



SLOVENSKI STANDARD

SIST EN 2337:2001

01-januar-2001

Aerospace series - Spherical plain bearings - Technical specification

Aerospace series - Spherical plain bearings - Technical specification

Luft- und Raumfahrt - Gelenklager - Technische Lieferbedingungen

Série aérospatiale - Rotules lisses - Spécification technique

Ta slovenski standard je istoveten z: EN 2337:1996

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ICS:

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

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EUROPEAN STANDARD

EN 2337

NORME EUROPÉENNE

EUROPÄISCHE NORM

January 1996

ICS 49.040.30

Descriptors: aircraft industry, plain bearing, spherical bearing, specification

English version

**Aerospace series - Spherical plain bearings -
Technical specification**

Série aéronautique - Rotules lisses - Luft- und Raumfahrt - Gelenklager - Technische
Spécification technique Lieferbedingungen

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Up-to-date lists and bibliographical references concerning such national standards may be obtained on application to the Central Secretariat or to any CEN member.

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CEN members are the national standards bodies of Austria, Belgium, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Luxembourg, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland and United Kingdom.

CEN

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

Central Secretariat: rue de Stassart, 36 B-1050 Brussels

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 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of an identical text or by endorsement, at the latest by July 1996, and conflicting national standards shall be withdrawn at the latest by July 1996.

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.

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INTERNATIONAL STANDARD
 EN 2337
 AEROSPACE

 TECHNICAL GROUP OF EUROPEAN COMMITTEE FOR STANDARDIZATION

1 Scope

This standard specifies the required characteristics, inspection and test methods, qualification and acceptance conditions for plain spherical bearings designed to withstand static loads and loads with slight swivelling.

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.

EN 3042 Aerospace series - Quality assurance - EN aerospace products - Qualification procedure

3 Definitions

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

3.1 Surface discontinuities

3.1.1 Crack

Break in the material which may extend in all directions and be intercrystalline or transcrytalline in character

3.1.2 Score, scratch

Open surface defect <https://standards.iteh.ai/catalog/standards/sist/0ef37149-9119-4a02-87d2-76c42453bbc4/sist-en-2337-2001>

3.1.3 Lap

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

3.1.4 Seam

Unwelded fold which appears as an open defect in the material

3.2 Permissible static loads

3.2.1 Radial (C_r)

This corresponds to a permissible unit pressure multiplied by the projected surface area, the inner ring being able to take any position within the limits of the tilting angle indicated in the product standards, or design documentations.

The direction of the load shall remain in the center plane of the outer ring.

3.2.2 Axial (C_a)

This corresponds to a permissible unit pressure multiplied by the effective area projected in the axial direction.

3.3 Production batch

Batch consisting of bearings of the same type, the same dimensions and the same material batch, defined by the same product standard

3.4 Delivery batch

Batch consisting of spherical plain 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

| Sub-clause | Characteristics | Requirements | Inspection and test methods | Q 1) | A 2) |
|------------|---------------------------|---|---|------|------|
| 4.1 | Materials | In accordance with the product standards or design documentation | Chemical analysis or certificate of conformity issued by semi-finished products manufacturer. | X | X |
| 4.2 | Dimensions and tolerances | In accordance with the product standards or design documentation | <p>Suitable measuring instruments</p> <p>Measurement of bore and outer diameter</p> <ul style="list-style-type: none"> - 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. <p>Measurement of ring width :</p> <ul style="list-style-type: none"> - The width of each ring (distance between the two faces) shall be verified at a minimum of four points. <p>Checking of ring symmetry :</p> <ul style="list-style-type: none"> - Repeat this check after rotating the outer ring by 180°. | X | X |
| 4.3 | Mass | 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 |

(continued)

Table 1 (concluded)

| Sub-clause | Characteristics | Requirements | Inspection and test methods | Q 1) | A 2) |
|------------|---|---|--|------|------|
| 4.5 | Surface appearance | The bearing shall be free of surface discontinuities liable to have an adverse effect on their characteristics and endurance. | | | |
| 4.5.1 | Assembled spherical bearings | | Visual examination using suitable methods. | X | X |
| 4.5.2 | Unassembled rings | | Magnetic or dye penetrant inspection | X | X |
| 4.6 | Hardness | In accordance with the product standards or design documentation | Suitable processes and measuring instruments. | X | X |
| 4.7 | Surface roughness | In accordance with the product standards or design documentation | Suitable measuring instruments or visual-tactile samples | X | X |
| 4.8 | Lubrication | In accordance with the product standards or design documentation The dry lubricant shall be compatible with the code A or code B grease (see annexe C) which may be used in accordance with the product standards or design documentation. | Visual examination Suitable method | X | X |
| 4.9 | Internal clearances : - radial; - axial | In accordance with the product standards or design documentation | See annex A. | X | X |
| 4.10 | Behaviour in rotation and swivelling | The bearings shall be able to move freely, within the angular limits specified in the product standards or design documentation for swivelling. | Manual inspection | X | X |
| 4.11 | Permissible static loads : | In accordance with the product standards or design documentation | See annex B. | X | |
| | - radial : C_s | After the removal of the loads, no permanent deformations > 0,07 mm. | | | |
| | - axial : C_a | After the removal of the loads no permanent deformations > 0,1 mm | | | |
| 4.12 | Ultimate static loads : - radial; - axial | After the removal of the loads, there shall be no cracks or deterioration of the bearing. | See annex B. | X | |

1) Q = Qualification test
2) A = Acceptance test

5 Quality assurance

5.1 Product qualification

See EN 3042 and tables 2 and 3.

Qualification shall be obtained for each bearing.

However, qualification of a bearing is acquired if it has been obtained, for the bearing immediately before and the one immediately after the bearing in question, within the range of bearings indicated in the product standard.

5.2 Acceptance conditions

5.2.1 Inspections and tests to be carried out by the manufacturer

See table 4.

5.2.2 User's quality control

The user may, on acceptance of a delivery batch, proceed to inspect it by using the inspections specified in table 4, in full or in part, to ensure that the items conform to the required quality level, and to determine whether the delivery batch is acceptable.

This inspection can be carried out in the user's factory, or, by special agreement, in the manufacturer's factory.

6 Packaging

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The bearings shall be packaged either individually or in rolls so that they will not be damaged during transportation.

They shall be protected against moisture, corrosion, dirt and other harmful substances.

The packaging material in contact with the bearing shall provide this protection and be grease-resistant.

The following indications shall be affixed to each individual package :

- manufacturer's name and address ;
- quantity (for rolls) ;
- identity block as defined by product standards or design documentation ;
- packaging date ;
- lubrication date.

The following indications at least shall appear on collective packaging :

- manufacturer's name and address ;
- number of order ;
- quantity ;
- identity bloc(s) as defined by the products standards or design documentation.

7 Certificate of conformity

All the bearings supplied in accordance with this standard shall be accompanied by a certificate of conformity from the manufacturer.

Table 2 - Non-destructive inspections and tests to be carried out for qualification

| Types of inspections and tests ¹⁾ | | Defined in subclause | Serial n° samples | | | | |
|--|--|----------------------|-------------------|---|---|---|---|
| | | | 1 | 2 | 3 | 4 | 5 |
| Materials | | 4.1 | X | X | X | X | X |
| Dimensions and tolerances | | 4.2 | X | X | X | X | X |
| Mass | | 4.3 | X | X | X | X | X |
| Marking | | 4.4 | X | X | X | X | X |
| Surface appearance | | 4.5 | X | X | X | X | X |
| Hardness | | 4.6 | X | | | | |
| Surface roughness | | 4.7 | X | | | | |
| Lubrication | | 4.8 | X | X | X | X | X |
| Internal clearances | | 4.9 | X | X | X | X | X |
| Behaviour in rotation and swivelling | | 4.10 | X | X | X | X | X |
| 1) The order is left to the initiative of the qualification authority. | | | | | | | |

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Table 3 - Destructive inspections and tests to be carried out for qualification

| Types of inspections and tests ¹⁾ | | | Defined in subclause | Serial n° samples | | | | |
|--|--------|-----------------------|----------------------|-------------------|---|---|---|---|
| | | | | 1 | 2 | 3 | 4 | 5 |
| Test under static load | radial | permissible (C_s) | 4.11 | | X | X | X | |
| | | ultimate | 4.12 | X | X | X | | |
| | axial | permissible (C_a) | 4.11 | | X | X | X | |
| | | ultimate | 4.12 | | | | X | X |
| 1) The order is left to the initiative of the qualification authority. | | | | | | | | |