaming condition only.

Component parts or sub-assemblies, others than those affected by paragraph 7.3.1, shall be tested, if not otherwise specified (see Table 1 and Table 2), under both, flaming and non-flaming conditions.

Non-metallic structural component parts inside the pressurized section of the fuselage, as listed below, shall be tested under flaming condition only:

- Floor beam struts[24]
- Floor structure
- Pressure bulkheads

Component parts and sub-assemblies of the airframe, which from the pressurized section of the fuselage (stiffened skin, frames and door structure) [25], are exempted from this test.

The toxicity test procedure shall be performed as defined hereinafter.

23 No "toxicity requirements" had been received from the airworthiness authorities when this issue was published nor was there any evidence of an intention to introduce such requirements.

24 With the exception of the "floor beam struts" designed before the effective date of issue B.

25 AIB reserves the right to cancel, in part or in whole, this limitation, e.g. prior to the introduction of a "Non-metallic design", replacing it by corresponding individual programme directives.

Test method: AITM 3.0005

Test requirements:

- Compliance with "Guideline and Requirements for Manufacturing/Preparation of Fire Test Specimens, and Corresponding Quality Assurance Precautions" (APPENDIX B), and with the requirements of chapter 8 of this document.
- This test shall be performed in combination (not simultaneously) with the "Smoke Density Test" in acc. to AITM 2.0007 or AITM 2.0008. It requires that the gas sampling procedure starts not before, but immediately after the 4 minutes respectively the 16 minutes smoke test run.
- A minimum of 2 specimens shall be tested if not otherwise specified for each test mode (flaming and non-flaming condition).

  If the observed concentration of a gas component exceeds 50% of the maximum permitted value (see limits below), for either specimens, a third specimen shall be tested.

  Methods used for the chemical analysis other than defined by AITM 3.0005, e.g. ion chromatography or gas chromatography, may be used alternatively. But in that case it must be demonstrated by comparison tests that equivalent results are obtained.

Acceptance criteria:

The average concentration (in parts per million, ppm) of following gas components of smoke must not exceed the limits, listed table below, within the relevant test duration under the required test conditions:

GAS COMPONENT	*LIMIT OF CONCENTRATION*
Hydrogen Fluoride	HF → 100 ppm
Hydrogen Chloride	HCl → 150 ppm
Hydrogen Cyanide	HCN → 150 ppm
Sulfur Dioxide	SO_2 → 100 ppm[26]
Nitrous Gases	NO/NO_2 → 100 ppm
Carbon Monoxide	CO → 1000 ppm

7.5 Flammability of Seat Cushions

In addition to meeting the requirements of paragraph 7.1.2, seat cushions, except those on flight crew member seats, of Airbus commercial aircraft, must comply with the requirements of JAR/FAR § 25.853 specified in paragraph 6.4 of this document.

These requirements are also relevant for seats and mattresses in Flight Crew Rest Compartments (FCRC) and mattresses used in compartments, such as Lower Deck Mobile Crew Rest (LDMCR) or Lower Deck Facilities (LDF).

The seat cushion test procedure specified in JAR/FAR Part 25, Appendix F - Part II, must be performed as defined hereinafter.

26 150 ppm for non-metallic structural parts

Test method: AITM 2.0009

Test requirements:

- Compliance with "Guideline and Requirements for Manufacturing/Preparation of Fire Test Specimens, and Corresponding Quality Assurance Precautions" (APPENDIX B), and with the requirements of chapter 8 of this document.
- 4 specimen shall be provided for each test.
- A minimum of 3 specimens shall be tested for seat bottom and seat back if not otherwise specified.
- The selection and preparation of the seat cushion test specimens must follow the instructions prescribed in Part II [10, 11].

Acceptance criteria[27]:

- For at least two-thirds of the total number of the specimens sets tested, the burn length must not reach the side of the cushion opposite the burner.
- The burn length must not exceed 432 mm (17 inches).
- The average percentage weight loss must not exceed 10%.
- For at least two-thirds of the total number of the specimens sets tested the weight loss must not exceed 10%.

7.6 Flame Penetration Resistance of Cargo Compartment Liners

Ceiling and sidewall liner panels of Class C and formally Class D cargo or baggage compartment, as defined in [5, 6], of Airbus commercial aircraft, must comply with the requirements of JAR/FAR § 25.855 specified in paragraph 6.5 of this document.

These requirements are also relevant for installations, such as LDMCR or LDF, which may be in place of cargo liners.

The cargo compartment liner test procedure specified in JAR/FAR Part 25, Appendix F - Part III, shall be performed as defined hereinafter.

Test method: AITM 2.0010

Test requirements:

- Compliance with "Guideline and Requirements for Manufacturing/Preparation of Fire Test Specimens, and Corresponding Quality Assurance Precautions" (APPENDIX B), and with the requirements of chapter 8 of this document.
- 4 specimens shall be provided for each test.
- A minimum of 3 specimens shall be tested if not otherwise specified.
- The selection and preparation of the cargo liner test specimens must follow the instructions prescribed in Part III [10, 11].

Acceptance criteria[28]:

- No flame penetration of any specimens within 5 minutes after application of the flame source.
- Maximum (peak) temperature measured 102 mm (4 inches) above the upper surface of the horizontal test sample must not exceed 204°C (400°F).

27 Equivalent to the certification requirements given in 6.4.
28 Equivalent to the certification requirements given in 6.5.

7.7 Fire Containment of Waste Stowage Compartments

In order to comply with the airworthiness requirements specified in paragraph 6.6 of this document, each disposal receptacle for towel, paper or waste, that are intended for use inside the compartments of Airbus commercial aircraft occupied by crew or passengers, must be fully enclosed and constructed of materials adequate in resistance to fire such that any fire likely to occur in it under normal use will be contained.

The ability of the disposal receptacle to contain those fires under all probable conditions of wear, misalignment, and ventilation expected in service must be demonstrated by test.

The galley, lavatory etc. supplier must submit a test plan for approval or an approved test plan prior to testing. Airbus and/or AA may carry out witnessing of the test.

7.8 Flammability and Flame Propagation of Thermal/Acoustic Insulation Materials

Thermal/acoustic insulation materials used inside the pressurized section of Airbus commercial aircraft, manufactured after 02 Sep. 2005 must comply with the requirements of FAR25 § 25.856(a) specified in paragraph 6.7 of this document.

Areas within the fuselage which are designated fire zones in acc. with FAR 25 § 25.1181 are not concerned.

The term "thermal/acoustic insulation materials" comprises materials with specified thermal/acoustic properties like foams and insulation material combination (e.g. insulation blankets.

Components parts or sub-assemblies made of thermal/acoustic insulation materials as well as components parts or sub-assemblies permanently attached thermal/acoustic insulation materials must also comply with FAR 25 § 25856(a).

Excepted parts are:

Small parts, such as single label, fastener, small foam standoffs, threads, ventilation hole reinforcement grommets, blanket inlays e.g. that are not themselves thermal/acoustic insulation or not integral to the insulation system.

The applicable flame propagation test procedure specified in FAR Part 25, § 25.856

Appendix F, Part VI, shall be performed as defined hereinafter.

Test method: AITM 2.0053

Test requirements:

- Compliance with "Guideline and Requirements for Manufacturing/Preparation of Fire Test Specimens, and Corresponding Quality Assurance Precautions" (APPENDIX B)
- and with the requirements of chapter 8 of this document.
- If not otherwise specified the selection and preparation of the specimens must follow the instructions prescribed in Part VI [11].
- Thickness of specimens must be defined in the test plan prepared by the responsible design authority.

- The test specimen construction must be comparable to the construction as shown in the corresponding Airbus drawings in consideration of Appendix A of the AITM 2.0053.
- At least 4 specimens shall be provided for each test set.
- A minimum of 3 specimens shall be tested.
- For test specimens which may have anisotropic flammability characteristics
- (e.g. different properties in different directions, such as machine and cross machine direction for extrusion) each direction shall be tested in a separate test set.
- If not otherwise specified the sample side that is in the installation condition next to a possible flame propagation source should be tested.

Acceptance criteria[29]:

- No flame propagation beyond the 51 mm cross line measured from the pilot flame application point to the left of the centre line.
- The flame time after removal of the pilot burner must not exceed 3 s on each specimen.

7.9 Flame Penetration of Thermal/Acoustic Insulation

The final rule FAR 25 § 25.856(b) addressed to all thermal/acoustic materials and its necessary retainers used as "primary insulation" in the lower half of the aircraft.

The term "primary insulation" comprises materials (e.g. foam) or material combinations (e.g. insulation blankets) with specified thermal/acoustic properties installed nearest to the aircraft skin.

All Airbus commercial aircraft manufactured after 02 Sep. 2007 must comply with the requirements of FAR 25, § 25.856 (b), specified in paragraph 6.8 of this document.

The assembly process of the specimen must imitate the original process but with the sample size specified in AITM 2.0056.

Additional design features which apply to the specimen surface, would not need to be included in the test sample if they do not affect the fire penetration resistance.

The applicable flame penetrating test procedure specified in FAR Part 25, § 25.856 Appendix F, Part VII, shall be performed as defined hereinafter.

Test method: AITM 2.0056

Test requirements:

- Compliance with "Guideline and Requirements for Manufacturing/Preparation of Fire Test Specimens, and Corresponding Quality Assurance Precautions "(APPENDIX B)
- and with the requirements of chapter 8 of this document.
- If not otherwise specified the selection and preparation of the specimens must follow the instructions prescribed in Part VII [11] .
- Thickness of specimens must be defined in the test plan prepared by the responsible design authority.

29 Equivalent to the certification requirements given in 6.7

- At least 4 specimen sets (each set consist of minimum 2 insulation blanket test specimen) must be provided for each test set.
- A minimum of 3 specimen sets shall be tested.
- The test side (the side the flame will be applied) of the insulation blanket test specimen will be defined as the side next to the fire barrier if not otherwise defined in the test plan.
- A surface propagation is not considered a burn through and would be acceptable, provided the heat flux level, measured behind the sample dose not exceeds 2,27 kW/cm² in the specified distance.

Acceptance criteria[30]:

- Each of the, in minimum two, insulation blanket test specimens must not allow fire or flame penetration in less than 4 minutes.
- Each of the, in minimum two, insulation blanket test specimens must not allow more than 2,27 kW/cm² on the cold side of the insulation specimen at a point 305 mm away from the stringer (hot surface) of the test rig.

30 Equivalent to the certification requirements given in 6.8

8 Fire Testing - Proceeding, Requirements and Procurement

8.1 General Requirements

8.1.1 Test Methods

The paragraphs 7.1 to 7.6, 7.8 and 7.9 of this document require fire tests in accordance to Airbus standards[31].

The fire tests methods defined by JAR/FAR, listed in APPENDIX A, may be used as approved equivalent methods to demonstrate compliance with the paragraphs 7.1, 7.2, 7.3.1, 7.5, 7.6, 7.8 and 7.9.

On request a responsible Airbus design office may assent to use an other comparable fire test method, e.g. standards by CEN or AECMA.

8.1.2 Test Specimen Selection

If a material, part or sub-assembly have to show compliance with more than one requirement according to chapter 7 of this document (e.g. Flammability + Heat Release + Smoke Density) the following is to be applied:

- The test specimens must be produced with the same production lot.

  Note: Details are given in APPENDIX B, "Guideline and Requirements for Manufacturing/Preparation of Fire Test Specimens, and Corresponding Quality Assurance Precautions".
- All applicable fire tests shall be performed by the same fire test laboratory, and within a period of time of 30 days.

8.1.3 Test Side of the Specimen

Unless otherwise specified in the test plan the test side of the specimen with exception of paragraph 7.8 and 7.9, shall be the surface facing into the cabin or cargo compartment of the component part or sub-assembly installed in the aeroplane.

8.1.4 Test Specimen Inscription

Every test sample shall be definitely marked. The surface not to be tested is to be marked with a removable label as following:

- Top of the specimen
- Reference number regarding to the test plan

8.1.5 Specimen Test Plan

Every test specimen is to be described in a specimen-test-plan unambiguously. The test-plan must contain the following information:

- Name of specimen manufacturer
- Date of specimen manufacture
- Specimen construction
- Identification or drawing number

31 For distribution of the relevant test standards see 4.2.

8.1.6 Specimen Size

The specimen dimension, specified in the table below, must be kept after sample preparation.

TEST METHODS	SAMPLE DIMENSION [MM]			MINIMUM NUMBER OF SPECIMEN	REMARK
	LENGTH	WIDTH	THICKNESS		
AITM 2.0002A/B	300 ± 1	75 ±1	-[32].	4	
AITM 2.0003A/B	300 ± 1	75 ± 1		4	
AITM 2.0004	220 ± 1	220 ± 1		4	
AITM 2.0005	765	∅		4	
AITM 2.0006	150 ± 2	150 ± 2	-[32] but less than 45	5	
AITM 2.0007A/B	73± 2	73 ± 2	-[32] but less than 45	10	-[33]
AITM 2.0008A/B	1600 3100	∅ > 3,3 ∅ ≤ 3,3	-[32]	8	
AITM 3.0005	75 ± 1	75 ± 1	-[32] but less than 45	10	-[33]
AITM 2.0009 Seat bottom Seat back	 508 ± 3 635 ± 3	 457 ± 3 457 ± 3	 102 ± 3 51 ± 3	 4 4	-[34]
AITM 2.0010	610 ± 3	406 ± 3	-[32].	4	
AITM2.0038					
AITM 2.0053	584 ± 3	320 ± 3 295 ± 3[35]	-[32]	4	
AITM 2.0056	914 ± 10	813 ± 10	-[32]	4 [36]	--

Table 3: Test specimen information

8.2 Fire Test Plan

The design authority shall show that a component part or sub-assembly complies with the applicable fireworthiness design criteria in chapter 7 of this document and is responsible for the preparation of a test plan and the selection of a suitable test laboratory which fulfils the requirements defined hereinafter, see paragraph 8.3.

Furthermore the design authority has to assure that the selection and definition of the test specimen comply with the applicable requirements in paragraph 7.1 to 7.6, and to the requirements related to the manufacturing/preparation of the test specimens, prescribed in APPENDIX B.

The Fire Test Plan shall contain at least:

- name and address of the design authority,
- name and address of the fire test laboratory,
- designation of the component part or sub-assembly to be tested,

32 Thickness as installed in the aircraft
33 Max thickness for foam materials ≤ 13 mm
34 Dimension exclusive of fabric closures and seam overlap
35 Sample size for inflexible materials
36 Specimen set

- purpose of the test (e.g. Certification or Qualification) including the name of the project, e.g. Airbus A320-200, a/c 444, version DLH1, etc.,
- identification or drawing number,
- detailed information about the specimens, like:
  - structure of material/part,
  - manufacturer of the test specimens,
  - manufacturing process → generic or production part

    (see APPENDIX B).
- Test side of the specimens.
- Fire test method and test criteria.

The completed test plan shall be to made available to the responsible design office of Airbus and sites for review and approval.

The approved test plan shall be invoked on the test order to the test laboratory and shall be used in the preparation of the test specimens.

8.3 Fire Test Laboratories

The test laboratory performing fire tests as required in chapter 7, except paragraphs 7.1.7, 7.3.2, 7.3.3, 7.3.4, 7.3.5, 7.4, 7.8 and 7.9 must be accepted by the National Airworthiness Authority.

Fire tests required by paragraphs 7.1.7, 7.3.2, 7.3.3, 7.3.4, 7.3.5, 7.4, 7.8, and 7.9 shall be performed by a test laboratory accepted by an Airbus design authority.

See APPENDIX C for a list with the name and address of some fire test laboratories which are used to perform fire tests on request by the design authority.

8.4 Test Documentation

The test laboratory is responsible for the preparation of a test report according to the requirements detailed in the test plan and to the applicable test standard.

Unless otherwise specified, the test report must be in English language.

The test report shall be made available to the purchaser. The test laboratory shall retain the original test report for at least five years if not otherwise specified.

The disclosure of the test report in part or full to other parties shall be subject to agreement by the purchaser.

APPENDIX A
Requirements and Test Methods

A-1 Airbus Fireworthiness Requirements, Certification Requirements and Corresponding Airbus Test Methods, a Summary

FIREWORTHINESS REQUIREMENTS BY AIRBUS	*CERTIFICATION REQUIREMENTS*		*AIRBUS TEST METHOD*
	JAR25	*FAR PART25*	
Flammability, 60 s vert. Bunsen burner (ABD0031 Paragraph 7.1.1)	§ 25.853 (a) Change 15 (ABD0031 Paragraph 6.1.1)	§ 25.853 (a) Amdt. 25-83	AITM 2.0002 A
Flammability, 12 s vert. Bunsen burner (ABD0031 Paragraph 7.1.2)	§ 25.853 (a) Change 15 (ABD0031 Paragraph 6.1.2)	§ 25.853 (a) Amdt. 25-83	AITM 2.0002 B
Flammability, horizontal Bunsen burner (ABD0031 Paragraph 7.1.3)	§ 25.853 (a) Change 15 (ABD0031 Paragraph 6.1.3)	§ 25.853 (a) Amdt. 25-83	AITM 2.0003
Flammability, horizontal Bunsen burner (ABD0031 Paragraph 7.1.4)	§ 25.853 (a) Change 15 (ABD0031 Paragraph 6.1.4)	§ 25.853 (a) Amdt. 25-83	
Flammability, 45° Bunsen burner (ABD0031 Paragraph 7.1.5)	§ 25.855 (d) Change 15 (ABD0031 Paragraph 6.1.5)	§ 25.855 (d) Amdt. 25-83	AITM 2.0004
Flammability, 60° Bunsen burner (ABD0031 Paragraph 7.1.6)	§ 25.869 (a) (4) Change 15 (ABD0031 Paragraph 6.1.6)	§ 25.869 (a) (4) Amdt. 25-72	AITM 2.0005
Flammability of heat shrinkable tubings (ABD0031 Paragraph 7.1.7)	- (ABD0031 Paragraph 6.1.6)	-	AITM 2.0038
Heat Release and Heat Release Rate (ABD0031 Paragraph 7.2)	§ 25.853 (c) Change 15 (ABD0031 Paragraph 6.2)	§ 25.853 (d) Amdt. 25-83	AITM 2.0006
Smoke Density/Interior and Equipment parts (ABD0031 Paragraph 7.3.1, 7.3.2)	§ 25.853 (c) Change 15 (ABD0031 Paragraph 6.3)	§ 25.853 (d) Amdt. 25-83	AITM 2.0007
Smoke Density/Electrical Wire/cable Insulation (ABD0031 Paragraph 7.3.3 to 7.3.4)	No Certification Requirement		AITM 2.0008
Toxicity/Interior and Equipment parts Electrical Wire/cable Insulation (ABD0031 Paragraph 7.4)			AITM 3.0005
Flammability of Seat Cushions (ABD0031 Paragraph 7.5)	§ 25.853 (b) Change 15 (ABD0031 Paragraph 6.4)	§ 25.853(c) Amdt. 25-83	AITM 2.0009
Flame Penetration of Cargo Liners (ABD0031 Paragraph 7.6)	§ 25.855 (c) Change 15 (ABD0031 Paragraph 6.5)	§ 25.855 (c) Amdt. 25-91	AITM 2.0010
Fire Containment of Waste Stowage Compartments (ABD0031 Paragraph 7.7)	§ 25.853 (f) Change 15 (ABD0031 Paragraph 6.6)	§ 25.853 (h) Amdt. 25-83	Not applicable

FIREWORTHINESS REQUIREMENTS BY AIRBUS	CERTIFICATION REQUIREMENTS		AIRBUS TEST METHOD
	JAR25	FAR PART25	
Flame propagation for thermal/acoustic insulation ABD0031 Paragraph 7.8	--	§ 25.856 (a) Amdt. 25-110 (ABD0031 Paragraph 6.7)	AITM 2.0053
Flame penetration for thermal/acoustic insulation ABD0031 Paragraph 7.9	--	§ 25.856 (b) Amdt. 25-110 (ABD0031 Paragraph 6.8)	AITM 2.0056

A-2 Fire Test Methods: AITM's ↔ JAR/FAR, Part 25, Appendix F

AIRBUS TEST METHOD[1]		TEST METHOD IN ACCORDANCE WITH APPENDIX F OF	
		JAR 25, CHANGE 16	FAR 25, AMDT. 25-111
AITM 2.0002 A	Flammability, 60s, vert. Bunsen burner test	Part I para. (b), (1), (2), (3), (4)	Part I para. (b), (1), (2), (3), (4)
AITM 2.0002 B	Flammability, 12s, vert. Bunsen burner test	Part I para. (b), (1), (2), (3), (4)	Part I para. (b), (1), (2), (3), (4)
AITM 2.0003	Flammability, Horizontal Bunsen burner test	Part I para. (b), (1), (2), (3), (5)	Part I para. (b), (1), (2), (3), (5)
AITM 2.0004	Flammability, 45° Bunsen burner test	Part I para. (b), (1), (2), (3), (6)	Part I para. (b), (1), (2), (3), (6)
AITM 2.0005	Flammability, 60° Bunsen burner test	Part I para. (b), (1), (2), (3), (7)	Part I para. (b), (1), (2), (3), (7)
AITM 2.0038	Flammability of Heat shrinkable tubings	Not applicable	
AITM 2.0006	Heat Release	Part IV	
AITM 2.0007 A	Smoke Density, Interior parts	Part V	
AITM 2.0007 B		Not applicable	
AITM 2.0008 A AITM 2.0008 B	Smoke Density, Electrical Wire/cable Insulation		
AITM 3.0005	Toxicity		
AITM 2.0009	Seat Cushion (... fire resistance test)	Part II	
AITM 2.0010	Cargo Liner (... fire resistance test)	Part III	
AITM 2.0053	Flame propagation	Part VI	
AITM 2.0056	Flame penetration	Part VII	

[1] For distribution of AITMs see 4.2.

APPENDIX B
Guideline and Requirements for Manufacturing/Preparation of Fire Test Specimens, and Corresponding Quality Assurance Precautions

If not otherwise specified in the test plan the test specimens shall be manufactured (prepared) with regard to the following requirements.

B-1 Specimen Selection

According to the test plan the specimens shall be taken from the fabricated part as installed in the aircraft, or manufactured as a generic panel representing a production part, or a certain area of a production part.

When it is not possible to remove test specimens from component a generic panels may be used. This panel shall be flat and shall represent the production panel in all respects of material, configuration and processes.

B-2 Quality Assurance

The test specimens shall be manufactured in accordance with the requirements specified in this document.

The quality assurance authority of the test specimen manufacturer shall certify that the test specimens comply in all respects with the requirements of this document, see paragraph 8.2.

APPENDIX C
List of Fire Test Laboratories

C-1 Fire Test Laboratories of Airbus Members

Airbus Deutschland GmbH

Airbus Deutschland GmbH
Materials & Processes, ECTB,
Material & Fire Test, ECTB 3
Hünefeldstr. 1-5
D 28199 Bremen, Germany
Tel.: (49) 421.538 2484/4860
Fax.: (49) 421.538 4852

C-2 Fire Test Laboratories of European Institutes

Centre d'Essais
Aeronautique de
Toulouse

C E A T
Division Matériaux et Structures
Aménagements Intérieurs
23 Avenue Henri Guillaumet
F 31056 Toulouse Cedex, France
Tel.: (33) 05.61.58.74.10
Fax.: (33) 05.61.58.74.78

Deutsche
Forschungsanstalt
für Luft- und
Raumfahrt e.V.

D L R
Institut für Antriebstechnik
Linder Höhe
D 51147 Köln, Germany
Tel.: (49) 2203.601.3236
Fax.: (49) 2203.601.2353

C-3 Other Test Laboratories

There are a large number of laboratories in and outside of Europe, which offer fire test service. Not all of them comply with the acceptance requirements set by the competent airworthiness authority. It is recommended to ask the airworthiness office[1] for information about accepted test laboratories.

1 The names and addresses of the JAA members are listed in paragraph D-2 of Appendix D.

APPENDIX D
Advisory Material

D-1 Distribution of Airbus Test Methods (AITM)

Airbus Internal

AIB-BOD will supply AIB Partners with a Handbook copy in accordance with contractual agreement with Airbus

Airbus External

External manufacturers or suppliers will receive the necessary Test Methods forwarded as a part of the contract issued by the purchasing department concerned.

D-2 Addresses of JAA members

Austria [BAZ]	Bundesamt für Zivilluftfahrt Schnirchgasse 11 A 1030 Vienna Tel.: (43) 1.797.98.000	Belgium [AA]	Administration de l'Aéronautique Centre Communication Nord Rue du Progrès 80 B-1210 Brussels Tel.: (32) 2.21.21.211
Cyprus	Department of Civil Aviation Ministry of Communications & Works Nicosia		
Denmark [DCA]	Civil Aviation Administration Department of Aviation Inspection P.O. Box 744 DK-2450 Copenhagen SV Tel.: (45) 36.44.48.48	Finland [NBA]	Civil Aviation Administration Box 50 SF-01531 Helsinki-Vantaa Tel.: (358) 0.82.771
France [DGAC]	Direction Générale de l'Aviation Civile 246 Rue Lecourbe F 75732 Paris Cedex 15 Tel.: (33) 1.40.43.43.21	Germany [LBA]	Luftfahrt Bundesamt Postfach 30 54 D 38020 Braunschweig Tel.: (49) 531.23.55.0

Greece [CAA]	Flight Standards Division Aeropolit P.O. Box 73751 GR 166 04 Helliniko	Iceland [CAAd]	Civil Aviation Administration Flight Safety Department P.O. Box 350 Reykjavik Airport 121 Reykjavik Tel.: (351) 1.69.41.00
Ireland [DOTT]	Department of Tourism & Transport Scotch House Hawkins Street Dublin 2 Tel.: (353) 1.71.86.55	Italy [RAI]	Registro Aeronautico Italiano Via del Tritone 169 Rome Tel.: (39) 6.67.58.41
Luxembourg [MOT]	Ministry of Transport 19-21 Boulevard Royal 2910 Luxembourg	Malta	Department of Civil Aviation Luqa Airport
Monaco	Service de l'Aviation Civile Héliport de Monaco Fontvieille MC 98000 Principauté de Monaco	Nether-lands [RLD]	Rijksluchtvaartdienst Directie Luchtvaartinspectie P.O. Box 575 NL 2130 AN Hoofddorp Tel.: (31) 25.03.63.131
Norway [CAAd]	Civil Aviation Administration Aeronautical Inspection Dept. P.O. Box 18 N-1330 Oslo Lufthavn Tel.: (47) 2.942.000	Portugal	Direccao-Geral de Aviacao Civil Rua B - Edificio No 6 Aeroporto de Lisboa 1700 Lisboa Tel.: (351) 1.88.81.51
Poland	General Inspectorate of Civil Aviation ul. Grójecka 17 02-01 Warszawa	Slovenia	Ministry of Transport and Communication Civil Aviation Authority Kotnikova 19a 61000 Ljubljana

Spain [DGAC]	Ministerio de Obras Publicas y Transportes Subdireccion General de Control del Transporte Aereo Pze. San Juan de la Cruz s/n 28071 Madrid Tel.: (34) 1.535.1375	Sweden [LFV]	Luftfahrtsverket Flight Safety Department S-601 79 Norrkoping Tel.: (46) 11.19.20.00
Switzerland [FOCA]	Federal Office for Civil Aviation Bundeshaus Inselgasse CH-3003 Berne Tel.: (41) 31.61.41.11	United Kingdom [CAA]	Civil Aviation Authority Safety Regulation Group Aviation House Gatwick Airport RH6 OYR Tel.: (44) 293.56.71.71

Table of approval

	NAME	*FUNCTION*
AUTHORING		
APPROVAL	H.P. Busch	Material and Process Cabin
	I. Weichert	Cabin Arrangement/Cabin Safety
	R. Cordes	Electrical/Optical Components
	J. Feldhaus	Certification Manager
	B. Lazorthes	Material and Process Structure
	T. Klems	Cabin Architecture Advanced Concepts
	C. Cuy-Y-Mola	CoC Systems
	L. Paris	Structure Design Harmonization
	F. Lefebvre	HO Quality Special Programs
	X. Champion	A330/340 Chief Engineer
	R. Lafontan	A380 Chief Engineer
	H. Dilmaghani	A318/319/320/321 Chief Engineer
	C. Favre	A300/310 Chief Engineer
	A. Cassier	A400M Chief Engineer

Record of Revisions

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		PAGE	*PARA*	
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E	Feb 2003			Editorial corrections.

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		PAGE	*PARA*	
F	May 2005			Paragraphs 7.8, 7.9: introduced. Paragraph Approval, Completion the Approval. Editorial corrections.

If you have a query concerning the implementation or updating of this document, please contact the Owner on page 1

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