INTERNATIONAL STANDARD

ISO 12302

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Plain bearings — Quality characteristics — Statistical process control (SPC)

Paliers lisses — Caractéristiques de qualité — Contrôle statistique du procédé (CSP)

Reference number
ISO 12302:1993(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 12302 was prepared by Technical Committee ISO/TC 123, *Plain bearings*, Sub-Committee SC 5, *Quality, analysis and assurance*.

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Plain bearings — Quality characteristics — Statistical process control (SPC)

1 Scope

This International Standard specifies for plain bearings (except thick-walled half-bearings) those quality characteristics in accordance with ISO 12301 which can be used to regulate and control a production process on the basis of statistical process control (SPC).

It covers dimensional variables but does not take account of attributes.

2 Normative reference

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

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

3 Definitions

For the purposes of this International Standard, the following definitions apply.

3.1 quality characteristic: Characteristic by means of which the quality of a plain bearing is assessed.

3.2 statistical process control (SPC): Control of quality characteristics of plain bearings during the production process by means of statistical techniques in order to comply with quality requirements.

4 SPC methods

The applied statistical methods used to achieve control of a production process may be different and thus are to be agreed upon between the manufacturer and customer.

5 Selection of SPC quality characteristics

Depending on the intended purpose, function, etc. of the plain bearings to be used, the manufacturer and customer shall select and stipulate the particular characteristics for SPC according to clause 6.

NOTE 1 It should be noted that the designated characteristics in the matrix of clause 6 have been prepared as a guide.

6 Geometric quality characteristics

The quality characteristics are classified into three groups.

Following the order of the specified characteristics in accordance with ISO 12301, these quality characteristics are listed in the form of a matrix as:

— preferred with "yes";

— optional with "(yes)";

— unsuitable with "no".

Those quality characteristics which are marked with "(yes)" and "no" are accompanied by an explanation in the column "remarks" in table 1.

A horizontal dash (—) in a column means that this characteristic is not relevant for the specific type of plain bearing.

Table 1

Subclause No. (according to ISO 12301)	Quality characteristic	Type of plain bearing							Remarks
		Thin-walled half-bearing a	Thick-walled half-bearing b	Wrapped bush c	Solid metal bush d	Thermoplastic bush e	Sintered bush f	Thrust washer (ring and half) g	
6.1	Wall thickness								
6.1.1	Line measurement	no	—	no	no	no	no	—	**a** and **c** to **f**: There is an unlimited number of values on a single measuring line ranging between minimum and maximum
6.1.2	Point measurement (defined)	yes	—	(yes)	yes	yes	(yes)	yes	**c**: Only where it is possible to measure at predetermined points **f**: For closed tolerance requirement, 100 % grading may be requested as an alternative to SPC
6.2	Outside diameter	—	—	yes	yes	yes	yes	(yes)	**g**: Blanking tool; tool checking by means of initial product acceptance with each order
6.3	Inside diameter	—	—	(yes)	yes	yes	yes	(yes)	**c**: Normally determined by wall thickness and outside diameter **g**: Blanking tool; tool checking by means of initial product acceptance with each order
6.4	Width	(yes)	—	(yes)	(yes)	(yes)	(yes)	—	**a** and **c** to **f**: Not a primary characteristic
6.5	Locating features	no	—	—	—	—	—	no	**a** and **g**: Are only locating aids
6.6	Lubricant feed and distribution features	no	—	no	no	no	—	no	**a**, **c** to **e** and **g**: Not a primary characteristic
6.7	Surface conditions	no	—	no	no	no	no	no	**a** and **c** to **g**: No Gaussian distribution of measured values
6.8	Crush height	yes	—	—	—	—	—	—	
6.9	Free spread	(yes)	—	—	—	—	—	—	**a**: Not a primary characteristic
6.10	Straightness of sliding surface	no	—	—	—	—	—	—	**a**: Graphical evaluation in most cases
6.11	Joint face taper	(yes)	—	—	—	—	—	—	**a**: Not a primary characteristic
6.12	Back contact (proportion of surface area)	no	—	—	—	—	—	—	**a**: Attribute (qualitative) characteristic
6.13	Joint displacement	—	—	(yes)	—	—	—	—	**c**: Will be adjusted when fitting the bush into the housing bore; attribute characteristic
6.14	Height of thrust half-washer (thickness)	—	—	—	—	—	—	(yes)	**g**: Blanking tool; tool checking by means of initial product acceptance with each order

Subclause No. (according to ISO 12301)	Quality characteristic	Type of plain bearing							Remarks
		Thin-walled half-bearing **a**	Thick-walled half-bearing **b**	Wrapped bush **c**	Solid metal bush **d**	Thermoplastic bush **e**	Sintered bush **f**	Thrust washer (ring and half) **g**	
6.15	Flatness	—	—	—	—	—	—	no	**g**: Attribute (qualitative) characteristic
6.16	Flange diameter	(yes)	—	(yes)	(yes)	(yes)	(yes)	—	**a** and **c** to **f**: Not a primary characteristic
6.17	Distance between flanges	(yes)	—	(yes)	(yes)	(yes)	(yes)	—	**a** and **c** to **f**: Not a primary characteristic
6.18	Flange thickness	(yes)	—	(yes)	(yes)	(yes)	(yes)	—	**a** and **c** to **f**: Measuring point shall be defined
6.19	Perpendicularity (squareness) of flange	(yes)	—	(yes)	(yes)	(yes)	(yes)	—	**a** and **c** to **f**: Not a primary characteristic
6.20	Geometric deviations	—	—	—	(yes)	(yes)	(yes)	—	**d**, **e** and **f**: Not a primary characteristic

7 Material quality characteristics

Control of the material manufacturing processes depends on a large number of parameters which involve "process knowledge". The manufacturer shall decide which parameters are to be checked using statistical techniques in accordance with customer requirements.

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