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**Aeronavtika - Nastavljivi drsni zgibi s samovarovalnim dvorednim nihalnim krogličnim ležajem in navojnim steblom iz korozijsko odpornega jekla z zmanjšanim radialnim ohlapom ležaja - Mere in nosilnosti**

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

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

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

**Ta slovenski standard je istoveten z: prEN 4036**

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**ICS:**

49.035

Sestavni deli za letalsko in  
vesoljsko gradnjo

Components for aerospace  
construction

**oSIST prEN 4036:2020**

**en,fr,de**

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EUROPEAN STANDARD  
NORME EUROPÉENNE  
EUROPÄISCHE NORM

**DRAFT**  
**prEN 4036**

July 2020

ICS 49.035

Will supersede EN 4036:2006

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

This draft European Standard is submitted to CEN members for enquiry. It has been drawn up by the Technical Committee ASD-STAN.

**iTeh STANDARD PREVIEW**

If this draft becomes a European Standard, 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.

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Recipients of this draft are invited to submit, with their comments, notification of any relevant patent rights of which they are aware and to provide supporting documentation.

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

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

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## European foreword

This document (prEN 4036:2020) 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 is currently submitted to the CEN Enquiry.

This document will supersede EN 4036:2006.

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## 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  $121\text{ }^{\circ}\text{C}$ .

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## 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 —  $De \leq 150\text{ mm}$*

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

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

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 —  $De \leq 200\text{ mm}$  —  $900\text{ MPa} \leq R_m \leq 1\,100\text{ MPa}$*

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*<sup>1</sup>

### 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.

|                      |                                           |
|----------------------|-------------------------------------------|
| $\Delta ds$          | deviation of a single bore diameter       |
| $\Delta dmp$         | single plane mean bore diameter deviation |
| $C_s$                | permissible static radial load            |
| $F_{a \text{ max.}}$ | 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  $\geq 58 \text{ HRC}$  on the raceway;
- by hardening and tempering to a strength of  $R_m > 830 \text{ MPa}$  on the whole rod end.

<sup>1</sup> 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), [www.asd-stan.org](http://www.asd-stan.org).

**prEN 4036:2020 (E)**

Bearing:

Inner ring: Steel EN 2030 or EN 2226,  $\geq 58$  HRC

Balls: Steel EN 2030 or EN 2226,  $\geq 58$  HRC

Seals: Polytetrafluoroethylene (PTFE) or glass fabric reinforced polytetrafluoroethylene (PTFE)

Shields: Corrosion resisting material

**4.4 Surface treatment**

Rod end: passivation ISO 8074

Bearing: passivation ISO 8075: code T

with no surface treatment: no code

**4.5 Thread**

MJ thread to ISO 5855-2, rolled

Right hand thread, code R

Left hand thread, code L

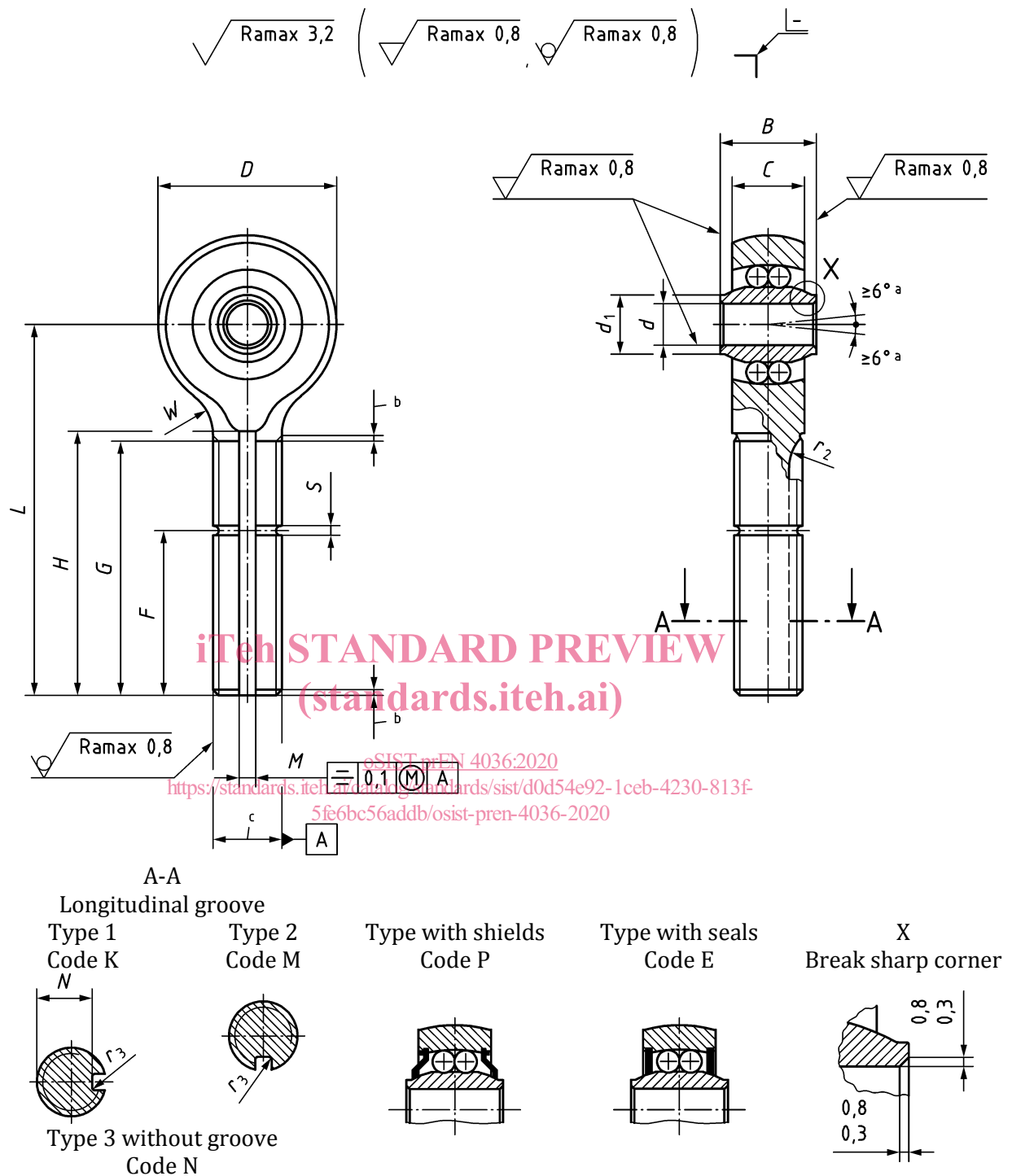
Break sharp edges and corners and remove all burrs and slivers

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**Key**

- a  $6^\circ$  min. The acceptance value is the maximum value for the user
- b conform to ISO 3353-1
- c thread

The circumferential groove and the longitudinal groove over the distance  $F$  shall be painted red.  
 The installation of seals and shields is at the manufacturer's option.

NOTE The dimensions shown in Figure 1 are given in Table 1.

**Figure 1**