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

GB/T 17421.6-2016

**Test code for machine tools -- Part 6: Determination of
positioning accuracy on body and face diagonals (Diagonal
displacement tests)**

机床检验通则 第6部分：体和面对角线位置精度的确定（对角线位移检验）
(English Translation)

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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 noise emission;

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

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

Part 9. GB/T 17421 Machine tool inspection series of standards for the uncertainty of the basic formula (technical report);

Part 10. Determination of measurement performance of CNC machine tools;

- Part 11. Measuring instruments for geometrical accuracy of machine tools (technical report).

This part is part 6 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 230-6.:2002 "Machine Testing General Part 6. Body and face-to-face position accuracy Determine (diagonal displacement check) ".

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 General rules for machine tool inspection - Part 2. Definitions of positioning accuracy and repeated positioning accuracy for NC axes (EqvISO 230-2..1997) this section compares with ISO 230-6.:2002 as follows.

- the statement to be applied to international standards should be changed to the expression applicable to our standards;

--- Fixed errors in international standards (see 3.2).

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. Beijing Kai En Di CNC technology limited liability company, the State Machine Tool Quality Supervision and Inspection Center, Shenyang Machine Tool (set Group) limited liability company.

1 Scope

This part of GB/T 17421 specifies a diagonal displacement test, through which the spatial performance of the machine can be estimated. On the machine A complete test of spatial performance is a difficult and time-consuming process. Diagonal displacement testing reduces the time and cost of detecting spatial performance.

The diagonal displacement test itself is not a self-diagnostic test procedure, although it is sometimes possible to derive diagnostic properties from the test results in conclusion. In particular, when a diagonal check is included, a direct measurement of the axis perpendicularity can be made. Diagonal diagonally the inspection can be supplemented by face-to-face inspection, verified by ISO 230-2 parallel to the machine axis, or by basis GB/T 17421.4-2003 defined in the three coordinate plane generated contours to achieve the evaluation.

Diagonal displacement check can be used for machine acceptance, can also be used to re-confirm the performance of the machine, which will test parameters used as a ratio More indicators.

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.

General rules for machine tool inspection - Part 3. Determination of thermal effects (ISO

230-3.:2001, IDT) GB/T 17421.3-2009.

GB/T 17421.4-2003 General rules for machine inspection - Part 4. Circular inspection of CNC machine tools (ISO 230-4.:1996, IDT) ISO 230-1.:1996 General principles for machine inspection - Part 1. Geometrical accuracy of machine tools under no load or finishing conditions ISO 230-1.:1996 ISO 230-2.:1997 General rules for machine inspection - Part 2. Determination of positioning accuracy and repeatability of NC axes

3 Terms and definitions

The following terms and definitions apply to this document.

Working space

The machine is used for machining operations defined by the space defined by the linear axis travel (not including the stroke for auxiliary operation, such as tool change, etc.).

Body diagonal the working diagonal of the rectangular parallelepiped in the working space of the machine is shown in Fig.

Note 1: The workspace defines 4 body diagonals.

Note 2: The user can name the body diagonal with the starting point of the diagonal of the body, for example, X YZ is the volume from the start point X YZ to the end point -XY Z diagonal. Another method of naming is to use the NNP method (X negative, Y negative, Z positive, travel direction).

Face line

A diagonal in a plane of a rectangular parallelepiped.