

# INTERNATIONAL STANDARD

**ISO**  
**12129-2**

First edition  
1995-04-01

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## **Plain bearings —**

### **Part 2:**

Tolerances on form and position and surface roughness for shafts, flanges and thrust collars

*Paliers lisses —*

*Partie 2: Tolérances de forme et de position et rugosité de surface des arbres, collerettes et collets de butée*



Reference number  
ISO 12129-2:1995(E)

## Foreword

ISO (the International Organization for Standardization) is a worldwide federation of national standards bodies (ISO member bodies). The work of preparing International Standards is normally carried out through ISO technical committees. Each member body interested in a subject for which a technical committee has been established has the right to be represented on that committee. International organizations, governmental and non-governmental, in liaison with ISO, also take part in the work. ISO collaborates closely with the International Electrotechnical Commission (IEC) on all matters of electrotechnical standardization.

Draft International Standards adopted by the technical committees are circulated to the member bodies for voting. Publication as an International Standard requires approval by at least 75 % of the member bodies casting a vote.

International Standard ISO 12129-2 was prepared by Technical Committee ISO/TC 123, *Plain bearings*, Subcommittee SC 3, *Dimensions, tolerances and construction details*.

ISO 12129 consists of the following parts, under the general title *Plain bearings*:

- *Part 1: Fits*
- *Part 2: Tolerances on form and position and surface roughness for shafts, flanges and thrust collars*

# Plain bearings —

## Part 2:

## Tolerances on form and position and surface roughness for shafts, flanges and thrust collars

### 1 Scope

This part of ISO 12129 specifies tolerances on form and position as well as the surface roughness of shafts, flanges and thrust collars as used in plain bearing units. It is applicable to journal or thrust plain bearing units or to a combination of both, installed either horizontally or vertically.

This part of ISO 12129 is not applicable to crankshaft bearing units in combustion engines.

### 2 Normative references

The following standards contain provisions which, through reference in this text, constitute provisions of this part of ISO 12129. At the time of publication, the editions indicated were valid. All standards are subject to revision, and parties to agreements based on this part of ISO 12129 are encouraged to investigate the possibility of applying the most recent editions of the standards indicated below. Members of IEC and ISO maintain registers of currently valid International Standards.

ISO 7902-1:—<sup>1)</sup>, *Hydrodynamic plain journal bearings under steady-state conditions — Circular cylindrical bearings — Part 1: Calculation procedure.*

ISO 7902-2:—<sup>1)</sup>, *Hydrodynamic plain journal bearings under steady-state conditions — Circular cylindrical bearings — Part 2: Functions used in the calculation procedure.*

ISO 7902-3:—<sup>1)</sup>, *Hydrodynamic plain journal bearings under steady-state conditions — Circular cylindrical bearings — Part 3: Permissible operational parameters.*

ISO 12301:1992, *Plain bearings — Quality control techniques and inspection of geometrical and material quality characteristics.*

### 3 General

Specifications for use in thick-wall plain journal bearings are based on a minimum wall thickness diameter ratio greater than or equal to 0,11 (reference value).

The reliability of a plain bearing is not only a function of the proper selection of material and fit, but depends in particular on the quality of the shafts, flanges and thrust collars used in the plain bearing unit.

The spread of the accuracy grade is based on the minimum lubricant film thickness  $h_0$ , in micrometers, calculated for each particular application in accordance with parts 1 to 3 of ISO 7902.

### 4 Dimensions

See figures 1 to 4 and table 1.

The illustrations show plain bearings in the horizontal position.

1) To be published.

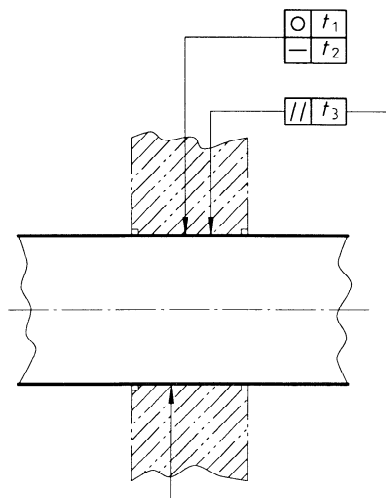


Figure 1 — Shaft for journal bearings — A

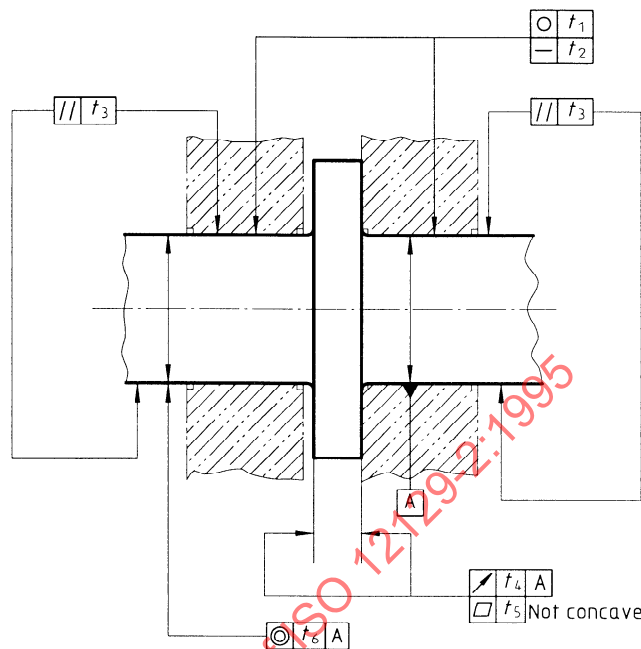


Figure 3 — Shaft with thrust collar for journal thrust bearings, capable of carrying load on both sides — C

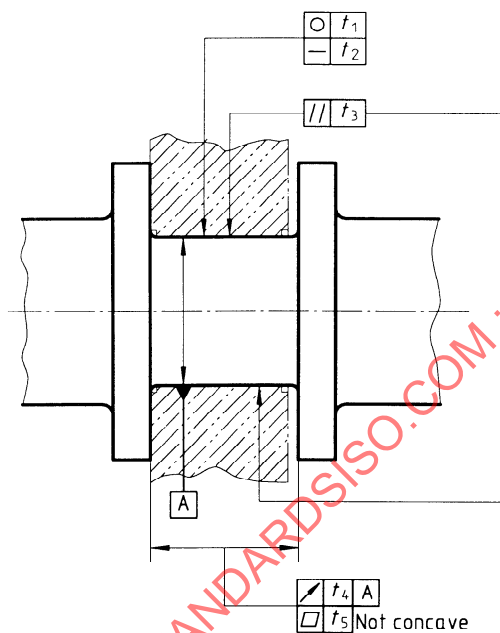


Figure 2 — Shaft with two flanges for journal thrust bearings, capable of carrying load on both sides — B

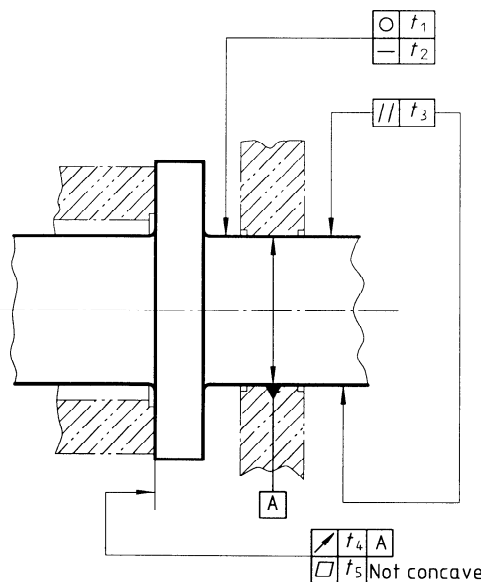


Figure 4 — Shaft with flange or thrust collar for journal thrust bearings, capable of carrying load on one side — D

Table 1

| Feature/parameter on drawing                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |                        |          | Accuracy grade    |                    |                    |               |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------|----------|-------------------|--------------------|--------------------|---------------|
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                        |          | 5                 | 10                 | 20                 | 30            |
| Lubricating film thickness                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | $h_0$ $\mu\text{m}$    |          | $5 \leq h_0 < 10$ | $10 \leq h_0 < 20$ | $20 \leq h_0 < 30$ | $h_0 \geq 30$ |
| Cylindrical form <sup>1)</sup>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | Roundness tolerance    | $t_1$ mm | 0,004             | 0,006              | 0,01               | 0,015         |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | Straightness tolerance | $t_2$ mm | 0,005             | 0,01               | 0,015              | 0,02          |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | Parallelism tolerance  | $t_3$ mm | 0,015             | 0,02               | 0,03               | 0,04          |
| Runout tolerance                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | $t_4$ mm               |          | 0,006             | 0,008              | 0,012              | 0,018         |
| Flatness tolerance <sup>2)</sup>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | $t_5$ mm               |          | 0,006             | 0,008              | 0,012              | 0,018         |
| Concentricity tolerance                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | $t_6$ mm               |          | 3)                | 3)                 | 3)                 | 3)            |
| Surface roughness <sup>4)</sup>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | $R_a$ $\mu\text{m}$    |          | 0,4               | 0,4                | 0,63               | 0,8           |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | $R_z$ $\mu\text{m}$    |          | 2,5               | 4                  | 5                  | 6,3           |
| <p>1) For reasons of measurement techniques and economic considerations, the cylindrical form has been toleranced for characteristics of roundness, straightness and parallelism.</p> <p>2) The restrictive specification "not concave" on figures 2 to 4 shall be observed.</p> <p>3) The concentricity tolerance is a function of the specific operating conditions and thus is subject to agreement.</p> <p>4) The specification of the surface roughness shall be based on <math>R_a</math> or <math>R_z</math>, subject to agreement.</p> |                        |          |                   |                    |                    |               |

## 5 Design

For reasons of production engineering, the curved transition on the shaft between the radial part and the axial part can also be made as an undercut.

Given the great number of possible bearing seals, no details can be indicated with regard to the area of the sealing zone. The geometry and surface finish of the shafts, flanges and thrust collars shall be specified as a function of the bearing seal selected.

## 6 Testing

Testing of the quality characteristics shall be carried out in accordance with ISO 12301.

## 7 Designation

Designation of the tolerances on form and position as well as of the surface roughness of a shaft with two flanges at the position of a journal thrust bearing capable of carrying load on both sides (B) (see figure 2), accuracy grade 20:

**Plain bearing ISO 12129 - B20**

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