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**NATIONAL STANDARD OF THE
PEOPLE'S REPUBLIC OF CHINA**

GB/T 18400.6-2025

Replacing GB/T 18400.6-2001

**Test conditions for machining centres - Part 6: Accuracy of
speeds and interpolations**

加工中心检验条件 第6部分：速度和插补精度检验

(English Translation)

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References

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Foreword

This document complies with the provisions of GB/T 1.1-2020 "Standardization Work Guidelines Part 1: Structure and Drafting Rules of Standardization Documents".

Drafting.

This document is Part 6 of GB/T 18400 "Inspection Conditions for Machining Centers". GB/T 18400 has already published the following parts.

---Part 1: Geometric Accuracy Inspection of Horizontal Machine Tools and Machine Tools with Additional Spindle Heads (Horizontal Z-axis);

---Part 2: Geometric accuracy inspection of vertical or universal spindle head machine tools with vertical spindle axis (vertical Z-axis);

---Part 4: Inspection of Positioning Accuracy and Repeatability of Linear and Rotary Axes;

---Part 5: Inspection of the positioning accuracy and repeatability of the workpiece clamping plate;

---Part 6: Speed and Interpolation Accuracy Verification;

---Part 7: Precision Inspection of Finished Specimens;

---Part 8: Evaluation of Profile Characteristics on Three Coordinate Planes;

---Part 9: Evaluation of tool change and pallet change operation time;

---Part 10: Assessment of thermal deformation.

This document replaces GB/T 18400.6-2001 "Inspection Conditions for Machining Centers - Part 6: Feed Rate, Speed and Interpolation Accuracy Inspection".

Compared with GB/T 18400.6-2001, the main technical changes in the "Experimental Standard" are as follows, except for structural adjustments and editorial modifications.

a) Increased the requirement for the number of recorded sampling points (or sampling frequency) (see 4.5);

b) Added content on "Non-inspection axis position" and "Software compensation" (see 4.7 and 4.8);

- c) The method for checking feed rate deviation has been changed, and the requirements for stroke selection and data processing have been clarified (see 5.2, 4.1 of the 2001 version);
- d) The inspection conditions for linear interpolation motion have been changed, the types of tilt angles have been added, and the measurement length has been changed (see 5.3, 2001 edition).
- e) The inspection conditions for circular interpolation motion were changed, a smaller measurement diameter was added, the feed rate was increased, and the circular hysteresis inspection was improved.

Change to a two-way circular deviation test (see 5.4, 4.3 in the 2001 edition);

- f) The angle interpolation accuracy check has been removed (see 4.4 in the 2001 edition);
- g) The five-axis spherical interpolation accuracy check has been removed (see 4.5 in the 2001 edition);
- h) Added three structural types of machine tool linear axis and rotary axis combined linkage accuracy inspection (see Appendix A~) Appendix C).

This document is equivalent to ISO 10791-6:2014 "Inspection conditions for machining centers - Part 6: Inspection of speed and interpolation accuracy".

The following minimal editorial changes have been made to this document.

- a) A laser interferometer (see 5.3) has been added to the inspection tools for linear interpolation motion accuracy testing;
- b) Note 3 was added to A.2.1 and B.2.1, and Note 2 was added to C.2.1;
- c) The position of index number "2" in Figure B.2 has been corrected.

Please note that some content in this document may involve patents. The issuing organization of this document assumes no responsibility for identifying patents.

This document was proposed by the China Machinery Industry Federation.

This document is under the jurisdiction of the National Technical Committee on Standardization of Metal Cutting Machine Tools (SAC/TC22).

Introduction

GB/T 18400, "Inspection Conditions for Machining Centers", mainly covers the inspection methods for machining centers.

A machining center is a CNC machine tool capable of performing various machining operations, including milling, boring, and tapping, and can adjust the machining according to the machining program.

Configure automatic tool exchange from a tool magazine or similar storage unit.

The purpose of GB/T 18400 is to provide comprehensive standards for product comparison, acceptance, maintenance, or any other purpose deemed necessary by the user/manufacturer.

Possibly broad and comprehensive testing information.

GB/T 18400, by referring to relevant parts of GB/T 17421 General Rules for Machine Tool Inspection, specifies various types of inspections for machining centers.

GB/T 18400 also specifies the tolerances or maximum permissible values for inspection results of general-purpose and ordinary precision machining centers.

For CNC milling machines and CNC boring machines whose structure, components, and motion meet the inspection conditions described in this document, this document also includes, in whole or in part, all of them.

Applicable.

GB/T 18400 is proposed to consist of ten parts.

---Part 1: Geometric Accuracy Inspection of Horizontal Machine Tools and Machines with Additional Spindle Heads. The purpose is to standardize the machining of horizontal (horizontal Z-axis) machining centers.

Geometric accuracy inspection methods and corresponding requirements.

---Part 2: Geometric Accuracy Inspection (Vertical Z-axis) of Vertical or Universal Spindle Head Machine Tools with Vertical Spindle Heads. The purpose is to standardize...

Geometric accuracy inspection methods and corresponding requirements for vertical (Z-axis) machining centers.

---Part 3: Geometric Accuracy Inspection of Indexed or Continuously Indexed Overall Universal Spindle Head Machine Tools (Vertical Z-Axis). The purpose is to standardize...

Methods and corresponding requirements for geometric accuracy inspection of integral universal spindle head machine tools with indexing or continuous indexing are provided, along with three methods.

Geometric accuracy inspection of universal spindle heads.

---Part 4: Inspection of Positioning Accuracy and Repeatability of Linear and Rotary Axes. The purpose is to standardize the positioning accuracy and repeatability of machining centers.

Methods and requirements for testing the positioning accuracy and repeatability of the rotary axis.