
**Assembly tools for screws and nuts —
Doubled-headed box wrenches, flat
and offset — Outside dimensions and
test torques**

*Outils de manoeuvre pour vis et écrous — Clés polygonales doubles,
droites et inclinées — Dimensions extérieures et couples d'essai*

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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

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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 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 (standards.iteh.ai)

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 third edition cancels and replaces the second edition (ISO 10103:2001), which has been technically revised. The main changes compared to the previous version are as follows:

- [Table 1](#) (preferred pairings) and [Table 2](#) (non-preferred pairings) have been merged into one table;
- sizes of pairings have been added;
- [Clause 7](#) (Technical specification) has been added with a new table giving the minimum test torsion torques;
- the title has been changed.

Assembly tools for screws and nuts — Doubled-headed box wrenches, flat and offset — Outside dimensions and test torques

1 Scope

This document specifies the overall length and the maximum head thickness for double-headed box wrenches, flat (Form B) and offset (Form A).

NOTE The wrenches covered by this document are the ones identified in ISO 1703:2005 under reference numbers 1 1 02 03 0 and 1 1 02 04 0.

This document covers technical specifications for the test torque of these products. All other technical specifications are given in ISO 1711-1.

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 691, *Assembly tools for screws and nuts — Wrench and socket openings — Tolerances for general use*

ISO 3318, *Assembly tools for screws and nuts — Open-ended wrenches, box wrenches and combination wrenches — Maximum widths of heads*

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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 <http://www.electropedia.org/>

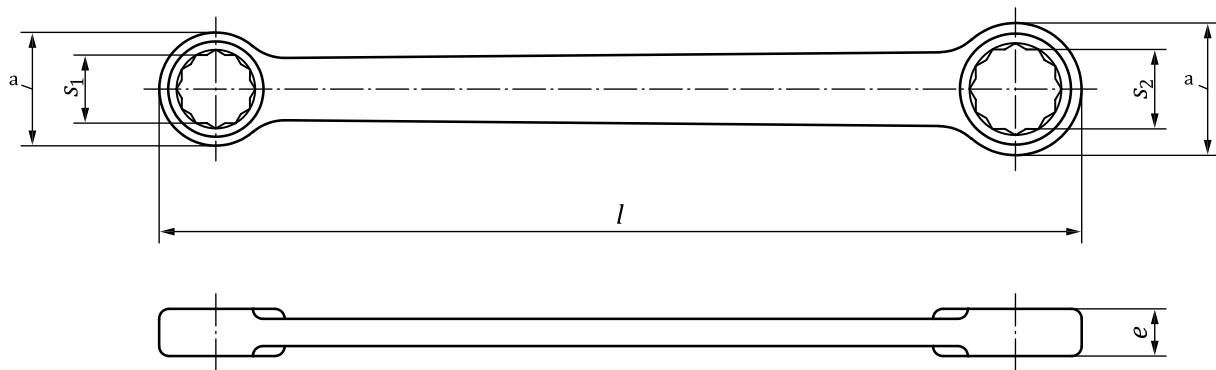
4 Dimensions

The length l and thickness e are given in [Table 1](#), which is based on the following formulae:

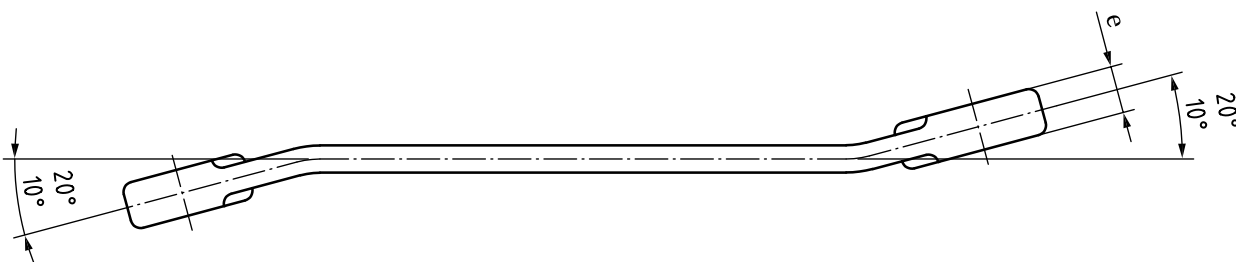
- $l_{\min} = s_1 \times 8 + 25 \text{ mm}$ (from pairing 6×7 to 16×18)
 $= s_1 \times 8 + 30 \text{ mm}$ (from pairing 17×19 to 27×32)
 $= s_1 \times 8 + 35 \text{ mm}$ (from pairing 30×32 to 55×60)
- $e_{\max} = 2 \times s_2^{0,6}$
- $l_{\max} = l_{\min} \times 1,4$

The maximum outside head dimensions shall be those specified in ISO 3318.

[Figure 1](#) shows only an example and should not influence the design of the wrench.



Form B: flat



Form A: off-set

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Key

s_1, s_2 nominal width across flats

l length of the wrench

e thickness

a Maximum outside head dimensions according to ISO 3318.

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Figure 1 — Double-headed box wrench

Table 1 — Lengths of wrenches and thickness of the heads

Pairing ^a Nominal sizes $s_1 \times s_2$	l mm		e mm
	min.	max.	max.
6 × 7 ^b	73	100	6,5
7 × 8	81	113	7
8 × 9 ^b	89	115	7,5
8 × 10	89	125	8
10 × 11	105	147	8,5
10 × 12	105	147	9
10 × 13	105	147	9,5
11 × 13	113	158	9,5
12 × 13 ^b	121	169	9,5
12 × 14 ^b	121	169	9,5
13 × 14 ^b	129	181	9,5

^a The tolerances on openings s_1 and s_2 shall comply with ISO 691.

^b The pairing contains at least one value of s not covered by ISO 272.

^c This pairing is not covered by ISO 1085.

Table 1 (continued)

Pairing ^a Nominal sizes $s_1 \times s_2$	l mm		e mm max.
	min.	max.	
13 × 15	129	181	10
13 × 16	129	181	10,5
13 × 17 ^b	129	181	11
14 × 15 ^b	137	192	10
14 × 16 ^b	137	192	10,5
14 × 17 ^b	137	192	11
15 × 16	145	203	10,5
15 × 17 ^b	145	203	11
15 × 18 ^b	145	203	11,5
16 × 17 ^b	153	214	11
16 × 18	153	214	11,5
17 × 19 ^b	166	232	11,5
18 × 19 ^b	174	244	11,5
18 × 21	174	244	12,5
19 × 22 ^b	182	255	13
19 × 24 ^b	182	255	13,5
20 × 22 ^b	190	266	13
21 × 22 ^b	198	277	13
21 × 23 ^b	198	277	13
21 × 24 ^b	198	277	13,5
22 × 24 ^b	206	277	13,5
24 × 26 ^{b,c}	222	311	15,5
24 × 27	222	311	14,5
24 × 30 ^b	222	311	15,5
27 × 29 ^{b,c}	246	344	15
27 × 30	246	344	15,5
27 × 32 ^b	246	344	16
30 × 32 ^b	275	385	16
30 × 34	275	385	16,5
30 × 36	275	385	17
32 × 34 ^b	291	407	16,5
32 × 36 ^b	291	407	17
34 × 36	307	430	17
36 × 41	323	452	18,5
41 × 46	363	508	20
46 × 50	403	564	21
50 × 55	435	609	22
55 × 60	475	665	23,5

^a The tolerances on openings s_1 and s_2 shall comply with ISO 691.

^b The pairing contains at least one value of s not covered by ISO 272.

^c This pairing is not covered by ISO 1085.

5 Designation

A double-headed box wrench in accordance with this document shall be designated by:

- a) “wrench”;
- b) a reference to this document, i.e. ISO 10103;
- c) the form, i.e. A or B;
- d) the pairing according to [Table 1](#).

EXAMPLE A double-headed box wrench, flat (Form B), with the pairing $s_1 \times s_2 = 8 \times 10$ is designated as follows:

Wrench ISO 10103, B 8 × 10

6 Marking

Double-headed box wrenches, flat and offset, shall be marked, permanently and legibly, with at least the following:

- a) the nominal widths across flats;
- b) the name or trademark of the manufacturer (or the responsible supplier).

7 Technical specification

The test torque values are given in [Table 2](#).

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Table 2 — Minimum test torsion torque

Nominal width across flats <i>s</i> mm	Test torque minimum N · m
6 ^a	7,4
7	11,4
8	16,5
9 ^a	23
10	30,9
11	40,4
12 ^a	51,5
13	64,5
14 ^a	79,4
15	96,3
16	115,3
17 ^a	136,6
18	160,3
19 ^a	186,5
20 ^a	215,4
21	246,9

^a Not according to ISO 272.

NOTE The values in column “Test torque” are equal to those of ISO 1711-1:2016, Table 3, Series C, multiplied by factor 1,25.

Table 2 (continued)

Nominal width across flats s mm	Test torque minimum N · m
22 ^a	281,1
2 ^a	318,5
24	358,8
25 ^a	402,1
27	498,8
30	670
32 ^a	802,5
34	951,3
36	1 116,3
41	1 442,5
46	1 816,3
50	2 145
55	2 596,3
60	3 088,8

^a Not according to ISO 272.

NOTE The values in column "Test torque" are equal to those of ISO 17111-1:2016, Table 3, Series C, multiplied by factor 1,25.

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