

Bearings, airframe rolling, rigid or self-aligning — Technical specification

The European Standard EN 3280:1994 has the status of a
British Standard

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National foreword

This British Standard has been prepared under the direction of the Aerospace Standards Policy Committee and is the English language version of EN 3280:1993 *Aerospace series — Bearings, airframe rolling, rigid or self-aligning — Technical specification* published by the European Committee for Standardization (CEN).

EN 3280 was produced as a result of international discussions in which the United Kingdom took an active part.

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Summary of pages

This document comprises a front cover, an inside front cover, pages i and ii, the EN title page, pages 2 to 22, an inside back cover and a back cover.

This standard has been updated (see copyright date) and may have had amendments incorporated. This will be indicated in the amendment table on the inside front cover.

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English version

Aerospace series — Bearings, airframe rolling, rigid or self-aligning — Technical specification

Série aérospatiale — Roulements pour structures d'aéronefs, rigides ou à rotule —
Spécification technique

Luft- und Raumfahrt — Flugwerklager —
Wälzlager, Rillenkugellager oder
Pendellager — Technische Lieferbedingungen

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CEN

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of an identical text or by endorsement, at the latest by August 1994, and conflicting national standards shall be withdrawn at the latest by August 1994.

According to the Internal Regulations of CEN/CENELEC, the following countries are bound to implement this European Standard:

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1 Scope

This standard specifies the required characteristics, inspection and test methods, qualification and acceptance conditions for rigid or self-aligning airframe rolling bearings.

It is applicable whenever referenced.

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 1132, *Rolling bearings — Tolerances — Definitions*.

EN 3042, *Aerospace series — Quality assurance — EN aerospace products — Qualification procedure*.

EN 3045, *Aerospace series — Bearings, airframe rolling — Rigid single row ball bearings in steel — Diameter series 0 and 2 — Reduced clearance category — Dimensions and loads*.

EN 3046, *Aerospace series — Bearings, airframe rolling — Rigid single row ball bearings in steel, cadmium plated — Diameter series 0 and 2 — Reduced clearance category — Dimensions and loads*.

EN 3047, *Aerospace series — Bearings, airframe rolling — Rigid single row ball bearings in corrosion resisting steel — Diameter series 0 and 2 — Reduced clearance category — Dimensions and loads*.

EN 3053, *Aerospace series — Bearings, airframe rolling — Single row self-aligning roller bearings in steel — Dimensions and loads*.

EN 3054, *Aerospace series — Bearings, airframe rolling — Single row self-aligning roller bearings in steel, cadmium plated — Dimensions and loads*.

EN 3055, *Aerospace series — Bearings, airframe rolling — Single row self-aligning roller bearings in corrosion resisting steel — Dimensions and loads*.

EN 3056, *Aerospace series — Bearings, airframe rolling — Rigid double row ball bearings in steel — Dimensions and loads*.

EN 3057, *Aerospace series — Bearings, airframe rolling — Rigid double row ball bearings in steel, cadmium plated — Dimensions and loads*.

EN 3058, *Aerospace series — Bearings, airframe rolling — Rigid double row ball bearings in corrosion resisting steel — Dimensions and loads*.

EN 3281, *Aerospace series — Bearings, airframe rolling — Rigid single row ball bearings in steel — Diameter series 8 and 9 — Dimensions and loads*.

EN 3282, *Aerospace series — Bearings, airframe rolling — Rigid single row ball bearings in steel, cadmium plated — Diameter series 8 and 9 — Dimensions and loads*.

EN 3283, *Aerospace series — Bearings, airframe rolling — Rigid single row ball bearings in corrosion resisting steel — Diameter series 8 and 9 — Dimensions and loads*.

EN 3284, *Aerospace series — Bearings, airframe rolling — Rigid single row ball bearings in steel — Diameter series 0 and 2 — Normal clearance category — Dimensions and loads*.

EN 3285, *Aerospace series — Bearings, airframe rolling — Rigid single row ball bearings in steel, cadmium plated — Diameter series 0 and 2 — Normal clearance category — Dimensions and loads*.

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*.

EN 3287, *Aerospace series — Bearings, airframe rolling — Double row self-aligning ball bearings in steel — Diameter series 2 — Dimensions and loads*.

EN 3288, *Aerospace series — Bearings, airframe rolling — Double row self-aligning ball bearings in steel, cadmium plated — Diameter series 2 — Dimensions and loads*.

EN 3289, *Aerospace series — Bearings, airframe rolling — Double row self-aligning ball bearings in corrosion resisting steel — Diameter series 2 — Dimensions and loads*.

EN 3290, *Aerospace series — Bearings, airframe rolling — Single row self-aligning roller bearings in steel — Diameter series 3 and 4 — Dimensions and loads*.

EN 3291, *Aerospace series — Bearings, airframe rolling — Single row self-aligning roller bearings in steel, cadmium plated — Diameter series 3 and 4 — Dimensions and loads.*

EN 3292, *Aerospace series — Bearings, airframe rolling — Single row self-aligning roller bearings in corrosion resisting steel — Diameter series 3 and 4 — Dimensions and loads.*

3 Definitions

For the use of this standard, the following definitions apply:

3.1 Rolling bearings, rigid or self-aligning

These bearings have a full complement of balls or rollers.

3.1.1 shielded rolling bearing

a bearing whose rolling elements and raceways are protected with shields attached to one of the rings and separated from the other by a small space

3.1.2 sealed rolling bearing

a bearing whose rolling elements and raceways are completely enclosed by seals attached to one of the rings and rubbing on the other

3.2 Surface discontinuities

3.2.1 crack

break in the material which may extend in all directions and be intercrystalline or transcrystalline in character

3.2.2 score, scratch

open surface defect

3.2.3 lap

surface defect where particles of metal or sharp edges are folded over and then rolled or forged into the surface

3.2.4 seam

unwelded fold which appears as an open defect in the material

3.3 radial (K_{ia} , K_{ea}) and axial (S_{ia} , S_{ea}) running accuracy

see ISO 1132

3.4 Internal clearances

3.4.1 radial (G_r)

total value of possible radial displacements of one ring in relation to the other

3.4.2 axial (G_a)

total value of possible axial displacements of one ring in relation to the other

3.4.3 diagonal (G_d)

value of total cant of the inner ring in relation to the outer ring

3.5 starting torque at zero load

maximum torque required to start the rotation of the outer ring with the inner ring held stationary

3.6

delivery batch

this consist of bearings with the same identity block, which may come from different production batches

4 Required characteristics, inspection and test methods

See Table 1.

Table 1

Clause	Characteristics	Requirements	Inspection and test methods	Q ^a	A ^b
4.1	Materials	In accordance with the product standards or design documentation	Chemical analysis or certificate issued by semi-finished product manufacturer.	X	X
4.2	Dimensions and tolerances	In accordance with the product standards or design documentation	Suitable measuring instruments <u>Measurement of bore and outer diameter:</u> — Rings with a width of ≤ 10 mm: in the centre plane. — Rings with a width of > 10 mm: in two planes parallel to the outer faces and at a distance from these faces of twice the maximum value of the ring chamfer. The minimum and maximum diameters shall be determined in each measuring plane. <u>Measurement of ring width:</u> — The width of each ring (distance between the two faces) shall be verified at a minimum of four points.	X	X
4.3	Masses	In accordance with the product standards or design documentation	Suitable methods	X	
4.4	Marking	In accordance with the product standards or design documentation It shall be legible and shall not adversely affect the material or the functioning of the bearing.	Visual examination	X	X
4.5	Surface appearance	No surface discontinuities liable to have an adverse effect on their characteristics and endurance		X	X
4.5.1	Assembled bearings		Visual inspection using suitable methods		
4.5.2	Unassembled rings and balls		Magnetic or dye penetrant inspection		