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

*Outils de manœuvre pour vis et écrous — Clés polygonales doubles,  
droites et inclinées — 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 10103 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 10103:1990), which has been technically revised.



# Assembly tools for screws and nuts — Double-headed, flat and 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, flat (Form B) and offset (Form A), box wrenches complying with the test torque given by the formula  $M_1 = 1,25 M$ , where  $M$  is the test torque, series C, of ISO 1711-1:1996.

NOTE Double-headed, flat and offset, box wrenches are listed in ISO 1703:1983 under numbers 8 (Form B) and 9 (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.

$$\begin{aligned} \text{— } l_{\min} &= s_1 \times 8 + 25 \text{ mm (from pairing } 6 \times 7 \text{ to } 16 \times 18) \\ &= s_1 \times 8 + 30 \text{ mm (from pairing } 17 \times 19 \text{ to } 27 \times 32) \\ &= s_1 \times 8 + 35 \text{ mm (from pairing } 30 \times 32 \text{ to } 55 \times 60) \end{aligned}$$

$$\text{— } e_{\max} = 2 \times s_2^{0,6}$$

$$\text{— } l_{\max} = l_{\min} \times 1,4$$

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

## 4 Designation

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

- "wrench";
- reference to this International Standard, i.e. ISO 10103;
- the Form (A or B);
- its openings.

EXAMPLE A double-headed flat (Form B) box wrench with the wrench openings  $s_1 = 8$  mm and  $s_2 = 10$  mm is designated as follows:

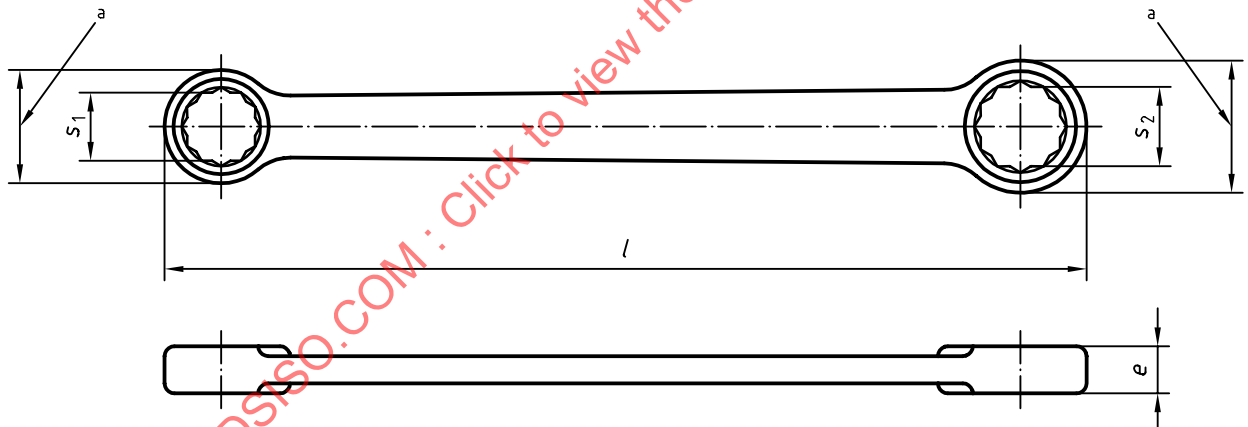
**Wrench ISO 10103 - B 8 × 10**

## 5 Marking

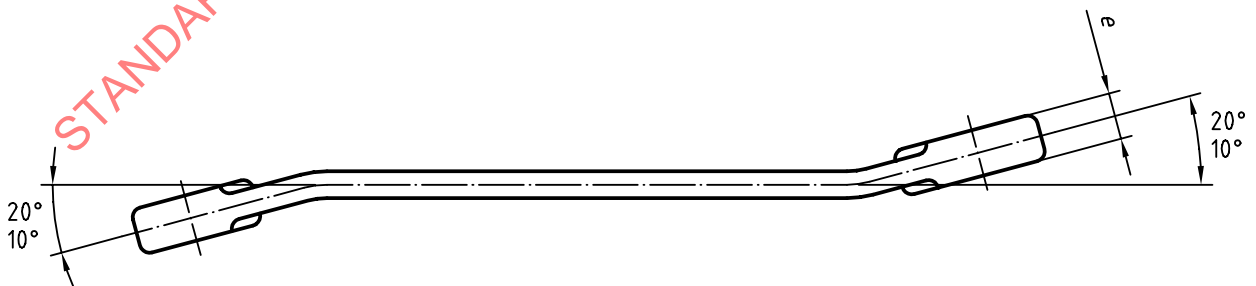
Double-headed, flat and offset, box wrenches shall be marked, permanently and legibly, with at least the following:

- two wrench openings;
- the name or trademark of the manufacturer (or the responsible supplier).

**Form B**



**Form A**



<sup>a</sup> 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 <sup>a</sup><br>$s_1 \times s_2$                                           | $l$  |      | $e$<br>max. |
|------------------------------------------------------------------------------------|------|------|-------------|
|                                                                                    | min. | max. |             |
| 7 × 8                                                                              | 81   | 113  | 7           |
| 8 × 10                                                                             | 89   | 125  | 8           |
| 10 × 11                                                                            | 105  | 147  | 8,5         |
| 10 × 13                                                                            | 105  | 147  | 9,5         |
| 11 × 13                                                                            | 113  | 158  | 9,5         |
| 13 × 15                                                                            | 129  | 181  | 10          |
| 13 × 16                                                                            | 129  | 181  | 10,5        |
| 15 × 16                                                                            | 145  | 203  | 10,5        |
| 16 × 18                                                                            | 153  | 214  | 11,5        |
| 18 × 21                                                                            | 174  | 244  | 12,5        |
| 21 × 24                                                                            | 198  | 277  | 13,5        |
| 24 × 27                                                                            | 222  | 311  | 14,5        |
| 27 × 30                                                                            | 246  | 344  | 15,5        |
| 30 × 34                                                                            | 275  | 385  | 16,5        |
| 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        |
| <sup>a</sup> 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 <sup>a</sup><br>$s_1 \times s_2$                                           | $l$  |      | $e$<br>max. |
|------------------------------------------------------------------------------------|------|------|-------------|
|                                                                                    | min. | max. |             |
| 6 × 7                                                                              | 73   | 100  | 6,5         |
| 8 × 9                                                                              | 89   | 115  | 7,5         |
| 12 × 13                                                                            | 121  | 169  | 9,5         |
| 12 × 14                                                                            | 121  | 169  | 9,5         |
| 13 × 14                                                                            | 129  | 181  | 9,5         |
| 13 × 17                                                                            | 129  | 181  | 11          |
| 14 × 15                                                                            | 137  | 192  | 10          |
| 14 × 17                                                                            | 137  | 192  | 11          |
| 15 × 18                                                                            | 145  | 203  | 11,5        |
| 16 × 17                                                                            | 153  | 214  | 11          |
| 17 × 19                                                                            | 166  | 232  | 11,5        |
| 18 × 19                                                                            | 174  | 244  | 11,5        |
| 19 × 22                                                                            | 182  | 255  | 13          |
| 19 × 24                                                                            | 182  | 255  | 13,5        |
| 20 × 22                                                                            | 190  | 266  | 13          |
| 21 × 22                                                                            | 198  | 277  | 13          |
| 21 × 23                                                                            | 198  | 277  | 13          |
| 22 × 24                                                                            | 206  | 277  | 13,5        |
| 24 × 26                                                                            | 222  | 311  | 15,5        |
| 24 × 30                                                                            | 222  | 311  | 15,5        |
| 25 × 28                                                                            | 230  | 322  | 15          |
| 27 × 29                                                                            | 246  | 344  | 15          |
| 27 × 32                                                                            | 246  | 344  | 16          |
| 30 × 32                                                                            | 275  | 385  | 16          |
| 30 × 36                                                                            | 275  | 385  | 17          |
| 32 × 34                                                                            | 291  | 407  | 16,5        |
| 32 × 36                                                                            | 291  | 407  | 17          |
| <sup>a</sup> The tolerances on openings $s_1$ and $s_2$ shall comply with ISO 691. |      |      |             |

## 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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