INTERNATIONAL STANDARD

ISO 3316

Fifth edition
2018-05

Assembly tools for screws and nuts — Attachments for hand-operated square drive socket wrenches — Dimensions and tests

Outils de manoeuvre pour vis et écrous — Adaptateurs pour douilles à main à carré conducteur — Dimensions et essais

Reference number
ISO 3316:2018(E)

ISO copyright office
CP 401 • Ch. de Blandonnet 8
CH-1214 Vernier, Geneva
Phone: +41 22 749 01 11
Fax: +41 22 749 09 47
Email: copyright@iso.org
Website: www.iso.org

Published in Switzerland

Contents

Page

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.

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 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).

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. ISO shall not be held responsible for identifying any or all such patent rights. Details of any patent rights identified during the development of the document will be in the Introduction and/or on the ISO list of patent declarations received (see www.iso.org/patents).

Any trade name used in this document is information given for the convenience of users and does not constitute an endorsement.

For an explanation on the voluntary nature of standards, the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the World Trade Organization (WTO) principles in the Technical Barriers to Trade (TBT) see the following URL: www.iso.org/iso/foreword.html.

This document was prepared by Technical Committee ISO/TC 29, *Small tools,* Subcommittee SC 10, *Assembly tools for screws and nuts, pliers and nippers*.

This fifth edition cancels and replaces the fourth edition (ISO 3316:2012), of which it constitutes a minor revision. The changes compared to the previous edition are as follows:

a) correction of footnotes in Table 1;

b) change of the gender related terms “male” to “external” and “female” to “internal”;

c) deletion of the unit “mm” for the nominal dimensions;

d) addition of the mandatory Clause 3 “Terms and definitions”.

Assembly tools for screws and nuts — Attachments for hand-operated square drive socket wrenches — Dimensions and tests

1 Scope

This document applies to attachments for hand-operated square drive socket wrenches.

NOTE 1 The attachments for hand-operated square drive socket wrenches covered by this standard are the ones identified in ISO 1703:2018 under reference No. 5 1 00 03 0, 5 1 00 04 0, 5 1 00 04 1 and 5 1 00 05 0.

It specifies

a) the overall dimensions;

b) the minimum Rockwell hardness value for their driving squares;

c) the method of torque testing;

d) the minimum torsional strength values;

e) the designation; and

f) the marking.

NOTE 2 For the specification of square adaptors with a hexagon or cylindrical flat drive, for power socket wrenches, see ISO 3317.

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 1174-1, *Assembly tools for screws and nuts — Driving squares — Part 1: Driving squares for hand socket tools*

3 Terms and definitions

No terms and definitions are listed in this document.

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

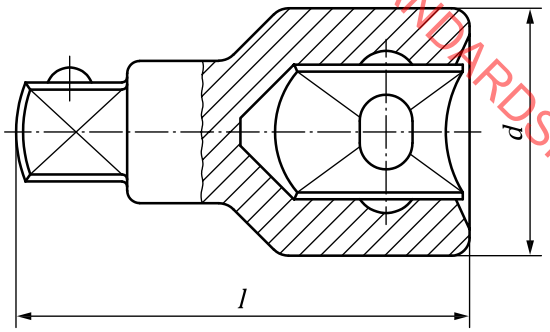
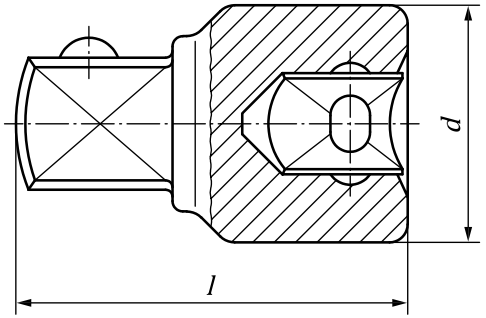
— ISO Online browsing platform: available at https://www.iso.org/obp

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

4 Dimensions

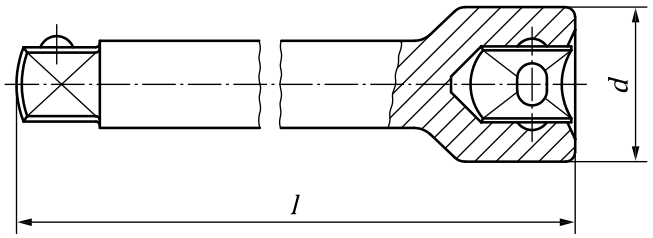
The overall dimensions are given in Table 1.

Table 1 — Overall dimensions

Tool	Description and designation according to ISO 1703	Nominal dimension of square drive		Dimensions mm		Torque[a] M_{min} N·m
		Internal square	External square	l_{max}	d_{max}	
	Adaptor socket wrench, hand-operated 5 1 00 03 0	10	6,3	32	20	62
		12,5	10	44	25	202
		20	12,5	58	38	512
		25	20	85	52	1 412
		6,3	10	27	16	62
		10	12,5	38	23	202
		12,5	20	50	30	512
		20	25	68	40	1 412

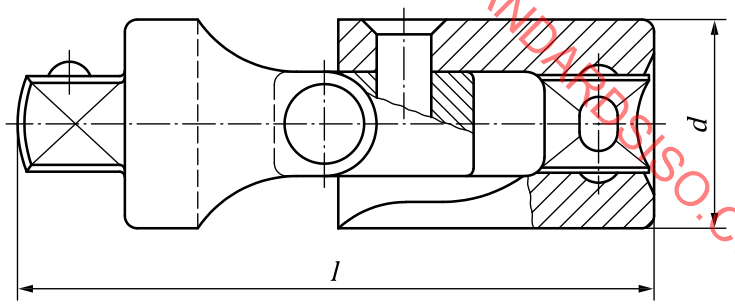
a Torques, M, for adaptors and extension bars are the maximum values for the smaller square from series E of ISO 1711-1:2016. For the universal joints, the values have been calculated using those maximum values, multiplied by the coefficient 0,55.

Table 1 *(continued)*

Tool	Description and designation according to ISO 1703	Nominal dimension of square drive	Dimensions mm		Torque[a] M_{min} N·m
		Internal and external square	l	d_{max}	
	Extension bar, hand-operated 5 1 00 04 0 5 1 00 04 1	6,3	55 ± 3 100 ± 5 150 ± 8	12,5	62
		10	75 ± 4 125 ± 6 250 ± 12	20	202
		12,5	75 ± 4 125 ± 6 250 ± 12	25	512
		20	200 ± 10 400 ± 20	38	1 412
		25	200 ± 10 400 ± 20	52	2 515

a Torques, M, for adaptors and extension bars are the maximum values for the smaller square from series E of ISO 1711-1:2016. For the universal joints, the values have been calculated using those maximum values, multiplied by the coefficient 0,55.

Table 1 *(continued)*

Tool	Description and designation according to ISO 1703	Nominal dimension of square drive	Dimensions mm		Torque[a] M_{min} N·m
		Internal and external square	l_{max}	d_{max}	
	Universal joint, hand-operated, square drive 5 1 00 05 0	6,3	45	14	34
		10	68	23	112
		12,5	80	28	284
		20	110	42	784

a Torques, M, for adaptors and extension bars are the maximum values for the smaller square from series E of ISO 1711-1:2016. For the universal joints, the values have been calculated using those maximum values, multiplied by the coefficient 0,55.

5 Driving squares

Driving squares shall be in accordance with ISO 1174-1 and shall have a minimum hardness of 39 HRC.

6 Torque testing

6.1 Method

Place the tool in an internal test square and apply the corresponding torque.

Smoothly apply an increasing load until the minimum testing torque (see Table 1) is reached.

The across-flats dimension of the internal test square shall be equal to the minimum dimension of the corresponding internal square (see ISO 1174-1) with a tolerance of H8; the internal test square shall be hardened to a hardness of not less than 55 HRC.

A device in which the internal test square can be rotated at a certain torque, determined with an accuracy of ±2,5 %, may also be used for this test.

Following the application of the minimum test torsion torque, no damage or deformation shall affect the usability of the tool.

6.2 Test of adaptor socket wrench and extension bar as universal joint, square drive

The torque shall be achieved by applying a load using a driving part, the square drive of which has been treated for a minimum hardness of 55 HRC and whose across-flats dimension is equal to the maximum dimension of the corresponding male square (see ISO 1174-1) with a tolerance of h8.

The universal joint shall be tested in the position in which the two squares are on the same axis.

7 Designation

An attachment for hand-operated square drive socket wrenches in accordance with this International Standard shall be designated by

a) an abbreviated description/descriptor as shown in Table 1;

b) a reference to this document, i.e. ISO 3316;

c) the dimension of the internal square drive and the external square drive, in millimetres, for the adaptor; or

d) the dimension of the square drive, in millimetres, and the overall length, *l*, in millimetres, for the extension bar; or

e) the dimension of the square drive, in millimetres, for the universal joint.

EXAMPLE 1 An adaptor socket wrench 5 1 00 03 0 with a nominal dimension of 10 mm, an internal square drive and a 6,3 mm external square drive is designated as follows:

Adaptor ISO 3316 — 10 × 6,3

EXAMPLE 2 An extension bar 5 1 00 04 0 and 5 1 00 04 1 with a nominal dimension of 10 mm, a square drive and an overall length *l* = 125 mm is designated as follows:

Extension bar ISO 3316 — 10 × 125