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Test conditions for pillar type vertical drilling machines — Testing of the accuracy

Conditions d'essais des machines à percer verticales à colonne — Contrôle de la précision

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Foreword

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The procedures used to develop this document and those intended for its further maintenance are described in the ISO/IEC Directives, Part 1. In particular, the different approval criteria needed for the different types of ISO ~~documents~~document should be noted. This document was drafted in accordance with the editorial rules of the ISO/IEC Directives, Part 2 (see www.iso.org/directives).

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This document was prepared by Technical Committee ISO/TC 39, *Machine tools*, Subcommittee SC 2, *Test conditions for metal cutting machine tools*.

This first edition of ISO 2773 cancels and replaces ISO 2773-1:1973 and ISO 2773-2:1973. ~~The original P1 test in ISO 2773-2:1973 has been deleted.~~

Any feedback or questions on this document should be directed to the user's national standards body. A complete listing of these bodies can be found at www.iso.org/members.html.

~~In addition to terms given in the official ISO languages (English and French), this document gives the equivalent terms in Persian and Italian These are published under the responsibility of the member bodies for Iran (INSO) and Italy (UNI) and are given for information only. Only the terms given in the official languages can be considered as ISO terms.~~

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Introduction

The purpose of this document is to standardize methods of testing the accuracy of pillar type vertical drilling machines including geometrical tests.

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Test conditions for pillar type vertical drilling machines — Testing of the accuracy

1 Scope

This document specifies, with reference to ISO 230-1, geometrical tests on general purpose and normal accuracy pillar type vertical drilling machines. ~~It~~This document also specifies the applicable tolerances corresponding to the above-mentioned tests.

This document ~~deals~~covers only with the verification of accuracy of the machine.

~~It~~This document does not apply to the testing of the machine operation (vibrations, abnormal noises, stick-slip motion of components, etc.) or to machine characteristics (such as speeds~~, etc.),~~ and feeds, which are generally checked before testing of machine accuracy.

2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

ISO 230-1:2012, *Test code for machine tools — Part 1: Geometric accuracy of machines operating under no-load or quasi-static conditions*

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3 Terms and definitions

For the purposes of this document, the terms and definitions given in ISO 230-1 and the following apply.

ISO and IEC maintain terminology databases for use in standardization at the following addresses:

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— ISO Online browsing platform: available at https://www.iso.org/obp

— IEC Electropedia: available at https://www.electropedia.org/

3.1
manual drilling machine
drilling machine where the axial motion of the cutting tool is controlled through the actuation of a handwheel or lever

Note 1 to entry: The handwheel or lever can include powered axial feed or powered unprogrammed positioning of spindle or workpiece.

3.2
pillar type vertical manual drilling machine
manual drilling machine (3.1) in which the drilling head and working table are mounted in adjustable positions on a vertical column

4 Terminology, designation of axes and machine configurations

For the nomenclature and terminology of a pillar type vertical manual drilling machine, see Figure 1.

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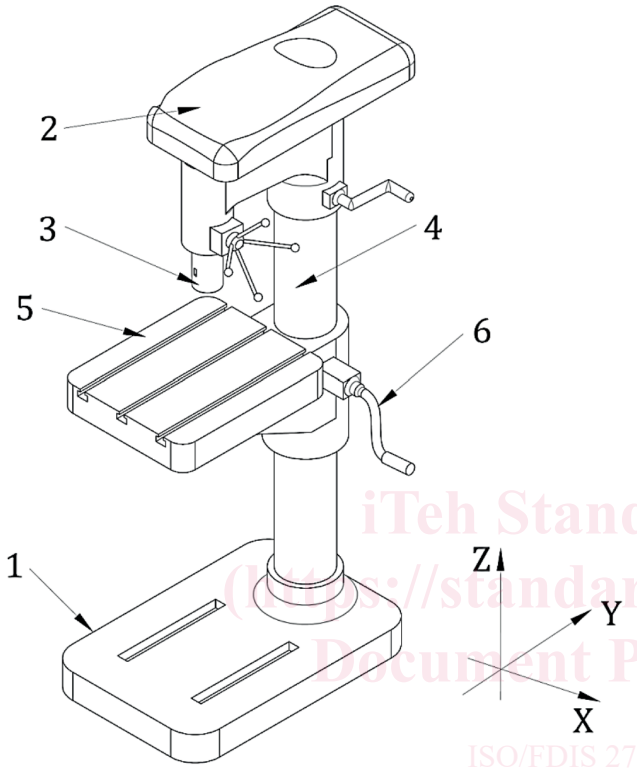

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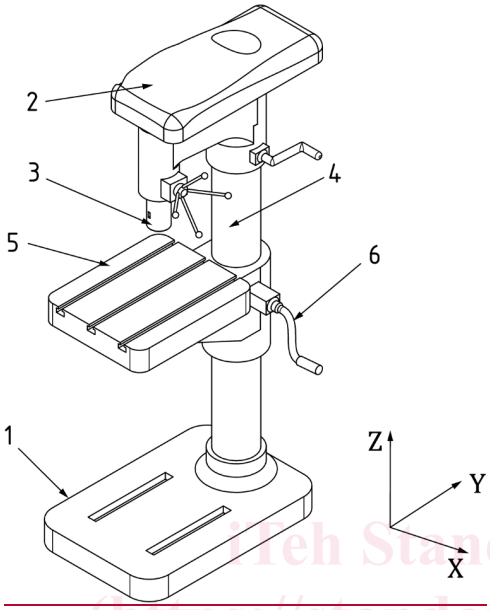

Key

	~~English~~	~~French~~
1	base	~~socle~~
2	spindle head (Z2 axis)	~~poupée porte-broche~~
3	spindle/quill (Z axis)	~~broche/fourreau (axe Z)~~
4	column	~~colonne~~
5	table (W-axis)	~~table (axe W)~~
6	table height adjuster	~~réglage de la table en hauteur~~

NOTE For ~~languages other than official ISO languages~~terms in French, Italian and Persian, see Table A.1.

Figure 1 — Example of a pillar type vertical manual drilling machine

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5 Preliminary remarks

5.1 Measurement units

In this document, all linear dimensions, deviations and corresponding tolerances are expressed in millimetres (mm); angular dimensions are expressed in degrees (°), and angular deviations and the corresponding tolerances are expressed in ratios. In some cases, microradians (µrad) or arcseconds (") may be used for clarification purposes. The equivalence of the following expressions should always be kept in mind:

0,010 / 1 000 = 10 µrad ≈ 2”

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5.2 Reference to ISO 230-1, ISO 230-7 and ISO/TR 230-11

To apply this document, reference shall be made to ISO 230-1, especially for the installation of the machine before testing, the warming up of spindles and other moving components, and the description of measuring methods and recommended accuracy of the test equipment.

Where the test concerned is in compliance with the specifications of ISO 230-1, a reference to the corresponding subclause of ISO 230-1 is shown before the instructions in the "Observations" block of the tests described in ~~Clauses 5 and~~Clause 6.

5.3 Testing sequence

The sequence in which the tests are presented in this document in no way defines the practical order of testing. In order to make the mounting of instruments or gauging easier, tests may be performed in any order.

5.4 Test to be performed

When testing a machine, it is not always necessary or possible to carry out all the tests described in this document. When the tests are required for acceptance purposes, it is up to the user to choose, in agreement with the supplier/manufacturer, the relevant tests relating to the components and/or the properties of the machine which are of interest. These tests ~~are to~~shall be clearly stated when ordering a machine. A simple reference to this document for the acceptance tests, without specifying the tests to be carried out or without agreement on the relevant expenses, cannot be considered as an agreement between manufacturer/supplier and user.

5.5 Measuring instruments

Measuring instruments indicated in the tests described below are only examples. Other instruments capable of measuring the same quantities and having the same, or a smaller, measurement uncertainty may be used. Reference shall be made to ISO 230-1:2012, Clause 5, which indicates the relationship between measurement uncertainties and the tolerances.

5.6 Minimum tolerance

When establishing the tolerance for a measuring length different from that given in this document (see ISO 230-1:2012, 4.1), it shall be taken into consideration that the minimum value of tolerance is 0,010.

5.7 Levelling

Prior to conducting tests on a pillar type vertical drilling machine, the machine should be levelled according to the recommendations of the manufacturer/supplier (see ISO 230-1:2012, 6.1.2).

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