



SLOVENSKI STANDARD SIST EN 4841-1:2022

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Aeronavtika - Dušilniki vibracij z oblogami - 1. del: Tehnična specifikacija

Aerospace series - Shock mount with bushes - Part 1: Technical specification

Luft- und Raumfahrt - Schwingungsdämpfer mit Buchse - Teil 1: Technische Lieferbedingung

Série aérospatiale - Amortisseur de vibrations avec douille - Partie 1 : Spécification technique

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Components for aerospace construction

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Série aérospatiale - Amortisseur de vibrations à bagues
- Partie 1 : Spécification technique

Luft- und Raumfahrt - Schwingungsdämpfer mit
Buchse - Teil 1: Technische Lieferbedingung

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EN 4841-1:2022 (E)**European foreword**

This document (EN 4841-1:2022) has been prepared by the Aerospace and Defence Industries Association of Europe - Standardization (ASD STAN).

After enquiries and votes carried out in accordance with the rules of this Association, this document has received the approval of the National Associations and the Official Services of the member countries of ASD-STAN, prior to its presentation to CEN.

This European Standard shall be given the status of a national standard, either by publication of an identical text or by endorsement, at the latest by November 2022, and conflicting national standards shall be withdrawn at the latest by November 2022.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. CEN shall not be held responsible for identifying any or all such patent rights.

According to the CEN-CENELEC Internal Regulations, the national standards organizations of the following countries are bound to implement this European Standard: Austria, Belgium, Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, Former Yugoslav Republic of Macedonia, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Romania, Serbia, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey and the United Kingdom.

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Introduction

This document is part of the series of EN mechanical standards for aerospace applications.

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EN 4841-1:2022 (E)**1 Scope**

This document specifies the required characteristics, inspection and test methods, qualification and acceptance conditions for shock mounts with bushes, designed to withstand static and dynamic loads possible for aerospace interior applications in the temperature range from –55 °C to 85 °C.

2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

EN 2424:2008, *Aerospace series — Marking of aerospace products*

EN 2825, *Aerospace series — Burning behaviour of non metallic materials under the influence of radiating heat and flames — Determination of smoke density*

EN 2826, *Aerospace series — Burning behaviour of non metallic materials under the influence of radiating heat and flames — Determination of gas components in the smoke*

EN 3844 (all parts), *Aerospace series — Flammability of non-metallic materials*

EN 4662, *Aerospace series — Test specification for vibration control components*

EN 4841-2, *Aerospace series — Shock mounts with bushes — Part 2: Technical overview*

EN 10204, *Metallic products — Types of inspection documents*

EN ISO 75-2, *Plastics — Determination of temperature of deflection under load — Part 2: Plastics and ebonite (ISO 75-2)*

EN ISO 175, *Plastics — Methods of test for the determination of the effects of immersion in liquid chemicals (ISO 175)*

EN ISO 178, *Plastics — Determination of flexural properties (ISO 178)*

EN ISO 179-1:2010, *Plastics — Determination of Charpy impact properties — Part 1: Non-instrumented impact test (ISO 179-1:2010)*

EN ISO 291, *Plastics — Standard atmospheres for conditioning and testing (ISO 291)*

EN ISO 527-2:2012, *Plastics — Determination of tensile properties — Part 2: Test conditions for moulding and extrusion plastics (ISO 527-2:2012)*

EN ISO 1172, *Textile-glass-reinforced plastics — Prepregs, moulding compounds and laminates — Determination of the textile-glass and mineral-filler content; calcination methods (ISO 1172)*

EN ISO 1183-1, *Plastics — Methods for determining the density of non-cellular plastics — Part 1: Immersion method, liquid pycnometer method and titration method (ISO 1183-1)*

EN ISO 9227, *Corrosion tests in artificial atmospheres — Salt spray tests (ISO 9227)*

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DIN 53504:2017, *Testing of rubber — Determination of tensile strength at break, tensile stress at yield, elongation at break and stress values in a tensile test*¹

DIN 65271, *Aerospace series — Elastomeric semi-finished products and parts — Technical specification*¹

ISO 34-1:2015, *Rubber, vulcanized or thermoplastic — Determination of tear strength — Part 1: Trouser, angle and crescent test pieces*

ISO 37:2017, *Rubber, vulcanized or thermoplastic — Determination of tensile stress-strain properties*

ISO 48-4, *Rubber, vulcanized or thermoplastic — Determination of hardness — Part 4: Indentation hardness by durometer method (Shore hardness)*

ISO 1817:2015, *Rubber, vulcanized or thermoplastic — Determination of the effect of liquids*

ISO 2781:2018, *Rubber, vulcanized or thermoplastic — Determination of density*

FAR/JAR/CS 25.853:1999, *Compartment interiors*²

RTCA DO-160G:2010, *Environmental Conditions and Test Procedures for Airborne Equipment*³

UL 746B, *Standard for Safety for Polymeric Materials — Long Term Property Evaluations*⁴

3 Terms and definitions

For the purposes of this document, the following terms and definitions apply.

ISO and IEC maintain terminological databases for use in standardization at the following addresses:

- ISO Online browsing platform: available at <https://www.iso.org/obp>
- IEC Electropedia: available at <https://www.electropedia.org/>

3.1

standard part

complete shock mount assembly, which consists of inner and outer metal rings with vulcanized rubber and spherical bearing

3.2

Batch definition

3.2.1

manufacturing batch

batch composed of inner and outer rings made of same material (same material batch), with same dimensions and belonging to the same manufacturing campaign and vulcanized with the same rubber compound

¹ Published by: Beuth Verlag GmbH. www.beuth.de

² Published by: European Aviation Safety Agency, Postfach 10 12 53, D-50452 Koeln, Germany.

³ Published by: Radio Technical Commission for Aeronautics (RTCA), 1140 Connecticut Ave., N.W. Suite 1020, Washington, D.C. 20036, USA.

⁴ Published as UL Standard, <https://ulstandards.ul.com/>.

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3.2.2

artificial batch

batch which consists of different manufacturing batches and is limited to a maximum of 100 shock mounts

3.3

qualification test

test or series of tests to demonstrate that the products comply with the requirements stipulated in this document and/or in a product standard and are accomplished according to documented parameters and under reproducible conditions

3.4

acceptance test

test that demonstrates the characteristics of manufactured products comply with the requirements

4 Symbols and abbreviations

R_a roughness value

s_1 ultimate/limit load factor

s_2 fitting factor

QTP Qualification Test Plan

QTR Qualification Test Report

5 Required characteristics, inspections and test methods

Inspection and test methods shall be done according to Table 1.

Table 1 — Inspections and test methods

Clause	Characteristic	Requirement	Inspection and test method	Qa	Ab
8.2	Check of external surfaces	In accordance with 8.2 in this specification or design documents	See 8.2.1 and 8.2.2	X	X
8.3	Dimensional check	In accordance with 8.3 in this specification or design documents	See 8.3.1 and 8.3.2	X	X
8.4	Check of mass	In accordance with 8.4 in this specification or design documents	See 8.4	X	X
8.5	Stiffness	According to EN 4662	See EN 4662	X	X
8.6	Load test	In accordance with 8.6 in this specification or design documents	See 8.6.1 and 8.6.2	X	—
8.7	Corrosion test	According to EN ISO 9227 spray time 192 h	See EN ISO 9227	X	—

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Clause	Characteristic	Requirement	Inspection and test method	Q ^a	A ^b
8.8	Fire worthiness requirements	According to FAR/JAR/CS 25.853	See FAR/JAR/CS 25.853	X	—
8.9	Environmental conditions	According to RTCA DO-160G:2010, Section 11, Category F	See 8.9.1, 8.9.2, 8.9.3 and 8.9.4	X	—
8.10	Marking	According to EN 2424:2008, style A	Visual examination	X	X
11	Material	See 10.1	See 11.2	X	X
^a Q: Qualification test. ^b A: Acceptance test (per delivery batch).					

A sample plan for qualification and series production shall be used according to Annex A.

6 Static loads

6.1 Description of test procedure

The values for limit and ultimate loads are measured at a temperature of 85 °C.

The values for stiffness are measured at a temperature of 20 °C.

The factor of safety between ultimate and limit load is $s_1 = 1,5$.

The factor for manufacturing and material tolerances is $s_2 = 1,1$.

6.2 Load calculation

For ultimate and limit load calculation, see Equation (1) and Equation (2).

$$\text{Ultimate load} = \text{verified measured values} / s_2 \quad (1)$$

$$\text{Limit load} = \text{ultimate load} / s_1 \quad (2)$$

7 Fatigue loads

If fatigue loads are required they shall be tested according to the applicable technical specification.

8 Technical requirements

8.1 General

Unless required otherwise on the product standard or specification drawing, the characteristics of the shock mounts shall be in accordance with this document.