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

GB/T 18400.1-2010

**Test conditions for machining centre -- Part 1: Geometric tests
for machines with horizontal spindle and with accessory heads
(horizontal Z-axis)**

加工中心检验条件 第1部分：卧式和带附加主轴头机床几何精度检验(水平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);

Universal spindle head Geometric tests for machines (vertical Z-axis) or vertical with vertical primary rotary axis;. --- Part 2

--- 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 1.

This part identical with ISO 10791-1:1998 "Test conditions for machining centers - Part 1. horizontal spindle and with head machine geometry Accuracy test (horizontal Z-axis) "(in English).

Taking into account China's national conditions, in the use of ISO 10791-1:1998 when this part has made several editorial changes.

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

--- Chapter 4, the heading "brief description" to "General requirements";

--- Remove the ISO 10791-1:1998 Foreword and Introduction, increasing the national standards foreword;

--- Remove the ISO 10791-1:1998 Annex D (informative).

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 First Machine Tool Plant, Shenyang Machine Group Kunming Machine Tool Co., Ltd., Beijing Machine Tool Research Institute, Sichuan Changzheng Machine Bed Group Co., Ltd., Shenyang Institute of boring machine.

1 Scope

GB/T 18400 provisions of this part of the horizontal (ie horizontal Z axis) machining centers (or applicable CNC milling, CNC boring machine, etc.) Geometric tests.

This section applies to essentially have four CNC axes, three linear axes (X, Y, Z) and a return trip to 2000mm Rotation axis (B ') of the horizontal machining center. Also applies to spindle slide, additional movement of the ram or three different forms of additional universal spindle head.

This section lists three possible test items additional universal spindle head in the appendix.

--- Appendix A (normative). 45 ° mechanical indexing of the minutes of the spindle head, with two objects of different angular positions of the corresponding inspection Test project (AG1 ~ AG9) checks only the last position in which the spindle;

--- Appendix B (normative). rotary spindle head having two mutually perpendicular NC rotary axis (test items BG1 ~ BG7);

--- Appendix C (Normative Appendix). 45 ° to divide the continuous indexing spindle head, similar to the first form, but with two NC rotary axis all geometric properties of continuous indexing, the corresponding test items (CG1 ~ CG7) To check the influence of the last position in which the spindle (plane and except axis), two rotary axis positioning accuracy; if their movement and allow locking, these test items can be used for sub-45 ° Spindle head to do more in-depth testing.

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)

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.