SLOVENSKI STANDARD
SIST EN 4613:2021

01-december-2021

Nadomešča:
SIST EN 4613:2009

Aeronavtika - Kroglasti drsni ležaj iz korozijsko odpornega jekla s samomazalno oblogo, ozki tip - Mere in nosilnosti - Palčne mere

Aerospace series - Spherical plain bearing in corrosion resisting steel with self-lubricating liner, narrow series - Dimensions and loads - Inch series

Luft- und Raumfahrt - Gelenklager aus korrosionsbeständigem Stahl mit selbstschmierender Beschichtung, schmale Reihe - Maße und Belastungen - Inch Reihe

Série aérospatiale - Rotule lisse, en acier résistant à la corrosion, à garniture autolubrifiante, série étroite - Dimensions et charges - Série en inches

Ta slovenski standard je istoveten z: **EN 4613:2021**

ICS:

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

SIST EN 4613:2021 **en,fr,de**

EUROPEAN STANDARD

NORME EUROPÉENNE

EUROPÄISCHE NORM

EN 4613

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ICS 49.035

Supersedes EN 4613:2009

English Version

Aerospace series - Spherical plain bearing in corrosion resisting steel with self-lubricating liner, narrow series - Dimensions and loads - Inch series

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This European Standard was approved by CEN on 12 July 2020.

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

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European foreword

This document (EN 4613:2021) 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-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of an identical text or by endorsement, at the latest by April 2022, and conflicting national standards shall be withdrawn at the latest by April 2022.

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This document supersedes EN 4613:2009.

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Any feedback and questions on this document should be directed to the users' national standards body. A complete listing of these bodies can be found on the CEN website.

1 Scope

This document specifies the characteristics of a bearing, spherical plain in corrosion resisting steel with self-lubricating liner, narrow series for aerospace applications.

These bearings are not intended for use of moving parts especially for control mechanisms and operating systems. They shall be used in the temperature range −55 °C to 163 °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 — De ≤ 150 mm*

EN 2133, *Aerospace series — Cadmium plating of steels with specified tensile strength ≤ 1 450 MPa, copper, copper alloys and nickel alloys*

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

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

EN 3161, *Aerospace series — Steel FE-PM3801 (X5CrNiCu17-4) — Air melted, solution treated and precipitation treated, bar a or D ≤ 200 mm, R_m ≥ 930 MPa*

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

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

TR 4475, *Bearings and mechanical transmissions for airframe applications — Vocabulary*[1]

3 Terms, definitions and symbols

For the purposes of this document, the terms and definitions given in TR 4475 apply.

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

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

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

α = maximum angle of tilt of the inner ring with respect to the outer ring, with the spherical raceway of the outer ring being completely in contact with the inner ring (see Figure 1 and Figure 2);

C_a = permissible static axial load;

C_s = permissible static radial load;

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).

C_{25} = permissible dynamic radial load by 25 000 cycles;

Δ_{dmp} = single plane mean bore diameter deviation;

Δ_{Dmp} = single plane mean outside diameter deviation;

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

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

4 Requirements

4.1 Configuration, dimensions, tolerances and mass

According to Figure 1, Figure 2 and Table 1. Dimensions and tolerances are expressed in millimetres (inches).

Values after passivating and/or cadmium plating.

4.2 Surface roughness

In accordance with Figure 1 and Figure 2. Values in micrometres (micro inches), apply prior to surface treatment.

4.3 Material

Inner ring: according to EN 2030, hardness 55 ≤ HRC ≤ 62;

Outer ring: according to EN 3161, hardness 28 ≤ HRC ≤ 38 before swaging;

Liner: self-lubricating liner according to EN 2755.

4.4 Surface treatment

Code T: Surface treatment according to ISO 8075 for inner ring before swaging.

Code P:

Without swaging groove code S: Surface treatment according to ISO 8075 for inner ring before swaging.

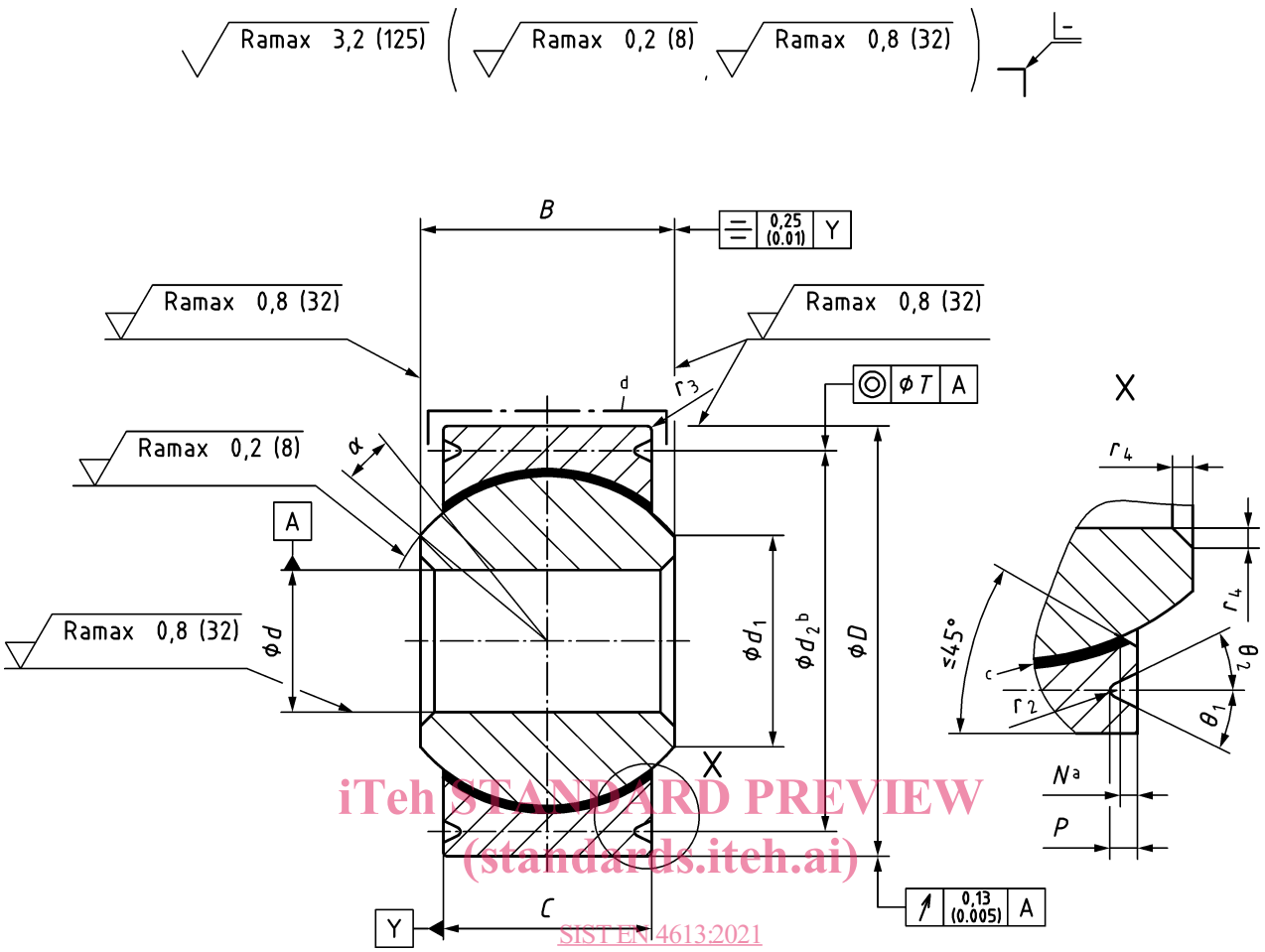
Cadmium plating of outer ring: 5 µm to 8 µm (0.2 µin to 0.3 µin) according to EN 2133 (cylindrical surface area and chamfers and both end surfaces at manufacturer's option), followed by chromating.

With swaging groove code R: Surface treatment according to ISO 8075 for inner ring before swaging.

Cadmium plating of outer ring: 5 µm to 8 µm (0.2 µin to 0.3 µin) according to EN 2133 (cylindrical surface area, broken angles and radii, respectively, as well as both end surfaces up to the swaging grooves), followed by chromating.

4.5 Loads and starting torque values

According to Table 2 and Table 3.



Key

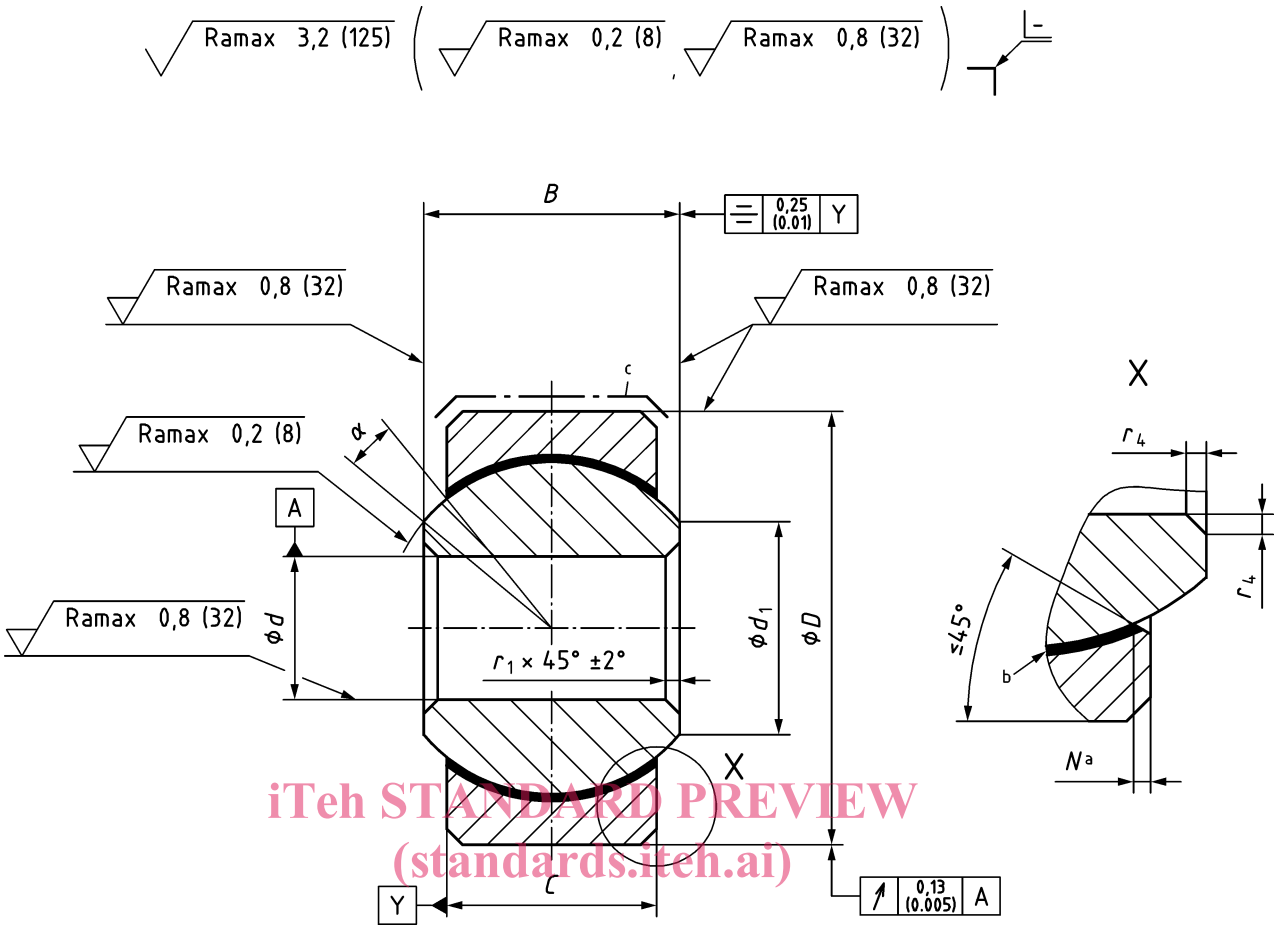
a set back

b swaging groove

c TFE liner

d cadmium plated

Figure 1 — Code R — with swaging grooves



Key

a set back

b TFE liner

c cadmium plated

Figure 2 — Code S — without swaging grooves

Table 1 — Dimensions, tolerances and mass *(1 of 2)*

Dia-meter code[a]	Diameter						B	C	d_1	d_2	P
	d	D	Limit deviation				$^{0}_{-0,05}$	±0,13		$^{0}_{-0,20}$	$^{0}_{-0,254}$
	mm (inches)	mm (inches)	Δ_{dmp}	Δ_{ds}	Δ_{Dmp}	Δ_{Ds}	($^{0}_{-0.002}$)	(±0.005)	min.	($^{0}_{-0.007}$)	($^{0}_{-0.0100}$)
03	4,826 (0.190 0)	14,287 (0.562 5)	$^{0}_{-0,013}$ ($^{0}_{-0.0005}$)	$^{0}_{-0,013}$ ($^{0}_{-0.000 5}$)	$^{0}_{-0,008}$ ($^{0}_{-0.000 3}$)	$^{0}_{-0,013}$ ($^{0}_{-0.000 5}$)	7,14 (0.281)	5,54 (0.218)	7,44 (0.304)	12,70 (0.500)	0,635 (0.025 0)
04	6,350 (0.250 0)	16,667 (0.656 2)					8,71 (0.343)	6,35 (0.250)	9,25 (0.364)	15,09 (0.594)	
05	7,937 (0.312 5)	19,050 (0.750 0)					9,53 (0.375)	7,14 (0.281)	10,64 (0.419)	16,51 (0.650)	0,889 (0.035 0)
06	9,525 (0.375 0)	20,637 (0.812 5)			$^{0}_{-0,009}$ ($^{0}_{-0.000 4}$)		10,31 (0.406)	7,93 (0.312)	12,06 (0.475)	18,08 (0.712)	
07	11,113 (0.437 5)	23,017 (0.906 2)					11,10 (0.437)	8,71 (0.343)	13,46 (0.530)	20,47 (0.806)	
08	12,700 (0.500 0)	25,400 (1.000 0)					12,70 (0.500)	9,91 (0.390)	15,24 (0.600)	22,25 (0.876)	1,397 (0.055 0)
09	14,288 (0.562 5)	27,780 (1.093 7)					14,28 (0.562)	11,10 (0.437)	17,02 (0.670)	24,64 (0.966)	
10	15,875 (0.625 0)	30,163 (1.187 5)					15,88 (0.625)	12,70 (0.500)	18,77 (0.739)	27,00 (1.063)	
12	19,050 (0.750 0)	36,513 (1.437 5)			$^{0}_{-0,011}$ ($^{0}_{-0.000 4}$)		19,05 (0.750)	15,06 (0.593)	23,37 (0.920)	33,35 (1.313)	
14	22,225 (0.875 0)	39,688 (1.562 5)					22,23 (0.875)	17,86 (0.703)	24,89 (0.980)	36,52 (1.438)	
16	25,400 (1.000 0)	44,450 (1.750 0)		$^{+0,003}_{-0,015}$ ($^{+0.000 1}_{-0.000 6}$)	$^{0}_{-0,013}$ ($^{0}_{-0.000 5}$)	$^{+0,003}_{-0,015}$ ($^{+0.000 1}_{-0.000 6}$)	25,40 (1.000)	20,24 (0.797)	28,40 (1.118)	41,30 (1.626)	
20	31,750 (1.250 0)	50,800 (2.000 0)					27,76 (1.093)	23,93 (0.942)	36,42 (1.434)	47,65 (1.876)	
24	38,100 (1.500 0)	61,912 (2.437 0)					33,33 (1.312)	28,70 (1.130)	46,43 (1.828)	58,75 (2.313)	
28	44,450 (1.750 0)	71,437 (2.812 0)					38,89 (1.531)	33,45 (1.317)	50,71 (1.997)	68,27 (2.688)	
32	50,800 (2.000 0)	80,962 (3.187 5)					44,45 (1.750)	38,23 (1.560)	61,98 (2.530)	77,83 (3.064)	