

ICS 25.080.01

CCS J 50



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

GB/T 17421.3-2009

**General machine test -- Part 3: determination of thermal effects
(English Translation)**

Issued on: April 13, 2009

Implemented on: January 1, 2010

Issued by: Standardization Administration of China

Table of Contents

Preface

1 Scope

2 Normative references

3 Terms and definitions

Brief description 4

5 Changes in ambient temperature error (ETVE) inspection

6 Thermal deformation caused by the rotation of the spindle

The heat generated by the linear axis motion caused by the deformation 7

Appendix A (informative) displacement sensor information

Annex B (informative) required number of guide displacement sensor

Annex C (informative) Guide to the machine 25 ambient temperature

References

Foreword

GB/T 17421 "General machine test" is divided into nine sections.

--- Part 1. under no-load or finishing conditions Geometric accuracy of machines;

--- Part 2. CNC axis positioning accuracy and repeatability of the determination;

--- Part 3. determination of thermal effects;

--- Part 4. Circular tests CNC machine tools;

--- Part 5. determination of noise emission;

--- Part 6. diagonal displacement test;

--- Part 7. Geometric accuracy of the axis of rotation of the test;

--- Part 8. vibration level is determined;

Part --- Article 9. GB/T 17421 basic equation measuring machine test series standard uncertainty assessment.

This section GB/T 17421 Part 3.

This section identical with ISO 230-3:2001 "General machine test - Part 3. determination of thermal effect" (in English).

This portion ISO 230-3. compared to 2001, editorial changes as follows.

- The "international standards in this section" to "this Part";
- Use the decimal symbol instead of as a decimal comma " , " . " , " ;
- Remove the foreword and introduction of international standards;
- For ISO 230-3:2001 references to other international standards, has been adopted as a standard by our country in place of the corresponding international standard Standard, the standard has not been adopted as the country still adopt international standards;
- Chapter 2 normative documents cited by ISO 1:2002 "Geometrical Product Specifications (GPS) Geometrical product specifications Standard reference temperature and check "Replace ISO 230-3:2001 referenced ISO 1. 1975" standards-based industrial length measurement Reference temperature ";
- Will apply international standards applicable to our presentation to the standard formulation.

This part of the Annex A, Annex B and Annex C is informative appendix.

This part is proposed by China Machinery Industry Federation.

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

This section is drafted. Shenyang Machine Tool (Group) Co., Ltd., Beijing Machine Tool Research Institute, Beijing Institute of milling, Tianshui Spark Machine Tool limited liability company.

1 Scope

This section GB/T 17421 specifies the three thermal deformation test, namely.

- Changes in ambient temperature error (ETVE) test;
- Examination by the thermal deformation caused by the rotation of the spindle;
- Examination by a linear axis thermal distortion caused by the movement.

Inspection by the thermal deformation caused by moving linear axes (see Chapter 7) applies only to CNC machine tools, and used to quantify the thermal expansion and contraction axis Positioning accuracy and repeatability of the impact. For practical reasons, the test methods described in Chapter 7 applies to the linear axis line Drive to the machine 2000mm, if used machine axis travel is greater than 2000mm, then the election within the normal operating range for each axis Given a representative of 2000mm length to be tested.

It should be noted that the test described in this section does not give a specific tolerance value.

2 Normative references

The following documents contain provisions which, through reference GB/T 17421 in this section constitute provisions of this section. For dated references, all subsequent amendments (excluding corrections) or revisions do not apply to this section, however, encourage an agreement under this section Parties to study the latest versions of these documents. For undated reference documents, the latest versions apply to this section.

GB/T 17421.1-1998 Test code for machine tools - Part 1. under no-load or finishing conditions Geometric accuracy of machines (EqvISO 230-1.1996) GB/T 17421.2-2000 Test code for machine tools - Part 2. CNC axis positioning accuracy and repeatability of determination (EqvISO 230-2.1997) GB/T 17421.4-2003 Test code for machine tools - Part 4. CNC machine tools circular test (ISO 230-4:1996, IDT) ISO 1:2002 Geometrical Product Specifications (GPS) Geometrical product specifications and inspection standard reference temperature

3 Terms and Definitions

The following terms and definitions apply to this part of the GB/T 17421 of.

Become one with the machine tool used to measure the linear axis or rotary axis position measurement system.

Due to the difference in thermal expansion estimated value of the estimated value of the thermal expansion and testing instruments measured object temperature 20 °C non-arising.

Integrated thermal uncertainty by the measured object and test instruments coefficient of thermal expansion caused by uncertainty.

NOTE: Both the square of its value by the expansion of the object nominal heat uncertainty squared test equipment nominal thermal expansion Uncertainty and rms drawn.

1) In the definition of this entry, according to the requirements of ISO terminology, you should use the term "deviation (deviation)" instead of "error (error)", but due to the use ETVE's long history as an exception to the ISO terminology, the Committee agreed to retain the term.

It refers to the machine at any time during the performance measurement section, only for the largest possible measurement uncertainty caused by the ambient temperature was GB/T 17421.3-2009/ISO 230-3:2001