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Test code for machine tools — Part 8: Vibrations

*Code d'essai des machines-outils —
Partie 8: Vibrations*



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Contents

Page

Foreword	v
Introduction.....	vii
1 Scope	1
2 Normative references	1
3 Terms and definitions	2
4 Theoretical background to the dynamic behaviour of machine tools	13
4.1 Nature of vibration: basic concepts	13
4.2 Single-degree-of-freedom systems	16
4.3 Mathematical considerations	20
4.4 Graphical representations	22
4.5 Different types of harmonic excitation and response	26
4.6 More degrees of freedom	33
4.7 Other miscellaneous types of excitation and response of machine tools	40
4.8 Spectra, responses and bandwidth	43
5 Types of vibration and their causes	44
5.1 Vibrations occurring as a result of unbalance	44
5.2 Vibrations occurring through the operation of linear slides	48
5.3 Vibrations occurring externally to the machine	49
5.4 Vibrations initiated by the machining process: forced vibration and chatter	50
5.5 Other sources of excitation	52
6 Practical testing: general concepts	54
6.1 General	54
6.2 Measurement of vibration values	54
6.3 Instrumentation	55
6.4 Relative and absolute measurements	56
6.5 Units and parameters	56
6.6 Uncertainty of measurement	58
6.7 Note on environmental vibration evaluation	58
6.8 Type testing	59
6.9 Location of machine	59
7 Practical testing: specific applications	60
7.1 Unbalance	60
7.2 Machine slide acceleration along its axis (inertial cross-talk)	64
7.3 Vibrations occurring externally to the machine	67
7.4 Vibrations occurring through metal cutting	67
8 Practical testing: structural analysis through artificial excitation	68
8.1 General	68
8.2 Spectrum analysis and frequency response testing	69
8.3 Machine set-up conditions	70
8.4 Frequency analysis	71
8.5 Modal analysis	73
8.6 Cross-response tests	73
8.7 “Non-standard” vibration modes	75
8.8 Providing standard stability tests	76
Annex A (informative) Overview and structure of this part of ISO 230	77
Annex B (informative) Relationships between vibration parameters	78

This is a preview of "ISO/TR 230-8:2010". [Click here to purchase the full version from the ANSI store.](#)

Annex C (informative) Summary of basic vibration theory	80
Annex D (informative) Spindle and motor balancing protocol	84
Annex E (informative) Examples of test results and their presentation	85
Annex F (informative) Instrumentation for analysis of machine tool dynamic behaviour	94
Bibliography	107

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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.

International Standards are drafted in accordance with the rules given in the ISO/IEC Directives, Part 2.

The main task of technical committees is to prepare International Standards. 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.

In exceptional circumstances, when a technical committee has collected data of a different kind from that which is normally published as an International Standard ("state of the art", for example), it may decide by a simple majority vote of its participating members to publish a Technical Report. A Technical Report is entirely informative in nature and does not have to be reviewed until the data it provides are considered to be no longer valid or useful.

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.

ISO/TR 230-8 was prepared by Technical Committee ISO/TC 39, *Machine tools*, Subcommittee SC 2, *Test conditions for metal cutting machine tools*.

This second edition cancels and replaces the first edition (ISO/TR 230-8:2009). Annex F has been added and minor editorial corrections have been made.

ISO 230 consists of the following parts, under the general title *Test code for machine tools*:

- *Part 1: Geometric accuracy of machines operating under no-load or quasi-static conditions*
- *Part 2: Determination of accuracy and repeatability of positioning numerically controlled axes*
- *Part 3: Determination of thermal effects*
- *Part 4: Circular tests for numerically controlled machine tools*
- *Part 5: Determination of the noise emission*
- *Part 6: Determination of positioning accuracy on body and face diagonals (Diagonal displacement tests)*
- *Part 7: Geometric accuracy of axes of rotation*
- *Part 8: Vibrations [Technical Report]*
- *Part 9: Estimation of measurement uncertainty for machine tool tests according to series ISO 230, basic equations [Technical Report]*
- *Part 10: Determination of measuring performance of probing systems of numerically controlled machine tools*

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The following part is under preparation:

- *Part 11: Measuring instruments and their application to machine tool geometry tests* [Technical Report]

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Introduction

The purpose of ISO 230 is to standardize methods of testing the performance of machine tools, generally without their tooling¹⁾, and excluding portable power tools. This part of ISO 230 establishes general procedures for the assessment of machine tool vibration.

The need for vibration control is recognized in order that those types of vibration that produce undesirable effects can be mitigated. These effects are identified principally as:

- unacceptable cutting performance with regard to surface finish and accuracy;
- premature wear or damage of machine components;
- reduced tool life;
- unacceptable noise level;
- physiological harm to operators.

Of these, only the first is considered to lie within the scope of this part of ISO 230, although the other effects may well occur incidentally. (Noise is covered by ISO 230-5, and the effect of vibration on operators is covered by ISO 2631-1.) For the most part, this necessarily limits this part of ISO 230 to the problems of vibrations that are generated between tool and workpiece.

Although this part of ISO 230 is in the form of a Technical Report, a number of acceptance tests are proposed within it. These take on the appearance of "standard tests" to be found in other parts of the 230 series. These tests may be used in this way, but, being less rigorous in their formulation, they do not carry the authority that a test in accordance with an International Standard would have.

1) In some cases, practical considerations require that real or dummy tooling and workpieces be used (see 7.1.1, 7.2.1, 7.4 and 8.3).