INTERNATIONAL STANDARD

ISO
10104

Assembly tools for screws and nuts — Double-headed, deep offset and modified offset, box wrenches — Length of wrenches and thickness of the heads

Outils de manœuvre pour vis et écrous — Clés polygonales doubles contre-coudées et contre-coudées profondes — Longueurs des clés et épaisseurs des têtes

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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.

International Standards are drafted in accordance with the rules given in the ISO/IEC Directives, Part 3.

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.

Attention is drawn to the possibility that some of the elements of this International Standard may be the subject of patent rights. ISO shall not be held responsible for identifying any or all such patent rights.

International Standard ISO 10104 was prepared by Technical Committee ISO/TC 29, *Small tools*, Subcommittee SC 10, *Assembly tools for screws and nuts, pliers and nippers*.

This second edition cancels and replaces the first edition (ISO 10104:1990), which has been technically revised.

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Assembly tools for screws and nuts — Double-headed, deep offset and modified offset, box wrenches — Length of wrenches and thickness of the heads

1 Scope

This International Standard specifies the overall length and the maximum head thickness for double-headed, deep offset (Form B) and modified offset (Form A), box wrenches complying with the test torque, series A, of ISO 1711-1:1996.

NOTE   Double-headed, deep offset and modified offset, box wrenches are listed in ISO 1703 under numbers 10 (Form B) and 11 (Form A).

2 Normative references

The following normative documents contain provisions which, through reference in this text, constitute provisions of this International Standard. For dated references, subsequent amendments to, or revisions of, any of these publications do not apply. However, parties to agreements based on this International Standard are encouraged to investigate the possibility of applying the most recent editions of the normative documents indicated below. For undated references, the latest edition of the normative document referred to applies. Members of ISO and IEC maintain registers of currently valid International Standards.

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

ISO 1711-1:1996, *Assembly tools for screws and nuts — Technical specifications — Part 1: Hand-operated wrenches and sockets.*

ISO 3318, *Assembly tools for screws and nuts — Double-headed open-ended wrenches, double-headed ring wrenches and combination wrenches — Maximum widths of heads.*

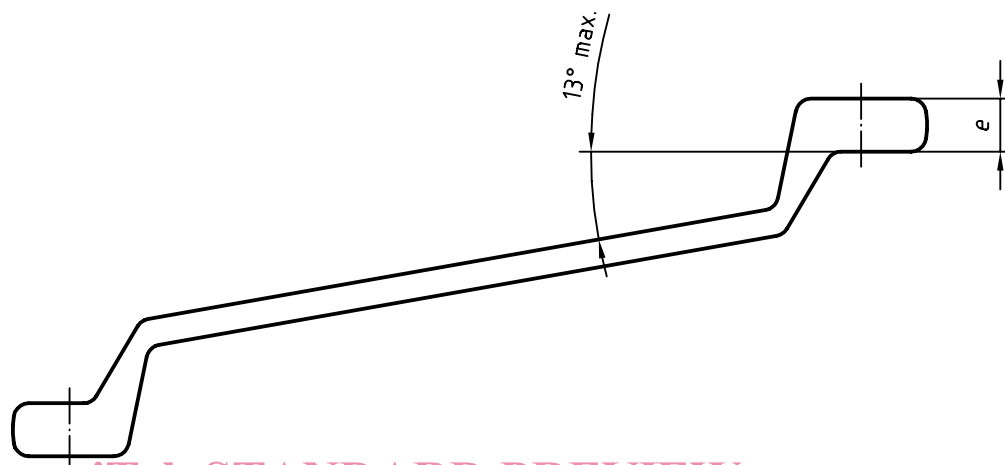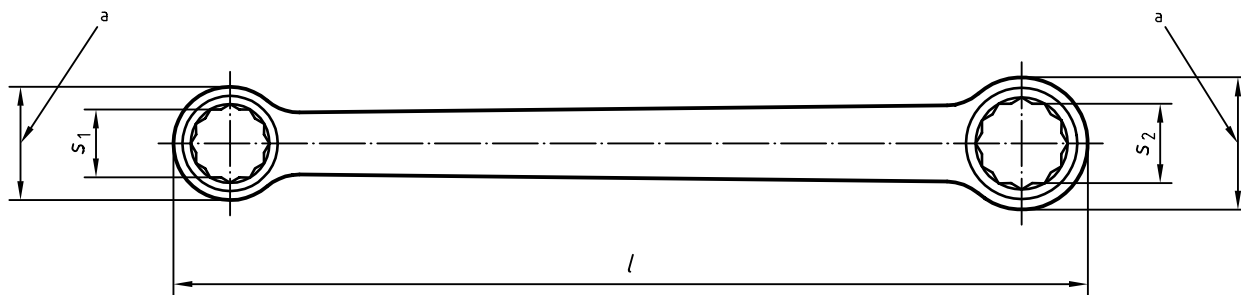## 3 Dimensions

See Figure 1 and Tables 1 and 2.

— $l_{min} = s_1 \times 9 + 80$ mm (from pairing 6×7 to 27×32)

    $= s_1 \times 9 + 60$ mm (from pairing 30×32 to 55×60)

— $e_{max} = 2 \times s_2^{0,65}$

— $l_{max} = l_{min} \times 1,4$

NOTE   Figure 1 of this International Standard is only an example and should not influence the design of the wrench.
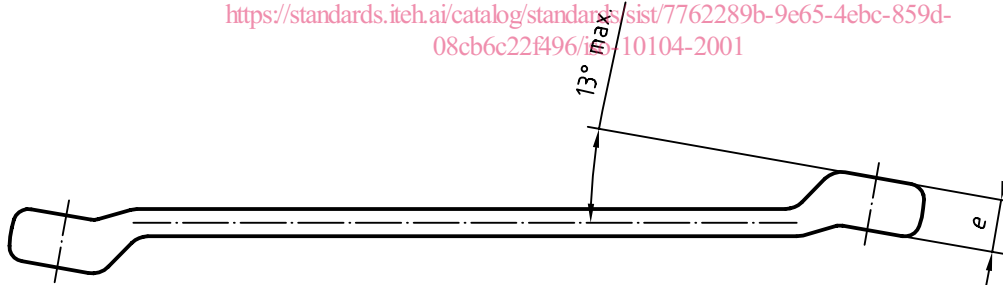
Form B

Form A

a   Overall dimensions of heads in accordance with ISO 3318, with the exception of the width across flat 20 mm, 23 mm, 25 mm and 28 mm.

Figure 1

Table 1 — Lengths of wrenches and thickness of the heads, preferred pairings

Dimensions in millimetres

Pairing [a] $s_1 \times s_2$	l min.	l max.	e max.
7×8	143	200	7,5
8×10	152	213	9
10×11	170	238	9,5
10×13	170	238	11
11×13	179	251	11
13×15	197	276	12
13×16	197	276	12
15×16	215	301	12
16×18	224	314	13
18×21	242	339	14
21×24	269	377	16
24×27	296	414	17
27×30	323	452	18
30×34	330	462	20
34×36	366	512	21
36×41	384	538	22
41×46	429	601	24
46×50	474	664	25
50×55	510	714	27
55×60	555	777	28,5

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

Table 2 — Lengths of wrenches and thickness of the heads, non-preferred pairings

Dimensions in millimetres

Pairing [a] $s_1 \times s_2$	l min.	l max.	e max.
6×7	134	188	7
8×9	152	213	8,5
12×13	188	263	11
12×14	188	263	11
13×14	197	276	11
13×17	197	276	13
14×15	206	288	12
14×17	206	288	13
15×18	215	301	13
16×17	224	314	13
17×19	233	326	14
18×19	242	339	14
19×22	251	351	15
19×24	251	351	16
20×22	260	364	15
21×22	269	377	15
21×23	269	377	15
22×24	278	389	16
24×26	296	414	16,5
24×30	296	414	18
25×28	305	427	17,5
27×29	323	452	18
27×32	323	452	19
30×32	330	462	19
30×36	330	462	21
32×34	348	487	20
32×36	348	487	21

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

4   Designation

A double-headed box wrench in accordance with this International Standard shall be designated by

a)   "wrench";

b)   reference to this International Standard, i.e. ISO 10104;

c)   the Form (A or B);

d)   its openings.

EXAMPLE   A double-headed deep offset (Form B) box wrench with the wrench openings s_1 = 13 mm and s_2 = 15 mm is designated as follows:

Wrench ISO 10104 - B 13 $\times$ 15

5   Marking

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

a)   two wrench openings;

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

Bibliography

[1]   ISO 1085, *Assembly tools for screws and nuts — Double-ended wrenches — Size pairing.*

[2]   ISO 1703:1983, *Assembly tools for screws and nuts — Nomenclature.*

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