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

GB/T 5291-1985

Replacing GB/T 5291.1-2001

**Die sinking electro-discharge machines - Testing of the
accuracy - Part 1: Single-column machines (cross-slide table
type and fixed-table type)**

(English Translation)

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Foreword

This document is in accordance with the provisions of GB/T 1.1-2020 "Guidelines for Standardization Work Part 1: Structure and Drafting Rules for Standardization Documents"

drafting:

This document is the first part of GB/T 5291 "Accuracy Inspection of EDM Machine Tools":
GB/T 5291 has issued the following part:

--- Part 1: Single-column machine tools (cross table type and fixed table type);

--- Part 2: Double-column machine tools (moving spindle head type):

This document replaces GB/T 5291.1-2001 "Accuracy Inspection of EDM Machine Part 1: Single Column Machine Tool (Cross Table Compared with GB/T 5291.1-2001, except for structural adjustment and editorial changes, the main technical changes are as follows:

--- Added requirements such as "machine tool leveling" and "software compensation" (see 5.3, 5:7);

---Changed the geometric accuracy tolerance value of X-axis, Y-axis, Z-axis and other linear motion axes (see 6.1, 5:1 of the:2001 edition);

--- Added the item "Check of straightness of spindle (Z axis) motion" (see G3 in 6:1);

--- In "Geometric Accuracy Inspection", change the inspection item name "Deflection" to "Angular Deviation" (see G7 in 6:1,;2001 edition G6 in 5:1);

--- Deleted the item "Inspection of the straightness of the workbench datum T-slot or datum plane in the X direction" (see 5.2 of the:2001 edition middle G9);

---Deleted the item "Inspection of the parallelism between the table reference T-slot or reference plane and the X-axis movement" (see the:2001 edition G10 in 5:2);

---Changed the tolerance value of the parallelism check between the electrode mounting plate and the X-axis/Y-axis movement (see G10 in 6:3, the:2001 edition G11 in 5:3);

--- Deleted the item "Inspection of the lateral clearance between the spindle and the table" (see G14 in 5:3 of the:2001 edition);

--- Deleted the "manually operated shaft" test (see 6.1 of the:2001 edition);

--- Changed the positioning accuracy of the X-axis, Y-axis, and Z-axis, the repeatability of the positioning accuracy and the tolerance of the positioning reverse difference (see Chapter 7,;2001 version 6:2):

This document is equivalent to ISO 11090-1:2014 "EDM Machine Tool Inspection Conditions Accuracy Inspection Part 1: Single Column Machine Tool (Cross table type and fixed table type)":

The following minimal editorial changes have been made to this document:

--- In order to coordinate with the existing standard, the name of the standard is changed to "Precision Inspection of EDM Machine Tool Part 1: Single Column Machine Tool (10 Word

table type and fixed table type)";

--- Include ISO 1101, which is normatively referenced in Chapter 8, in Chapter 2:

Please note that some contents of this document may refer to patents: The issuing agency of this document assumes no responsibility for identifying patents:

Introduction

In order to distinguish between single-column and double-column EDM machine tools, GB/T 5291 consists of two parts:

--- Part 1: Single-column machine tools (cross table type and fixed table type): The purpose of this document is to enable regular precision and general Standardization of inspection methods for electric discharge forming machine tools (cross table type and fixed table type):

--- Part 2: Double-column machine tools (moving spindle head type): The purpose of this document is to specify general purpose and conventional precision electrical discharge Inspection methods for forming machine tools (moving spindle head type):

In this document, the tolerances of G1, G2, G3, G4, G5, G14, P1, P2, P3, and P4 have been changed compared with GB/T 5291.1-2001 Change: Due to the limited availability of T-slots in typical machine tools currently on the market, the following test in GB/T 5291.1-2001 is deleted: G9 "Straightness inspection of table reference T-slot or reference surface in X direction" and G10 "Worktable reference T-slot or reference surface and X-axis Parallelism check between motions":

Precision Inspection of EDM Machine Tool Part 1: Single-column machine tools (cross table type and Fixed table type)

1 Scope

With reference to ISO 230-1 and ISO 230-2, this document specifies the geometric accuracy inspection of general-purpose, conventional-precision electric discharge forming machine tools:

Inspection, CNC axis positioning accuracy and repeat positioning accuracy inspection and machining accuracy inspection: This document also specifies the standards corresponding to the above inspections:

difference:

This document applies to single-column machine tools of cross-sliding table type and fixed table type:

This document only involves the verification of machine tool accuracy, and is not applicable to machine tool operation tests (vibration, abnormal noise, crawling of parts, etc.) or its

Inspection of parameters (such as speed, feed rate, etc.), these inspections should usually be carried out before the accuracy inspection:

This document also specifies the terms used for the main components of machine tools, and refers to GB/T 19660-2005 named coordinate axes:

Note: In addition to terms expressed in ISO official languages (English, French), Appendix A gives Dutch, German, Italian, Swedish, Persian and Japanese text equivalent terms: These language standards are published by the Netherlands (NEN), Germany (DIN), Italy (UNI), Sweden (SIS), Iran (ISIRI) and Japan (JISC) national member bodies are responsible: However, only terms given in official languages are considered ISO terms:

2 Normative references

The contents of the following documents constitute the essential provisions of this document through normative references in the text: Among them, dated references for documents, only the version corresponding to the date is applicable to this document; for undated reference documents, the latest version (including all amendments) is applicable to this document:

ISO 230-1:2012 General rules for inspection of machine tools Part 1: Geometric accuracy of machine tools under no-load or quasi-static conditions (Test staticconditions) Note: GB/T 17421.1-1998 General inspection rules for machine tools Part 1: Geometric accuracy of machine tools under no-load or finishing conditions (eqvISO 230-1:

1996)

ISO 230-2:2014 General rules for inspection of machine tools Part 2: Determination of positioning accuracy and repeatability accuracy of CNC axes (Test calycontrolledaxes) Note: GB/T 17421.2-2016 General Rules for Inspection of Machine Tools Part 2: Determination of Positioning Accuracy and Repeatability Accuracy of CNC Axis (ISO 230-2: 2006, IDT)

ISO 1101 Product Geometric Specifications (GPS) Geometric Tolerances Shape, Orientation, Position and Runout Tolerance Dimensions [Geometrical and run-out] Note: GB/T 1182-2018 Product Geometric Specifications (GPS) Geometric Tolerance Shape, Orientation, Position and Runout Tolerance Marking (ISO 1101:2017, MOD)