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

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

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

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

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**Ta slovenski standard je istoveten z: EN 2022:1988**

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**ICS:**

49.035

Sestavni deli za letalsko in  
vesoljsko gradnjo

Components for aerospace  
construction

**SIST EN 2022:2001**

**en**

## **iTeh STANDARD PREVIEW (standards.iteh.ai)**

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EUROPEAN STANDARD  
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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  
Light series  
Dimensions and loads

Série aéronautique  
Rotules en acier résistant à la corrosion  
à garniture autolubrifiante  
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SIST EN 2022:2001

<https://standards.iteh.ai/catalog/standards/sist/4f798657-46b5-4f5c-b506-1987-11-16>

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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.

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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

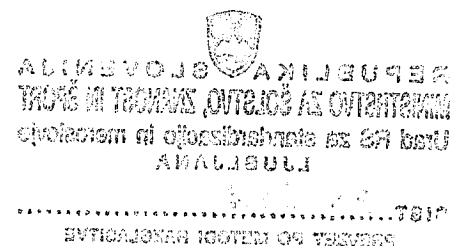
### Brief history

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:

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## 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.

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 -  $900 \text{ MPa} \leq R_m \leq 1100 \text{ MPa}$  - Bars  $D_e \leq 100$  mm - Aerospace series

EN 2539, Aerospace series - Steel FE-PM61- $R_m \geq 960 \text{ MPa}$  - Bars  $D_e \leq 150$  mm 1)

## 3 Symbols

$\Delta_{ds}$  = 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 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 steel EN 2539

Liner : Self-lubricating low friction wear resisting material consistent with requirements of EN 2064.

1) In preparation.

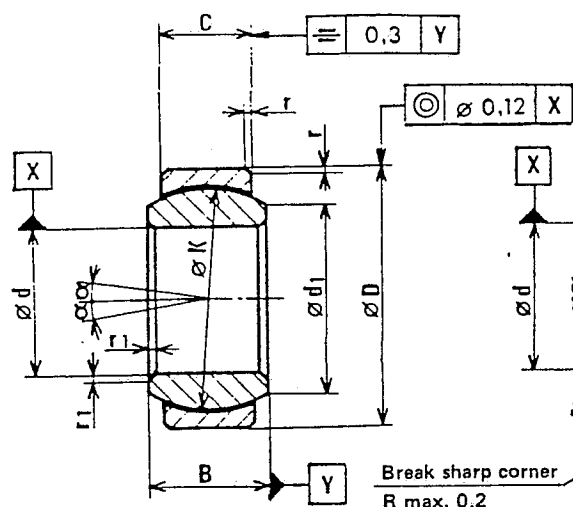


Figure 1 : without swaging groove  
Code S

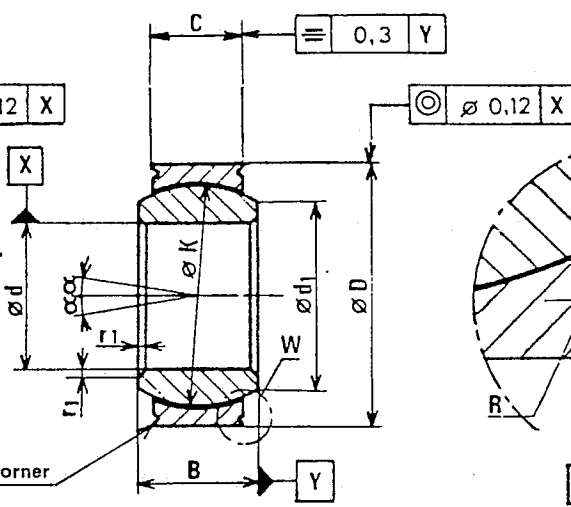
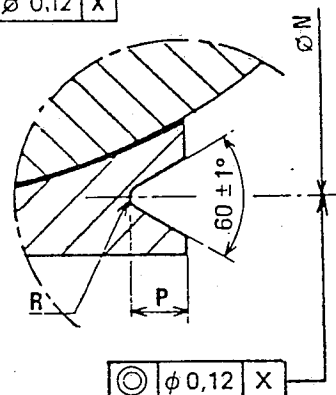


Figure 2 : with swaging grooves  
Code R



Detail W

Table 1

Dimensions in millimetres

| Code | d<br>Nominal | D  | C  | B  | Tolerances $\mu\text{m}$ |              |                 |              | $d_1$<br>min. | K    | r    | $r_1$ | N    | P   | R   | $\alpha$<br>in<br>degrees | Mass<br>$\approx$<br>g |
|------|--------------|----|----|----|--------------------------|--------------|-----------------|--------------|---------------|------|------|-------|------|-----|-----|---------------------------|------------------------|
|      |              |    |    |    | $\Delta d_{mp}$          | $\Delta d_s$ | $\Delta d_{mp}$ | $\Delta d_s$ |               |      |      |       |      |     |     |                           |                        |
| 12   | 12           | 22 | 7  | 10 | 0                        | +6           | 0               | +3           | 14,3          | 17,5 | 0,8  | 0     | 20,2 | 0   | 0,2 | 11                        | 17                     |
| 15   | 15           | 26 | 9  | 12 | -9                       | -15          | -8              | -11          | 18,7          | 22,2 | 0,8  | 0     | 24,2 | 0,7 | 0,2 | 9                         | 32                     |
| 17   | 17           | 30 | 10 | 14 |                          |              |                 |              | 21,2          | 25,4 |      |       | 28,2 |     |     | 10                        | 49                     |
| 20   | 20           | 35 | 12 | 16 |                          |              |                 |              | 24,9          | 29,6 |      |       | 33,2 |     |     | 9                         | 65                     |
| 25   | 25           | 42 | 16 | 20 | 0                        | +8           | 0               | +3           | 30,0          | 36,0 | +0,5 | 0     | 39,4 |     |     | 7                         | 115                    |
| 30   | 30           | 47 | 18 | 22 | -11                      | -19          | -10             | -13          | 34,3          | 40,7 | -0,4 |       | 44,4 | 0,9 |     | 6                         | 160                    |
| 35   | 35           | 55 | 20 | 25 |                          |              |                 |              | 40,5          | 47,6 |      |       | 51,8 |     |     | 7                         | 229                    |
| 40   | 40           | 62 | 22 | 28 | 0                        | +10          | 0               | +3           | 45,0          | 53,0 | +0,5 | 0     | 58,8 |     |     | 7                         | 315                    |
| 45   | 45           | 68 | 25 | 32 | -13                      | -23          | -12             | -15          | 51,3          | 60,4 | 1,2  | -0,4  | 64,8 | 1,4 |     | 7                         | 460                    |
| 50   | 50           | 75 | 28 | 35 |                          |              |                 |              | 58,2          | 67,9 |      |       | 71,8 |     |     | 7                         | 560                    |

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

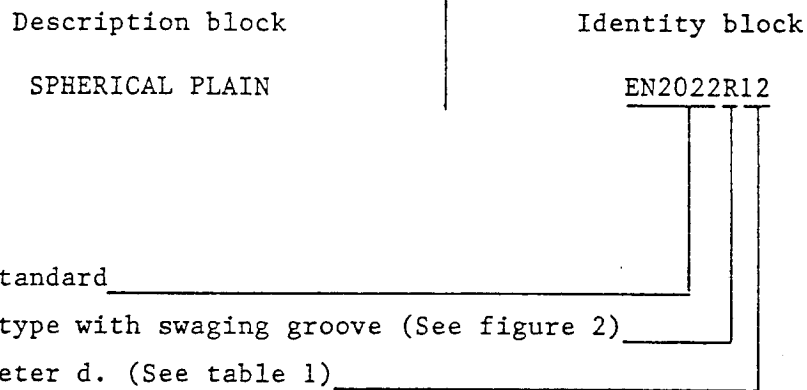
Table 2

| d<br>nominal<br>mm | Permissible static loads kN |                |                                                                             | Permissible<br>dynamic<br>radial loads<br>25000 cycles<br>kN | Starting<br>torques<br>N.m |
|--------------------|-----------------------------|----------------|-----------------------------------------------------------------------------|--------------------------------------------------------------|----------------------------|
|                    | radial<br>$C_s$             | axial<br>$C_a$ | axial for<br>spherical bearings<br>with swaging grooves<br>after swaging 1) |                                                              |                            |
| 12                 | 40,5                        | 1,5            | 1,5                                                                         | 16,2                                                         | 0,12 to 0,80               |
| 15                 | 66,9                        | 5,1            | 5,1                                                                         | 26,7                                                         |                            |
| 17                 | 87,4                        | 7,1            | 7,1                                                                         | 34,9                                                         |                            |
| 20                 | 127,3                       | 13,7           | 13,7                                                                        | 50,9                                                         |                            |
| 25                 | 216,7                       | 28,6           | 22,2                                                                        | 86,7                                                         | 0,25 to 1,00               |
| 30                 | 262,5                       | 38,0           | 26,0                                                                        | 105,0                                                        | 0,40 to 2,00               |
| 35                 | 348,1                       | 49,0           | 32,5                                                                        | 139,0                                                        |                            |
| 40                 | 410,2                       | 61,2           | 37,5                                                                        | 164,1                                                        | 0,60 to 3,50               |
| 45                 | 545,5                       | 81,9           | 42,0                                                                        | 218,2                                                        |                            |
| 50                 | 695,7                       | 105,6          | 47,0                                                                        | 278,3                                                        |                            |

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

## 5 Designation

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



Where the following code for type is applied :

R = with swaging grooves  
S = without swaging groove

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

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## 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.