



AEROSPACE STANDARD

AS6960™

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Performance Standard for Seat Furnishings in Transport Aircraft

RATIONALE

Seat furnishings are installed on Transport Category aircraft. This Aerospace Standard provides design, qualification, and performance requirements with associated pass/fail criteria for seat furniture installation in Part 25 aircraft.

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1. SCOPE

1.1 General

Seat furnishings are installed around seats and are intended to enhance passenger privacy and comfort. They may have provisions for additional occupants to be seated when the aircraft is in-flight, but would not be occupied during taxi, take-off, and landing (TTL).

This Aerospace Standard (AS) establishes the minimum design, performance and qualification requirements for seat furnishings with and without upper attachments (see Figures 1 and 2) to be installed in large transport category airplanes. This standard excludes seat furnishing designs that are directly attached to the seat assembly, for which AS8049 is the applicable standard.

Integrated items (desk tops, cabinets, shelves, stowage areas, closeouts, dividers, etc.) connected to seat furnishings shall comply with the requirements of this AS as part of the seat furnishings.

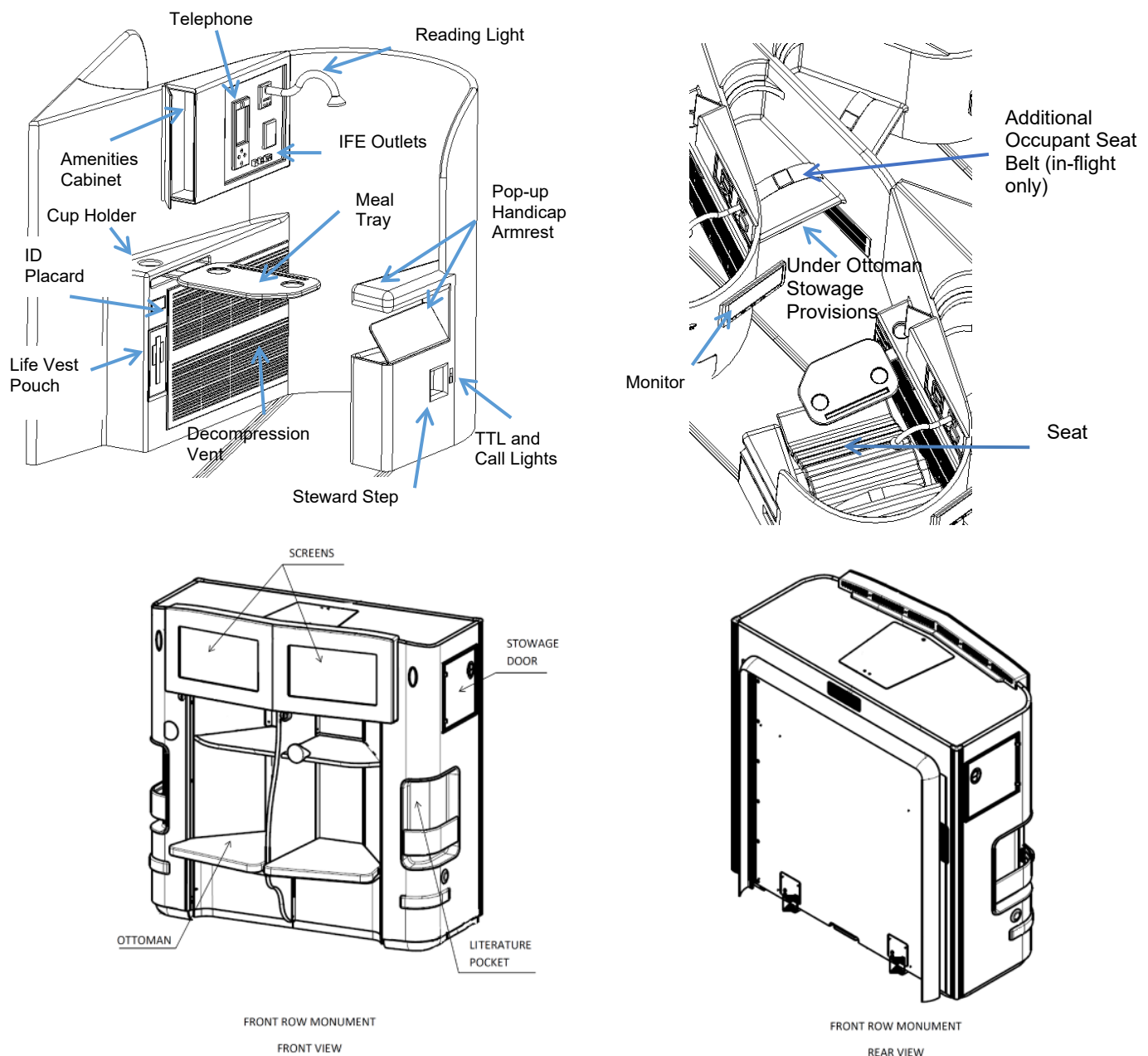


Figure 1 - Typical seat furnishing



1.1.1 Seat Furnishing Groups

Seat furnishings, much like passenger seat assemblies, are designed for installation into specific aircraft types with configurations equipped with different furnishing styles and passenger amenities.

Also, in the same manner as seat assemblies, seat furnishings can be categorized into “groups” similar to seat families. The seat furnishing groups should be developed with the philosophy that the primary load path is equivalent and consists of equivalent structural components in the load path. Seat furnishing grouped together must have the same number of upper and lower attachments, and those attachments must be structurally equivalent (see 5.1.1 for further details).

The seat furnishing attachments may vary in location based on aircraft manufacturer's design. However, for this document, seat furnishing groups are identified by the design philosophy of their load carrying structure rather than only their attachment types and locations.

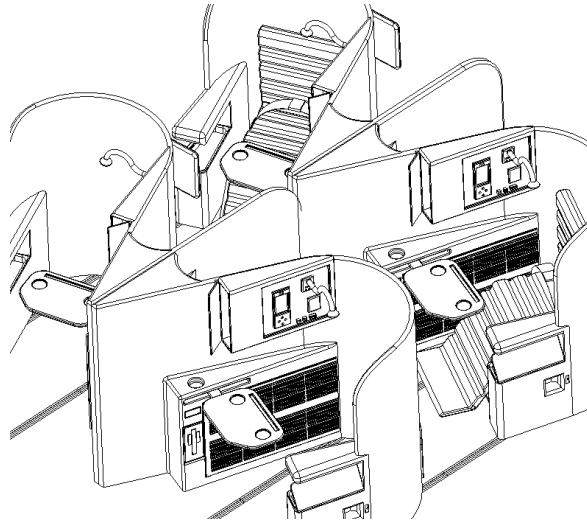


Figure 2 - Typical seat furnishing installations

1.2 Applicability

This document addresses certain performance criteria for seat furnishings to be used in transport aircraft (14 CFR Part 25). A seat furnishing may contain electrical features, however, the electrical qualification aspects of these features are currently beyond the scope of this document.

1.3 Units

In this document, U.S. customary units (inch-pound) and International System of Units (SI) are provided. In all cases, the inch-pound units take precedence and the SI (metric) units provided are approximate and conservative conversions. Those who routinely use SI units in practice may make the conversions more precise.

2. REFERENCES

2.1 Applicable Documents

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

2.1.1 SAE Publications

Available from SAE International, 400 Commonwealth Drive, Warrendale, PA 15096-0001, Tel: 877-606-7323 (inside USA and Canada) or +1 724-776-4970 (outside USA), www.sae.org.

ARP5526 Aircraft Seat Design Guidance and Clarifications

AS8049 Performance Standard for Seats in Civil Rotorcraft, Transport Aircraft, and General Aviation Aircraft

2.1.2 Code of Federal Regulations (CFR) and Other FAA Publications

Available from the United States Government Printing Office, 732 North Capitol Street, NW, Washington, DC 20401, Tel: 202-512-1800, www.gpo.gov.

Code of Federal Regulations (14 CFR) part 25, Airworthiness Standards: Transport Category Airplanes

Code of Federal Regulations (14 CFR) part 25, Appendix F, part I (a): Material test criteria

AC20-107 Composite Aircraft Structure

FAA Policy Statement PS-ANM-25.853-01-R2, Flammability Testing of Interior Materials

2.1.3 EASA Publications

Available from European Aviation Safety Agency, Konrad-Adenauer-Ufer 3, D-50668 Cologne, Germany (for visitors and for mail over 1 kg) and Postfach 10 12 53, D-50452 Cologne, Germany (for mail 1 kg or less); Tel: +49 221 8999 000, www.easa.europa.eu.

AMC 25.603(a) Acceptable Means of Compliance: Large Glass Items

AMC 25.788(b) Large Display Panels

2.1.4 ASME Publications

Available from ASME, P.O. Box 2900, 22 Law Drive, Fairfield, NJ 07007-2900, Tel: 800-843-2763 (U.S./Canada), 001-800-843-2763 (Mexico), 973-882-1170 (outside North America), www.asme.org.

ASME V&V 10-2019 Guide for Verification and Validation in Computational Solid Mechanics

2.1.5 ARINC Publications

Available from ARINC, 2551 Riva Road, Annapolis, MD 21401-7435, Tel: 410-266-4000, www.arinc.com.

ARINC Specification 628 Cabin Equipment Interfaces (CEI), Part 5: Cabin Electrical Equipment and Wiring Installation Guidelines

2.2 Definitions

COMPOSITE: Materials made from two or more constituent materials with significantly different physical or chemical properties, that when combined, produce a material with characteristics different from the individual components.

CONFIGURATION: Relative arrangement of parts. The figure, contour, and pattern produced by a spatial arrangement of parts, assemblies, or structures.

INTENDED FUNCTION: The activity that an item of equipment is designed to normally execute or provide.

INTERFACE: The fit and functional relationships of the seat furnishing with the seat or with other structure (e.g., side walls, overhead bins, partitions, lavatories, and galleys).

JOINT: The line of meeting of two or more pieces or parts of equipment.

NORMAL PASSENGER MOVEMENT: Normal passenger movement is the act of the seated occupant getting up out of the seat and moving to egress the airplane (i.e., unbuckling their restraint, standing, turning towards the aisle and moving into the aisle). It does not include additional movements to lift or stow items, or latching an item in place.

PERMANENT DEFORMATION AND DEFLECTION: Measurement of a fixed point collected on an article while load is applied is defined as deflection whereas permanent deformation is measured after all load is removed.

PRIMARY LOAD PATH: Primary load path in the context of seat furnishings are defined as structure(s) which in isolation (stand-alone ottoman) or in combination with multiple structures support the load transfer from the point of load application to the attachment points to the aircraft. Determination of such load path(s) should be based on engineering judgment or supported by rational analysis.

PRIVACY DOOR: Moveable partition(s) typically installed along an aisle that creates privacy for occupant(s) within a seat furnishing assembly. This excludes flexible curtains. The term “stowed (open)” in this document is used to indicate the door(s) in the TTL position where access through the passage is unobstructed, the term “deployed (closed)” is used to indicate that the door is deployed to provide privacy to a passenger occupying the seat enclosed inside a seat furnishing.

RAPID DECOMPRESSION: Rapid decompression is the sudden release of pressure from the aircraft fuselage. Rapid decompression will exert forces on seat furnishings in the same way wind fills a sail. This load case may be design critical for seat furnishings, particularly high wall structures.

SMOOTH SURFACES: Free of pits, pinholes, cracks, crevices, inclusions, rough edges, and other surface imperfections detectable by visual and tactile inspection.

USE OF SHOULD, SHALL, MAY, AND MUST: Requirements for which no deviation can be accepted are denoted by the use of “shall” in this document. Non-mandatory recommendations are denoted by the use of “should” or “may” in this document. Requirements stated as “must” are mandatory; requirements stated as “must not” are prohibited.

2.3 Acronyms

AC	Advisory Circular
AMC	Acceptable Means of Compliance
ARP	Aerospace Recommended Practice (SAE)
ARINC	Aeronautical Radio Inc.
AS	Aerospace Standard (SAE)
ASME	American Society of Mechanical Engineers
BBA	Building Block Approach as Described in AC20-107
CEI	Cabin Equipment Interfaces
CFR	Code of Federal Regulations
CS	Certification Specification (American CFR Equivalent)
EASA	European Union Aviation Safety Agency
EPF	Emergency Passage Feature
FAA	Federal Aviation Administration
OHCR/OHCRC	Overhead Crew Rest Compartment

OEM Original Equipment Manufacturer

TTL Taxi, Takeoff, and Landing

3. GENERAL DESIGN

3.1 Guidance

The purpose of this section is to provide general design guidance for seat furnishings in order to develop designs that may satisfy the applicable airworthiness and installation requirements.

For certain performance criteria (examples: life vest retrieval, egress, etc.), the seat furnishing unit should be considered as a total system in association with the passenger seat. Any substitution of these elements should be made only on the basis of additional tests or analysis.

3.1.1 General Construction

Suitable materials should be selected to prevent corrosion within components of the seat furnishing as well as at the interface with the aircraft structure. Mechanical/electrical isolation to prevent galvanic corrosion is an acceptable strategy.

The use of pure static friction between two or more flat or curved surfaces in direct contact as the sole means to restrain items of mass is not acceptable. Items restrained by mechanical fasteners, such as screws, bolts, nuts, hook and loop fasteners, tape, hooks, springs, clamps, detents, rivets, etc., are not considered friction restrained items.

Each part of the structure should be protected against deterioration or loss of strength in service due to any cause and have provisions for ventilation and drainage where necessary for corrosion prevention.

Major structural joints should not primarily rely on potting compound bond strength for load transfer or have threads in bearing.

3.1.2 Large Glass Items in the Cabin

In addition to the loads listed in Table 4 as part of the seat furnishing assembly, installation of large glass items in the seat furnishing, whether as a decorative divide or as part of a large component (door, video monitors, cathode-ray tubes, etc.), may be evaluated in accordance to RTCA DO-313, EASA AMC 25.603(a), and EASA AMC 25.788(b) (large display panels only).

3.1.3 Abuse Loads

Abuse loads are considered "ultimate" loads. See 4.1.3 for special factors when applicable (e.g., casting factor).

The integrity of seat furnishings and features (doors, handles, tables, bassinet fittings, etc.) to which cabin occupants may impart abuse loads to due to their location or configuration, should be designed such to avoid injury to the crew or passengers; and detrimental effect on evacuation. In the event that a secondary structure breaks or deforms, no projections, protrusions, or sharp edges may exist and should not impede egress.

Seat furnishings features should be designed to meet the abuse loads shown in Table 1. Use Figure 3 in conjunction with Table 1 for selection of load conditions.

Table 1 - Abuse loads

Feature [1]	Load Condition	Up to 60 Inches (Up to 150 cm) Above Floor	At 80 Inches (200 cm) Above Floor [Linear Reduction Between 60 Inches (150 cm) and 80 Inches (200 cm)]	Concentrated Load Application Area
Abuse from falling over on sidewall	Pushing	300 pounds (1335 N)	100 pounds (445 N)	4 inches x 4 inches (10 cm x 10 cm)
Pulling on sidewall/ handle/monitor, etc.	Horizontal pull one hand	150 pounds (667 N)	50 pounds (222 N)	4 inches x 4 inches (10 cm x 10 cm)
Pulling on sidewall/ handle/monitor, etc.	Horizontal pull two hands	300 pounds (1335 N)	100 pounds (445 N)	4 inches x 4 inches (10 cm x 10 cm)
Movable table in the deployed position (stowed for TTL)	Down	150 pounds (667 N)	N/A	Evenly distributed
Armrest (not adjacent to an aisle)	Down	150 pounds (667 N)	N/A	4 inches x 4 inches (10 cm x 10 cm) applied 3 inches (7.6 cm) from the forward end of the armrests
Armrest (adjacent to an aisle)	Down	200 pounds (890 N)	N/A	4 inches x 4 inches (10 cm x 10 cm) applied 3 inches (7.6 cm) from the forward end of the armrests
Movable monitor in the deployed position (stowed for TTL)	Horizontal /Down	200 pounds (890 N)	50 pounds (222 N)	4 inches x 4 inches (10 cm x 10 cm)
Feature above 38 inches (100 cm)	Down	200 pounds (890 N)	100 pounds (445 N)	4 inches x 4 inches (10 cm x 10 cm)
Any seating or stepping surface up to 38 inches (100 cm) (option 3 of 3.6.5)	Seating or stepping	300 pounds (1335 N)	N/A - up to 38 inches (100 cm)	Seat: 12 inches x 12 inches (30 cm x 30 cm) Step: 4 inches x 8 inches (10 cm x 20 cm)
Glass surface that can be sat or stepped on	Seating or stepping	500 pounds (2225 N)	N/A - up to 38 inches (100 cm)	Seat: 12 inches x 12 inches (30 cm x 30 cm) Step: 4 inches x 8 inches (10 cm x 20 cm)

[1] Any feature not identified in this table should be evaluated using the graph in Figure 3 for normal in-flight operations.