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Second edition
2015-02-01

Test conditions for machining centres —

Part 1: Geometric tests for machines with horizontal spindle (horizontal Z-axis)

Conditions d'essai pour centres d'usinage —

Partie 1: Essais géométriques des machines à broche horizontale (axe Z horizontale)



Reference number
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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.

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).

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For an explanation on the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the WTO principles in the Technical Barriers to Trade (TBT) see the following URL: [Foreword - Supplementary information](#)

The committee responsible for this document is ISO/TC 39, *Machine tools*, SC 2, *Test conditions for metal cutting machine tools*.

This second edition cancels and replaces the first edition (ISO 10791-1:1998), which has been technically revised.

ISO 10791 consists of the following parts, under the general title *Test conditions for machining centres*:

- *Part 1: Geometric tests for machines with horizontal spindle (horizontal Z-axis)*
- *Part 2: Geometric tests for machines with vertical spindle or universal heads with vertical primary rotary axis (vertical Z-axis)*
- *Part 3: Geometric tests for machines with integral indexable or continuous universal heads (vertical Z-axis)*
- *Part 4: Accuracy and repeatability of positioning of linear and rotary axes*
- *Part 5: Accuracy and repeatability of positioning of work-holding pallets*
- *Part 6: Accuracy of speeds and interpolations*
- *Part 7: Accuracy of finished test pieces*
- *Part 8: Evaluation of contouring performance in the three coordinate planes*
- *Part 9: Evaluation of the operating times of tool change and pallet change*
- *Part 10: Evaluation of the thermal distortions*

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Introduction

A machining centre is a numerically controlled machine tool capable of performing multiple machining operations, including milling, boring, drilling, and tapping, as well as automatic tool changing from a magazine or similar storage unit in accordance with a machining program.

The object of ISO 10791 (all parts) is to supply information as wide and comprehensive as possible on tests which can be carried out for comparison, acceptance, maintenance, or any other purpose deemed necessary by user or manufacturer/supplier. ISO 10791 specifies, with reference to the relevant parts of ISO 230, several families of tests for machining centres with horizontal spindle, standing alone or integrated in flexible manufacturing systems.

This part of ISO 10791 also establishes the tolerances for the test results corresponding to general purpose and normal accuracy machining centres.

This part of ISO 10791 is also applicable, totally or partially, to other numerically controlled machines, when their configuration, components, and movements are compatible with the tests described herein.

Accessory spindle heads, forming the object of [Annexes A](#) through [C](#) in the first edition of this part of ISO 10791, are now covered by the more general ISO 17543-1, as they are not only used on machining centres.

In this edition of ISO 10791-1, the test of the table flatness (formerly G15) has been deleted for several reasons, among which are the following:

- the table surface is not normally used as a reference for the location of the workpiece;
- sometimes, the machine is supplied with some fixtures already mounted on the table;
- sometimes, the machine is provided with a receiver where several pallets can be mounted;
- for tests made during the working life of the machine, the surface might no longer be suitable for accurate measurements, mostly on large machines.

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