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Test conditions for numerically controlled turning machines and turning centres —

Part 5:
Accuracy of speeds and interpolations

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

Partie 5: Exactitude des vitesses et interpolations

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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*, Subcommittee SC 2, *Test conditions for metal cutting machine tools*.

This second edition cancels and replaces the first edition (ISO 13041-5:2006), which has been technically revised.

ISO 13041 consists of the following part, under the general title *Test conditions for numerically controlled turning machines and turning centres*:

— *Part 1: Geometric tests for machines with a horizontal workholding spindle*

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

— *Part 3: Geometric tests for machines with inverted vertical workholding spindles*

— *Part 4: Accuracy and repeatability of positioning of linear and rotary axes*

— *Part 5: Accuracy of speeds and interpolations*

— *Part 6: Accuracy of a finished test piece*

— *Part 7: Evaluation of contouring performance in the coordinate planes*

— *Part 8: Evaluation of thermal distortions*

Introduction

A numerically controlled turning machine is a machine tool in which the principal motion is the rotation of the workpiece against the non-rotating cutting tool(s) and where cutting energy is provided by the motion of the workpiece which is driven by a spindle. This machine is controlled by a numerical control (NC) providing automatic function according to ISO 13041-1:2004, 3.3, and can be of single- or multi-spindle type.

A turning centre is an NC turning machine equipped with power driven tool(s) and the capacity to control orientation of the workholding and/or toolholding spindle by continuously rotating, indexing, and/or interpolating around their axes.

The objective of ISO 13041 (all parts) is to provide information as widely and as comprehensively as possible on geometric, positional, contouring, thermal, and machining tests, which can be carried out for comparison, acceptance, maintenance, or any other purpose deemed necessary by user or manufacturer.

ISO 13041 (all parts) specifies, with reference to the relevant parts of ISO 230, tests for turning centres and numerically controlled turning machines with/without tailstocks, standing alone, or integrated in flexible manufacturing systems. ISO 13041 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.

Attention should be given to the tolerances in tests AK5, BK5, and CK5, which are reduced from ISO 13041-5 (Test K5) due to improved centring procedure or practical experience that proves that the closer tolerances can be met.