

Aerospace series - Rod end, adjustable, with self-aligning double row ball bearing and threaded shank, in corrosion resisting steel, reduced internal radial clearance - Dimensions and loads

EESTI STANDARDI EESSÕNA

NATIONAL FOREWORD

See Eesti standard EVS-EN 4036:2021 sisaldab Euroopa standardi EN 4036:2021 ingliskeelset teksti.	This Estonian standard EVS-EN 4036:2021 consists of the English text of the European standard EN 4036:2021.
Standard on jõustunud sellekohase teate avaldamisega EVS Teatajas.	This standard has been endorsed with a notification published in the official bulletin of the Estonian Centre for Standardisation and Accreditation.
Euroopa standardimisorganisatsioonid on teinud Euroopa standardi rahvuslikele liikmetele kättesaadavaks 10.03.2021.	Date of Availability of the European standard is 10.03.2021.
Standard on kättesaadav Eesti Standardimis-ja Akrediteerimiskeskusest.	The standard is available from the Estonian Centre for Standardisation and Accreditation.

Tagasisidet standardi sisu kohta on võimalik edastada, kasutades EVS-i veebilehel asuvat tagasiside vormi või saates e-kirja meiliaadressile standardiosakond@evs.ee.

ICS 49.035

Standardite reprodutseerimise ja levitamise õigus kuulub Eesti Standardimis- ja Akrediteerimiskeskusele

Andmete paljundamine, taastekitamine, kopeerimine, salvestamine elektroonsesse süsteemi või edastamine ükskõik millises vormis või millisel teel ilma Eesti Standardimis-ja Akrediteerimiskeskuse kirjaliku loata on keelatud.

Kui Teil on küsimusi standardite autorikaitse kohta, võtke palun ühendust Eesti Standardimis-ja Akrediteerimiskeskusega: Koduleht www.evs.ee; telefon 605 5050; e-post info@evs.ee

The right to reproduce and distribute standards belongs to the Estonian Centre for Standardisation and Accreditation

No part of this publication may be reproduced or utilized in any form or by any means, electronic or mechanical, including photocopying, without a written permission from the Estonian Centre for Standardisation and Accreditation.

If you have any questions about copyright, please contact Estonian Centre for Standardisation and Accreditation:

Homepage www.evs.ee; phone +372 605 5050; e-mail info@evs.ee

English Version

**Aerospace series - Rod end, adjustable, with self-aligning
double row ball bearing and threaded shank, in corrosion
resisting steel, reduced internal radial clearance -
Dimensions and loads**

Série aérospatiale - Embout réglable à roulement à
rotule sur deux rangées de billes et tige filetée, en acier
résistant à la corrosion, jeu interne radial réduit -
Dimensions et charges

Luft- und Raumfahrt - Einstellbarer Ösenkopf mit
zweireihigem Pendelkugellager und Gewindenschaft aus
korrosionsbeständigem Stahl, reduzierte radiale
Lagerluft - Maße und Belastungen

This European Standard was approved by CEN on 13 February 2021.

CEN members are bound to comply with the CEN/CENELEC Internal Regulations which stipulate the conditions for giving this European Standard the status of a national standard without any alteration. Up-to-date lists and bibliographical references concerning such national standards may be obtained on application to the CEN-CENELEC Management Centre or to any CEN member.

This European Standard exists in three official versions (English, French, German). A version in any other language made by translation under the responsibility of a CEN member into its own language and notified to the CEN-CENELEC Management Centre has the same status as the official versions.

CEN members are the national standards bodies of Austria, Belgium, Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Republic of North Macedonia, Romania, Serbia, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey and United Kingdom.



EUROPEAN COMMITTEE FOR STANDARDIZATION
COMITÉ EUROPÉEN DE NORMALISATION
EUROPÄISCHES KOMITEE FÜR NORMUNG

CEN-CENELEC Management Centre: Rue de la Science 23, B-1040 Brussels

Contents

Page

European foreword.....	3
1 Scope	4
2 Normative references	4
3 Terms and definitions.....	5
4 Required characteristics.....	5
4.1 Dimensions — Tolerances — Masses	5
4.2 Surfaces roughness	5
4.3 Materials	5
4.4 Surface treatment.....	6
4.5 Thread	6
4.6 Loads, starting torques and clearances.....	9
5 Designation	9
6 Marking	10
7 Technical specification	10
8 Quality management systems	10
Bibliography	11

European foreword

This document (EN 4036:2021) 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 document shall be given the status of a national standard, either by publication of an identical text or by endorsement, at the latest by September 2021, and conflicting national standards shall be withdrawn at the latest by September 2021.

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.

This document will supersede EN 4036:2006.

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

1 Scope

This document specifies the characteristics of adjustable rod ends with self-aligning double row ball bearing with reduced internal radial clearance and threaded shank in corrosion resisting steel, designed to withstand only slow rotations and oscillations under load.

They consist of:

- a rod end comprising:
- circumferential groove to identify location;
- either seals or shields;
- an optional longitudinal groove for locking purpose;
- an inner ring with balls.

These rod ends are intended for use with flight control rods or rods for aerospace structures.

They are intended to be used in the temperature range: $-54\text{ }^{\circ}\text{C}$ to $150\text{ }^{\circ}\text{C}$.

However, being lubricated with the following greases:

- very high pressure grease, ester type (code A), operational range $-73\text{ }^{\circ}\text{C}$ to $121\text{ }^{\circ}\text{C}$; or
- very high pressure grease, synthetic hydrocarbons, general purpose (code B), operational range $-54\text{ }^{\circ}\text{C}$ to $177\text{ }^{\circ}\text{C}$ (see EN 2067);

their field of application when lubricated with code A grease is limited to $121\text{ }^{\circ}\text{C}$.

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 2030, *Aerospace series — Steel X105CrMo17 (1.3544) — Hardened and tempered — Bars — $D_e \leq 150\text{ mm}$*

EN 2067, *Aerospace series — Rod ends with self-aligning ball bearings — Technical specification*

EN 2226, *Aerospace series — Steel X105CrMo17 (1.4125) — Hardened and tempered — Hand and die forgings — $D_e \leq 150\text{ mm}$*

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

EN 3490, *Aerospace series — Steel FE-PM3901 (X15CrNi17-3) — Air melted — Hardened and tempered — Bar for machining — $D_e \leq 200\text{ mm}$ — $900\text{ MPa} \leq R_m \leq 1\,100\text{ MPa}$*

ISO 1132-1, *Rolling bearings — Tolerances — Part 1: Terms and definitions*

ISO 3353-1, *Aerospace — Lead and runout threads — Part 1: Rolled external threads*

ISO 5855-2, *Aerospace — MJ threads — Part 2: Limit dimensions for bolts and nuts*

ISO 8074, *Aerospace — Surface treatment of austenitic stainless steel parts*

ISO 8075, *Aerospace — Surface treatment of hardenable stainless steel parts*

TR 3775, *Aerospace series — Bolts and pins — Materials*¹

3 Terms and definitions

For the purposes of this document, the terms and definitions given in ISO 1132-1 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.ui>
- IEC Electropedia: available at <http://www.electropedia.org/>

Symbols of limit deviations are in accordance with definitions of ISO 1132-1.

Δds	deviation of a single bore diameter
Δdmp	single plane mean bore diameter deviation
C_s	permissible static radial load
$F_{a \max.}$	permissible static axial load

4 Required characteristics

4.1 Dimensions — Tolerances — Masses

Configuration: see Figure 1; the bearings are fitted with either seals or shields.

Values: see Figure 1 and Table 1: values after surface treatment.

4.2 Surfaces roughness

Rolling elements and raceway: $R_a = 0,2 \mu\text{m}$

Bore, side faces and cylindrical outer surface: $R_a = 0,8 \mu\text{m}$

For code T values prior to the surface treatment

4.3 Materials

Rod end: Steel EN 3490 or TR 3775; heat treated to obtain:

- by case hardening, hardening and tempering a surface hardness of ≥ 58 HRC on the raceway;
- by hardening and tempering to a strength of $R_m > 830$ MPa on the whole rod end.

¹ Published as ASD-STAN Technical Report at the date of publication of this document by AeroSpace and Defence Industries Association of Europe – Standardization (ASD-STAN) (<https://asd-stan.org/>).