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**Test conditions for numerically  
controlled turning machines and  
turning centres —**

**Part 2:  
Geometric tests for machines with a  
vertical workholding spindle**

*Conditions d'essai des tours à commande numérique et des centres de  
tournage —*

*Partie 2: Essais géométriques pour les machines à broche porte-pièce  
verticale*

ISO 13041-2:2020

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Published in Switzerland

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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](http://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](http://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 of 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 [www.iso.org/iso/foreword.html](http://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*.

Any feedback or questions on this document should be directed to the user's national standards body. A complete listing of these bodies can be found at [www.iso.org/members.html](http://www.iso.org/members.html).

This second edition cancels and replaces the first edition (ISO 13041-2:2008), which has been technically revised. The main changes compared to the previous edition are as follows:

- the categorization of machine size ranges has been abolished;
- the discrimination of tolerances, if any, due to different machine sizes (diameter of chuck or workholding spindle) is expressed in the specific tests G1 to G21;
- the tolerances given in the G-tests have been changed due to the absence of size categories;
- the numbering of tests G1 to G21 has been changed;
- tests for horizontal rams have been removed because these are no longer in existence;
- former G1 test "checking of flatness of the workholding spindle" has been removed;
- terms in Persian and Japanese have been added in [Annex B](#).

In addition to text written in the official ISO languages (English, French or Russian), this document gives text in German, Italian, Japanese and Persian. This text is published under the responsibility of the member body/National Committee for Germany (DIN), Italy (UNI), Japan (JISC) and Iran (ISRI) and is given for information only. Only the text given in the official languages can be considered as ISO text.

A list of all parts in the ISO 13041 series can be found on the ISO website.

## Introduction

A turning centre is a machine tool in which the principal movement is the rotation of the workpiece against the stationary cutting tool(s). It is a numerically controlled machine tool capable of performing multiple machining operations, including milling, turning, boring, drilling and tapping, as well as automatic tool changing from a magazine or similar storage unit in accordance with a machining program.

The objective of the ISO 13041 series is to provide information as wide and comprehensive as possible on geometric, positional, contouring, thermal and machining tests which can be carried out for comparison, acceptance, maintenance or any other purpose.

The ISO 13041 series specifies, with reference to ISO 230-1 and ISO 230-7, tests for turning centres and numerically controlled turning machines with/without tailstocks standing alone or integrated in flexible manufacturing systems. The ISO 13041 series also establishes the tolerances or maximum acceptable values for the test results corresponding to general-purpose and normal-accuracy turning centres and numerically controlled turning machines.

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