BRITISH STANDARD

BS 906-1: 1972

Specification for

Engineers' parallels —

Part 1: Metric units

Confirmed February 2012

Co-operating organizations

The Mechanical Engineering Industry Standards Committee, under whose supervision this British Standard was prepared, consists of representatives from the following Government departments and scientific and industrial organizations:

Associated Offices Technical Committee
Association of Consulting Engineers
Association of Hydraulic Equipment Manufacturers Ltd.
Association of Mining Electrical and Mechanical Engineers
British Chemical Plant Manufacturers' Association
British Compressed Air Society
British Electrical and Allied Manufacturers' Association
British Gear Manufacturers' Association
British Internal Combustion Engine Manufacturers' Association
British Mechanical Engineering Confederation
British Pump Manufacturers' Association
British Steel Industry
Crown Agents for Oversea Governments and Administrations
Department of Employment and Productivity (H.M. Factory Inspectorate)
Department of the Environment
Department of Trade and Industry
Department of Trade and industry — National Engineering Laboratory
Electricity Council, the Central Electricity Generating Board and the Area Boards in England and Wales
Engineering Equipment Users' Association
Gas Council
Institution of Civil Engineers
Institution of Gas Engineers
Institution of Heating and Ventilating Engineers
Institution of Mechanical Engineers
Institution of Mechanical Engineers (Automobile Division)
Institution of Plant Engineers
Institution of Production Engineers*
Locomotive and Allied Manufacturers' Association of Great Britain
London Transport Executive
Machine Tool Trades Association
Ministry of Defence
Ministry of Defence, Army Department*
National Coal Board
National Physical Laboratory (Department of Trade and Industry)*
Royal Institute of British Architects
Telecommunications Engineering Manufacturing Association
Water Tube Boilermakers' Association

The Government departments and the industrial organization marked with an asterisk in the above list, together with the following, were directly represented on the committee entrusted with the preparation of this British Standard and were assisted by a number of individual members:

Gauge and Tool Makers' Association

This British Standard, having been approved by the Mechanical Engineering Industry Standards Committee, was published under the authority of the Executive Board on
16 June 1972

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The following BSI references relate to the work on this standard:
Committee reference MEE/59
Draft for comment 70/4282

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Amendments issued since publication

Amd. No.	Date	Comments

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Foreword

In order to keep abreast of progress in the industries concerned, British Standards are subject to periodical review. Suggestions for improvements will be recorded and in due course brought to the notice of the committees charged with the revision of the standards to which they refer.

A complete list of British Standards, numbering over 5000, fully indexed and with a note of the contents of each, will be found in the British Standards Yearbook, which may be purchased from BSI Sales Department. It may also be consulted in many public libraries and similar institutions.

This standard makes reference to the following British Standards:

BS 860, *Tables for comparison of hardness scales.*

BS 891, *Method for Rockwell hardness test. Part 1: Testing of metals.*

BS 906, *Engineers' parallels. Part 2: Imperial units.*

BS 1133, *Packaging code, Section 6: Temporary prevention of corrosion of metal surfaces.*

This British Standard, prepared under the authority of the Mechanical Engineering Industry Standards Committee, is part of the BSI programme to produce standards in metric units.

An earlier British Standard, BS 906, BS 1940, specified engineers' parallels in imperial units. This has been revised to become Part 2 of this standard, and will be withdrawn when the change to metric has been completed. It should therefore be considered as obsolescent. Part 1 of this standard lists a small number of standard sizes which have been chosen consistent with using the parallels individually or in combination over a useful range of reasonably small increments. The sizes are easily called to mind.

The tolerances in this Part of this standard are based on formulae shown in an appendix and are inter-related for different dimensions and for the two grades. It should be noted that the tolerances shown in the two parts of the standard differ slightly.

A British Standard does not purport to include all the necessary provisions of a contract. Users of British Standards are responsible for their correct application.

Compliance with a British Standard does not of itself confer immunity from legal obligations.

Summary of pages

This document comprises a front cover, an inside front cover, pages i and ii, pages 1 to 4, an inside back cover and a back cover.

This standard has been updated (see copyright date) and may have had amendments incorporated. This will be indicated in the amendment table on the inside front cover.

1 Scope

This British Standard applies to parallel sided steel blocks of six sizes in Grade A and eight sizes in Grade B, namely:

GRADE A

5 mm × 10 mm × 100 mm

10 mm × 20 mm × 125 mm

15 mm × 30 mm × 150 mm

20 mm × 40 mm × 200 mm

25 mm × 50 mm × 250 mm

30 mm × 60 mm × 300 mm

GRADE B

5 mm × 10 mm × 100 mm

10 mm × 20 mm × 125 mm

15 mm × 30 mm × 150 mm

20 mm × 40 mm × 200 mm

25 mm × 50 mm × 250 mm

30 mm × 60 mm × 300 mm

40 mm × 80 mm × 350 mm

50 mm × 100 mm × 400 mm

NOTE 1 See also **2**, Material.
NOTE 2 The titles of the British Standards referred to in this standard are listed on page ii.

2 Material

Parallels shall be made of high quality steel, hardened and stabilized by a stress relieving process; the finished parallel shall give a hardness number of not less than 800 HV[1)] for Grade A and not less than 640 HV[1)] for Grade B.

NOTE The two largest sizes of Grade B parallels may be made with a series of lightening holes drilled through the thickness, provided that the accuracy of the parallels is not thereby affected.

The requirements in this specification may be applied to parallels made of materials other than steel, e.g. granite, provided they are durable.

3 Finish

The sides of Grades A and B parallels shall have a finely ground, or lapped finish. The ends of both grades of parallels shall be smoothly finished by milling or grinding.

All sharp edges shall be removed.

4 Accuracy

4.1 Each parallel and pair of parallels shall comply with the requirements for accuracy for the appropriate grade stated in Table 1 and Table 2.

4.2 Additionally, the maximum errors in squareness of adjacent width and thickness faces shall not exceed 0.005 mm per 25 mm for both Grade A and Grade B parallels.(For widths less than 25 mm the tolerance is 0.005 mm over the width *W* for both grades.) (See Table 1 and Table 2.)

5 Marking

Each parallel shall have legibly and permanently marked on it the following information:

the nominal dimensions of *T* and *W* (see Table 1 and Table 2),

the grade of accuracy,

the manufacturer's name or trade mark,

the serial number common to each parallel of the pair,

e.g.

20 mm × 40 mm

A

X Co.

1 234

NOTE Attention is drawn to certification facilities offered by BSI; see the back cover of this standard.

[1)] The equivalent hardness numbers on the Rockwell C scale are 64 for 800 HV, and 57.6 for 640 HV. When Rockwell values are used, tests should be carried out in accordance with BS 891, and it should be noted that conversion values may vary as shown in BS 860.

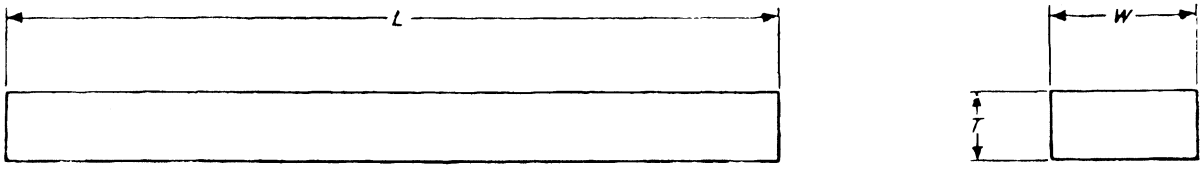

Table 1 — Tolerances on grade A parallels

1	2	3	4	5	6	7
Nominal size			Calliper measurements for individual parallels (see Figure 1)		Functional requirements (see Figure 2)	
			Departure from nominal *T* and *W*	Variations in calliper measurements of *T* and *W*	for individual parallels	for a pair
T	*W*	*L*			parallelism of *T* and *W*	matching
mm	mm	mm	mm	mm	mm	mm
5	10	100	± 0.005	0.002	0.004	0.006
10	20	125				
15	30	150				
20	40	200				
25	50	250	± 0.010	0.003	0.006	0.010
30	60	300				
NOTE Tolerance on *L* is ± 1 mm throughout.						

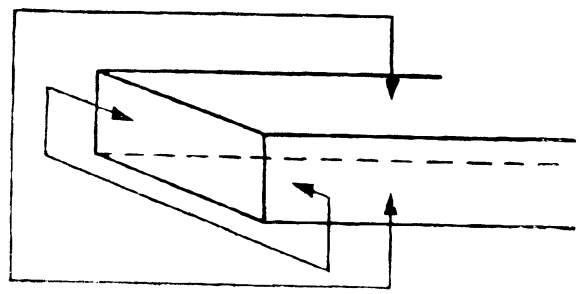

Figure 1

Calliper measurement is the perpendicular distance from any point on one surface to the corresponding point on the opposite surface.

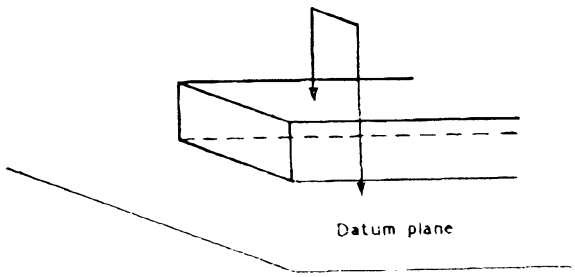

Figure 2

When resting on a true plane, either way up in turn, the variation at any point shall be within the values shown in Column 6 for a single parallel. For matching, the maximum variation over the two parallels, however associated, shall not exceed the tolerance in Column 7.

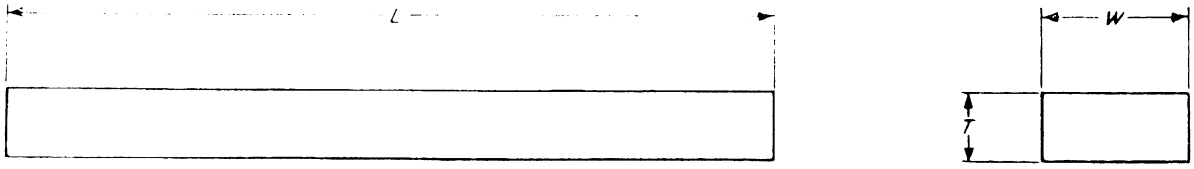

Table 2 — Tolerances on grade B parallels

1	2	3	4	5	6	7
Nominal size			Calliper measurements for individual parallels (see Figure 1)		Functional requirements (see Figure 2)	
			Departure from nominal *T* and *W*	Variations in calliper measurements of *T* and *W*	for individual parallels	for a pair
T	*W*	*L*			parallelism of *T* and *W*	matching
mm	mm	mm	mm	mm	mm	mm
5	10	100	± 0.010	0.004	0.008	0.012
10	20	125				
15	30	150				
20	40	200				
25	50	250	± 0.020	0.006	0.012	0.020
30	60	300				
40	80	350	± 0.025	0.007	0.014	0.020
50	100	400	± 0.030	0.008	0.016	0.025
NOTE Tolerance on *L* is ± 1 mm throughout.						

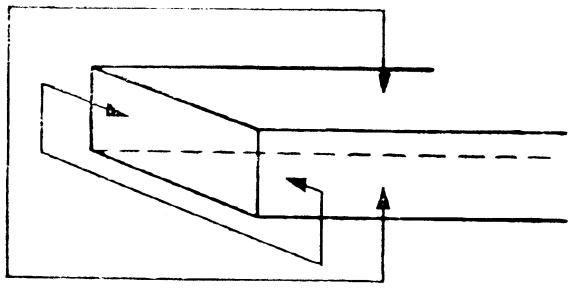

Figure 1

Calliper measurement is the perpendicular distance from any point on one surface to the corresponding point on the opposite surface.

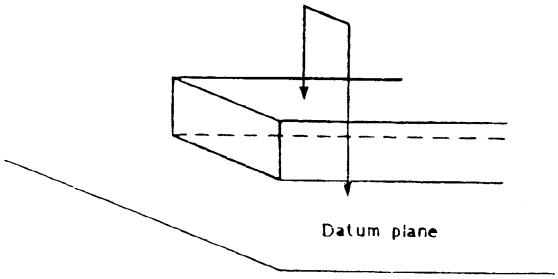

Figure 2

When resting on a true plane, either way up in turn, the variation at any point shall be within the values shown in Column 6 for a single parallel. For matching, the maximum variation over the two parallels, however associated, shall not exceed the tolerance in Column 7.

6 Protection

Grade A and B steel parallels shall be protected against climatic conditions by being covered with a suitable corrosion preventative preparation[2)] during storage and transit.

Grade A parallels shall always be supplied in pairs and in a suitable protective box.

[2)] Temporary (easily removable) corrosion preventatives are dealt with fully in BS 1133, Section 6: Guidance on sealed packs with dessicants is given in Section 19, "Use of dessicants in packaging".

Appendix Derivation of tolerances stated in Table 1 and Table 2

The tolerances given in Table 1 and Table 2 of this standard have been calculated on the basis shown in Table 3.

Table 3 — Basis of tolerances

Tolerances in μm (0.001 mm = 1 μm)

Grade A parallels

	Calliper measurements for individual parallels (see Figure 1)		Functional requirements (see Figure 2)	
	Departure from nominal T and W	Variations in calliper measurement of T and W	for individual parallels	for a pair
			parallelism of T and W	matching
	$\pm\left[\frac{W}{10}+\frac{L}{100}\right]$	$\frac{L}{100}$	$2\times\frac{L}{100}$	$3\times\frac{L}{100}$
Expressed to minimum tolerance	5	1	1	1
	± 5	2	4	4

Grade B parallels

The tolerances for Grade B parallels are double the respective tolerances calculated for Grade A using the above formulae and the appropriate nominal values of W and L.

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London
W4 4AL