

**Aerospace series - Bushes with self-lubricating liner -
Technical specification**

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NATIONAL FOREWORD

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ICS 49.030.99

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English Version

Aerospace series - Bushes with self-lubricating liner - Technical specification

Série aérospatiale - Bagues avec garniture autolubrifiante -
Spécification technique

Luft- und Raumfahrt - Buchsen mit selbstschmierender
Beschichtung - Technische Lieferbedingungen

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Foreword

This document (EN 2311:2012) 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 Standard has received the approval of the National Associations and the Official Services of the member countries of ASD, 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of an identical text or by endorsement, at the latest by September 2012, and conflicting national standards shall be withdrawn at the latest by September 2012.

This document supersedes EN 2311:1987.

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1 Scope

This European Standard specifies the required characteristics, inspections and tests, quality assurance and qualification, acceptance and delivery conditions for bushes, designed to be subjected under load, to slow sliding movements, rotations and small oscillations only for aerospace applications.

This standard applies to all bushes when referred to in respective product standards or in a design documentation.

The liner is designed to be used in the temperature range of – 50 °C to 163 °C. Aluminium bushes are limited to – 55 °C to 121 °C.

2 Normative references

The following documents, in whole or in part, are normatively referenced in this document and are indispensable for its application. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

EN 2285, *Aerospace series — Bushes, plain aluminium alloy with self-lubricating liner — Dimensions and loads*

EN 2286, *Aerospace series — Bushes, flanged aluminium alloy with self-lubricating liner — Dimensions and loads*

EN 2287, *Aerospace series — Bushes, plain corrosion resisting steel with self-lubricating liner — Dimensions and loads*

EN 2288, *Aerospace series — Bushes, flanged corrosion resisting steel with self-lubricating liner — Dimensions and loads*

EN 2755, *Aerospace series — Bearings, spherical plain in corrosion resisting steel with self-lubricating liner — Elevated load at ambient temperature — Technical specification*

EN 4534-2, *Aerospace series — Bushes, plain in aluminium alloy with self-lubricating liner, elevated load — Part 002: Dimensions and loads — Inch series*

EN 4535-2, *Aerospace series — Bushes, flanged in aluminium alloy with self-lubricating liner, elevated load — Part 002: Dimensions and loads — Inch series*

EN 4536-2, *Aerospace series — Bushes, plain in corrosion resisting steel with self-lubricating liner, elevated load — Part 002: Dimensions and loads — Inch series*

EN 4537-2, *Aerospace series - Bushes, flanged, corrosion-resisting steel with self-lubricating liner, elevated load - Dimensions and loads - Inch series*

EN 9100, *Quality management systems — Requirements for Aviation, Space and Defense Organizations*

EN 9133, *Aerospace series — Quality management systems — Qualification procedure for aerospace standard parts*

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

ISO 11078, *Aircraft — De-icing/anti-icing fluids — ISO types II, III and IV*

EN ISO 8785, *Geometrical Product Specification (GPS) — Surface imperfections — Terms, definitions and parameters (ISO 8785)*

TR 4475, *Aerospace series — Bearings and mechanical transmissions for airframe applications — Vocabulary*¹⁾

3 Terms and definitions

For the purpose of this standard the terms and definitions given in TR 4475 and the following definitions apply.

3.1 Description

Bushes with self-lubricating liner are composed of a ring in corrosion resisting steel or aluminium alloy with a self-lubricating liner bonded to the bore. As regards flanged bushes, the self-lubricating material is bonded to the outer face of the flange as well as the bore.

3.2 Loads

3.2.1

permissible static radial load C_s or permissible static axial load C_a (flanged bushes only)

the maximum permissible load (without safety factor), which can be applied statically

It is defined as a unit pressure multiplied by the effective projected area (radial or axial), for deformations that are compatible with correct operational behaviour.

3.2.2

ultimate static load (radial or axial)

1,5 times the value of the permissible static load and defined as being the highest load the bush will support without failure occurring

3.2.3

permissible dynamic radial load C_{25}

the load that a bush can withstand, when subjected to an oscillating movement for 25 000 cycles, at the rate of (12 ± 2) cycles/min

3.2.4

cycle

an angular displacement of the shaft in relation to the lined bush of 0° to 25° , then of 25° to -25° and finally -25° to 0°

1) Published as ASD-STAN Technical Report at the date of publication of this standard by Aerospace and Defence Industries Association of Europe-Standardization (ASD-STAN), (www.asd-stan.org).