
Aeronavtika - Kotalni leňaji za letala - Enoredni hlebasti krogliľni leňaji iz korozijsko odpornega jekla - Serija s premeroma 8 in 9, z zmanjĝanim radialnim ohlapom leňaja - Mere in nosilnosti

Aerospace series - Bearings, airframe rolling - Rigid single row ball bearings in corrosion resisting steel - Diameter series 8 and 9, reduced internal radial clearance - Dimensions and loads

Luft- und Raumfahrt - Flugwerklager - Einreihige Rillenkugellager aus korrosionsbeständigem Stahl - Durchmesserreihen 8 und 9, reduzierte radiale Lagerluft - Maße und Belastungen

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

Ta slovenski standard je istoveten z: EN 4033:2007

ICS:

49.035

Sestavni deli za letalsko in
vesoljsko gradnjo

Components for aerospace
construction

SIST EN 4033:2009

en,de

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EUROPEAN STANDARD

EN 4033

NORME EUROPÉENNE

EUROPÄISCHE NORM

June 2007

ICS 49.035

English Version

Aerospace series - Bearings, airframe rolling - Rigid single row ball bearings in corrosion resisting steel - Diameter series 8 and 9, reduced internal radial clearance - Dimensions and loads

Série aérospatiale - Roulements pour structures d'aéronefs
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Rillenkugellager aus korrosionsbeständigem Stahl -
Durchmesserreihen 8 und 9, reduzierte radiale Lagerluft -
Maße und Belastungen

This European Standard was approved by CEN on 16 March 2006.

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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 the CEN Management Centre has the same status as the official versions.

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Foreword

This document (EN 4033:2007) has been prepared by the Aerospace and Defence Industries Association of Europe - Standardization (ASD-STAN).

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

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 2007, and conflicting national standards shall be withdrawn at the latest by December 2007.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. CEN [and/or CENELEC] shall not be held responsible for identifying any or all such patent rights.

According to the CEN/CENELEC Internal Regulations, the national standards organizations of the following countries are bound to implement this European Standard: Austria, Belgium, Bulgaria, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, Switzerland and the United Kingdom.

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EN 4033:2007 (E)

1 Scope

This standard specifies the characteristics of rigid single row ball bearings, in corrosion resisting steel, reduced internal radial clearance, diameter series 8 and 9 ¹⁾, 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.

They are intended to be used in the temperature range: – 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

The following referenced documents are indispensable for the application of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

ISO 15, *Rolling bearings — Radial bearings — Boundary dimensions, general plan.*

ISO 1132-1, *Rolling bearings — Tolerances — Part 1: Terms and definitions.*

ISO 8075, *Aerospace — Surface treatment of hardenable stainless steel parts.*

EN 2030, *Steel FE-PM43 — Hardened and tempered — Bars $D \leq 150$ mm — Aerospace series.* ²⁾

EN 2226, *Steel FE-PM43 — Hardened and tempered — Hand and die forgings $D_e \leq 150$ mm — Aerospace series.* ²⁾

EN 2424, *Aerospace series — Marking of aerospace products.*

EN 3280, *Aerospace series — Bearings, airframe rolling, rigid or self-aligning — Technical specification.*

1) See ISO 15.

2) Published as ASD Standard at the date of publication of this standard.

3 Symbols and abbreviations

The definitions of tolerances and clearances are given in ISO 1132-1.

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

4 Required characteristics

4.1 Dimensions – Tolerances – Masses

Configuration : see Figure 1; the bearings are fitted with either seals or shields.

Values : see Figure 1 and Table 1: values after surface treatment.

4.2 Surface roughness (standards.iteh.ai)

Rolling elements and raceways: $R_a = 0,2 \mu\text{m}$

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

For code T, values prior surface treatment

4.3 Materials

Inner ring : Steel EN 2030 or EN 2226, $\geq 58 \text{ HRC}$

Outer ring : Steel EN 2030 or EN 2226, $\geq 58 \text{ HRC}$

Balls : Steel EN 2030, $\geq 58 \text{ HRC}$

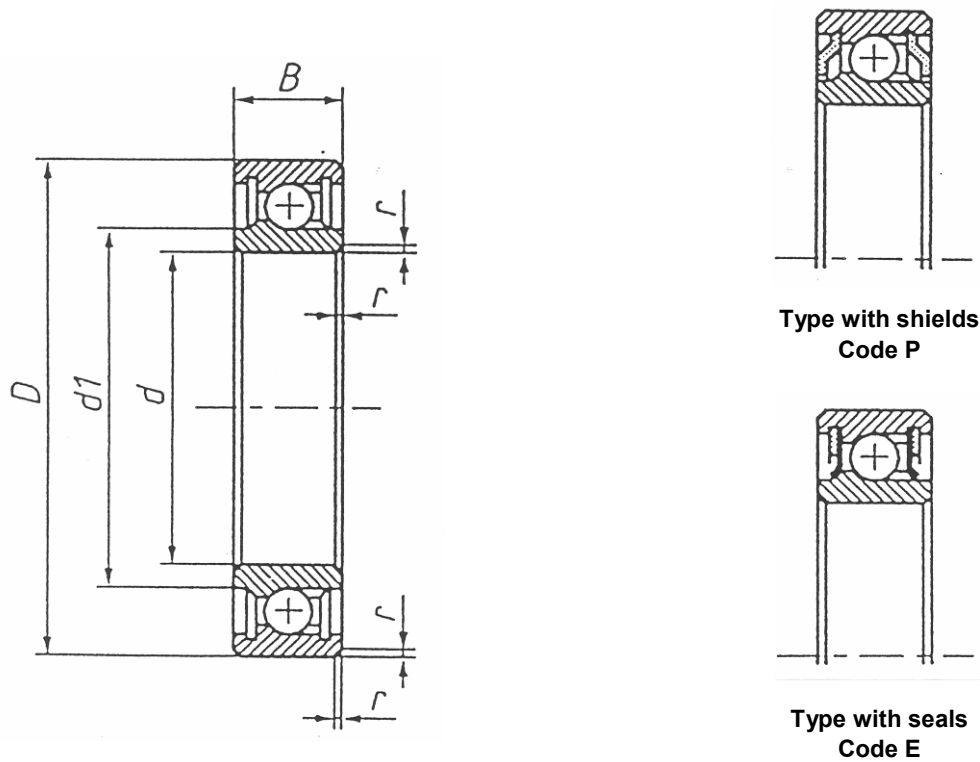
Shields : Corrosion resisting material

Seals : Polytetrafluoroethylene (PTFE) or glass fabric reinforced polytetrafluoroethylene (PTFE)

4.4 Surface treatment

Passivated ISO 8075: Code T

With no surface treatment: no code



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

NOTE 2 The seals shall not extend beyond "B".

Figure 1

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Table 1

Dimensions in millimetres

Diameter d				B	D	d_1	r	Mass g/pieces	
Code	Nominal	Tolerance μm							
		Δ_{dmp}	Δ_{Dmp}	0 − 0,12		min.		$\approx$	
10	10	0 − 8	0 − 9	6	22	13,0	0,3 to 0,8	11	
12	12				24	15,0		13	
15	15			28	17,6	16			
17	17			30	19,6	18			
20	20	0 − 10	0 − 11	7	32	23,0		20	
25	25				37	28,1		23	
30	30				42	33,1		26	
35	35				47	38,3		30	
40	40	0 − 12	0 − 13		52	43,3		38	
50	50				65	53,0		55	
60	60	0 − 15		10	78	63,5			100

4.5 Loads, starting torques and clearances

See Table 2.

Table 2

Diameter code	Permissible static loads		Clearance ^b		Runout tolerances max.				Starting torque ^b max.	
	kN		μm		μm				mN.m	
	Axial load ^a	Radial load ^a	Axial max.	Radial	Axial		Radial		With shields	With seals
					F_a max.	C_s	G_a	G_r		
10	4,8	10,6	100	2	40	40	25	40	4,5	12
12	5,6	12,3		to					5,0	13
15	7,4	16,2		7					5,5	14
17	8	17,6							6,0	15
20	7,9	17,3							6,5	16
25	9,8	21,5							8,5	18
30	11,1	24,5		2					14,0	20
35	12,9	28,4		to					18,0	23
40	14,5	31,8		9					22,0	29
50	19,6	43,1		120					32,0	47
60	31,8	70,0	150	55,0	77					

^a Definition and testing for ultimate static loads as per EN 3280, Annex F.

^b Definition and testing as per EN 3280.

5 Designation

EXAMPLE

Description block	Identity block
BEARING	EN4033A10PT
Number of this standard	
Code letter for grease type (see 1)	
Diameter code (see Table 1)	
Code for shields or seals (see Figure 1)	
Surface treatment (see 4.4)	

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