

# SLOVENSKI STANDARD

## SIST EN 3048:2001

01-januar-2001

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

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

Luft- und Raumfahrt - Gelenklager aus korrosionsbeständigem Stahl mit selbstschmierender Beschichtung - Leichte Reihe - Hohe Belastungen bei Raumtemperatur - Maße und Belastungen

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Série aérospatiale - Rotules en acier résistant a la corrosion a garniture autolubrifiante - Série légère a charge élevée a température ambiante - Dimensions et charges

**Ta slovenski standard je istoveten z: EN 3048:1992**

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**ICS:**

49.035	Sestavni deli za letalsko in vesoljsko gradnjo	Components for aerospace construction
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**SIST EN 3048:2001**

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EUROPEAN STANDARD

EN 3048:1992

NORME EUROPÉENNE

EUROPÄISCHE NORM

May 1992

UDC 629.7.02:621.822.3-408.2-72.004.1:669.14.018.89

Descriptors: Aircraft industry, spherical bearings, corrosion resisting steel, self-lubricating parts, dimensions, loads

English version

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

Série aérospatiale - Rotules en acier résistant à la corrosion à garniture autolubrifiante - Série légère à charge élevée à température ambiante - Dimensions et charges

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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.

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**CEN**

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

Central Secretariat: rue de Stassart, 36 B-1050 Brussels

Foreword

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

After inquiries and votes carried out in accordance with the rules of this Association, this Standard has successively received the approval of the National Associations and the Official Services of the member countries of AECMA, prior to its presentation to CEN.

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According to the Common CEN/CENELEC Rules, the following countries are bound to implement this European Standard: Austria, Belgium, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Luxembourg, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland and United Kingdom.

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INTERNATIONAL NORMING OF TECHNICAL

## 1 Scope and field of application

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

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  $- 55\text{ }^{\circ}\text{C}$  to  $+ 163\text{ }^{\circ}\text{C}$ .

## 2 Normative References

- ISO 1132 Rolling bearings - Tolerances - Definitions
- EN 2030 Steel FE-PM43 - Hardened and tempered - Bars  $D \leq 150\text{ mm}$  - Aerospace series <sup>1)</sup>
- EN 2132 Electrodeposition of chromium for engineering purposes - Aerospace series <sup>1)</sup>
- EN 2539 Aerospace series - Steel FE-PM61 - Solution annealed and precipitation hardened -  $R_m \geq 960\text{ MPa}$  - Bars  $D_e \leq 120\text{ mm}$  <sup>2)</sup>
- EN 2755 Aerospace series - Bearings, spherical plain in corrosion resisting steel with self-lubricating liner - Elevated loads at ambient temperature - Technical specification <sup>3)</sup>.

## 3 Symbols

The definitions of tolerances and clearances are given in ISO 1132.

- $\Delta_{ds}$  = the deviation of a single bore diameter
- $\Delta_{Ds}$  = the deviation of a single outside diameter
- $\Delta_{dmp}$  = single plane mean bore diameter deviation
- $\Delta_{Dmp}$  = single plane mean outside diameter deviation
- $\alpha$  = maximum 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.

## 4 Required characteristics

### 4.1 Configuration - Dimensions - Tolerances - Mass

See figures 1 and 2 and table 1.

### 4.2 Surface roughness

See figures 1 and 2.

### 4.3 Materials

- Inner ring : Steel EN 2030, Hardness  $55 \leq \text{HRC} \leq 62$
- Outer ring : Steel EN 2539, Hardness  $28 \leq \text{HRC} \leq 37$  before swaging
- Liner : Self-lubricating low friction wear resistant material consistent with the requirements of EN 2755.

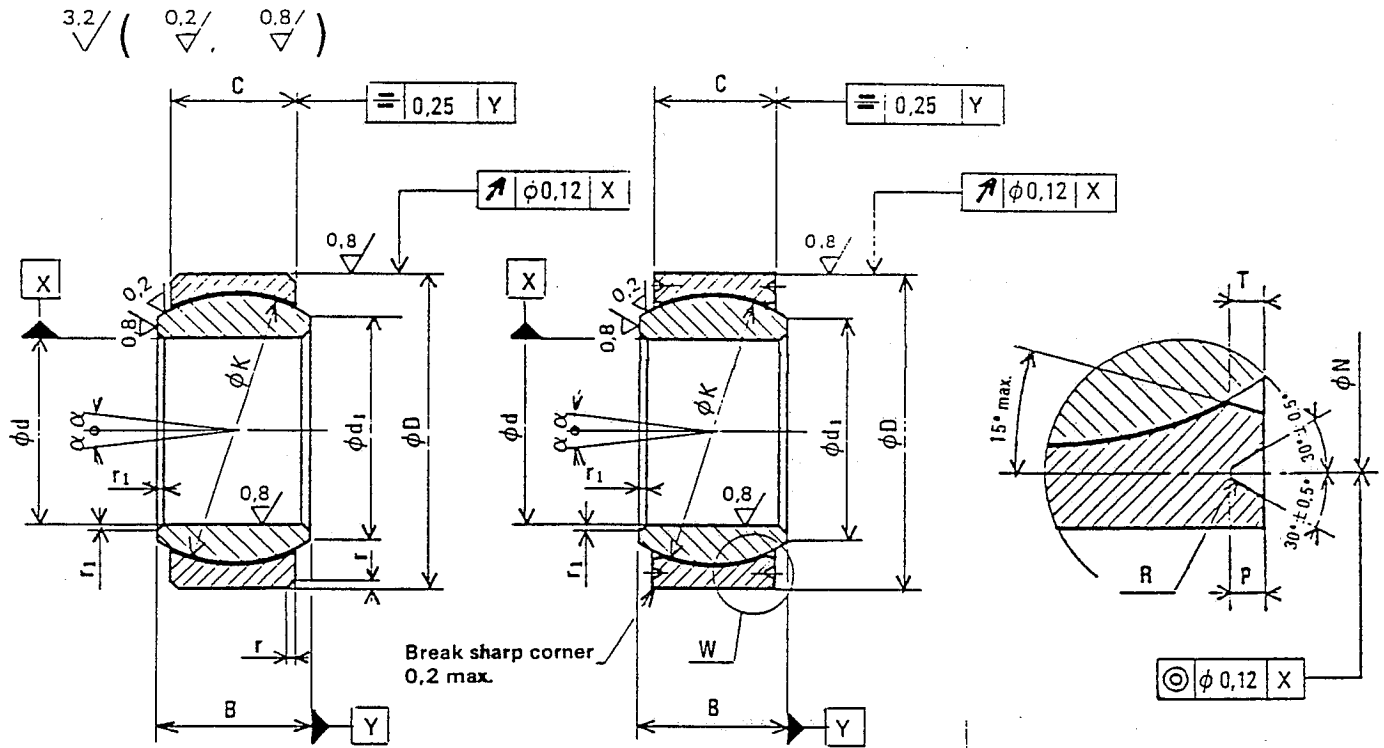
### 4.4 Surface treatment

If specified in designation, chromium plating EN 2132, thickness  $15\text{ }\mu\text{m}$  to  $50\text{ }\mu\text{m}$  on the spherical surface of the inner ring.

1) Published as AECMA standard at the date of publication of the present standard

2) Published as AECMA pre-standard at the date of publication of the present standard.

3) In preparation at the date of publication of the present standard.



Without swaging grooves - Code S  
Figure 1

With swaging grooves - Code R  
Figure 2

Detail W

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Table 1

Dimensions in millimetres

Code	d Nom.	B	C	D	Tolerances $\mu\text{m}$				$d_1$ 1) min.	K $\approx$	N +0,1 0	P 0 -0,2	R +0,1 0	r	$r_1$	T max.	$\alpha$ in degrees min.	Mass $\approx$ g/piece
					$\Delta D_{mp}$	$\Delta D_s$	$\Delta d_{mp}$	$\Delta d_s$										
12	12	10	7	22					14,3	17,5	20,2					0,9	11	17
15	15	12	9	26	0 -9	+6 -15	0 -8	+3 -11	18,7	22,3	24,2	0,7	0,2	0,8 -0,3	0,1	1,0	9	26
17	17	14	10	30					21,2	25,5	28,2					10	40	
20	20	16	12	35					24,9	29,8	33,2					9	65	
25	25	20	16	42	0 -11	+8 -19	0 -10	+3 -13	30,0	36,1	39,4	0,9		1,0 -0,4	to	1,2	7	115
30	30	22	18	47					34,3	40,8	44,4					6	160	
35	35	25	20	55					40,5	47,6	51,8						229	
40	40	28	22	62	0 -13	+10 -23	0 -12	+3 -15	45,0	53,1	58,8	1,4		1,2 -0,4	0,4	1,5	7	315
45	45	32	25	68					51,3	60,5	64,8						460	
50	50	35	28	75					58,2	68,0	71,8						560	

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

## 4.5 Loads and starting torque values

See table 2.

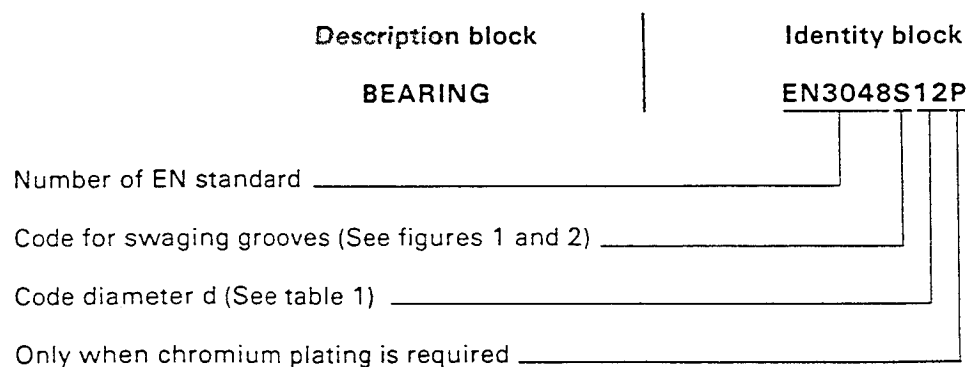
Table 2

d Nominal mm	Permissible static loads kN		Permissible dynamic radial loads 25 000 cycles kN	Starting torques N.m
	Radial C <sub>s</sub>	Axial <sup>1)</sup> C <sub>a</sub>		
12	46,4	3,7	25,5	0,12 to 0,80
15	79,5	8,0	43,7	
17	102,6	10,6	56,4	
20	147,4	17,0	81,0	
25	221,7	28,7	110,8	0,25 to 1,00
30	285,6	38,2	142,8	0,40 to 2,00
35	374,5	48,7	187,3	
40	462,7	60,7	231,3	0,60 to 3,50
45	605,8	81,6	302,9	
50	768,0	105,6	384,0	

1) These values apply to bearings without swaging groove. For bearings with swaging grooves, the push-out loads may be smaller than these values.

## 5 Designation

Example :



NOTE : If necessary, the originator code I9005 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

EN 2755.

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