

**SLOVENSKI STANDARD**  
**SIST EN 3284:2001****01-januar-2001**

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**Aerospace series - Bearings, airframe rolling - Rigid single row ball bearings in steel - Diameter series 0 and 2 - Normal clearance category - Dimensions and loads**

Aerospace series - Bearings, airframe rolling - Rigid single row ball bearings in steel - Diameter series 0 and 2 - Normal clearance category - Dimensions and loads

Luft- und Raumfahrt - Flugwerkklager - Einreihige Rillenkugellager aus Stahl - Durchmesserreihen 0 und 2 - Normale Lagerluft - Maße und Belastungen

Série aérospatiale - Roulements pour structures d'aéronefs - Roulements en acier, rigides, a une rangée de billes - Séries de diamètres 0 et 2 - Catégorie a jeux normaux - Dimensions et charges

**Ta slovenski standard je istoveten z: EN 3284:1994**

**ICS:**

49.035	Sestavni deli za letalsko in vesoljsko gradnjo	Components for aerospace construction
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**SIST EN 3284:2001****en**

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EUROPEAN STANDARD

EN 3284

NORME EUROPÉENNE

EUROPÄISCHE NORM

June 1994

UDC 629.7.02:621.822.74.004.1:669.14

Descriptors: Aircraft industry, airframe bearings, ball bearings, steel, dimensions, static loads

English version

**Aerospace series - Bearings, airframe rolling -  
Rigid single row ball bearings in steel - Diameter  
series 0 and 2 - Normal clearance category -  
Dimensions and loads**

Série aérospatiale - Roulements pour structures  
d'aéronefs - Roulements en acier, rigides, à  
une rangée de billes - Séries de diamètres 0 et  
2 - Catégorie à jeux normaux - Dimensions et  
charges

Luft- und Raumfahrt - Flugwerkklager -  
Einreihige Rillenkugellager aus Stahl -  
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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



## 1 Scope

This standard specifies the characteristics of rigid single row ball bearings in steel <sup>1)</sup> of diameter series 0 and 2 <sup>2)</sup> designed to withstand only slow rotations and oscillations under load.

They are intended for use between fixed and moving parts of the aircraft structure and their control mechanisms. The airframe rolling bearings defined in this standard are used from - 54 °C to + 150 °C.

However, being lubricated with the following greases :

- very high pressure grease, ester type (code A), operational range - 73 °C to + 121 °C or
- very high pressure grease, synthetic hydrocarbons, general purpose (code B), operational range - 54 °C to + 177 °C (see EN 3280),

their field of application when lubricated with code A grease is limited to + 121 °C.

## 2 Normative references

This European Standard incorporates by dated or undated reference provisions from other publications. These normative references are cited at the appropriate places in the text and the publications are listed hereafter. For dated references, subsequent amendments to or revisions of any of these publications apply to this European Standard only when incorporated in it by amendment or revision. For undated references the latest edition of the publication referred to applies.

ISO 15	Rolling bearings - Radial bearings - Boundary dimensions - General plan
ISO 1132	Rolling bearings - Tolerances - Definitions
EN 2031	Steel FE-PL31 - Hardened and tempered - Bars - Aerospace series <sup>3)</sup>
EN 2221	Steel FE-PL31 - Hardened and tempered - Hollow bars 3,5 mm ≤ a ≤ 55 mm - Aerospace series <sup>3)</sup>
EN 2222	Steel FE-PL31 - Hardened and tempered - Hand and die forgings - Aerospace series <sup>3)</sup>
EN 3280	Aerospace series - Bearings, airframe rolling, rigid or self-aligning - Technical specification
EN 3286	Aerospace series - Bearings, airframe rolling - Rigid single row ball bearings in corrosion resisting steel - Diameter series 0 and 2 - Normal clearance category - Dimensions and loads

## 3 Definition

For the purposes of this standard, the following definition applies :

**Bearing** : full complement of balls (without cage), with filling slot.

## 4 Symbols

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

$\Delta_{dmp}$	= single plane mean bore diameter deviation
$\Delta_{Dmp}$	= single plane mean outside diameter deviation
$\Delta_{ds}$	= deviation of a single bore diameter
$\Delta_{Ds}$	= deviation of a single outside diameter
$G_a$	= axial internal clearance
$G_r$	= radial internal clearance
$S_{ia}$	= assembled bearing inner ring face runout with raceway
$S_{ea}$	= assembled bearing outer ring face runout with raceway
$K_{ia}$	= radial runout of assembled bearing inner ring
$K_{ea}$	= radial runout of assembled bearing outer ring
$F_a \text{ max.}$	= permissible static axial load
$C_s$	= permissible static radial load.

1) For new design, use preferably bearings in corrosion resisting steel, see EN 3286

2) See ISO 15

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

## 5 Required characteristics

### 5.1 Dimensions - Tolerances - Clearances - Loads - Mass

Configuration : see figure 1 ; the bearings are fitted with either seals or shields.  
Values : see table 1.

### 5.2 Surface roughness

Raceways and rolling elements :  $R_a = 0,2 \mu\text{m}$

Bore, side faces and cylindrical outer surface :  $R_a = 0,8 \mu\text{m}$ .

### 5.3 Materials

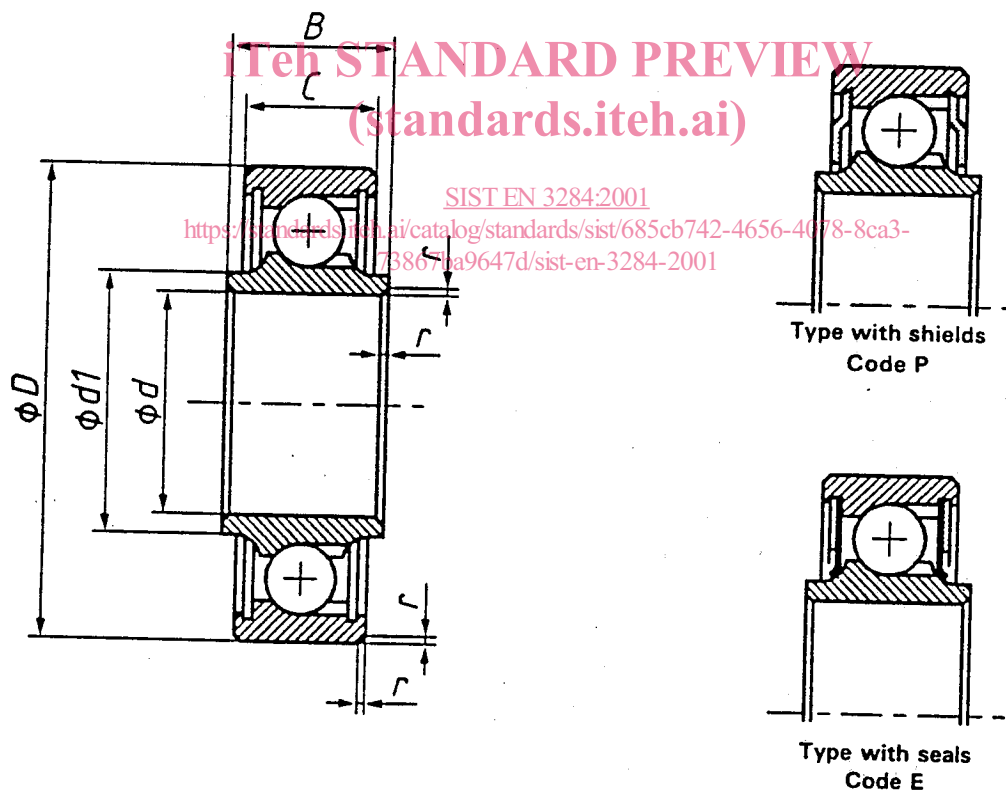
Inner ring : EN 2031 or EN 2221 or EN 2222, 59 HRC to 64 HRC

Outer ring : EN 2031 or EN 2221 or EN 2222, 59 HRC to 64 HRC

Balls : EN 2031, 59 HRC to 64 HRC

Shields : Corrosion resisting material

Seals : Polytetrafluoroethylene (PTFE) or polytetrafluoroethylene (PTFE) reinforced with fibreglass.



NOTE 1 : The installation of seals and shields is at the manufacturer's option.

NOTE 2 : The shields shall not extend beyond « C ».

Figure 1

Table 1

Dimensions in millimetres

d		B	C	D	d1	Tolerances $\mu\text{m}$				r	Mass kg/1000 parts $\approx$		
Code	Nominal	0 - 0,12	0 - 0,12		min.	$\Delta_{dmp}$	$\Delta_{Dmp}$	$\Delta_{ds}$	$\Delta_{Ds}$				
05	5	7	5	16	7,6	0 - 8	0 - 8	+ 2 - 10	+ 2 - 11	0,3 to 0,8	4		
06	6	8	6	19	8,6		0 - 9				+ 2 - 10	+ 2 - 11	9
08	8	9	7	22	10,6								0 - 9
10	10	10	8	26	12,6		0 - 9	+ 3 - 11	+ 2 - 11		21		
12	12			28	14,7						0 - 9	+ 3 - 11	+ 3 - 14
15	15	11	9	32	17,7		0 - 11	+ 3 - 11	+ 3 - 14				
17	17	12	10	35	20,2						0 - 11	+ 3 - 11	+ 3 - 14
20	20	14	12	42	23,5	0 - 11	+ 3 - 11	+ 3 - 14	72				
25	25			47	28,6				0 - 10	+ 3 - 13	+ 4 - 17	85	
30	30	15	13	55	34,1	0 - 10	0 - 13	0,3 to 1				123	

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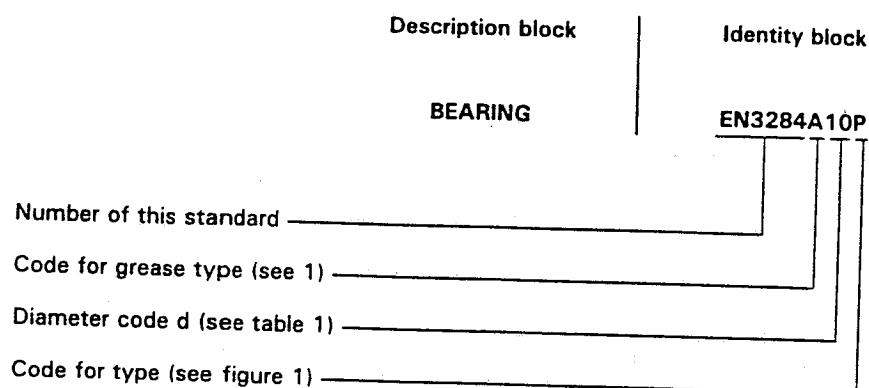
d Code	Internal clearances $\mu\text{m}$		Runout tolerances max. $\mu\text{m}$				Starting torque <sup>1)</sup> in mN.m		Permissible static loads <sup>2)</sup> kN	
	Axial max. $G_a$	Radial $G_r$	Axial		Radial		Code P	Code E	Axial $F_a$ max.	Radial $C_s$
			$S_{ia}$	$S_{ea}$	$K_{ia}$	$K_{ea}$				
05	100	2 to 13	40	40	25	40	2	4	3,1	6,8
06							2,5	5	4,2	9,2
08							3	6,5	5,4	11,8
10							4	7,5	7,7	17
12	120	3 to 18	40	40	25	40	5	8,5	8,9	19,5
15							6	10	10,6	23,3
17							8	12	12,2	26,9
20							10,5	15	18,7	41,2
25							13,5	18	21,2	46,6
30							150	5 to 20	19	25

1) Definition, see EN 3280.

2) Axial and radial loads may be applied simultaneously.  
For ultimate static loads, see EN 3280.

## 6 Designation

EXAMPLE :



NOTE : If necessary, the code I9005 shall be placed between the description block and the identity block.

## 7 Marking

In addition to the manufacturer's own marking, each bearing shall be marked, on one side face only, using the identity block, see 6.

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

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## 8 Technical specification

See EN 3280.

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