BS EN 3182:2012

BSI Standards Publication

Aerospace series — Ball bearings, rigid in corrosion resisting steel cadmium plated, for control cable pulleys — Dimensions and loads

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National foreword

This British Standard is the UK implementation of EN 3182:2012.

WARNING Ball bearings conforming to BS EN 3182:2012 have cadmium as plating material. Cadmium has been restricted and/or banned in many countries owing to environmental and health concerns and should not be used on new product designs. Health and safety officials such as surface treatment experts serving aerospace equipment service areas or aerospace product design areas should be consulted about any concerns on using cadmium-plated parts.

The UK participation in its preparation was entrusted to Technical Committee ACE/12, Aerospace fasteners and fastening systems.

A list of organizations represented on this committee can be obtained on request to its secretary.

This publication does not purport to include all the necessary provisions of a contract. Users are responsible for its correct application.

ISBN 978 0 580 75992 5

ICS 49.035

Compliance with a British Standard cannot confer immunity from legal obligations.

This British Standard was published under the authority of the Standards Policy and Strategy Committee on 30 April 2012.

Amendments issued since publication

Date	Text affected

EUROPEAN STANDARD

NORME EUROPÉENNE

EUROPÄISCHE NORM

EN 3182

March 2012

ICS 49.035

English Version

Aerospace series - Ball bearings, rigid in corrosion resisting steel cadmium plated, for control cable pulleys - Dimensions and loads

Série aérospatiale - Roulements à billes, rigides en acier résistant à la corrosion cadmiés, pour poulies de câbles de commande - Dimensions et charges

Luft- und Raumfahrt - Hartkugellager aus korrosionsbeständigem Stahl, verkadmet, für Seilrollen für Steuerseile - Maße und Belastungen

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EUROPÄISCHES KOMITEE FÜR NORMUNG

Management Centre: Avenue Marnix 17, B-1000 Brussels

Ref. No. EN 3182:2012: E

Contents

Foreword

This document (EN 3182:2012) 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 September 2012, and conflicting national standards shall be withdrawn at the latest by September 2012.

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1 Scope

This European Standard specifies the characteristics of ball bearings fitted with shields of seals, for aircraft control cable pulleys.

The pulley bearings defined in this standard shall be 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 (refer to EN 2062);

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

2 Normative references

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

EN 2030, *Aerospace series — Steel FE-PM3501 (X105CrMo17) — Hardened and tempered — Bar $D \leq 150$ mm* [1)]

EN 2062, *Fully non-metallic body pulleys, with bearing, for control cables - Technical specification - Aerospace series* [1)]

EN 2133, *Aerospace series - Cadmium plating of steels with specified tensile strength ≤ 1 450 MPa, copper, copper alloys and nickel alloys*

3 Definitions

Rigid bearings full complement (with or without cage), and one or two rows of balls.

4 Symbols and abbreviations

Δds = the deviation of a single bore diameter

ΔDs = the deviation of a single outside diameter

Δdmp = single plane mean bore diameter

ΔDmp = single plane mean outside diameter

C_S = permissible static radial load

Kia = radial runout of assembled bearing inner ring

Kea = radial runout of assembled bearing outer ring

Sia = assembled bearing inner ring face runout with raceway (groove)

Sea = assembled bearing outer ring face runout with raceway (groove)

1) Published as ASD-STAN pre-standard at the date of publication of the present standard.

5 Required characteristics

5.1 Dimensions — Tolerances — Clearances — Loads — Mass

Configuration shall correspond with Figures 1 or 2. Dimensions shall conform with values shown in the table. Bearings can be assembled with either seals or shields.

5.2 Surface roughness

Ra =0,2 µm for the raceway and rolling elements

Ra =0,8 µm for the bore, side faces and cylindrical outer surface

5.3 Materials

Inner ring: Steel EN 2030, ≥ 58 HRC

Outer ring: Steel EN 2030, ≥ 58 HRC

Balls: Steel EN 2030, ≥ 58 HRC

Shields: Corrosion resisting material

Seals: Polytetrafluorethylene (PTFE),
or polytetrafluorethylene (PTFE), glass fibre reinforced plastic material.

5.4 Surface treatment

Cadmium plating (type of passivation optional), 5 to 12 µm, of the inner and outer rings, the bore and raceway are not cadmium plated. Cadmium plating shall be in accordance with EN 2133. As soon as possible after plating, and within 16 hours de-embrittlement heat treatment shall be carried out at a temperature and for a time (compatible with the performance requirements of the bearing) which shall be subject to written approval of the qualifying authorities.

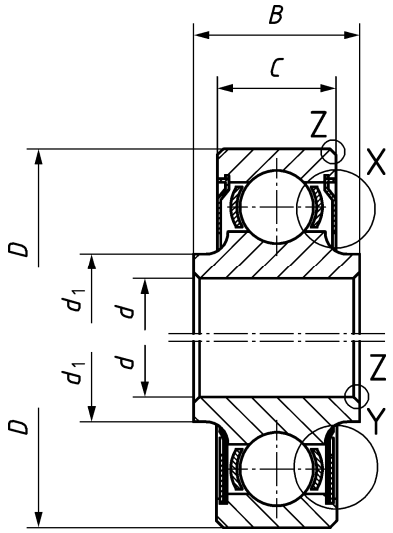
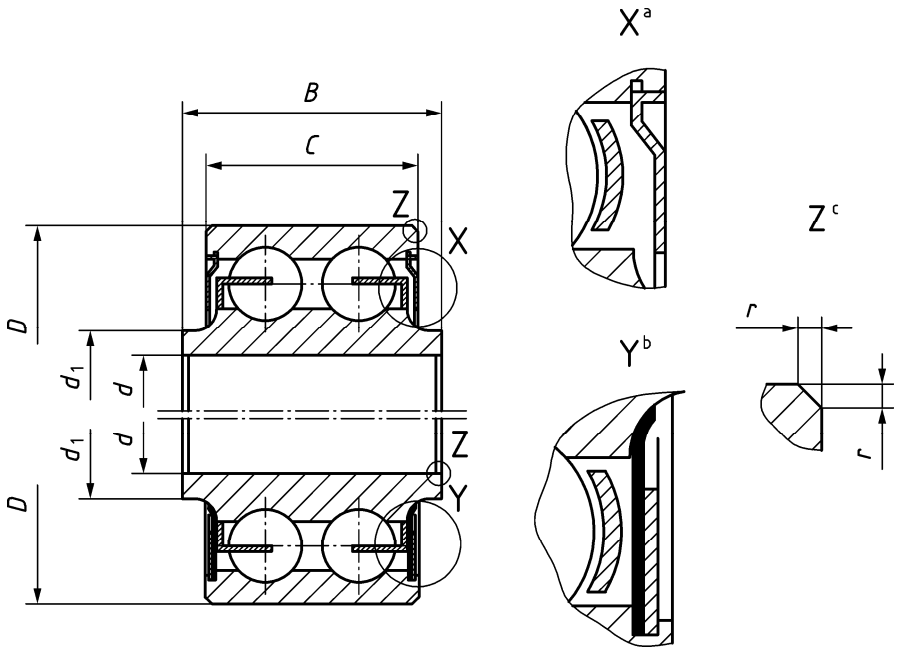


Figure 1

Code 05 without cage

Code 06 with cage



Key

a bearing with shields code P

b bearing with seals code E

c of chamfer applicable to bore and outer surface

Figure 2

Code 08 to 12 with cage

Code 15 without cage

The process for installation of seals and shields is at manufacturer's option.

Table 1

Dimensions in millimetres

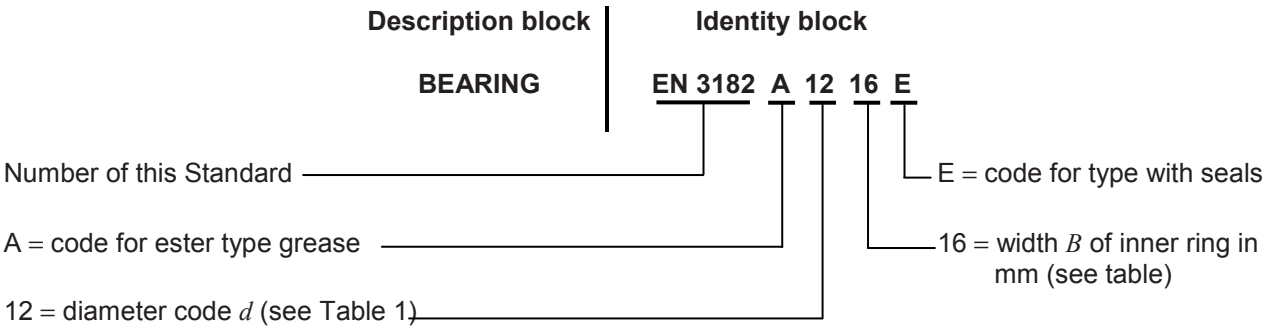
d		*D*	*C* 0 −0,12	*B* 0 −0,12	d_1 nom.	**Tolerances** µm				*r*	**Mass** kg/1 000 Parts ≥
Code	**Nominal**					Δdmp	ΔDmp	Δds	ΔDs		
05	5	16	5	7	7,1	0 −8	0 −8	+2 −10	+2 −10	0,3 to 0,8	4
06	6	19	6	8	8,8						9
08	8	22	10	12	10,6						20
10	10	26	12	14	13,2		0 −9		+2 −11		30
12	12	28	14	16	15,5			+3 −11			40
		32	15	17	16,0		0 −11		+3 −14		55
15	15	32	16	18	17,7						65

d		D	**Axial internal clearance**	**Radial internal clearance**	**Diagonal clearance**	**Axial runout** max. µm		**Radial runout** max. µm		**Starting torque** mNm [a]		**Permisible static radial load** C_S
Code	**Nominal**		µm [a]	µm [a]	µm [a]	d (Sia)	D (Sea)	d (Kia)	D (Kea)	Shields	Seals	kN
05	5	16	8 to 16	120	–	40	40	25	40	1,0	1,6	6,1
06	6	19								0,6	1,0	4,5
08	8	22		–	500 to 1 000					1,2	1,9	9,7
10	10	26								2,4	3,7	13,8
12	12	28								3,0	4,6	19,4
		32								3,5	5,2	25,2
15	15	32	8 to 22							5,0	8,5	42,3

[a] Measured on ball bearing not fitted on pulley.

6 Designation

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



Where the following codes are applied:

Greases	Types
A = ester type grease	E = with seals
B = synthetic hydrocarbon type grease	P = with shields

NOTE If necessary, the originator code S 9005 may be introduced 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 as defined in clause 7 of this standard.

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

8 Technical specification

Bearings supplied to this standard shall conform with the requirements of EN 2062.

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