
Test code for machine tools —

Part 11:

Measuring instruments suitable for machine tool geometry tests

Code d'essai des machines-outils —

*Partie 11: Instruments de mesure compatibles avec les essais de
géométrie des machines-outils*

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Contents

Page

Foreword	v
Introduction	vi
1 Scope	1
2 Normative references	1
3 Terms and definitions	1
4 Preliminary remarks	5
4.1 Measuring units	5
4.2 Uncertainty of measuring instrument	5
4.2.1 General	5
4.2.2 Environment factors	7
4.2.3 Measuring equipment factors	9
4.2.4 Setup and procedure factors	11
4.2.5 Software and calculation factors	17
4.3 Measuring equipment calibration (ISO 10012)	17
4.3.1 General	17
4.3.2 Manufacturer and supplier of measuring instruments	18
4.3.3 User of measuring instruments	18
4.3.4 Measurement uncertainty	18
4.4 Comparison of measurement results by instruments using different measurement principles	18
5 Description of measuring instruments	19
6 Mechanical artefacts for general use	20
6.1 General	20
6.2 Reference straightedge	23
6.3 Test mandrels with taper shanks	27
6.4 Mandrels between centres	32
6.5 Reference squares	34
6.6 Reference cube	36
6.7 Surface plates	37
6.8 Reference sphere	38
6.9 1D ball array	39
6.10 2D ball array	42
6.11 Step gauge	43
6.12 Gauge block	44
7 Length and displacement measuring instruments	45
7.1 General	45
7.2 Instruments for large and medium range linear displacements	46
7.2.1 Laser interferometer	46
7.2.2 Reference linear scale	49
7.2.3 Standard scale	50
7.3 Instruments for short range linear displacements	51
7.3.1 Contact-type sensors	51
7.3.2 Non-contact sensors	55
7.3.3 Contact probing system	60
8 Straightness measuring devices	63
8.1 General	63
8.2 Taut wire with optical reading device	64
8.3 Laser interferometer with straightness optics	66
8.4 Alignment telescope	67
8.5 Two planes laser scanning device	70
8.6 Alignment laser	71

9	Squareness measuring devices	72
9.1	General	72
9.2	Laser interferometer with squareness and straightness optics	73
9.3	Index table with straightedge	74
9.4	Three planes laser scanning device	76
10	Flatness measuring devices	77
10.1	General	77
10.2	Sweep optical square	78
10.3	Laser interferometer with angular optics	80
10.4	Single plane laser scanning device	81
11	Angle measuring instruments	82
11.1	General	82
11.2	Level	83
11.2.1	Precision level	83
11.2.2	Electronic level	84
11.2.3	Inclinometer	85
11.3	Autocollimators	86
11.3.1	Autocollimator	86
11.3.2	Photo-electric autocollimators	87
11.3.3	Laser autocollimators	88
11.4	Laser interferometer with angular optics	89
11.5	Reference indexing table with optical angle reading device	90
11.6	Optical polygon with optical reading device	91
11.7	Laser assisted index device	92
11.8	Reference angle encoders	93
12	Special purpose instruments	94
12.1	General	94
12.2	Single dimensional position reading device	94
12.2.1	Telescoping ball bar	94
12.2.2	Long range telescoping ball bar	96
12.2.3	Fibre interferometer	97
12.3	Multi-dimensional position reading device	98
12.3.1	Two-dimensional digital scale	98
12.3.2	Laser tracing system	99
12.3.3	3D-probe for spheres (contact type)	100
12.3.4	3D-probe head, non-contact type	101
12.4	Other position reading device	103
12.4.1	Spindle error test equipment	103
12.4.2	Swivelling angle measuring device	104
13	Special application examples of the instruments	105
13.1	Spindle rotation accuracy measurement	105
13.2	Thermal displacement measurements	105
13.3	Tool position set	105
13.4	Workpiece positioning	105
	Annex A (informative) Checking devices for instruments in the workshop	106
	Annex B (informative) Existing ISO and national standards for measuring equipment (2015)	112
	Annex C (informative) Special caution for supporting system of measuring devices	113
	Annex D (informative) Reference table of uncertainty contributor	115
	Bibliography	126

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.

The procedures used to develop this document and those intended for its further maintenance are described in the ISO/IEC Directives, Part 1. In particular the different approval criteria needed for the different types of ISO documents should be noted. This document was drafted in accordance with the editorial rules of the ISO/IEC Directives, Part 2 (see www.iso.org/directives).

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. ISO shall not be held responsible for identifying any or all such patent rights. Details of any patent rights identified during the development of the document will be in the Introduction and/or on the ISO list of patent declarations received (see www.iso.org/patents).

Any trade name used in this document is information given for the convenience of users and does not constitute an endorsement.

For an explanation on the voluntary nature of standards, the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the World Trade Organization (WTO) principles in the Technical Barriers to Trade (TBT) see the following URL: www.iso.org/iso/foreword.html.

This document was prepared by Technical Committee ISO/TC 39, *Machine tools*, Subcommittee SC 2, *Test conditions for metal cutting machine tools*.

A list of all parts in the ISO 230 series can be found on the ISO website.

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Introduction

The purpose of this document is to provide information for instruments and equipment for testing machine tools as specified in the ISO 230 series (except ISO 230-5 and ISO/TR 230-8), and in machine-specific standards of ISO/TC 39/SC 2, test conditions for metal cutting machine tools.

The main parts of this document have been transferred from ISO 230-1:1996, Annex A, which is no longer part of ISO 230-1. Newly developed measuring instruments, like special purpose measuring instruments in [Clause 12](#), have been added to this document as well as special application examples in [Clause 13](#).

The concept of measuring uncertainty has been implemented. Uncertainty contributors for measuring instruments and measuring procedures are listed in [Annex D](#) to improve reliability of test results. In addition, [Annex A](#) addresses checking devices for instruments applied in the workshop and [Annex C](#) addresses influences of supporting systems.

Additional information for existing ISO and national standards for measuring equipment is included in [Annex B](#).

This document and ISO 230-1:2012 together cover the entire content of ISO 230-1:1996, with updated instruments and concepts.

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Test code for machine tools —

Part 11:

Measuring instruments suitable for machine tool geometry tests

1 Scope

The aim of this document is to document the characteristics of precision measuring instruments for testing the geometric accuracy of machine tools, operating either under no-load or under quasi-static conditions.

Where necessary, reference is made to the appropriate International Standards.

The measuring instruments for operational testing of machine tools [vibrations (ISO/TR 230-8), noise (ISO 230-5), stick-slip motion of components, etc.] as well as instruments for checking of other characteristics of machine tools (speeds, feeds, temperature) are not covered in this document. The measuring instruments for checking of workpiece geometry (size, form, etc.) are not covered by this document either.

This document has list style construction for ease of search and identification of each instrument's characteristics.

Sources of uncertainty of instruments and measurements are described in this document for more accurate measurement procedures.

2 Normative references

[ISO/TR 230-11:2018](https://standards.iteh.ai/catalog/standards/iso/99f7fc50-9b22-4155-ad12-17cc5bb34122/iso-tr-230-11-2018)

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There are no normative references in this document.

3 Terms and definitions

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

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

- ISO Online browsing platform: available at <https://www.iso.org/obp>
- IEC Electropedia: available at <https://www.electropedia.org/>

3.1

calibration

operation that, under specified conditions, in a first step, establishes a relation between the quantity values with measurement uncertainties provided by measurement standards and corresponding indications with associated measurement uncertainties, and in a second step, uses this information to establish a relation for obtaining a measurement result from an indication

Note 1 to entry: A calibration may be expressed by a statement, calibration function, calibration diagram, calibration curve, or calibration table. In some cases, it may consist of an additive or multiplicative correction of the indication with associated measurement uncertainty.

Note 2 to entry: Calibration should not be confused with adjustment of a measuring system, often mistakenly called "self-calibration", nor with verification of calibration.