

BRITISH STANDARD

Engineers' squares (including cylindrical and block squares) – Specification

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Summary of pages

This document comprises a front cover, an inside front cover, pages i to iv, pages 1 to 26, an inside back cover and a back cover.

Foreword

Publishing information

This British Standard is published by BSI and came into effect on 31 October 2007. It was prepared by Technical Committee MTE/1, *Machine tools*. A list of organizations represented on this committee can be obtained on request to its secretary.

Supersession

This British Standard supersedes BS 939:1977, which is withdrawn.

Information about this document

This is a full revision of the standard.

Presentational conventions

The provisions of this standard are presented in roman (i.e. upright) type. Its requirements are expressed in sentences in which the principal auxiliary verb is “shall”.

Commentary, explanation and general informative material is presented in smaller italic type, and does not constitute a normative element.

Contractual and legal considerations

This publication does not purport to include all the necessary provisions of a contract. Users are responsible for its correct application.

Compliance with a British Standard cannot confer immunity from legal obligations.

Section 1: General

1 Scope

This British Standard specifies requirements for engineers' try squares (excluding adjustable squares), cylindrical squares and block squares of solid or open form.

Section 1 specifies general requirements applicable to all types of square.

Section 2 specifies requirements for engineers' try squares in three grades of accuracy, AA, A and B, with inner lengths of blade from 50 mm up to and including 1 000 mm.

Section 3 specifies requirements for cylindrical squares in accuracy grade AA in sizes from 75 mm up to and including 750 mm.

Section 4 specifies requirements for solid form block squares in accuracy grades AA and A in sizes from 50 mm × 40 mm up to and including 1 000 mm × 1 000 mm.

Section 5 specifies requirements for open form block squares in accuracy grades A and B in sizes from 150 mm × 100 mm up to and including 600 mm × 400 mm.

NOTE While the standard provides for squares in various grades of accuracy, it should be noted that their accuracy in use is dependent upon the flatness of the surfaces on which they are used.

2 Normative references

The following referenced documents are indispensable for the application 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.

BS 1134-1, *Assessment of surface texture – Part 1: Methods and instrumentation*

BS EN 1561:1997, *Founding – Grey cast irons*

BS 3643-1:1981, *ISO metric screw threads – Principles and basic data*

BS 3643-2:1981, *ISO metric screw threads – Specification for selected limits of size*

3 Terms and definitions

For the purposes of this British Standard the nomenclature given in Figure 2a), Figure 6, Figure 7 and Figure 8, and the following terms and definitions apply.

3.1 deviation from straightness and flatness

minimum distance between two parallel planes that just enclose the surface under consideration

3.2 deviation from parallelism

difference between the maximum and minimum distances separating the surfaces or edges under consideration

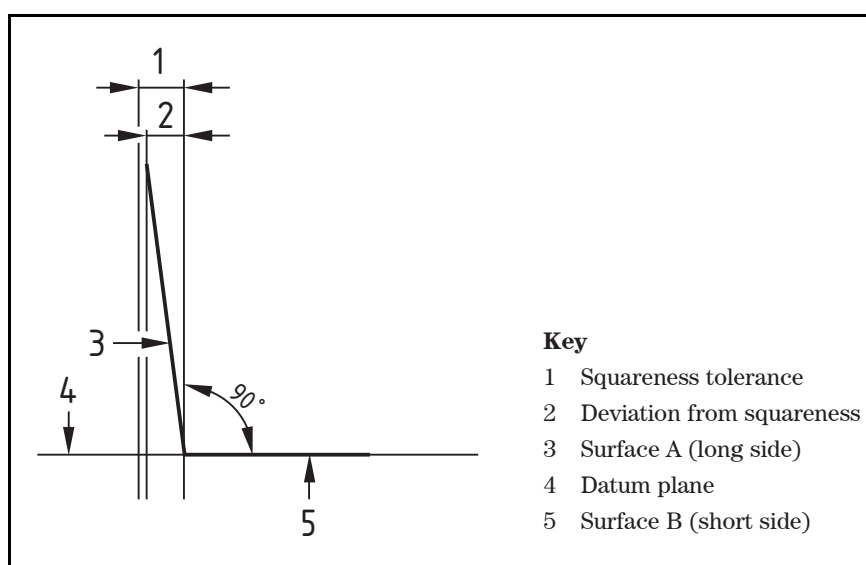
3.3 Squareness of two surfaces**3.3.1 deviation from squareness**

minimum distance between two parallel planes that will just enclose one surface (A), including any straightness error of surface (A), and that are perpendicular to a datum plane in contact with the other surface (B) (see Figure 1)

3.3.2 squareness tolerance

maximum permissible deviation from squareness (see Figure 1)

Figure 1 **Exaggerated illustration of deviation from squareness and squareness tolerance**

**3.4 tolerances**

maximum permissible deviations from straightness, flatness, parallelism and squareness

4 Protection against climatic conditions

All surfaces of the squares shall be protected against climatic conditions by being covered with a suitable corrosion preventative preparation or a paper impregnated with a vapour phase inhibitor (VPI).

NOTE 1 Temporary (easily removable) corrosion preventatives are dealt with fully in BS 1133-6.2.

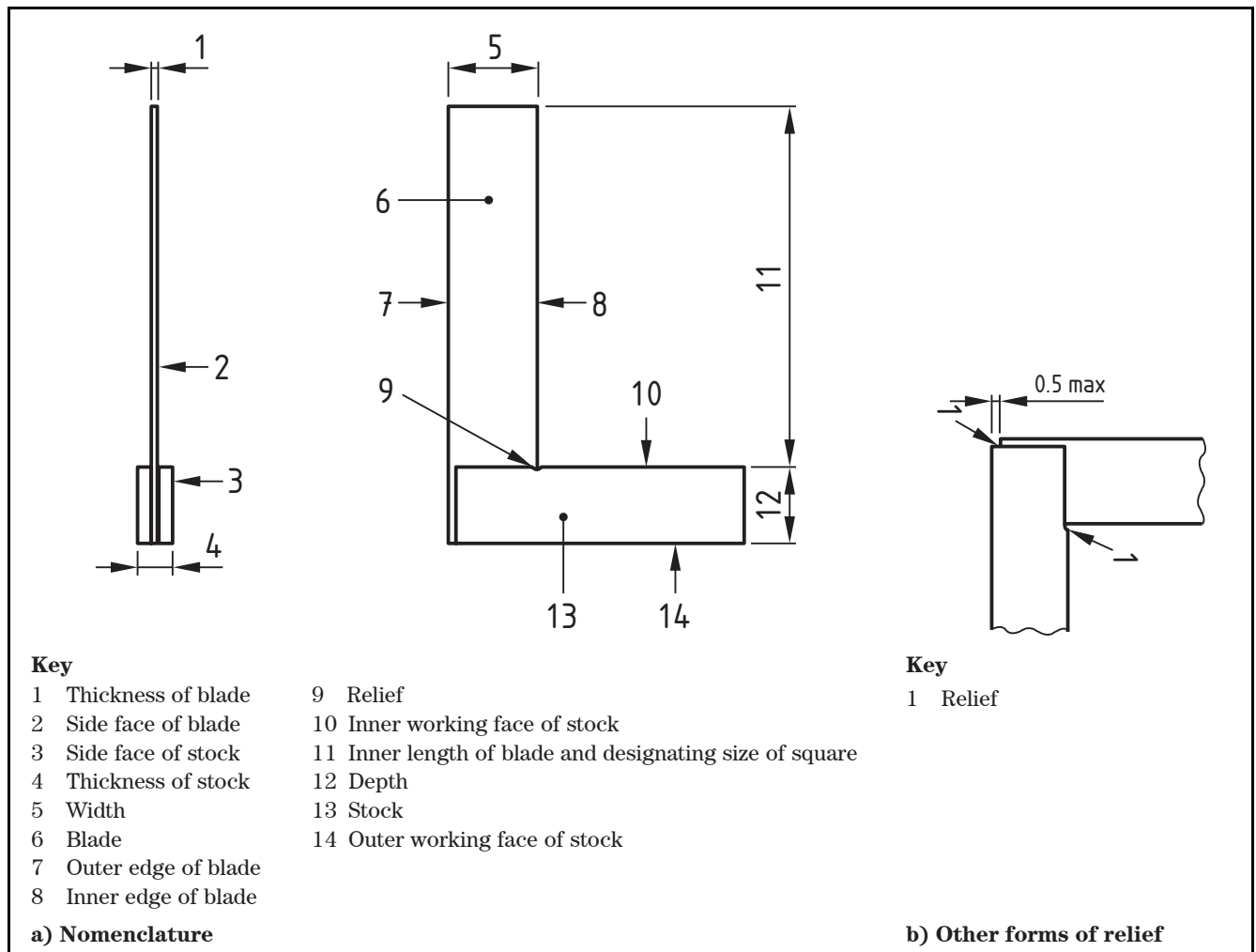
NOTE 2 Guidance on sealed packs with desiccants is given in BS 1133-19.

Section 2: Engineers' try squares

5 Designating size

The designating size of an engineers' try square shall be the length of the blade from its tip to the inner working face of the stock (see Figure 2).

Figure 2 Engineers' try squares



6 Recommended sizes

Recommended sizes (in mm) of engineers' try squares are: 50, 75, 100, 150, 200, 300, 450, 600, 800 and 1 000; squares of other sizes shall be ordered only when it is not practicable to adopt one of the recommended sizes. If squares of intermediate sizes are supplied they shall be made to the same tolerances as those specified for the next smaller recommended size.

7 Material and manufacture

All engineers' try squares shall be made of good quality steel. The working surfaces of grades AA and A squares shall be hardened to a value of not less than 600 HV and subjected to an appropriate stabilization process.

8 General features of design

8.1 When the blade and stock of a try square are built up from separate parts, the blade shall be rigidly and permanently fixed in the stock.

Grade AA try squares shall have the inner and outer edges of the blade bevelled so that the approximate width of the reduced edge is as follows (see also Annex A):

Size of square	Approximate width of bevelled edge
mm	mm
50 and 75	0.25
100 and 150	0.40
200 and 300	0.65
450	0.75
600	1.00
800 and 1 000	1.50

8.2 For all three grades of try square the stock shall be relieved at the junction of the inner edge of the blade and the inner working face of the stock [see Figure 2a)].

The inner working face of the stock may be terminated at its junction with the inner edge of the blade, in which case the area of the working face of the stock, which projects along both sides of the blade, shall be relieved below the plane of the working face of the stock [see Figure 2b)].

NOTE The blade may be recessed from the outer working face of the stock by not more than 0.5 mm [see Figure 2b)].

9 Finish

All working surfaces of the blade and stock of the three grades of engineers' try square shall have a lapped, finely ground or polished finish, having a surface roughness value of $1.0 \mu\text{m } R_a$ maximum according to BS 1134-1, and all sharp edges shall be removed.

10 Accuracy

10.1 Straightness of inner and outer edges of blade

Each edge of the blade shall be straight to within the tolerance specified in Table 1 when the outer working face or side face of the stock is resting on a horizontal surface.

Table 1 Tolerances on straightness of blade edges

Size of square	Tolerance		
	Grade AA	Grade A	Grade B
mm	µm	µm	µm
50, 75	2	4	8
100, 150	2	4	8
200	2	4	8
300	3	6	12
450	4	8	16
600	6	12	24
800	8	16	32
1 000	10	20	40

10.2 Parallelism of blade edges

The blade edges shall be parallel to each other to within the tolerances specified in Table 2.

Table 2 Tolerances on parallelism of blade edges

Size of square	Tolerance		
	Grade AA	Grade A	Grade B
mm	µm	µm	µm
Up to 150	3	5	8
200, 300	3	8	12
450, 600	7	12	18
800, 1 000	12	18	24