International Standard 6480

INTERNATIONAL ORGANIZATION FOR STANDARDIZATION•МЕЖДУНАРОДНАЯ ОРГАНИЗАЦИЯ ПО СТАНДАРТИЗАЦИИ•ORGANISATION INTERNATIONALE DE NORMALISATION

Conditions of acceptance for horizontal internal broaching machines — Testing of the accuracy

Conditions de réception des machines horizontales à brocher les intérieurs — Contrôle de la précision

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Descriptors : machine tools, broaching machines, designation, tests, testing conditions, dimensional deviations, precision.

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Foreword

ISO (the International Organization for Standardization) is a worldwide federation of national standards bodies (ISO member bodies). The work of developing International Standards is carried out through ISO technical committees. Every member body interested in a subject for which a technical committee has been authorized has the right to be represented on that committee. International organizations, governmental and non-governmental, in liaison with ISO, also take part in the work.

Draft International Standards adopted by the technical committees are circulated to the member bodies for approval before their acceptance as International Standards by the ISO Council.

International Standard ISO 6480 was developed by Technical Committee ISO/TC 39, *Machine tools*.

This second edition was submitted directly to the ISO Council, in accordance with clause 6.11.2 of part 1 of the Directives for the technical work of ISO. It cancels and replaces the first edition (i.e. ISO 6480-1980), which had been approved by the member bodies of the following countries :

Australia	India	South Africa, Rep. of
Belgium	Italy	Spain
Brazil	Japan	Sweden
Chile	Korea, Dem. P. Rep. of	Turkey
Czechoslovakia	Korea, Rep. of	United Kingdom
France	Libyan Arab Jamahiriya	USA
Germany, F.R.	Poland	USSR
Hungary	Romania	Yugoslavia

No member body had expressed disapproval of the document.

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Conditions of acceptance for horizontal internal broaching machines — Testing of the accuracy

1 Scope and field of application

This International Standard specifies, with reference to ISO/R 230, geometrical tests for general purpose and normal accuracy machines and gives the corresponding permissible deviations which apply. This International Standard also gives the terminology used for the main elements of the machine.

NOTE — In addition to terms used in the three official ISO languages (English, French and Russian), this International Standard gives, in the annex, the equivalent terms in German and Italian. These have been included at the request of ISO Technical Committee TC 39 and are published under the responsibility of the Member Bodies for Germany, F.R. (DIN) and Italy (UNI). However, only the terms given in the official languages can be considered as ISO terms.

It deals only with the verification of accuracy of the machine. It does not apply to the testing of the running of the machine (vibrations, abnormal noises, stick-slip motion of components, etc.), nor to its characteristics (speeds, feeds, etc.) which should generally be checked before testing accuracy.

2 Reference

ISO/R 230, *Machine tool test code.*

3 Preliminary remarks

3.1 In this International Standard, all dimensions and permissible deviations are expressed in millimetres and in inches.

3.2 To apply this International Standard, reference should be made to ISO/R 230, especially for installation of the machine before application of the methods of acceptance, warming up of moving parts, description of measuring methods, and recommended accuracy of testing equipment.

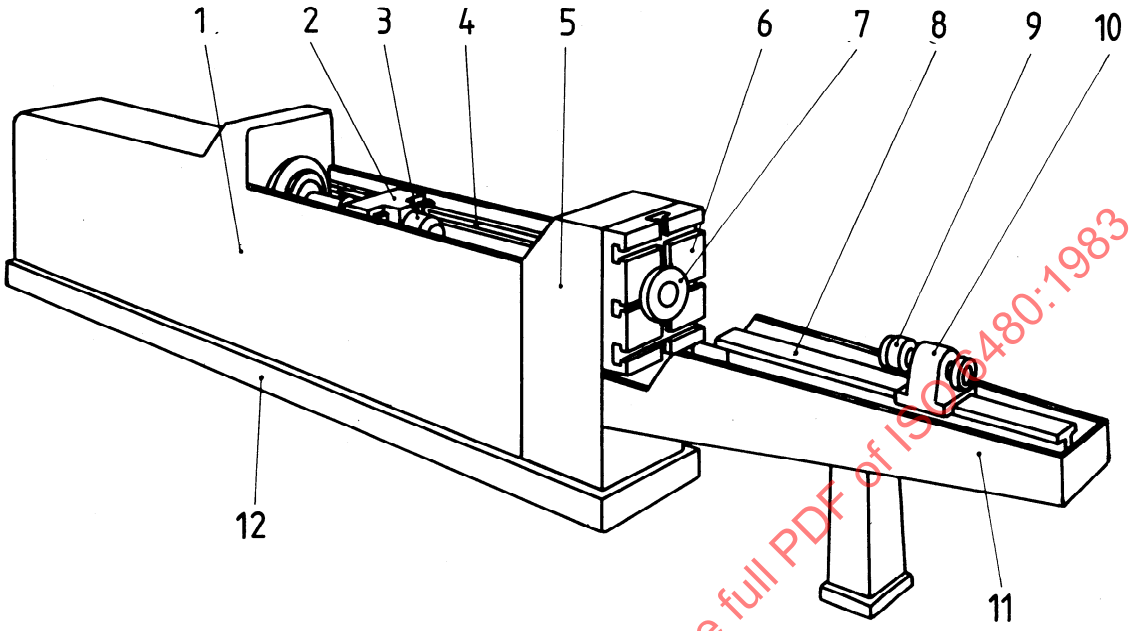
3.3 The sequence in which the geometrical tests are given is related to the sub-assemblies of the machine and this in no way defines the practical order of testing. In order to make the mounting of instruments or gauging easier, tests may be applied in any order.

3.4 When inspecting a machine, it is not always necessary to carry out all the tests given in this International Standard. The user may choose, in agreement with the manufacturer, those tests relating to the properties which are of interest to him, but these tests shall be clearly stated when ordering a machine.

3.5 Because of the diversity of shape of the pieces, practical tests have not been included. If the user wishes to carry out a practical test, this test shall be stated in agreement with the manufacturer.

3.6 When establishing the tolerance for a measuring range different from that given in this International Standard (see clause 2.311 in ISO/R 230), it should be taken into consideration that the minimum value of tolerance, for geometrical tests as well as for practical tests, is 0,01 mm (0.000 4 in).

4 Terminology

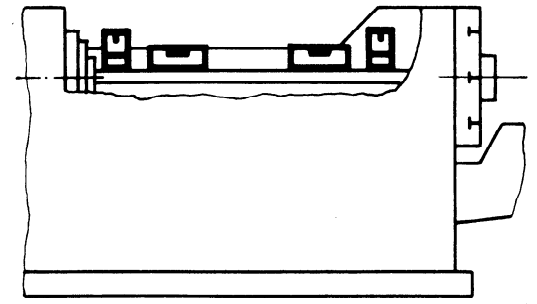
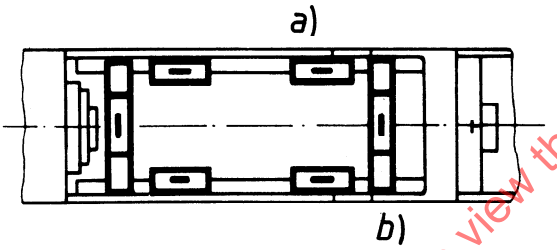
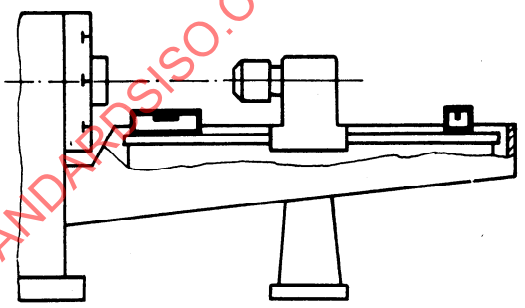
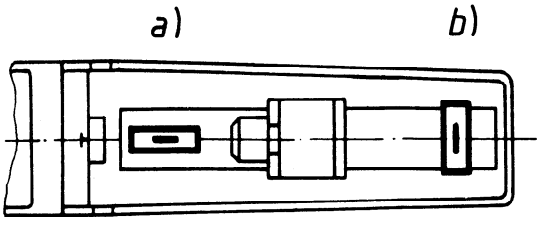


No.	English language	French language	Russian language
1	Bed	Bâti avant	Станина
2	Pull block	Chariot de traction	Рабочая каретка
3	Pulling chuck	Tête d'accrochage avant	Зажимной патрон
4	Pull block ways	Guidage du chariot de traction	Направляющие рабочей каретки
5	Table	Montant du plateau de fixation	Стол
6	Face plate	Plateau de fixation	Опорная плита
7	Work support bush	Support de pièce	Рабочая скользящая втулка
8	Outer support ways	Guidage du chariot d'amenage et d'accompagnement	Направляющая скользящего блока
9	Retrieving chuck	Tête d'accrochage arrière	Вспомогательный патрон
10	Outer support block	Chariot d'amenage et d'accompagnement	Скользящий блок
11	Outer support table	Support du chariot d'amenage	Приставная станина
12	Base box	Socle	Основание

Permissible deviation		Measuring instruments	Observations and references to test code ISO/R 230
mm	in		
a) and *b*) 0,05/1000	*a*) and *b*) 0.002/40	Level and special support	Clause 3.11 The level shall be placed in positions *a*) and *b*), and the deviation observed; for the two tests of G01, the deviations shall be in the same direction. NOTE — These tests shall be carried out in accordance with the manufacturer's instructions.
a) and *b*) 0,1/1000	*a*) and *b*) 0.004/40		

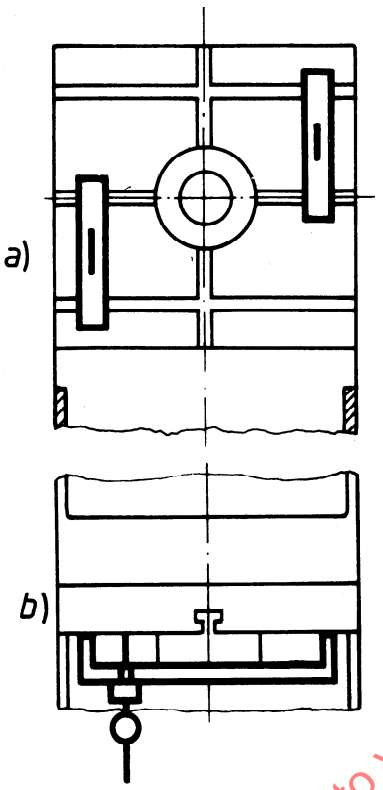
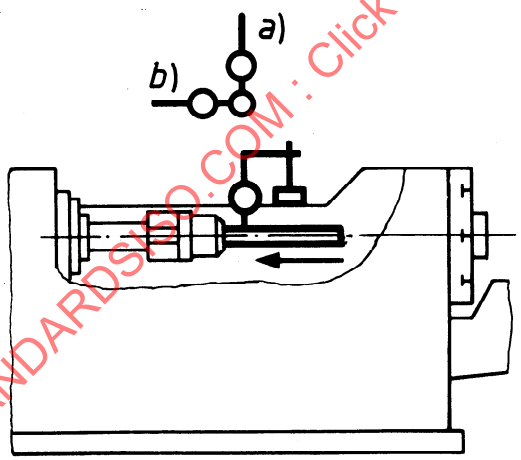
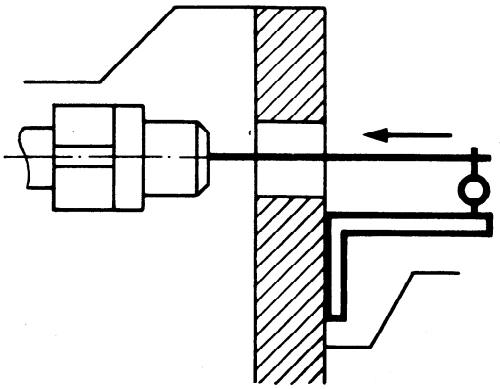
5 Conditions of acceptance and permissible deviations

5.1 Preliminary tests

No.	Diagram	Object
G01	 	Verification of levelling of the pull block ways : *a*) longitudinal verification; *b*) transverse verification.
	 	Verification of levelling of the outer support ways : *a*) longitudinal verification; *b*) transverse verification.

Permissible deviation		Measuring instruments	Observations and references to test code ISO/R 230
mm	in		
a) and *b*) 0,025 up to 300 0,025 for each additional 300 up to a maximum of 0,05	*a*) and *b*) 0.001 up to 12 0.001 12 0.002	*a*) Box spirit level or straightedge and gauge blocks *b*) Dial gauge and special support or straightedge and gauge blocks	Clauses 5.322 and 5.323 *a*) The box spirit level shall be placed successively at a number of positions equally spaced along the face plate, and the deviation observed. *b*) The special support shall be placed in the upper, mid and lower positions on the face plate. The dial gauge shall be moved on the special support in a horizontal plane, and the deviation observed.
a) and *b*) 0,05/300	*a*) and *b*) 0.002/12	Test mandrel and dial gauge	Clause 5.422.21 Pulling chuck extended. The dial gauge shall be fixed to a fixed part of the machine. The pulling chuck shall be moved and any horizontal or vertical deviation noted.
a) and *b*) 0,035/300	*a*) and *b*) 0.0014/12	Square and dial gauge	Clause 5.522. 2 The dial gauge shall be fixed to the pulling chuck and the square to the face plate; the pulling chuck shall be moved with the dial gauge along the square and any horizontal or vertical deviation noted.

5.2 Geometrical tests

No.	Diagram	Object
G1		Checking of flatness of the face plate : *a*) in a vertical plane; *b*) in a horizontal plane.
G2		Verification of parallelism of the pulling chuck hole axis to its movement : *a*) in a vertical plane; *b*) in a horizontal plane.
G3		Checking of squareness of the movement of the pulling chuck to the face plate : *a*) in a vertical plane; *b*) in a horizontal plane.

Permissible deviation		Measuring instruments	Observations and references to test code ISO/R 230
mm	in		
a) and *b*) 0,075/300	*a*) and *b*) 0.003/12	Dial gauge and special square	Clause 5.522.2 The dial gauge shall be fixed on the retrieving chuck. The special square shall be placed against the face plate. The retrieving chuck shall be moved, and any horizontal or vertical deviation noted.
0,05	0.002	Test mandrel and dial gauge	Clause 5.44 Pulling chuck in starting position. The dial gauge shall be set to swivel on the test mandrel, and the test mandrel shall be fixed to the pulling chuck. The dial gauge shall be turned 360° around the central hole, and any deviation observed (half value).
a) and *b*) 0,06/500	*a*) and *b*) 0.0024/20	Test mandrel of length $L = 1000$ and dial gauge	Clauses 5.43 and 5.44 The test mandrel shall be fixed in the retrieving chuck hole and in the pulling chuck hole. The plunger of the dial gauge shall touch the test mandrel. The retrieving chuck hole and pulling chuck hole shall be moved, and any horizontal or vertical deviation noted.