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GB/T 5291.1-2023

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)

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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":

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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):

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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)

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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)

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