

First edition
2020-02

Test conditions for numerically controlled broaching machines — Testing of accuracy — Vertical surface type broaching machines

*Conditions d'essai des machines à brocher à commande numérique —
Contrôle de l'exactitude — Machines verticales à brocher*



Reference number
ISO 19744:2020(E)

© ISO 2020



COPYRIGHT PROTECTED DOCUMENT

© ISO 2020

All rights reserved. Unless otherwise specified, or required in the context of its implementation, no part of this publication may be reproduced or utilized otherwise in any form or by any means, electronic or mechanical, including photocopying, or posting on the internet or an intranet, without prior written permission. Permission can be requested from either ISO at the address below or ISO's member body in the country of the requester.

ISO copyright office
CP 401 • Ch. de Blandonnet 8
CH-1214 Vernier, Geneva
Phone: +41 22 749 01 11
Fax: +41 22 749 09 47
Email: copyright@iso.org
Website: www.iso.org

Published in Switzerland

This is a preview of ISO 19744:2020. Click [here](#) to purchase the full version from the ANSI store.

Contents

	Page
Foreword	iv
Introduction	v
1 Scope	1
2 Normative references	1
3 Terms and definitions	2
4 Terminology and designation of axes	2
5 Preliminary remarks	4
5.1 Measurement units.....	4
5.2 Reference to the ISO 230 series.....	4
5.3 Testing sequence.....	5
5.4 Tests to be performed.....	5
5.5 Tolerances and minimum tolerance.....	5
5.6 Measuring instruments.....	5
5.7 Diagrams.....	5
5.8 Software compensation.....	6
5.9 Axes not under test.....	6
6 Geometric tests	7
6.1 Straightness errors of linear motions.....	7
6.2 Squareness/Parallelism errors between linear/rotary motions.....	8
6.3 Table and work holding rotary axis.....	16
6.4 Broach holder.....	18
7 Accuracy and repeatability of positioning tests	25
7.1 Positioning of numerically controlled linear axes.....	25
7.2 Positioning of numerically controlled rotary axes.....	27
8 Machining tests	29
Annex A (informative) Terms in other languages	30
Annex B (informative) Recommended tests for surface broaching operation	31
Bibliography	44

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.

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

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

This is a preview of ISO 19744:2020. [Click here to purchase the full version from the ANSI store.](#)

Introduction

Most numerically controlled broaching machines are classified into two categories characterized by their particular configuration:

- 1) vertical surface type machines;
- 2) horizontal surface type machines.

The main application of numerically controlled surface type broaching machines is for generating slots and grooves in turbine disks.

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