

European Aviation Safety Agency

European Technical Standard Order (ETSO)

Subject: AIRCRAFT SEATS and BERTHS CERTIFIED BY STATIC TESTING ONLY

1 – Applicability

This ETSO gives the requirements which aircraft seats and berths that are manufactured on or after the date of this ETSO must meet in order to be identified with the applicable ETSO marking for the following types:

Type A- Large Aeroplane (9g forward load seats only)

Type I – Large Aeroplane (berths only)

Type II – Normal, Utility and Commuter

Type III – Acrobatic

Type IV - Rotorcraft

2 - Procedures

2.1. - General

Applicable procedures are detailed in CS-ETSO Subpart A.

2.2 - Specific

None

3 - Technical Conditions

3.1 - Basic

3.1.1 - Minimum Performance Standard

3.1.1.2 - Type A

Standards set forth in sections 3.1.4, 3.1.8, 3.1.11, 3.1.14, 3.1.15, 3.1.17, 3.1.18, 3.1.19, 3.1.20, 3.2, 3.3, 3.4 (except 3.4.2), 3.5, 4 (except 4.2), 5 (except 5.3 and 5.4) of SAE Aerospace Standard (AS) document AS 8049 Rev. A, "Performance Standard for Seats in Civil Rotorcraft, Transport Aircraft, and General Aviation Aircraft" dated September 1997, as modified by **Appendix 1** of this ETSO.

Seat cushions, when included, for large aeroplane passenger, flight attendant, and observer seats shall meet the fire protection provisions of Appendix F, Part II of EASA CS 25, as required by CS 25.853(c).

3.1.1.3 - Type I, II, III and IV

Standards set forth in the National Aerospace Standard (NAS) Specification 809, dated January 1, 1956 with the following exception:

- (i) The sideward loads as specified in 4.1.2. Table I of NAS 809 need not exceed the requirements of the applicable Certification Specification (CS).

(ii) Materials in Type I berths must comply with the fire protection provisions of CS 25.853(a).

3.1.2 - Environmental Standard

None

3.1.3 - Computer Software

None

3.1.4 Electronic Hardware Qualification

None

3.2 - Specific

None

4 - Marking

4.1 - General

Marking is detailed in CS-ETSO Subpart A paragraph 1.2.

4.2 – Specific

4.2.1 The marking must also include the applicable seat type: "Type A-", "Type I-", "Type II-", "Type III-", or "Type IV-" followed by the appropriate seat facing direction designation: "FF" – forward; "RF"- rearward; or "SF" – sideward

4.2.2 Each passenger, flight attendant and observer seat cushion required for qualification of the seating system must be marked with "Complies with CS 25.853(c)" when tested in accordance with the requirements of CS 25.853(c)

5 - Availability of Referenced Document

See CS-ETSO Subpart A paragraph 3

APPENDIX 1

MODIFICATION TO AS 8049 Rev. A

Modify SAE AS8049 Rev. A as follows:

- (1) Disregard first paragraph in section 3.2 Requirements.
- (2) Revise Section 3.2.1 as follows:

Seat systems shall be designed to provide protection for the occupant at seat adjustment positions, orientations, and locations allowed to be occupied during takeoff and landing.
- (3) Revise Section 3.2.2 as follows:

Seat elements shall be designed so that, when evaluated under the static test conditions of this document, they do not leave hazardous projections that could significantly contribute to occupant injury or impede rapid evacuation.
- (4) Revise Section 3.2.6 as follows:

Adjustable features (seat swivel, back recline, and stowage of movable tables, armrests, footrests, etc.) shall be designed to permit the seat occupant access to those features to adjust to the positions required for takeoff and landing without releasing the occupant's restraints.
- (5) Revise Section 3.2.7 as follows:

When an under-seat baggage restraint is incorporated in a passenger seat, it shall be designed to restrain at least 9.1 kg (20 lb) or the placard weight of stowed items per passenger place, under the static test conditions of this document in a manner that will not significantly impede rapid egress from the seat.
- (6) Revise Section 3.5 as follows:

Allowable permanent deformations sustained by a seat subjected to the ultimate static tests of this document are specified below. Permanent seat deformations shall be measured on the critically loaded seat after static tests. Significant measuring points shall be identified and marked on the test seat, and their positions measured in the lateral, vertical, and longitudinal directions relative to fixed points on the test fixture. Measurement of the selected points shall be recorded before and after the tests. Post test deformations shall be recorded and reported.
- (7) Revise Section 4 as follows:

STRENGTH: All seats qualified for occupancy during takeoff and landing shall be capable of withstanding, within the criteria defined below, statically applied loading.
- (8) Revise Section 5 as follows:

QUALIFICATION TESTS: Initial qualification of a seat shall be performed by static tests. Subsequent qualifications related to design changes to seats of a similar type may be performed by rational analysis based on existing qualification test data.
- (9) Revise Section 3.1.11 as follows:

Restraint system anchorages should provide self-aligning features. If self-aligning features are not provided, the static tests in this document should be conducted with the restraints and anchorages positioned in the most adverse configuration allowed by the design. The anchorage system should minimise the possibility of incorrect installation or inadvertent disconnection of the restraints.