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

GB/T 18400.2-2010

**Test conditions for machining centre -- Part 2: Geometric tests
for machines with vertical spindle or universal heads with
vertical primary rotary axis (vertical Z-axis)**

加工中心检验条件 第2部分：立式或带垂直主回转轴的万能主轴头机床几何精度
检验(垂直Z轴)

(English Translation)

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Foreword

GB/T 18400 "Test conditions for machining centers" is divided into ten parts.

--- Part 1. horizontal spindle and with head Geometric tests for machines (horizontal Z-axis);

--- Part 2. Part 2. Vertical spindle head or universal Geometric tests for machines with

vertical primary rotary axis (vertical Z-axis);

--- Part 3. with horizontal rotary axis of the main spindle head overall universal Geometric tests for machines (vertical Z-axis);

--- Part 4. positioning accuracy and linear and rotary axes repeatability test;

--- Part 5. Clamp the workpiece pallet positioning accuracy and repeatability of positioning accuracy test;

--- Part 6. feed rate, speed and accuracy test interpolation;

--- Part 7. finishing accuracy test specimen;

--- Part 8. Evaluation of the contouring performance in the three coordinate plane;

--- Part 9. Evaluation of conversion tool changer and pallet operation time;

--- Part 10. Evaluation of thermal effects.

This section GB/T 18400 Part 2.

This part identical with ISO 10791-2. universal vertical or with vertical primary rotary axis 2001 "Test conditions for machining centers - Part 2 Geometric tests for machines spindle head (vertical Z axis) "(in English).

Taking into account China's national conditions, in the use of ISO 10791-2:2001 when this part has made several editorial changes.

--- "This standard" be replaced by "this section";

--- Title Chapter 3, "a brief description" to "General requirements";

--- Remove the ISO 10791-2:2001 Foreword and Introduction, increasing the national standards foreword;

--- Remove the ISO 10791-2:2001 references.

This section of the Appendix A, Appendix B and Appendix C are normative 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. Beijing Machine Tool Research Institute, Beijing First Machine Tool Plant, Kunming Machine Tool Co., Ltd., Shenyang Institute of boring machine.

1 Scope

This section GB/T 18400 specifies the vertical (ie. vertical Z axis) machining centers (or CNC milling, CNC boring machine, etc.) geometric accuracy test.

This section applies to basically have three CNC axes, namely three linear axes (X, Y and Z) to 2000mm vertical machining Heart, also applies to the ram, or additional movement of the sleeve universal spindle head, such as. the rotation axis (A ', B', and C ').

This section lists the possible additional optional horizontal axis and the two kinds of additional universal spindle head test items in the appendix.

--- Appendix A. optional horizontal axis (test items AG1 ~ AG6);

--- Appendix B. Rotary swing spindle head having a CNC rotary axis (test items BG1 ~ BG2);

--- Appendix C. rotary spindle head having two mutually perpendicular NC rotary axis (test items CG1 ~ CG7).

This section applies only to machine geometric accuracy test, does not apply to the movement of the machine accuracy test. Normally these two tests are Performed separately. Under no-load or finishing conditions of the machine some other tests will be included in GB/T 18400 in other parts.

2 Normative references

The following documents contain provisions which, through reference GB/T 18400 in this section constitute provisions of this section. For dated reference documents Member, all subsequent amendments (not including errata content) or revisions do not apply to this section, however, encouraged to reach under this section Parties to research agreement to use 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 (eqv ISO 230-1:1996) Part 1990 for machine tool pallet Chapter 1.. ISO 8526-1 nominal size to 800mm workpiece pallet Workpiece pallet nominal size greater than 800mm of. ISO 8526-2:1990 for machine tool pallet - Part 2

3.1 Units of measurement

In this section all linear dimensions, tolerances and corresponding tolerances in millimeters (mm); the size of the angle in degrees (°), the angle Deviations and corresponding tolerance as a ratio, but in some cases for clarity available microradians (μrad) or arcsec (") indicates Expressions Equivalent relationship is as follows.

$$0.010/1000 = 10 \times 10^{-6} = 10\mu\text{rad} \sim 2''$$

3.2 Reference standard

This section should be used with reference to GB/T 17421.1-1998, particularly liter machine testing before installation, spindles and other moving parts Recommended temperature accuracy, testing methods and tools.

GB in Chapter 4 and Appendices A to C of "test method" column, should be consistent with the description of the test reference/T 17421.1-in 1998 the provisions of the corresponding section.

3.3 Test order

This section lists the order of test items and does not represent the actual test sequence, in order to facilitate assembly and disassembly and inspection tool inspection, press