



The European Organisation for Civil Aviation Equipment
L'Organisation Européenne pour l'Équipement de l'Aviation Civile

MINIMUM OPERATIONAL PERFORMANCE SPECIFICATION FOR TROLLEYS, CONTAINERS AND ASSOCIATED EQUIPMENT COMPONENTS

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ED-121

September 2004

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FOREWORD

1. The development of this specification was jointly accomplished by European Organisation for Civil Aviation Equipment (EUROCAE) Working Group 65 and the Society of Automotive Engineers (SAE) through a consensus process. It was accepted by the Council of EUROCAE as ED 121 in September 2004.
2. This document is similar to SAE document AS 8056.
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TABLE OF CONTENTS

FOREWORD	i
CHAPTER 1 GENERAL.....	1
1.1 SCOPE	1
1.2 APPLICATIONS.....	1
1.3 DESCRIPTION	2
1.3.1 Purpose	2
1.3.2 Exceptions	2
1.3.3 Equipment	2
1.4 DEFINITIONS	2
1.5 ABBREVIATIONS.....	4
1.6 REFERENCES	5
CHAPTER 2 GENERAL REQUIREMENTS.....	6
2.1 INTRODUCTION	6
2.1.1 Applicable Requirements	6
2.2 GENERAL.....	6
2.2.1 Materials and Materials Control.....	6
2.2.2 General Construction	8
2.2.3 Construction of Waste Enclosures	9
2.2.4 Injury Hazard	9
2.3 STRUCTURAL.....	10
2.3.1 General.....	10
2.3.2 Design Load Factors	11
2.3.3 Adjacent Equipment Loads	11
2.3.4 Local Attachment Factor	11
2.3.5 Material Strength Properties and Material Variability	11
2.3.6 Retention of Items of Mass.....	12
2.3.7 Weight and Centre of Gravity	12
2.3.8 Doors and Hinges.....	13
2.3.9 Trolley Wheels.....	13
2.3.10 Floor Loads.....	13
2.3.11 Abuse Loads.....	13
2.4 OPERATIONAL	13
2.4.1 Trolley Brakes.....	13
2.4.2 Stability and Manoeuvrability.....	14
2.5 FIRE PROPERTIES.....	14
2.5.1 Flammability	14
2.5.2 Heat Release and Smoke Density	14
2.6 FIRE CONTAINMENT	14

2.7	PLACARDS.....	15
2.7.1	Placards for Design Limitations.....	15
2.7.2	Placards for Weight	15
2.7.3	Placards for Required Stowage.....	15
2.7.4	Placards for Fire Safety	16
CHAPTER 3	QUALIFICATION	23
3.1	GENERAL.....	23
3.2	STRUCTURAL.....	23
3.3	ABUSE LOADS (FOLDING TROLLEY ONLY).....	24
3.4	BRAKING.....	24
3.5	FIRE PROPERTIES.....	25
3.5.1	Flammability	25
3.5.2	Heat Release and Smoke Density	25
3.6	FIRE CONTAINMENT	25
CHAPTER 4	DATA REQUIREMENTS	26
4.1	INTERFACE CONTROL DRAWING	26
CHAPTER 5	COMPLIANCE MATRIX	27
	LIST OF EUROCAE WG-65 MEMBERS	30
	ED-121 Improvement Suggestion Form.....	31

CHAPTER 1

GENERAL

1.1 SCOPE

This EUROCAE Minimum Operational Performance Specification (MOPS) specifies the minimum performance requirements of in-flight trolleys, containers and associated equipment such as drawers, trays and waste bin liners intended for installation in galleys and other areas of transport category aeroplanes. The requirements include establishing installation criteria for use by compartment designers and installers of the equipment.

Chapter 1	provides information required to understand the need for equipment characteristics and tests defined in the remaining chapters. It describes typical equipment applications and operational objectives and is the basis for the performance criteria stated in Chapter 2. Definitions essential to the proper understanding of this document are provided in Chapter 1.
Chapter 2	contains general design requirements for the equipment.
Chapter 3	contains the minimum operational performance requirements for the equipment under conditions likely to be encountered during flight.
Chapter 4	contains the data Requirements
Chapter 5	contains the Compliance Matrix

1.2 APPLICATIONS

Compliance with this MOPS ensures that the equipment will satisfactorily perform its intended function to enable food and drink to be stored and moved within the passenger compartment of the aircraft.

Compliance with this MOPS does not necessarily constitute compliance with regulatory requirements, design details that provide extended service life and continued airworthiness or public health regulations. Any regulatory application of this document in whole or part is the sole responsibility of the appropriate government agencies.

When the term “equipment” is used in this specification, it refers to all trolleys, containers, or associated components identified in the Description unless specifically identified otherwise.

This MOPS is intended to provide safety considerations for design that will enhance safety for cabin personnel operating the equipment and to minimise hazards to passengers exposed to such operations.

Mandating and Recommendation Phrases

a. “Shall”

The use of the word “shall” indicates a mandatory criterion; i.e. compliance with the particular procedure or specification is mandatory and no alternative may be applied.

b. “Should”

The use of the word “should” (and phrases such as “it is recommended that .”, etc.) indicates that although the procedure or criterion is regarded as the preferred option, alternative procedures, specifications or criteria may be applied, provided that the manufacturer, installer or tester can provide information or data to adequately support and justify the alternative.

1.3 DESCRIPTION

1.3.1 Purpose

This specification is applied to, but not limited to, the following equipment that is intended for installation in galleys and other areas within transport category aeroplanes. The requirements include establishing installation criteria for use by compartment designers and installers of the equipment.

- a) Full Size and Half Size Trolleys (Beverage, Container, Meal, Sales and Waste)
- b) Folding Trolleys
- c) Containers (Carriers, Standard Units and Meal Boxes)
- d) Associated components such as drawers, trays, waste bin liners or other similar components that are stowed in trolleys and/or galley compartments but are non-stationary parts thereof.

1.3.2 Exceptions

This specification does not fully address:

- a) Trolleys or containers that include a self-contained mechanical refrigeration system, motors or other electrical components, or which dispense beverages through pressurized systems.
- b) Design details that provide extended service life and continued airworthiness since these are a function of:
 - (i) total galley and food beverage system design,
 - (ii) human factors engineering desired by individual operators,
 - (iii) techniques of care in servicing, and
 - (iv) maintenance philosophy.

However, references to these considerations are included as appropriate.

- c) Requirements that are covered by pertinent public health regulations, and/or design details, which should be covered by galley operator/aeroplane manufacturer, detailed specifications for the subject equipment.

1.3.3 Equipment

When the term "equipment" is used in this specification, it refers to all trolleys, containers or associated components identified in the Purpose (1.3.1), unless specifically identified otherwise.

1.4 DEFINITIONS

Associated

Components:

Defined as both of the following:

- a. Items such as drawers, trays, waste bin liners, or other similar components that are stowed in trolleys and/or galley compartments, but are non-stationary parts thereof.
- b. Items that need to meet CS 25 in order to be included as part of the aircraft type certificate.

Carrier:

For the purpose of this document, the word "carrier " is synonymous with "Container ".

Cart:

For the purpose of this document the word "cart" is synonymous with the word "trolley".

Container:	A moveable enclosure (without wheels) designed for the purpose of transporting and storing various items used for cabin service activities. A Container is typically carried by hand or in trolleys and is not typically removed from the galley work area during cabin service activities.
Detrimental Permanent Deformation:	Deformation that could (but is not limited to) allow equipment or its contents to become unrestrained from the stowage compartment, protrude into exit paths, hinder evacuation, or prevent equipment stowage prior to landing.
Industry Specifications:	Specifications that are accepted industry wide (e.g. SAE, EUROCAE (AS, ARP, AMS), military (MIL & MS) and National Aerospace Standards
Interchangeability:	That quality which allows an assembly or part to substitute or be substituted for another and to meet all physical, functional and structural requirements. No alterations except designed adjustments are allowed to install the item.
Interface:	The fit and functional relationships of the equipment with the galley or with other structure (e.g. a trolley and its stowage compartment).
Interface Control Drawing (ICD):	A drawing created for the purpose of communicating interface information.
Latch:	Retaining device (e.g. hand-operated quarter turn or a spring actuated latch for a door) which secures an item(s) during structural loading.
Periodic Testing:	Testing conducted on each batch of material or product used to determine conformance to the process specification. When consistent conformance has been demonstrated, reduced testing may be implemented in accordance with a quality assurance plan.
Process Specifications:	A specification used by the equipment manufacturer that controls manufacturing processes (such as bonding or welding) or materials (such as sandwich panels) that are dependent on preparation, application and procedure. These specifications ensure repeatability of the process or material for which it is written.
Retaining Devices:	Any device such as a latch, stop, detent, guide, or other mechanical configuration used to retain items such as doors, Drawers, Trolleys, modules, Containers, equipment items, or any other movable galley components.
Standard Unit	For the purpose of this document, the word "Standard Unit" is synonymous with "Container".
Stowed	Placed and retained in a stowage location for taxi, take-off, landing and during turbulence.
Trolley:	A movable enclosure on wheels designed for the purpose of transporting and storing various items used for cabin service activities. A Trolley is manoeuvred inside the cabin.

Trolley, Beverage:	A Trolley designed for the purpose of transporting and storing beverages such as liquors, soft drinks, juices, waters, and their associated condiments.
Trolley, Container:	An open sided unit on wheels used to stow and transport containers.
Trolley, Folding:	A shelf or shelves on wheels designed for the purpose of transporting various items during cabin service activities but is not designed for content stowage. A Folding Trolley will collapse or fold into a smaller configuration for stowage.
Trolley, Full Size:	A Trolley that is typically stowed as a single item in a stowage compartment. Typically a Full Size Trolley is approximately 30 inch (762 mm) to 35 inch (889 mm) deep.
Trolley, Half Size:	A Trolley that can be stowed as a single item or, in a full size compartment, can be stowed together with another Half Size Trolley. Typically a Half Size Trolley is approximately 15 inch (381 mm) to 18 inch (457.2 mm) deep.
Trolley, Meal:	A Trolley designed for the purpose of transporting and storing used and/or unused food tray set-ups. Provisions for interface with the galley refrigeration system may be provided in the trolley. This type of trolley is called an “air through” refrigerated Meal Trolley.
Trolley, Sales:	A Trolley designed for the purpose of transporting and storing on-board, often “duty free” sale items such as cigarettes, perfumes, liquors and gift items.
Trolley, Waste:	A Trolley designed for the purpose of transporting and storing waste generated by cabin service.
Waste Bin Liner:	A separate item installed in either a Waste Trolley or galley waste compartment, intended to assist in the easy removal of collected waste or for fire containment.

1.5

ABBREVIATIONS

AC	Advisory Circular (FAA)
ARP	Aerospace Recommended Practices (SAE)
AS	Aerospace Standard (SAE)
ASTM	Aerospace Standard Test Method
AMJ	Advisory Material Joint
AWS	American Welding Society
CFR	Code of Federal Regulations
CS	Certification Specification (EASA)
EASA	European Aviation Safety Agency
EN	Norme Européenne. European Standard. Europäische Norm
EUROCAE	The European Organisation for Civil Aviation Equipment
FAA	Federal Aviation Administration
FAR	Federal Aviation Regulations
ICD	Interface Control Drawing
IR21	Implementation Rule
JAA	Joint Aviation Authorities

MOPS	Minimum Operational Performance Specification
SAE	Society of Automotive Engineers

1.6**REFERENCES**

The following publications form a part of this document to the extent specified herein at their latest issue. 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 specified exemption has been obtained.

- AC 25-17: Transport Airplane Cabin Interiors Crashworthiness Handbook
- 14 CFR, Part 25: Airworthiness Standards: Transport Category Airplanes
- 14 CFR, Part 1: Definitions and Abbreviations
- CS 25: Large Aeroplanes
- HF-STD-001: The Human Factors Design Standard
- National Aeronautics and Space Administration Publication
- SAE AS 8056 –Minimum Design and Performance of Airplane Galley In-Flight Carts, Containers, and Associated Components
- ASTM Publications
- Darcor and Ergoweb® Ergonomic White Paper
- American Welding Standards Publication

CHAPTER 2

GENERAL REQUIREMENTS

2.1 INTRODUCTION

2.1.1 Applicable Requirements

Table 1 is the guide that defines applicable requirements. To use the table, find the galley equipment in question along the top row, and then read down that column; wherever a bullet appears in the column, that defines a grouping of requirements that must be addressed.

TABLE 1 : APPLICABLE REQUIREMENTS

Requirements	Section	Trolleys, Containers	Folding Trolleys, Container Trolleys	Associated Equipment (Drawers, Trays, Waste Bin Liners)
General	2.2	•	•	•
Structural	2.3	•	•	•
Operational	2.4	•	•	
Fire Properties	2.5	•	•	•
Fire Containment	2.6	•		
Placards	2.7	•	•	

2.2 GENERAL

2.2.1 Materials and Materials Control

Materials shall be proven by test or experience to have strength and durability per CS 25.603 and 25.613.

2.2.1.1 Sandwich Panels

- a. The mechanical properties of sandwich panels shall be controlled by process specification and the specification shall require periodic testing to assure conformance to the specification. At minimum, the specification shall contain requirements for the following, per SAE AMS-STD-401 (or equivalent):
 1. Core Shear or Sandwich Shear (Ref: ASTM C 273)
 2. Sandwich Flexure (Ref: ASTM C 393)
 3. Sandwich Climbing Drum Peel (Ref: ASTM D 1781)
- b. Fasteners and inserts installed into or through core shall be potted or sealed to prevent entry of moisture or water.
- c. Aluminium honeycomb core shall be finished for corrosion resistance at the time of fabrication.