SAE Aerospace
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AEROSPACE STANDARD

SAE AS8905

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Fittings and Cargo Rings, Tie-Down, Aircraft Floor

FSC 1670

RATIONALE

This document has been reaffirmed to comply with the SAE 5-year Review policy.

NOTICE

This document has been taken directly from U.S. Military Specification MIL-F-8905B, Amendment 1 and contains only minor editorial and format changes required to bring it into conformance with the publishing requirements of SAE technical standards. The initial release of this document is intended to replace MIL-F-8905B, Amendment 1. Any part numbers established by the original specification remain unchanged.

The original Military Specification was adopted as an SAE standard under the provisions of the SAE Technical Standards Board (TSB) Rules and Regulations (TSB 001) pertaining to accelerated adoption of government specifications and standards. TSB rules provide for (a) the publication of portions of unrevised government specifications and standards without consensus voting at the SAE Committee level, and (b) the use of the existing government specification or standard format.

Under Department of Defense policies and procedures, any qualification requirements and associated qualified products lists are mandatory for DOD contracts. Any requirement relating to qualified products lists (QPL's) has not been adopted by SAE and is not part of this SAE technical document.

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1. SCOPE:

1.1 Scope:

This specification establishes requirements for two types of aircraft floor fittings for tiedown of cargo and seats, and two types of cargo tiedown rings.

1.2 Classification:

Fittings and cargo rings shall be of the following types and capacities, as specified (see 6.2):

Type I - Fitting, tiedown, cargo ring (5000 lb.) and seat stud
Type II - Fitting, tiedown, cargo ring (10,000 lb.) and seat stud
Type III - Ring, cargo tiedown (10,000 lbs.)
Type IV - Ring, cargo tiedown (25,000 lbs.)

2. APPLICABLE DOCUMENTS:

2.1 The following documents, of the issue in effect on date of invitation for bids, or request for proposal, form a part of this specification to the extent specified herein:

SPECIFICATIONS

Military

MIL-P-116	Preservation, Methods of
MIL-D-1000	Drawings, Engineering and Associated Lists
MIL-A-21165	Adapters, Quick-Disconnect, Passenger Seat to Floor

STANDARDS

MIL-STD-104	Sampling Procedures and Tables for Inspection by Attributes
MIL-STD-130	Identification Marking of US Military Property
MIL-STD-794	Parts and Equipment, Procedures for Packaging and Packing
MIL-STD-831	Test Reports, Preparation of
MS21234	Fitting, Tiedown, Cargo Ring (5000 lb.) and Seat Stud, Type I
MS21235	Fitting, Tiedown, Cargo Ring (10,000 lb.) and Seat Stud, Type II
MS21236	Ring, Cargo Tiedown (10,000 lb.) Type III
MS21237	Ring, Cargo Tiedown (25,000 lb.) Type IV
MS22034	Adapter, Quick-Disconnect, Passenger Seat to Floor
MS33586	Metals, Definitions of Dissimilar

(Copies of specifications, standards, drawings, and publications required by suppliers in connection with specific procurement functions should be obtained from the procuring activity or as directed by the contracting officer.)

3. REQUIREMENTS:

3.1 Preproduction:

This specification makes provisions for preproduction testing (see 4.3).

3.2 Materials:

Materials shall conform to applicable specifications and shall be as specified herein and on applicable drawings or standards. Materials which are not covered by specifications, or which are not specifically described herein, shall be of the best quality, of the lightest practicable weight, and suitable for the purpose intended.

3.2.1 Dissimilar metals: Unless suitably protected against electrolytic corrosion, dissimilar metals as defined in MS33586 shall not be used in intimate contact.

3.2.2 Protective treatment: Fittings or cargo rings constructed of materials subject to deterioration when exposed to environmental conditions likely to occur during service usage, shall be protected against such deterioration in a manner that will in no way prevent compliance with the performance requirements of this specification. Protective coatings which might crack, chip, or scale shall not be used.

3.3 Design and construction:

3.3.1 Type I and type II fittings: The design and construction of the fittings shall be in conformance with MS21234 (type I), MS21235 (type II), and with applicable drawings and part numbers specified in the contract or order (see 6.2). Minimum clear openings and maximum cross-sectional diameters of the fitting cargo rings shall be as specified on the applicable MS. The cargo rings shall not project above the floor when not in use. The upper portion of the seat stud shall mate with the MS22034 adapter and its top extremity shall be flush with the plane of the top surface of the fitting base plate. Design load capacities for the cargo rings shall be as specified in table I. The fittings shall be easily maintained free from clogging by dirt, mud, debris, or ice, without the use of special equipment and shall contain no openings by which dirt, dust, debris, etc., can pass through to the space below the floor.

TABLE I. Cargo ring load capacities (pounds)

Type	Design load (rated capacity)	Proof load	Ultimate load
I	5,000	5,000	7,500
II	10,000	10,000	15,000
III	10,000	10,000	15,000
IV	25,000	25,000	37,500

3.3.2 Type III and type IV cargo rings: The design and construction of the cargo rings shall be in conformance with MS21236 (type III), MS21237 (type IV), and with applicable drawings and part numbers specified in the contract or order (see 6.2). Minimum clear openings and maximum cross-sectional diameters for the cargo rings shall be as specified on the applicable military standards. Design load capacities shall be as specified in table I.

3.4 Performance:

When subject to the applicable tests of section 4, the fittings and cargo rings shall conform to the following requirements.

3.4.1 Proof load on cargo rings and seat studs:

3.4.1.1 Proof load on cargo rings of type I and type II fittings: Cargo rings of type I and type II fittings shall be proof-loaded while attached to the complete fitting assembly. When subjected to the proof loads specified in table I and tested in accordance with 4.6.2, there shall be no permanent deformation of the cargo ring, its attachment to the base plate, or the base plate.

3.4.1.2 Proof load to type III and type IV cargo rings: When subjected to the proof loads specified in table I and tested in accordance with 4.6.2, there shall be no permanent deformation of any parts of the cargo rings.

3.4.1.3 Strength of seat studs of type I and type II fittings: The seat studs of type I and type II fittings shall be proof-loaded while attached to the complete fitting assembly. When subjected to the test specified in 4.6.3, there shall be no permanent deformation of the seat stud, its attachment to the base plate, or the base plate.

3.4.2 Ultimate load on cargo rings: When subjected to the ultimate loads specified in table I and tested in accordance with 4.6.4 the cargo rings may deform but shall not break.

3.5 Interchangeability:

All parts having the same manufacturer's part number shall be functionally and dimensionally interchangeable. The drawing number requirements of MIL-D-1000 shall govern changes in the manufacturer's part numbers.

3.6 Identification of product:

Fittings and cargo rings shall be marked for identification in accordance with MIL-STD-130.

3.7 Workmanship:

The fittings and cargo rings shall be free from irregularities or defects which could adversely affect performance, reliability, or durability.

4. QUALITY ASSURANCE PROVISIONS:

4.1 Responsibility for inspection:

Unless otherwise specified in the contract or purchase order, the supplier is responsible for the performance of all inspection requirements as specified herein. Except as otherwise specified, the supplier may utilize his own facilities or any commercial laboratory acceptable to the Government. The Government reserves the right to perform any of the inspections set forth in the specification where such inspections are deemed necessary to assure supplies and services conforming to prescribed requirements.

4.2 Classification of inspection:

The examination and testing of the fittings and cargo rings shall be classified as follows:

(a) Preproduction inspection (4.3)
(b) Quality conformance inspection (4.4)

4.3 Preproduction inspection:

Preproduction inspection shall consist of examination and tests for all the requirements of this specification. Quantity production shall be withheld until the preproduction samples have been pronounced satisfactory by the procuring activity. Preproduction tests may be waived at the discretion of the procuring activity. The approval of the preproduction samples or waiving the preproduction tests shall not relieve the contractor of his obligation to submit samples for the quality conformance inspections.

4.3.1 Manufacturer's tests: As soon as practicable after award of a contract or order, the manufacturer shall conduct preproduction tests on five of each type of fitting or cargo ring covered in the contract or order. The manufacturer shall then provide the procuring activity with test reports and drawings for the fittings or cargo rings covered in the contract or order.

4.3.1.1 Manufacturer's test report: The test report shall be prepared in accordance with MIL-STD-831 and shall include results of all tests, including a detailed statement indicating compliance or extent of noncompliance with each requirement of this specification, referring specifically to the applicable paragraph numbers in this specification.

4.3.1.2 Manufacturer's drawings: The following data shall be furnished on, or together with, the assembly and detail drawings:

(a) Complete dimensions including constructional details
(b) Material composition
(c) Heat treatment
(d) Protective coating, plating, or treatment

4.3.2 Preproduction samples: Unless otherwise directed, the supplier shall furnish, as soon as practicable after award of a contract or order, preproduction samples to the preproduction inspection activity specified in the contract or order (see 6.2). Five samples of each type of fitting or cargo ring covered in the contract or order shall be furnished. The samples shall be plainly identified by securely attached durable tags marked with the following information:

Sample submitted by (name) (date) for preproduction tests in accordance with the requirements of MIL-F-8905B under contract No. _____.
MS part number.
Manufacturer's part number.

4.3.2.1 Applicable to Navy: When required, unless otherwise directed, the preproduction samples shall be forwarded to the Supply Officer, U.S. Naval Air Development Center, Johnsville, Warminster, Pennsylvania 18974, Attention: Director, Aero Materials Department.

4.4 Quality conformance inspection:

Quality conformance inspection shall consist of the examination specified in 4.6.1 and the sampling tests specified in 4.6.2, 4.6.3, and 4.6.4.

4.4.1 Sampling for quality conformance inspection: Sampling for the tests of 4.6.2, 4.6.3, and 4.6.4 shall be performed in accordance with MIL-STD-105, inspection level S-2 and acceptance number zero. Samples subjected to these tests shall not be shipped as part of the order. All fittings and cargo rings to be shipped on the order, and those subjected to the sampling quality conformance inspection, shall be examined in accordance with 4.6.1.

4.4.2 Inspection lot: An inspection lot shall consist of fittings and cargo rings submitted for acceptance at one time. The unit of inspection shall be one fitting, or cargo ring, assembly.

4.5 Test conditions:

Unless otherwise specified, tests shall be conducted at room temperature.