
**Machine tools — Test conditions for
testing the accuracy of boring and milling
machines with horizontal spindle —**

Part 3:
**Machines with movable column and
movable table**

*Machines-outils — Conditions d'essai pour le contrôle de l'exactitude
des machines à aléser et à fraiser à broche horizontale —*

Partie 3: Machines à montant mobile et à table mobile



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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.

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 3070-3 was prepared by Technical Committee ISO/TC 39, *Machine tools*, Subcommittee SC 2, *Test conditions for metal cutting machine tools*.

This third edition cancels and replaces ISO 3070-0:1982 and ISO 3070-4:1998, of which it constitutes a technical revision.

ISO 3070 consists of the following parts, under the general title *Machine tools — Test conditions for testing the accuracy of boring and milling machines with horizontal spindle*:

- *Part 1: Machines with fixed column and movable table*
- *Part 2: Machines with movable column and fixed table*
- *Part 3: Machines with movable column and movable table*

Introduction

It is generally accepted that horizontal spindle boring and milling machines fall into three categories characterized by their particular configuration:

- a) machines with fixed column and movable table;
- b) machines with movable column and fixed table;
- c) machines with movable column and movable table.

In the past, all these types of machines and associated terminology were described in ISO 3070-0:1982. The relevant accuracy tests were described in ISO 3070-2:1997, ISO 3070-3:1997 and ISO 3070-4:1998 respectively. However, ISO/TC 39/SC 2 decided to integrate the descriptions and the terminology of these machines into appropriate parts of ISO 3070 describing the accuracy tests and to renumber the parts of this series accordingly.

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Machine tools — Test conditions for testing the accuracy of boring and milling machines with horizontal spindle —

Part 3: Machines with movable column and movable table

1 Scope

This part of ISO 3070 specifies, with reference to ISO 230-1, ISO 230-2 and ISO 230-7, geometric tests, machining tests, spindle tests and tests for checking the accuracy and repeatability of positioning by numerical control of general purpose, normal accuracy, horizontal spindle boring and milling machines having a movable column and movable table. This part of 3070 also specifies the applicable tolerances corresponding to these tests.

This type of machine can be provided with spindle heads of different types, such as those with sliding boring spindle and milling spindle, sliding boring spindle and facing head, or ram or milling ram.

This part of ISO 3070 concerns machines having movement of the column or column saddle on the bed (X axis), vertical movement of the spindle head (V axis), movement of the boring spindle or ram (Z axis) and, possibly, a feed movement of radial facing slide in the facing head (U axis). Some machines also have an intermediate saddle with slideways between column and bed to achieve additional movement of the column parallel to the spindle axis (W axis).

NOTE In ISO 3070-1 spindle ram movement is designated as the W axis.

This part of ISO 3070 deals only with the verification of the accuracy of the machine. It does not apply to the operational testing of the machine (e.g. vibration, abnormal noise, stick-slip motion of components) nor to machine characteristics (e.g. speeds, feeds), as such checks are generally carried out before testing the accuracy.

2 Normative references

The following referenced documents are indispensable for the application 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 230-1:1996, *Test code for machine tools — Part 1: Geometric accuracy of machines operating under no-load or finishing conditions*

ISO 230-2:2006, *Test code for machine tools — Part 2: Determination of accuracy and repeatability of positioning numerically controlled axes*

ISO 230-7:2006, *Test code for machine tools — Part 7: Geometric accuracy of axes of rotation*

ISO 1101:2004, *Geometrical Product Specifications (GPS) — Geometrical tolerancing — Tolerances of form, orientation, location and run-out*