SLOVENSKI STANDARD
SIST EN 2023:2001

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Aerospace series - Bearings, spherical plain in corrosion resisting steel with self-lubricating liner - Normal series - Dimensions and loads

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Luft- und Raumfahrt - Gelenklager aus korrosionsbeständigem Stahl mit selbstschmierender Beschichtung - Normale Reihe - Maße und Belastungen

Série aérospatiale - Rotules en acier résistant à la corrosion a garniture autolubrifiante - Série normale - Dimensions et charges

Ta slovenski standard je istoveten z: **EN 2023:1988**

ICS:

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

SIST EN 2023:2001 **en**

EUROPEAN STANDARD
NORME EUROPÉENNE
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EN 2023

January 1988

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Key words : Aircraft industry, spherical bearing, corrosion resisting steel, linings, self-lubricating parts, dimensions, loads.

English version

Aerospace series
Bearings, spherical plain in corrosion resisting steel with self-lubricating liner
Normal series
Dimensions and loads

Série aérospatiale
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This European Standard was accepted by CEN on 1987-11-16. CEN members are bound to comply with the requirements of CEN 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 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 CEN Central Secretariat has the same status as the official versions.

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CEN

European Committee for Standardization
Comité Européen de Normalisation
Europäisches Komitee für Normung

Central Secretariat : Rue Bréderode 2, B—1000 Bruxelles

Brief history

This European Standard has been prepared by the European Association of Aerospace Manufacturers (AECMA).

After enquiries and votes carried out in accordance with the rules of this Association, this draft has successively received the approval of the National Associations and the Official Services of the member countries of AECMA, prior to its presentation to C.E.N.

According to the Common CEN/CENELEC Rules, following countries are bound to implement this European Standard:

1 Scope and field of application

This standard specifies the characteristics of spherical plain bearings in corrosion resisting steel with self lubricating liner, normal series.

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

They shall be used in the temperature range -55 to +150 °C.

2 References

EN 2030, Steel FE-PM43 - Hardened and tempered - Bars D $\leq$ 150 mm - Aerospace series

EN 2064, Bearings, spherical plain in corrosion resisting steel with self lubricating liner - Technical specification - Aerospace series

EN 2136, Steel FE-PM42 - 900 MPa $\leq$ Rm $\leq$ 1100 MPa - Bars De $\leq$ 100 mm - Aerospace series

EN 2539, Aerospace series - Steel FE-PM61-Rm $\geq$ 960 MPa - Bars De $\leq$ 150 mm 1)

3 Symbols

Δds = the deviation of a single bore diameter
ΔDs = the deviation of a single outside diameter
Δdmp = single plane mean bore diameter deviation
ΔDmp = single plane mean outside diameter deviation
α = maximum displacement angle which can be formed by the outer ring with the inner ring the spherical track of the outer ring being fully in contact with the inner ring.

4 Required characteristics

4.1 Dimensions - Tolerances - Masses

Configuration shall correspond with figures 1 or 2.

Dimensions, tolerances and masses shall correspond with table 1.

4.2 Loads - Starting torques

Loads and starting torques shall correspond with table 2.

4.3 Materials

Inner ring : steel EN 2030
Outer ring : steel EN 2136 or EN 2539
Liner : Self-lubricating low friction wear resisting material consistent with requirements of EN 2064.

1) In preparation.

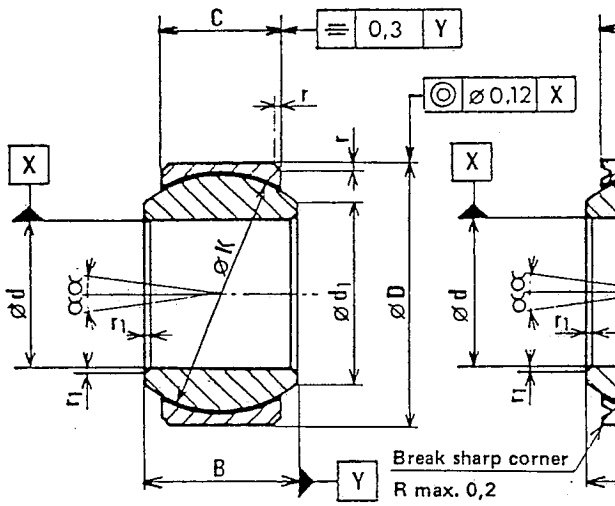


Figure 1 : without swaging groove
Code S

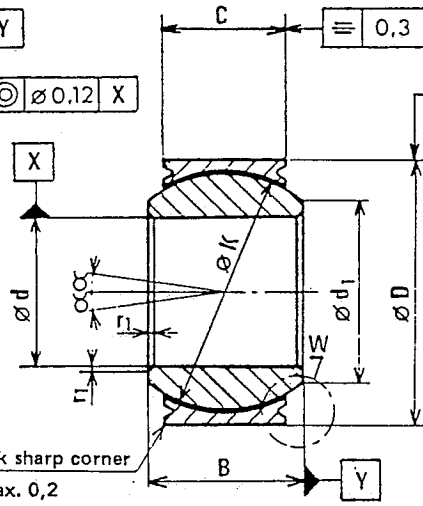
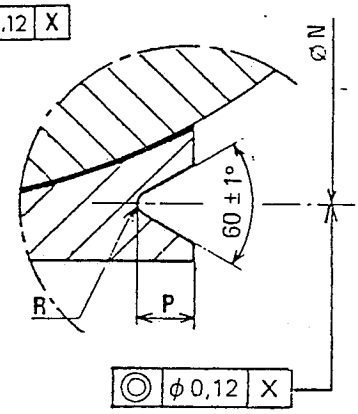


Figure 2 : With swaging grooves
Code R



Detail W

Table 1

Dimensions in millimetres

Séries	d Code	d Nominal	D	C ±0,1	B 0 −0,06	Tolerances µm ΔDmp	ΔDs	Δdmp	Δds	d_1 1) min.	K ≈	r_s	r_1	N +0,1 0	P 0 −0,2	R +0,1 0	α in degrees	Mass ≈ g
Normal narrow series	05	5	14	5,5	7,0	0 −8	+5 −13	0 −8	+2 −10	8,6	11,1	0,5 +0,1 −0,2	0,1 to 0,4	12,2	0,7	0,2	9	7
	06	6	16	6,5	9,0					9,0	12,7			14,2			14	9
	10	10	21	8,0	10,5	0 −9	+6 −15			11,9	15,9	0,8 0 −0,3		18,4	0,9	0,3	11	20
	12	12	25	10,0	13,0				+3 −11	15,0	19,8			22,4			10	32
	22	22	40	18,0	22,0	0 −11	+8 −19	0 −10	+3 −13	27,1	34,9	1,0 0 −0,4		36,8	1,4		8	126
	25	25	45	20,0	25,0					29,6	38,8			41,8				185
	30	30	51	24,0	28,0	0 −13	+10 −23			35,5	45,2			47,8			6	300
Normal wide series	06	6	16	8,5	11,0	0 −8	+5 −13	0 −8	+2 −10	7,7	13,5	0,8 0 −0,3	0,1 to 0,4	14,2	0,7	0,2	15	16
	08	8	18	8,0						10,3	15,0			16,2			14	17
	10	10	21	10,0	12,5	0 −9	+6 −15		+3 −11	12,2	17,5			18,4	0,9	0,3	10	27
	12	12	26	13,0	16,0					15,5	22,2			23,4				49
	15	15	29	13,5	17,0					18,9	25,4			26,4			9	62
	17	17	30	14,5	18,0					20,1	27,0			27,4				69
	20	20	35	16,0	20,0	0 −11	+8 −19	0 −10	+3 −13	23,5	30,9	1,0 0 −0,4		31,8	1,4		8	104
	25	25	54	26,0	32,0	0 −13	+10 −23			35,3	47,6			50,8			9	445
	30	30	60	28,0	34,0					40,9	53,2	1,2 0 −0,4		56,8			8	480
	35	35	65	29,0	36,0			0 −12	+3 −15	45,5	58,0			61,8				565
	40	40	68	31,0	38,0					47,0	60,4			64,8				600
	45	45	76	33,0	41,0					54,1	67,9			72,8				800
	50	50	82	35,0	44,0	0 −15	+13 −28			60,3	74,6			78,8				970

1) Attention should be paid to the possible indentation of the support mountings by the inner ring bearing faces.

Table 2

Series	d Nominal mm	Permissible static loads kN			Permissible dynamic radial loads 25000 cycles kN	Starting torques N.m
		Radial C_s	Axial C_a	axial for spherical bearings with swaging grooves after swaging 1)		
Normal narrow series	5	18,6	1,5	1,5	7,4	0,08 to 0,50
	6	26,7	2,7	2,7	10,7	
	10	43,7	5,1	5,1	17,4	0,12 to 0,80
	12	68,2	9,5	9,5	27,3	
	22	240,2	40,5	21,0	96,1	0,25 to 1,00
	25	307,0	51,7	24,0	122,8	
	30	389,0	78,0	29,0	155,6	0,40 to 2,00
Normal wide series	6	40,0	6,1	3,0	16,0	0,08 to 0,50
	8	41,5	5,1	4,5	16,6	0,12 to 0,80
	10	63,0	9,5	6,5	25,2	
	12	105,1	18,6	10,5	42,0	
	15	125,6	20,4	12,5	50,2	
	17	144,9	24,3	13,2	58,0	
	20	191,1	30,7	17,0	76,4	
	25	491,4	93,2	31,5	196,5	0,25 to 1,00
	30	548,6	109,7	36,0	219,5	0,40 to 2,00
	35	623,6	118,5	39,5	249,5	
	40	701,3	137,0	42,0	280,5	0,60 to 3,50
	45	846,2	157,0	48,0	338,5	
	50	994,5	178,2	52,5	397,8	

1) These values are given for information. The actual values depend on the method of swaging.

5 Designation

Each spherical plain bearing shall only be designated as in the following example :

Description block	Identity block
SPHERICAL PLAIN	EN2023S06E

Number of EN standard

S = Code for type without swaging groove (See figure 2)

06 = Code diameter d (See table 1)

E = Code for narrow normal series

Where the following codes for type are applied :

R = with swaging grooves
S = without swaging groove
E = narrow normal series
L = wide normal series

Note : If necessary, the originator code S9005 may be introduced between the description block and the identity block.

6 Marking

In addition to the manufacturer's own marking, each spherical plain bearing shall be marked, using the identity block as defined in clause 5 of this standard.

Marking position and method are at the manufacturer's option.

7 Technical specification

Bearings, spherical plain supplied to this standard shall conform with the requirements of EN 2064.