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BSI Standards Publication

Test conditions for vertical surface type broaching machines — Testing of accuracy

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National foreword

This British Standard is the UK implementation of ISO 6481:2019.

The UK participation in its preparation was entrusted to Technical Committee MTE/1/2, Machine tools - Accuracy.

A list of organizations represented on this committee can be obtained on request to its secretary.

This publication does not purport to include all the necessary provisions of a contract. Users are responsible for its correct application.

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Second edition
2019-06

Test conditions for vertical surface type broaching machines — Testing of accuracy

*Conditions de réception des machines verticales à brocher les
extérieurs — Contrôle de l'exactitude*



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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).

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 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.

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.

This second edition cancels and replaces the first edition (ISO 6481:1981), which has been technically revised. The main changes compared to the previous edition are as follows:

- the title has been changed;
- the document's format has been aligned with new published ISO/TC 39/SC 2 documents;
- some terms have been changed and equivalent non-formal terms in more languages have been added to [Annex A](#);
- all diagrams have been regenerated;
- old references to ISO/R 230:1961 have been changed to ISO 230-1:2012 and all observations have been updated accordingly;
- levelling test, G01, has been deleted and relevant explanations have been added to [Clause 5](#);
- test items G2 and G3 have been merged into one; consequently, a new tolerance has been applied;
- [Clause 7](#) has been created to provide considerations to machining tests to be agreed between manufacturer/supplier and user;
- imperial units of measurements have been deleted and only metric units are now used.

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In addition to terms given in the official ISO languages (English and French), this document gives the equivalent terms in German, Italian and Persian. These are published under the responsibility of the member bodies for Germany (DIN), Iran (ISIRI) and Italy (UNI) and are given for information only. Only the terms given in the official languages can be considered as ISO terms.

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Introduction

The object of this document is to supply information as wide and comprehensive as possible on tests on vertical surface type broaching machines which can be carried out for comparison, acceptance, maintenance or any other purposes.

This document also establishes the tolerances for the test results corresponding to general purpose and normal accuracy vertical surface type broaching machines.

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Test conditions for vertical surface type broaching machines — Testing of accuracy

1 Scope

This document specifies, with reference to ISO 230-1, the geometric tests on surface type broaching machines with vertical Z-axis providing the main cutting motion.

It also specifies the applicable tolerances corresponding to the tests mentioned above for normal-accuracy vertical surface type broaching machines.

This document explains different concepts or configurations and common features of vertical surface type broaching machines. It also provides related terminology and designation of axes.

This document deals only with the verification of the accuracy of the broaching machine.

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

2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements 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 230-1:2012, *Test code for machine tools — Part 1: Geometric accuracy of machines operating under no-load or quasi-static conditions*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in ISO 230-1 and the following 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 <http://www.electropedia.org/>

3.1

surface broaching operation

machining process in which a broach is pushed over an external surface to remove material by linear cutting

Note 1 to entry: Principal cutting motion is a relative translation of broach against the non-rotating workpieces and where the cutting energy is brought by the broach or workpiece motion.

3.2

broach

cutting tool that has multiple transverse cutting edges each with progressively increased size

3.3

broaching machine

machine tool in which broaching operation is executed