SLOVENSKI STANDARD
SIST EN 2009:2001

01-januar-2001

Bearings, airframe rolling, rigid, single row ball bearings in steel, diameter series 8 and 9 - Dimensions and loads - Aerospace series

Bearings, airframe rolling, rigid, single row ball bearings in steel, diameter series 8 and 9 - Dimensions and loads - Aerospace series

Luft- und Raumfahrt - Flugwerklager, einreihige Rillenkugellager aus Stahl, Durchmesserreihen 8 und 9 - Maße und Belastungen

Roulements pour structures d'aéronefs, roulements en acier, rigides a une rangée de billes, séries de diametres 8 et 9 - Dimensions et charges - Série aérospatiale

Ta slovenski standard je istoveten z: **EN 2009:1984**

ICS:

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

SIST EN 2009:2001 **en**

EUROPEAN STANDARD
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Key words : Aircraft industry, airframe bearings, ball bearings, steel, dimensions, static loads

English version

Bearings-airframe rolling rigid, single row ball bearings in steel diameter series 8 and 9 Dimensions and loads Aerospace series

Roulements pour structures d'aéronefs roulements en acier, rigides à une rangée de billes séries de diamètres 8 et 9 Dimensions et charges Série aérospatiale

Luft- und Raumfahrt Flugwerklager einreihige Rillenkugellager aus Stahl Durchmesserreihen 8 und 9 Masze und Belastungen

This European Standard was accepted by CEN on 1984-06-21. 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.

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CEN

European Committee for Standardization
Comité Européen de Normalisation
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EUROPEAN STANDARD

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EN 3281

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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 8 and 9 - Dimensions and loads

Série aérospatiale - Roulements pour structures d'aéronefs - Roulements en acier, rigides, à une rangée de billes - Séries de diamètres 8 et 9 - Dimensions et charges

Luft- und Raumfahrt - Flugwerklager - Einreihige Rillenkugellager aus Stahl - Durchmesserreihen 8 und 9 - Maße und Belastungen

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

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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.

This standard was submitted for Formal Vote, and the result was positive.

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 December 1994, and conflicting national standards shall be withdrawn at the latest by December 1994.

According to the CEN/CENELEC Internal Regulations, 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, United Kingdom.

1 Scope

This standard specifies the characteristics of rigid single row ball bearings in steel [1] of diameter series 8 and 9 [2] 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 [3]
EN 2221	Steel FE-PL31 - Hardened and tempered - Hollow bars 3,5 mm ≤ a ≤ 55 mm - Aerospace series [3]
EN 2222	Steel FE-PL31 - Hardened and tempered - Hand and die forgings - Aerospace series [3]
EN 3280	Aerospace series - Bearings, airframe rolling, rigid or self-aligning - Technical specification
EN 3283	Aerospace series - Bearings, airframe rolling - Rigid single row ball bearings in corrosion resisting steel - Diameter series 8 and 9 - 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.

Δ_{dmp} = single plane mean bore diameter deviation

Δ_{Dmp} = single plane mean outside diameter deviation

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 max. = permissible static axial load

C_s = permissible static radial load.

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1) For new design, use preferably bearings in corrosion resisting steel, see EN 3283

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

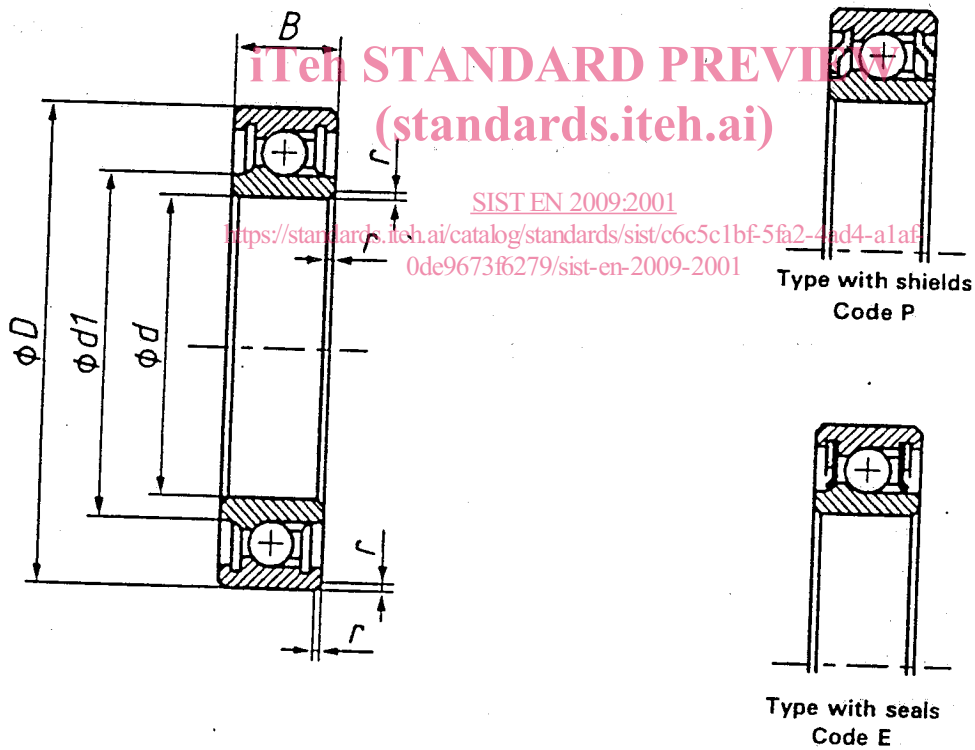
Configuration : see figure 1 ; the bearings are fitted with either seals or shields.
Values : see table 1.

5.2 Surface roughness

Raceways and rolling elements : R_a = 0,2 µm
Bore, side faces and cylindrical outer surface : R_a = 0,8 µm.

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 « B ».

Figure 1

Table 1

Dimensions in millimetres

d		B 0 − 0,12	D	d1 min.	Tolerances µm		r	Mass kg/1000 parts ≈
Code	Nominal				Δ_{dmp}	Δ_{Dmp}		
10	10	6	22	13	0 − 8	0 − 9	0,3 to 0,8	11
12	12		24	15				13
15	15	7	28	17,6				16
17	17		30	19,6				18
20	20		32	23	0 −10	0 −11		20
25	25		37	28,1				23
30	30		42	33,1				26
35	35		47	38,3	0 −12			30
40	40		52	43,3		0 −13		38
50	50		65	53				55
60	60	10	78	63,5	0 −15			100

d Code	Internal clearances µm		Runout tolerances max. µm				Starting torque 1) in mN.m		Permissible static loads 2) 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}				
10	100	2 to 13	40	40	25	40	4,5	12	4,8	10,6
12		3 to 18					5	13	5,6	12,3
15							5,5	14	7,4	16,2
17							6	15	8	17,6
20		5 to 20					6,5	16	7,9	17,3
25							8,5	18	9,8	21,5
30							14	20	11,1	24,5
35		6 to 20					18	23	12,9	28,4
40							22	29	14,5	31,8
50	120	6 to 23					32	47	19,6	43,1
60	150	8 to 28					55	77	31,8	70

1) Definition, see EN 3280.

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