
5 YfcbUj h_U!`@yUjž_fc[Yb]žXfgb]ž]n`_cfcn]g_c`cXdcfbY[U`Y`Ug`gUa ca UnUbc
cV`c[cžg`ý]fc_]a `bcfUo]a `cVfc Ya `!GYf]UnUj]ý`Y`cVfYa Yb]j Y`df]`hYa dYfUi f]
c_c`]W`!`A YfY]b`bcg]`bcgh]

Aerospace series - Bearings, spherical plain in corrosion resisting steel with self-lubricating liner with wide inner ring - Elevated loads at ambient temperature - Dimensions and loads

Luft- und Raumfahrt - Gelenklager aus korrosionsbeständigem Stahl mit selbstschmierender Beschichtung mit breitem Innenring - Hohe Belastung bei Raumtemperatur - Maße und Belastungen

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Série aérospatiale - Rotules en acier résistant à la corrosion à garniture autolubrifiante avec bague intérieure large - Série à charge élevée à température ambiante - Dimensions et charges

Ta slovenski standard je istoveten z: EN 4040:2006

ICS:

49.035	Sestavni deli za letalsko in vesoljsko gradnjo	Components for aerospace construction
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EUROPEAN STANDARD

EN 4040

NORME EUROPÉENNE

EUROPÄISCHE NORM

May 2006

ICS 49.035

English Version

**Aerospace series - Bearings, spherical plain in corrosion
resisting steel with self-lubricating liner with wide inner ring -
Elevated loads at ambient temperature - Dimensions and loads**

Série aérospatiale - Rotules en acier résistant à la
corrosion à garniture autolubrifiante avec bague intérieure
large - Série à charge élevée à température ambiante -
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Luft- und Raumfahrt - Gelenklager aus
korrosionsbeständigem Stahl mit selbstschmierender
Beschichtung mit breitem Innenring - Hohe Belastung bei
Raumtemperatur - Maße und Belastungen

This European Standard was approved by CEN on 16 March 2006.

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 Central Secretariat 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 Central Secretariat has the same status as the official versions.

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



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

Management Centre: rue de Stassart, 36 B-1050 Brussels

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Foreword

This European Standard (EN 4040:2006) has been prepared by the European Association of Aerospace Manufacturers - Standardization (AECMA-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 AECMA, 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 2006, and conflicting national standards shall be withdrawn at the latest by November 2006.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. CEN [and/or CENELEC] 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, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, Switzerland and the United Kingdom.

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EN 4040:2006 (E)**1 Scope**

This standard specifies the characteristics of spherical plain bearings in corrosion resisting steel with self-lubricating liner, with wide inner ring, for elevated loads at ambient temperature.

They are intended for use between fixed or moving parts of the aircraft structure and their control mechanisms.

The spherical plain bearings defined in this standard are used from -55 °C to 163 °C .

2 Normative references

The following referenced documents are indispensable for the application 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.

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

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

EN 2030, *Steel FE-PM43 — Hardened and tempered — Bars $D \leq 150\text{ mm}$ — Aerospace series*.¹⁾

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

EN 2539²⁾, *Aerospace series — Steel FE-PM3801(X5CrNiCu17-4) — Air melted — Solution treated and precipitation treated — Bar — a or $D \leq 200\text{ mm}$ — $R_m \geq 965\text{ MPa}$* .³⁾

EN 2755, *Aerospace series — Bearings, spherical plain in corrosion resisting steel with self-lubricating liner — Elevated loads at ambient temperature — Technical specification*.³⁾

EN 3161, *Aerospace series — Steel FE-PM3801(X5CrNiCu17-4) — Air melted — Solution treated and precipitation treated — Bar — a or $D \leq 200\text{ mm}$ — $R_m \geq 930\text{ MPa}$* .³⁾

3 Terms and definitions

For the purposes of this standard, the terms and definitions given in ISO 1132-1 apply.

1) Published as AECMA Standard at the date of publication of this standard.

2) Inactive for new design, see EN 3161.

3) Published as AECMA Prestandard at the date of publication of this standard.

4 Symbols and abbreviations

Δ_{ds} = the deviation of a single bore diameter

Δ_{Ds} = the deviation of a single outside diameter

Δ_{dmp} = single plane mean bore diameter deviation

Δ_{Dmp} = single plane mean outside diameter deviation

α = angle of tilt of the outer ring with respect to the inner ring, the spherical surface of the outer ring being completely in contact with the inner ring.

5 Required characteristics

5.1 Dimensions – Tolerances – Masses

Configuration : see Figure 1 or 2 ; the bearings are fitted with or without swaging grooves.

Values : see Figure 1 or 2 and Table 1: values after surface treatment.

5.2 Surface roughness

See Figures 1 and 2; the values are expressed in micrometres; they apply before surface treatment.

5.3 Materials

Inner ring : EN 2030, $55 < \text{HRC} < 62$ [SIST EN 4040:2009](https://standards.iteh.ai/catalog/standards/sist/66529b50-44f4-4db3-b7f7-8a3f76ac2612/sist-en-4040-2009)

Outer ring : EN 2539, $28 < \text{HRC} < 37$ before swaging

Liner : Self-lubricating low friction wear resistant material consistent with the requirements of EN 2755.

5.4 Surface treatment

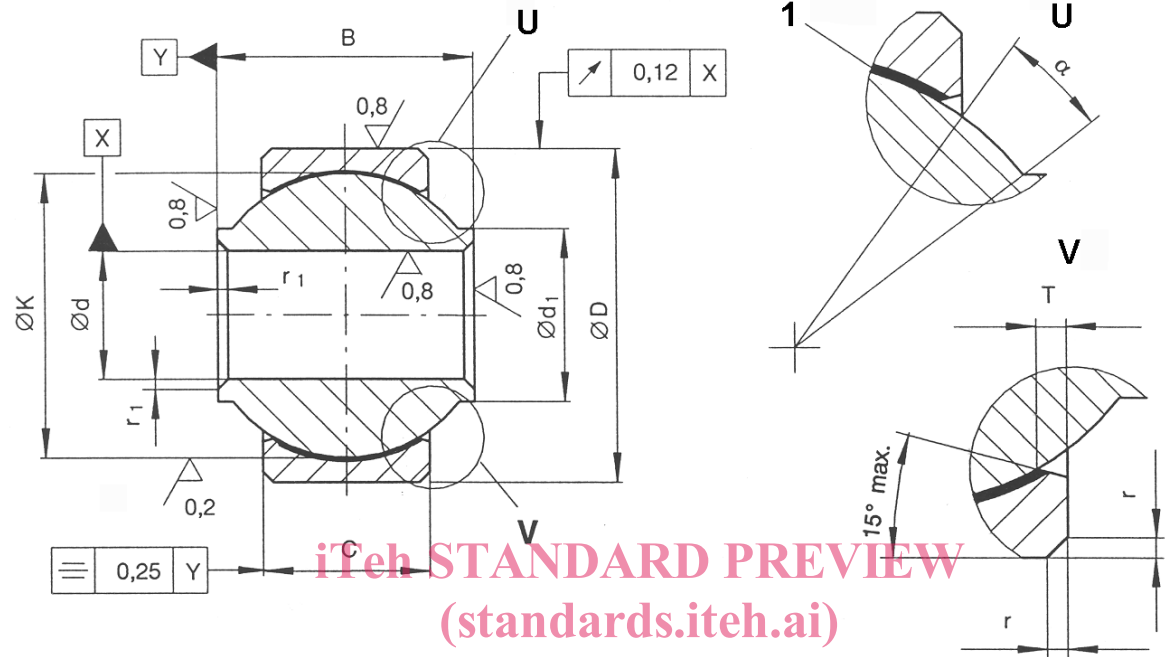
Inner ring : passivated ISO 8075: code T

with no surface treatment: no code

EN 4040:2006 (E)



Break sharp edges and corners and remove all burrs and slivers

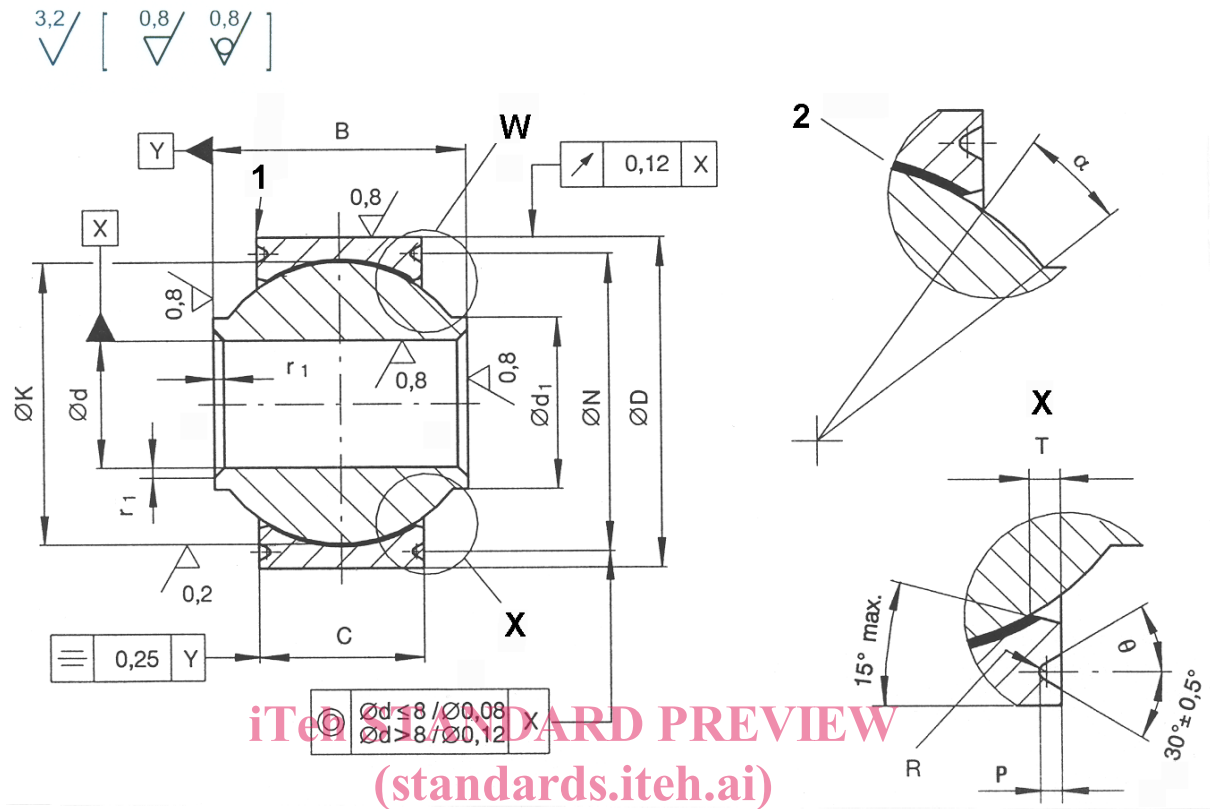


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Key

1 Liner

Figure 1 — Type without swaging grooves, code S



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Key

- 1 Break sharp corners 0,2 max.
- 2 Liner

Figure 2 — Type with swaging grooves, code R