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

GB/T 16462.5-2025

Replacing GB/T 16462.5-2017

**Test conditions for numerically controlled turning machines
and turning centres - Part 5: Accuracy of speeds and
interpolations**

数控车床和车削中心检验条件 第5部分：速度和插补精度检验

(English Translation)

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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 5 of GB/T 16462 "Inspection Conditions for CNC Lathes and Turning Centers". GB/T 16462 has been published as follows.

Part 2.

---Part 1: Geometric Accuracy Inspection of Horizontal Machine Tools;

---Part 2: Geometric Accuracy Inspection of Vertical Machine Tools;

---Part 3: Geometric Accuracy Inspection of Inverted Vertical Machine Tools;

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

---Part 5: Speed and Interpolation Accuracy Verification;

---Part 6: Precision Inspection of Finished Specimens;

---Part 7: Evaluation of Profile Properties in the Coordinate Plane;

---Part 8: Assessment of thermal deformation.

This document replaces GB/T 16462.5-2017 "Inspection conditions for CNC lathes and turning centers - Part 5: Feed rate, speed and interpolation".

Compared with GB/T 16462.5-2017, the main technical changes in "Accuracy Inspection" are as follows, except for structural adjustments and editorial modifications.

- a) A "Terms and Definitions" section has been added (see Chapter 3);
- b) The content related to angular dimensions, deviations, and corresponding tolerances in the "Units of Measurement" section has been removed (see section 3.1 of the 2017 edition);
- c) Added "Should comply with GB/T 17421.4-2016" (see 4.2);
- d) The description of "Inspection Tools" has been revised (see 4.5, 3.5 in the 2017 edition);
- e) Added requirements for "software compensation" (see 4.6);
- f) The inspection items were changed. "Motion accuracy inspection" was split according to machine tool structure type, and a new item was added related to "machine tool structure type".

For content related to "naming" (see Chapter 5, Appendix A, Appendix B, Appendix C, and Chapter 4 of the 2017 edition);

- g) The term "axis" in references to motion, feed, or interpolation in the documents has been changed to "axis" (see Chapter 1 of the 2017 edition).

4.2, 4.3, 4.4, K2, K4, K5);

- h) The feed rate sub-item "a) 100 mm/min" has been removed from the linear axis feed rate accuracy inspection item (see K2 in the 2017 version);
- i) The descriptive content of the circular interpolation accuracy inspection item for three-axis (X, Y, and C axes) linkage has been modified (see A.2.7.6 in the appendix).

B.2.7.6, C.2.7.6 (K6 in Chapter 4 of the 2017 edition)

- j) Some testing tools and diagrams have been modified (see Appendix A, Appendix B, Appendix C, Chapter 4, K1, K2, K3, K4 of the 2027 edition).

K5, K6);

- k) The inspection plane and some feed rates in the inspection items in the appendix have been changed (see A.2.7.4, A.2.7.5, B.2.7.4, B.2.7.5 in the appendix).

C.2.7.4, C.2.7.5, Chapter 4, K4 and K5 of the 2017 edition.

This document is modified to adopt ISO 13041-5:2015 "Inspection conditions for CNC lathes and turning centers - Part 5: Speed and interpolation accuracy".

test".

The technical differences between this document and ISO 13041-5:2015, and the reasons therefor, are as follows.

---The tolerances "0.05" and "0.07" in the international standards AK4, BK4, and CK4 are revised to "0.03" and "0.05" respectively. The international standards refer to...

The initial standard was too low; the revised standard is more in line with the actual situation of CNC lathes and turning centers in my country.

---The tolerances "0.07" and "0.09" in the international standards AK5, BK5, and CK5 are revised to "0.05" and "0.07" respectively. The international standards refer to...

The initial standard was too low; the revised standard is more in line with the actual situation of CNC lathes and turning centers in my country.

---Change the terms and definitions in the international standards to "GB/T 16462.1-2023, GB/T 16462.2-2023 and..." the terms and definitions defined in GB/T 16462.3-2017 apply to this document, as the terms and definitions in those documents have already been covered.

Cover all;

---ISO 230-1 has been replaced with the normatively referenced GB/T 17421.1-2023 to adapt to my country's technical conditions and increase operability.

Functional properties (see 4.2, A.2.7.3, B.2.7.3, C.2.7.3);

---ISO 230-4 has been replaced with the normatively referenced GB/T 17421.4-2016 to adapt to my country's technical conditions and increase operability.

(See 4.2, A.2.7.4, A.2.7.5, B.2.7.4, B.2.7.5, C.2.7.4, C.2.7.5, D.2.4, D.3.3);

---ISO 841 has been replaced with the normatively referenced GB/T 19660-2005 to adapt to my country's technical conditions and increase operability.

(See A.1, B.1, C.1).

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 16462 "Inspection Conditions for CNC Lathes and Turning Centers" is a general standard for the inspection of CNC lathes and turning centers, establishing the inspection standards for CNC lathes and turning centers.

Principles and requirements for the accuracy and performance inspection of lathes and turning centers.

GB/T 16462 "Inspection Conditions for CNC Lathes and Turning Centers" is proposed to consist of eight parts.

---Part 1: Geometric Accuracy Inspection of Horizontal Machine Tools. The purpose is to standardize the geometric accuracy inspection of CNC horizontal lathes and turning centers.

Methods and corresponding requirements.

---Part 2: Geometric Accuracy Inspection of Vertical Machine Tools. The purpose is to standardize the geometric accuracy inspection of CNC vertical lathes and turning centers.

Methods and corresponding requirements.

---Part 3: Geometric Accuracy Inspection of Inverted Vertical Machine Tools. The purpose is to standardize the geometric accuracy inspection of inverted CNC vertical lathes and inverted vertical turning processes.

Methods for verifying the geometric accuracy of a heart and corresponding requirements.

---Part 4: Inspection of Positioning Accuracy and Repeatability of Linear and Rotary Axes. The purpose is to standardize the operation of CNC lathes and turning processes.

Methods for verifying the positional accuracy of the center's linear and rotational axes, and corresponding requirements.

---Part 5: Speed and Interpolation Accuracy Inspection. The purpose is to standardize the spindle speeds of CNC lathes and turning centers, and the linearity of various CNC components.

Verification of the feed rate of the axes and the motion accuracy of the trajectories generated by the simultaneous movement of two or more linear axes and/or rotary axes.

Methods and corresponding requirements.

---Part 6: Accuracy Inspection of Finished Specimens. The purpose is to standardize a series of cutting inspection methods for standard specimens under finish machining conditions.

The law and corresponding requirements.