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

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

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Foreword

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This document was prepared by Technical Committee ISO/TC 123, *Plain bearings*, Subcommittee SC 5, *Quality analysis and assurance*.

This second edition cancels and replaces the first edition (ISO 12302:1993), which has been technically revised.

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

1 Scope

This document 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 references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

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

3 Terms and definitions

For the purposes of this document, the following definitions apply.

ISO and IEC maintain terminological databases for use in standardization at the following addresses:

— IEC Electropedia: available at http://www.electropedia.org/

— ISO Online browsing platform: available at http://www.iso.org/obp

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.

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: preferred, optional or unsuitable.

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”;

not relevant with “—”.

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 — Geometric quality characteristics

Subclause No. (according to ISO 12301)	Quality characteristic	Type of plain bearing						Remarks
		Thin-walled halfbearing	Wrapped bush	Unsplit metallic bush	Solid polymer bush	Sintered bush	Thrust washer (ring and half)	
		a	b	c	d	e	f	
6.1	Wall thickness							
6.1.1	Line measurement	no	no	no	no	no	—	**a** and **b** to **e**: 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	**b**: Only where it is possible to measure at predetermined points **e**: For closed tolerance requirement, 100 % grading may be requested as an alternative to SPC
6.2	Outside diameter	—	yes	yes	yes	yes	(yes)	**f**: Blanking tool; tool checking by means of initial product acceptance with each order

Table 1 *(continued)*

Subclause No. (according to ISO 12301)	Quality characteristic	Type of plain bearing						Remarks
		Thin-walled halfbearing a	Wrapped bush b	Unsplit metallic bush c	Solid polymer bush d	Sintered bush e	Thrust washer (ring and half) f	
6.3	Inside diameter	—	(yes)	yes	yes	yes	(yes)	**b**: Normally determined by wall thickness and outside diameter **f**: Blanking tool; tool checking by means of initial product acceptance with each order
6.4	Width	(yes)	(yes)	(yes)	(yes)	(yes)	—	**a** and **b** to **e**: Not a primary characteristic
6.5	Locating features	no	—	—	—	—	no	**a** and **f**: Are only locating aids
6.6	Lubricant feed and distribution features	no	no	no	no	—	no	**a**, **b** to **d** and **f**: Not a primary characteristic
6.7	Surface conditions	no	no	no	no	no	no	**a** and **b** to **f**: 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)	—	—	—	—	**b**: Will be adjusted when fitting the bush into the housing bore; attribute characteristic
6.14	Height of thrust half-washer (thickness)	—	—	—	—	—	(yes)	**f**: Blanking tool; tool checking by means of initial product acceptance with each order
6.15	Flatness	—	—	—	—	—	no	**f**: Attribute (qualitative) characteristic

Table 1 *(continued)*

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