

ICS 25.080.01
CCS J 50



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

GB/T 17421.7-2016

**Test code for machine tools -- Part 7: Geometric accuracy of
axes of rotation**

机床检验通则 第7部分：回转轴线的几何精度

(English Translation)

Issued on: April 25, 2016

Implemented on: November 1, 2016

**Issued by: General Administration of Quality Supervision, Inspection and
Quarantine of the People's Republic of China**

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Foreword

GB/T 17421 "Machine Testing General" is divided into 11 parts.

- Part 1. Geometrical accuracy of machine tools under no load or finishing conditions;
- Part 2. Determination of positioning accuracy and repeated positioning accuracy of NC axis;

Part 3. Determination of thermal effects;

- Part 4. Circular inspection of CNC machine tools;
- Part 5. Determination of emission noise;

Part 6. Determination of the accuracy of the positioning of the body and the diagonal (diagonal displacement test);

- Part 7. Geometric accuracy of the rotary axis;
- Part 8. Vibration (technical report);

Part 9. Basic equations for the estimation of the uncertainty of ISO 230 machine test series (technical report);

- Part 10. Determination of measurement performance of CNC machine tools (preparation phase);
- Part 11. Measuring instruments for geometrical accuracy of machine tools (preparation

phase) (technical report).

This part is part 7 of GB/T 17421.

This part is drafted in accordance with the rules given in GB/T 1.1-2009.

This part uses the translation method equivalent to ISO 230-7:2006 "Machine Testing General Part 7. Geometrical accuracy of the rotary axis".

And the normative reference in this part of the international documents have a consistent correspondence between the following documents.

General rules for machine tool inspection - Part 1. Geometrical accuracy of machine tools under no - load or finishing conditions GB/T 17421.1-1998.

(eqvISO 230-1:1996)

--- GB/T 17421.2-2000 Machine inspection side of the second part. CNC axis positioning accuracy and repeat the accuracy of positioning (EqvISO 230-2:1997) for ease of use, the following editorial changes are made in this section.

--- the original standard of the wrong content, the formula was corrected.

This part is made by the China Machinery Industry Federation.

This part of the National Metal Cutting Machine Standardization Technical Committee (SAC/TC22) centralized.

This part of the drafting unit. Ningxia Xinrui Great Wall Machine Tool Co., Ltd., Beijing Engineering Co., Ltd., the National Machine Tool Quality Supervision and Inspection Test center, Beijing Machine Tool Research Institute, Beijing first machine tool plant.

1 Scope

This part of GB/T 17421 specifies the method of checking the geometrical accuracy of the machine tool rotation axis.

The spindle of the machine, the rotary head and the rotary table form the axis of rotation, due to the multi-source of the error, so that the space movement of the rotary axis can not be expected.

This section covers the following features of the spindle.

--- rotary axis error movement;

The speed of the axis caused by the offset.

Other important characteristics of the spindle, such as the axis deviation caused by heat and ambient temperature, belong to the category of GB/T 17421.3.

The following features of the spindle are not included in this section.

- angular position accuracy (see ISO 230-1 and ISO 230-2);
- Beating of surfaces and components (ISO 230-1);

The technical requirements of the tool holder holding hole;

- Measurement of inertial vibration (see ISO 230-8);
- Measurement of noise (ISO 230-5);
- speed range and accuracy (see ISO 10791-6 and ISO 13041-6);

Balance method of balance or balance (ISO 1940-1 and ISO 6103);

--- idle loss (power loss);

- thermal drift (see GB/T 17421.3).

2 Normative reference documents

The following documents are indispensable for the application of this document. For dated references, only the dated edition applies to this article Pieces. For undated references, the latest edition (including all modifications) applies to this document.

GB/T 17421.3-2009 General rules for machine inspection - Part 3. Assessment of thermal effects (ISO 230-31)..2001, IDT) GB/T 19660-2005 Industrial automation systems and integrated machine tools Digital control coordinate systems and motion naming (ISO 841.:2001, IDT) ISO 230-1.:1996 General rules for machine inspection - Part 1. Geometric accuracy of machine tools under no load or finishing conditions (Test code formachinetools-Part 1.

Geometricaccuracyofmachinesoperatingunderno-loadorfinishingcondi-tions ISO 230-2.:2006 General rules for machine inspection - Part 2. Determination of positioning accuracy and repeatability of NC axes (Test codeformachinetools-Part 2. Determination ofaccuracyandrepeatabilityofpositioningnumericaly controledaxes

1) Coming soon (ISO 230-3.:2001 revision).