

INTERNATIONAL STANDARD

ISO
9960-3

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Draughting instruments with or without graduation —

Part 3: **Set squares**

Instruments de dessin avec ou sans graduation —
Partie 3: Équerres de dessinateurs



Reference number
ISO 9960-3:1994(E)

Foreword

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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 9960-3 was prepared by Technical Committee ISO/TC 10, *Technical drawings, product definition and related documentation*, Subcommittee SC 9, *Media and equipment for drawing and related documentation*.

ISO 9960 consists of the following parts, under the general title *Draughting instruments with or without graduation*:

- Part 1: *Draughting scale rules*
- Part 2: *Protractors*
- Part 3: *Set squares*

Annex A of this part of ISO 9960 is for information only.

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Draughting instruments with or without graduation —

Part 3: Set squares

1 Scope

This part of ISO 9960 specifies requirements for fixed set squares (45° and 60°) and for adjustable set squares for drawing-office use.

2 Normative reference

The following standard contains provisions which, through reference in this text, constitute provisions of this part of ISO 9960. At the time of publication, the edition indicated was valid. All standards are subject to revision, and parties to agreements based on this part of ISO 9960 are encouraged to investigate the possibility of applying the most recent edition of the standard indicated below. Members of IEC and ISO maintain registers of currently valid International Standards.

ISO 9960-1:1992, *Draughting instruments with or without graduation — Part 1: Draughting scale rules*.

3 Definitions

For the purposes of this part of ISO 9960, the definitions given in ISO 9960-1 and the following definitions apply.

3.1 set square: Draughting instrument designed to enable the direct transfer of set angles onto a surface.

NOTE 1 In this part of ISO 9960 a set square is understood to be a draughting aid. Qualifying terms are used to describe distinguishing features of set squares, e.g. "fixed set square" (type F) and "adjustable set square" (type A).

3.2 fixed set square: Set square with fixed angles of either 45°, 45° and 90° or 30°, 60° and 90°.

3.3 adjustable set square: Set square in which the hypotenuse can be adjusted.

4 Materials

Set squares shall be made from suitable (preferably transparent) materials of the manufacturer's choice.

The pivot, clamping screw and nut of adjustable set squares shall be made from corrosion-resistant materials.

5 General requirements

5.1 Working edges

All working edges shall comply with a straightness tolerance of 0,05 mm/100 mm. Shapes and dimensions of ink working edges and of bevelled working edges for set squares are shown in figures 1 and 2 and in table 1. If a set square is graduated, the graduations shall meet the requirements in ISO 9960-1.

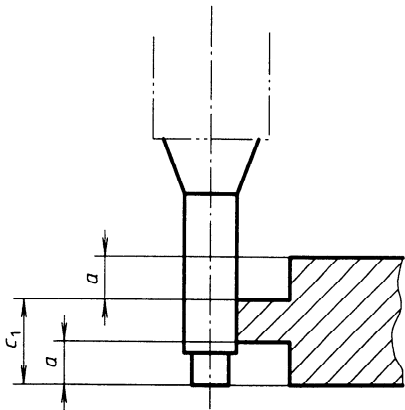


Figure 1 — Ink working edge

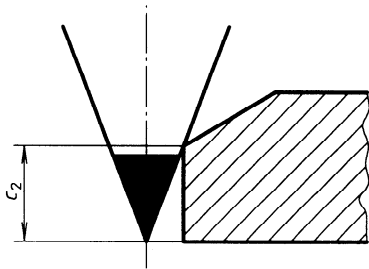


Figure 2 — Bevelled working edge

Table 1 — Dimensions of ink working edges and of bevelled working edges for set squares
Dimensions in millimetres

Symbol for draughting instrument	Description of draughting instrument	Working edges		
		Ink edge (see figure 1)		Bevelled edge c_2 (see figure 2)
		Ink recess a	c_1	
	Tubular technical pen with stepped tube tip (see ISO 9175-1)	0,4 to 0,6	1 to 1,5	—
	Tubular technical pen with tube tip not stepped	—	—	—
	Fine lead mechanical pencil, tubular guided	0,4 to 0,6	1 to 1,5	0,5 to 1
	Fine lead mechanical pencil, lead guided	—	—	
	Wood-cased pencil, clutch pencil	—	—	
	Felt-tip/fibre-tip pen, tubular guided	0,4 to 0,6	1 to 1,5	—
	Felt-tip/fibre-tip pen, fibre-tip guided	—	—	—
	Ballpoint pen	0,4 to 0,6	1 to 1,5	0,5 to 1

5.2 Adjustable set squares

5.2.1 Adjustable set squares consist of a straight-edge and a fixed set square (45°), which is fastened at a pivot and can be moved (see figure 3).

5.2.2 By means of a graduation the angles can be adjusted with respect to a reference line up to 45° between the hypotenuse and the upper working edge of the straightedge. The graduation consists of radial division lines and the distance between them corresponds to an angle of 1° or 0,5°. Division lines and

figuring as well as the reference line shall meet the requirements in ISO 9960-1.

The main divisions shall be figured at 0°, 10°, 20°, 30°, 40° and 45° and also in the opposite direction (from 45° to 90°) (see figure 4).

5.2.3 When the adjustable set square is fully closed its sides shall form a 45° set square.

The movable element shall be capable of being clamped at any selected adjustment.

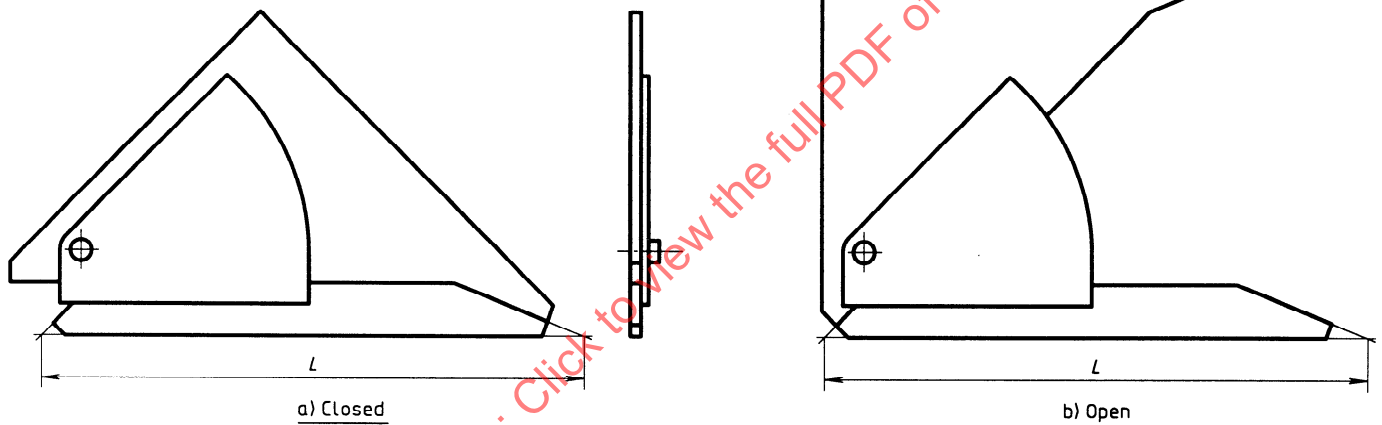


Figure 3 — Example of adjustable set square

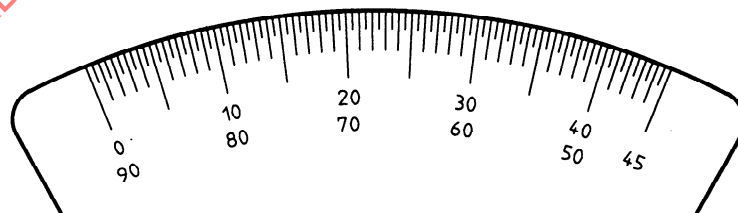


Figure 4 — Example of adjustable set square angular graduation

6 Dimensions and limit deviations

6.1 Fixed set squares (type F)

Fixed set square dimensions shall comply with figure 5 and table 2. The nominal size *L* refers to the length of the hypotenuse of the 45° fixed set square and to the longer rectangular side of the 60° fixed set square.

The limit deviation on angles shall be $\pm 2'$.

The fixed set square flatness tolerance shall be 0,25 mm/100 mm and the straightness tolerance shall be 0,05 mm/100 mm.

6.2 Adjustable set squares (type A)

Adjustable set square dimensions shall comply with figure 3 and table 3.

Table 2 — Nominal sizes for 45° and 60° fixed set squares

Dimensions in millimetres

Nominal size <i>L</i> (see figure 5)	Minimum thickness
160 200 250 300 320 350	2
400 450 500 600	3

Table 3 — Nominal sizes for adjustable set squares

Dimensions in millimetres

Nominal size <i>L</i> (see figure 3)	Minimum thickness (see figure 3)
250 300 350	3

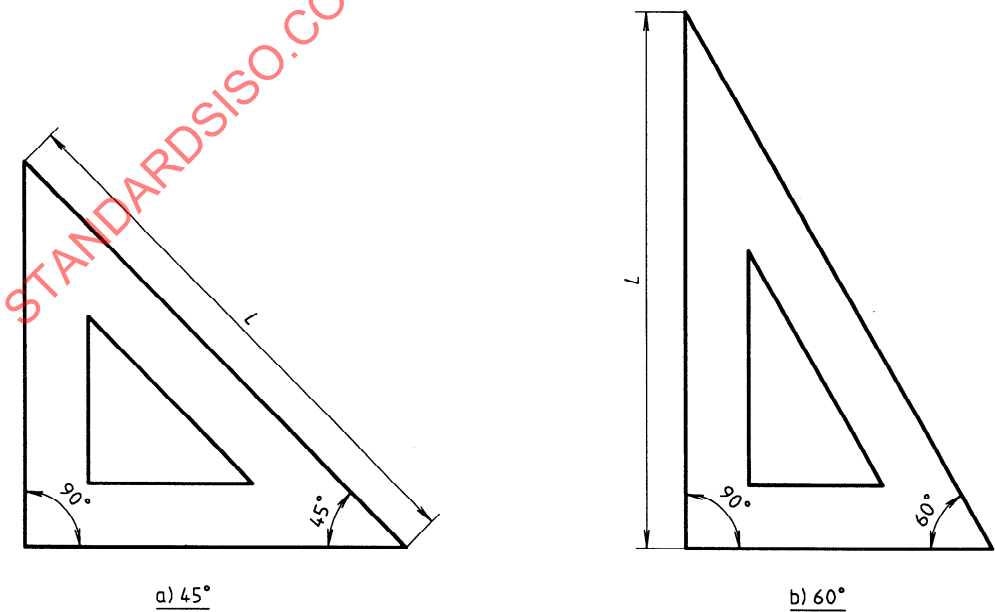


Figure 5 — Fixed set squares

7 Designation and marking

The designation of set squares shall consist of the following elements in the order given:

- a) "Set square";
- b) reference to this part of ISO 9960, i.e. ISO 9960-3;
- c) type identification (F or A) according to clause 6;
- d) for type F only, indication of the angle (45 or 60);
- e) nominal size according to clause 6.

EXAMPLE: Designation for a fixed set square with 60° angle and nominal size 200 mm:

Set square ISO 9960-3 - F 60 - 200

EXAMPLE: Designation for an adjustable set square with nominal size 300 mm:

Set square ISO 9960-3 - A 300

For set square marking purposes, item a) of the designation (i.e. the block descriptor "set square") may be omitted, and the graphical symbol indicating suitable draughting instruments in accordance with table 1 may be added.

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Annex A

(informative)

Bibliography

- [1] ISO 9175-1:1988, *Tubular tips for hand-held technical pens using India ink on tracing paper — Part 1: Definitions, dimensions, designation and marking.*

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