SLOVENSKI STANDARD
SIST EN 26789:2000

01-december-2000

Assembly tools for screws and nuts - Hand torque tools - Requirements and test methods (ISO 6789:1992)

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Schraubwerkzeuge - Handbetätigte Drehmoment-Werkzeuge - Anforderungen und Prüfungen (ISO 6789:1992)

Outils de manoeuvre pour vis et écrous - Outils dynamétriques a commande manuelle - Exigences et méthodes d'essai (ISO 6789:1992)

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CEN

European Committee for Standardization
Comité Européen de Normalisation
Europäisches Komitee für Normung

Central Secretariat: rue de Stassart,36 B-1050 Brussels

Foreword

The text of the International Standard ISO 6789:1992 prepared by ISO/TC 29 "Small tools" was submitted to the formal vote and was approved an EN 26789 on 13-03-1994 without any modification.

This European Standard shall be given the status of a national standard, either by publication of an identical text or by endorsement, at the latest by September 1994, and conflicting national standards shall be withdrawn at the latest by September 1994.

According to the CEN/CENELEC Internal Regulations, the following countries are bound to implement this European Standard: Austria, Belgium, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Luxembourg, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland and United Kingdom.

Endorsement notice

The text of the International Standard ISO 6789:1992 was approved by CEN as a European Standard without any modification.

INTERNATIONAL STANDARD

ISO 6789

Second edition
1992-12-01

Assembly tools for screws and nuts — Hand torque tools — Requirements and test methods

Outils de manœuvre pour vis et écrous — Outils dynamométriques à commande manuelle — Exigences et méthodes d'essai

Reference number
ISO 6789:1992(E)

Foreword

ISO (the International Organization for Standardization) is a worldwide federation of national standards bodies (ISO member bodies). The work of preparing International Standards is normally carried out through ISO technical committees. Each member body interested in a subject for which a technical committee has been established 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. ISO collaborates closely with the International Electrotechnical Commission (IEC) on all matters of electrotechnical standardization.

Draft International Standards adopted by the technical committees are circulated to the member bodies for voting. Publication as an International Standard requires approval by at least 75 % of the member bodies casting a vote.

International Standard ISO 6789 was prepared by Technical Committee ISO/TC 29, *Small tools*, Sub-Committee SC 10, *Spanners and wrenches*.

This second edition cancels and replaces the first edition (ISO 6789:1982 and ISO 7855:1985), of which it constitutes a technical revision.

Annexes A and B form an integral part of this International Standard. Annex C is for information only.

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Assembly tools for screws and nuts — Hand torque tools — Requirements and test methods

1 Scope

The present International Standard specifies the requirements and describes the test methods and marking of hand torque tools used for controlled tightening of bolted connections.

It applies to torque tools according to clause 2, in particular to indicating and setting torque wrenches according to numbers 258 and 259 of ISO 1703.

2 Classification

The torque tools to which this International Standard applies are classified as follows:

a) Type I: Indicating torque tools (see annex A)

- Class A: wrench, torsion or flexion bar
- Class B: wrench, rigid housing, with scale or dial or display
- Class C: wrench, rigid housing and electronic measurement
- Class D: screwdriver, with scale or dial or display
- Class E: screwdriver, with electronic measurement

b) Type II: Setting torque tools (see annex B)

- Class A: wrench, adjustable, graduated
- Class B: wrench, fixedly adjusted
- Class C: wrench, adjustable, non-graduated
- Class D: screwdriver, adjustable, graduated
- Class E: screwdriver, fixedly adjusted
- Class F: screwdriver, adjustable, non-graduated

3 Requirements

3.1 Assignment of the driving square

The size of the driving square is a function of the maximum torque value of the respective torque tool. The assignment is carried out according to the values given in table 1.

Table 1

Maximum torque value N·m	Driving square nominal size[1)] mm
30	6,3
135	10
340	12,5
1 000	20
2 700	25

1) In accordance with ISO 1174.

3.2 Specified measuring range

The requirements and test methods according to this International Standard cover a specified measuring range from 20 % to 100 % of the maximum torque value of the respective tool.

The scales of torque tools of type I shall be marked with a zero position.

3.3 Scales

The increment between two graduation marks of a scale shall not exceed 5 % of the maximum value.

3.4 Tolerances

3.4.1 Indicating torque tools (type I)

Permissible deviation of the torque value indicated by the tool from the simultaneous indication of the test device shall be

— Classes A and D: ± 6 % of the test device indication

— classes B, C and E: ± 4 % of the test device indication

3.4.2 Setting torque tools (type II)

Permissible deviation of the torque value set on the scale (classes A and D) or the nominal value (classes B and E) from the torque value indicated by the test device shall be

— Classes A and B: ± 4 % of the test device indication

— Classes D and E: ± 6 % of the test device indication

Permissible deviation of the torque value set from the torque value indicated by the test device shall be

— Class C: ± 4 % of the test device indication

— Class F: ± 6 % of the test device indication

For classes C and F, the torque value set is equal to the arithmetical mean of the 10 test readings obtained according to 4.4.

3.5 Calibration life

After overloading as specified in 3.5.1 and a number of cycles as specified in 3.5.2, the torque tool shall still be within the tolerances specified in 3.4 and shall show no physical damage.

3.5.1 Overloading

All torque tools to be tested shall be loaded once in each direction of operation to a torque value of 125 % of the maximum capacity (or nominal capacity for tools of type II classes B and E). This does not apply to limiting torque tools.

3.5.2 Number of cycles

All torque tools to be tested shall be cycled at maximum capacity (or nominal capacity for tools of type II classes B and E) for 5 000 cycles, in each direction of operation, at a rate between 10 and 20 cycles per minute.

4 Accuracy testing

4.1 Test device

The maximum permissible deviations of the test device shall be ± 1 % of the indicated value.

The test device shall be set to zero before starting the test.

4.2 Test temperature

The tests shall be carried out after stabilization of the torque tool to be tested and of the test device at an ambient temperature of 20 °C ± 5 °C.

4.3 Test procedure

4.3.1 Before starting the test, make sure that:

a) for indicating torque tools (type I), the pointer or the electronic indication is set to zero;

b) for torque tools of type I with scale or dial, the reading is viewed normal to the scale or dial;

c) for setting torque tools (type II), five releases without measurement are carried out in the direction of operation, at the maximum capacity or nominal capacity respectively;

d) for single-armed torque tools, the operating force *F* is applied within the limits specified in figures 1 and 2, in the centre of the handle.

4.3.2 The torque tools shall be loaded on the test device with increasing operating force until they indicate the respective test value or until release; the increase in force above approximately 80 % of this value shall be applied smoothly during a period of 1 s to 4 s according to the torque value, unless otherwise indicated by the manufacturer.

If, for type I torque tools, the load was increased above the torque value to be measured, the test shall be repeated.

Type II torque tools shall be adjusted to the respective test value, starting from a lower value.

4.4 Measurement procedure

Before and after the tests specified in 3.5.1 and 3.5.2, the tolerances given in 3.4 shall first be tested at 20 %, then at about 60 %, then at 100 % of the maximum torque value of the respective tool (or at the nominal value for type II tools, classes B and E).

If the scale mark of 20 % of maximum torque value is not indicated on the torque tool, tolerances shall be tested at the next lower scale mark.

The number of tests in each direction of operation shall be as follows:

— Type I, all classes: 5 times successively at each measuring point;

— Type II, classes A and D: 5 times successively at each measuring point;

— Type II, classes B and E: 5 times successively at nominal value;

— Type II, classes C and F: 10 times successively at each measuring point.

All readings shall be within the tolerances specified in 3.4.

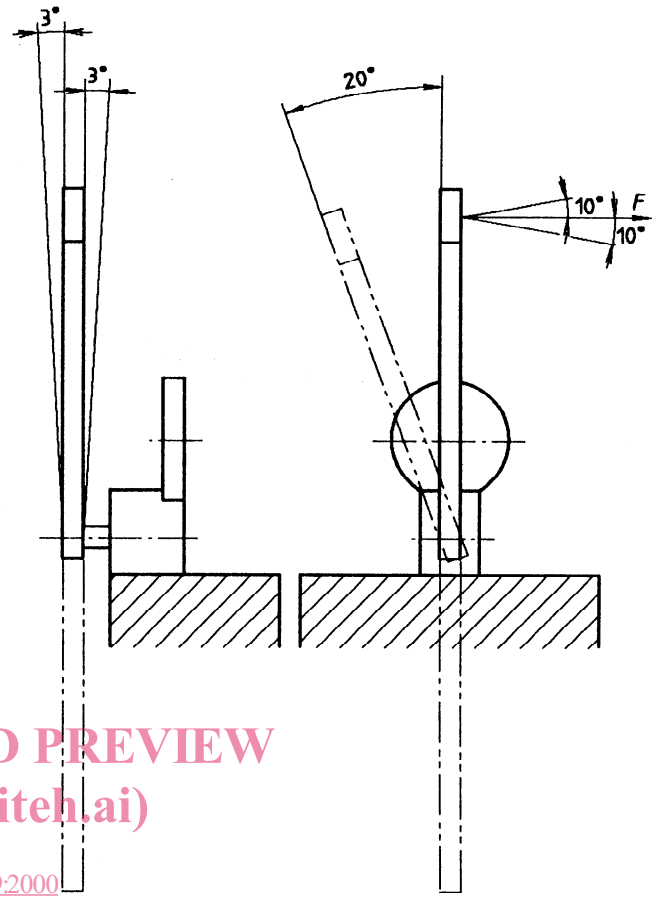

Figure 1 — Wrench vertical

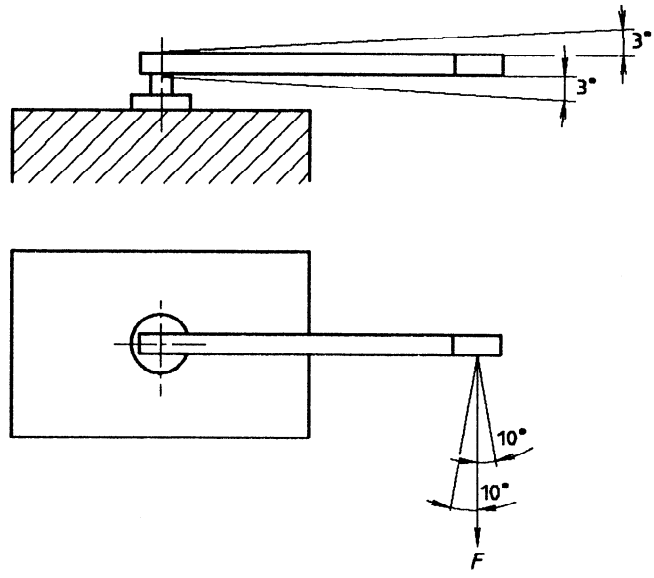

Figure 2 — Wrench horizontal

5 Marking

Torque tools shall be marked, permanently and legibly, with the following information:

a) the maximum torque value;

b) the measuring units;

c) the direction of operation (for tools capable of operating in one direction only);

d) the name or trademark of the manufacturer (or responsible supplier).