BRITISH STANDARD

BS 852:1939

Incorporating amendments issued August 1946 and December 1949

Specification for

Toolmakers' straightedges

Confirmed February 2012

Co-operating organisations

The Mechanical Industry Committee under whose supervision this British Standard was prepared consists of representatives from the following Government Departments and Scientific and Industrial Organisations:

Admiralty
Crown Agents for the Colonies
Department of Scientific and Industrial Research
High Commissioner for India
H.M. Office of Works
Home Office
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Institution of Mechanical Engineers
Institution of Production Engineers
Locomotive Manufacturers' Association
Machine Tool Trades Association
Railway Companies of Great Britain

This British Standard having been approved by the Mechanical Industry Committee and endorsed by the Chairman of the Engineering Divisional Council was published under the authority of the General Council on 19 June 1939

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Amendments issued since publication

Amd. No.	Date of issue	Comments
	August 1946	
	December 1949	Indicated by a sideline in the margin

Contents

Foreword

This Specification has been prepared under the authority of the Mechanical Industry Committee in response to a request received from the Institution of Production Engineers. It forms one of a series of Specifications in course of preparation for engineers' precision tools,[1)] and has been prepared with the co-operation of the manufacturers and in close collaboration with the National Physical Laboratory.

This Specification requires reference to the following British Standard:

BS 869, *Toolmakers' Flats and High Precision Surface Plates.*

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 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)] Other Specifications for engineers' precision tools published are as follows:
BS 817, *Cast iron surface plates and tables.*
BS 818, *Cast iron straightedges.*
BS 863, *Steel straightedges of rectangular section.*
BS 869, *Toolmakers' flats and high precision surface plates.*
BS 870, *Micrometers (external).*
BS 887, *Vernier callipers.*
BS 888, *Slip (or block) gauges and their accessories.*
BS 906, *Engineers' parallels (steel).*
BS 907, *Dial gauges for linear measurements.*
BS 939, *Engineers' squares.*
BS 957, *Feeler gauges.*
BS 958, *Precision levels.*
BS 959, *Internal micrometers.*
BS 1054, *Engineers' comparators.*
BS 1643, *Vernier height gauges.*

1 Scope

This Specification applies to toolmakers' straightedges of short length intended for very accurate work, and having one working edge, which is bevelled and very slightly rounded off (commonly described as a "knife-edge").

NOTE The attention of the purchaser is drawn to the necessity for indicating, in his enquiry and order, his particular requirements in regard to type and length, and whether a test plate (see Clause **6**) is required.

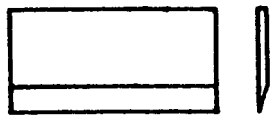
2 Material

The straightedges shall be made from high quality cast or alloy steel.

The straightedges shall be hardened and they shall be suitably heat treated to remove any stresses resulting from the hardening process and to give stability. The diamond pyramid hardness number of the hardened straightedges, measured adjacent to the working edge, shall be not less than 800.[2)]

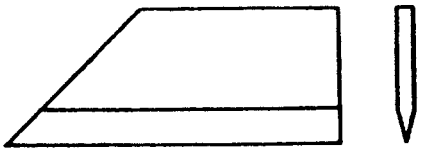
3 General features

Typical sections of straightedges of the type covered by this Specification are given in Figure 1 to Figure 4 inclusive.



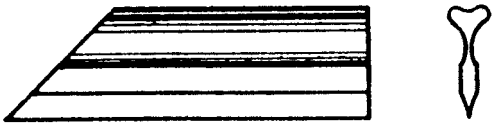
Lengths ½ in. to 1½ in.

Figure 1



Lengths 2 in. to 6 in.

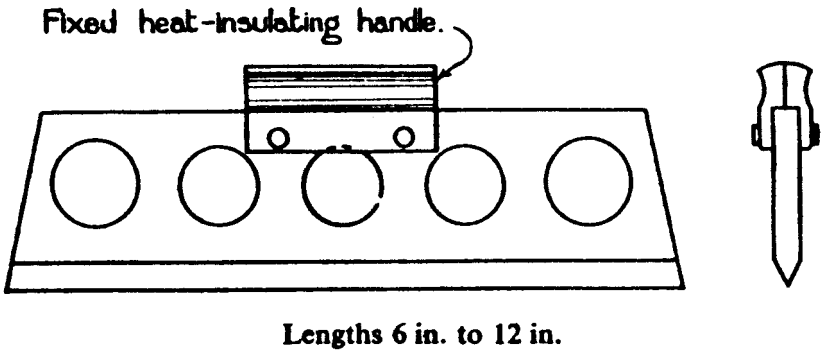
Figure 2



Lengths 2 in. to 6 in.

Figure 3

[2)] The approximate equivalent hardness number on the Rockwell C scale is 62.



Lengths 6 in. to 12 in.

Figure 4

The faces adjoining the working edge may be ground flat or may be hollow ground. It is desirable that the included angle of these faces (see Figure 5) be not more than 30°.

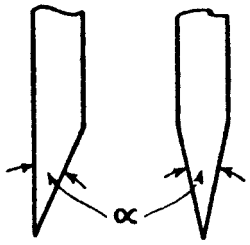


Figure 5

The working edge shall be very slightly rounded off, to furnish what is commonly described as a "knife-edge." (See Note to Clause 4.)

It is recommended that straightedges from 2 in. to 6 in. in length should have one end finished at an angle as shown in Figure 2 and Figure 3.

4 Finish

The working edge shall be finished by grinding, and lapping within the tolerances specified in Clause **5**.

NOTE The radius on the working edge shall be uniform from end to end so that accuracy of straightness is retained even when the straightedge is inclined (see Clause **5**).

5 Accuracy

Each straightedge shall conform to the following requirements for straightness of the working edge.

Straightedges up to and including 5 in. in length shall be tested on toolmakers' Flats (BS 869), and straightedges longer than 5 in. on high precision altered surface plates (BS 869).

When the straightedge is placed on a British Standard Toolmakers' Flat or on a British Standard High Precision Surface Plate (BS 869) against a well-illuminated background, no white light shall be visible at any point along its length. This test shall apply for any angle of application of the straightedge to the test plate up to 10° on either side of the normal.

NOTE This test is sensitive to the order of 0.000 03 in.

6 Glass test plate

It is recommended that a black glass test plate be supplied with each set of straightedges of lengths up to 6 in. The straightness of the reference face of this test plate shall be such that when a true straightedge is applied to the face against a well-illuminated background, no white light shall be visible at any point along its length. The reference face shall be indicated by means of an arrow and the words "test face" etched as shown in the following diagram:—

NOTE When using a glass test plate, care should be taken as far as possible to avoid handling it, as the resultant local temperature effects may introduce errors in the flatness of the working face.

7 Handles

Each straightedge of length from 6 in. to 12 in. inclusive shall have a permanently attached heat-insulating handle. It is recommended that a suitable form of handle be supplied with each set of straightedges of lengths from ½ in. to 1½ in. inclusive.

8 Case

It is desirable that each straightedge, and particularly sets of straightedges be supplied in a suitable protective case.

9 Packing

All surfaces of the straightedges shall be protected against climatic conditions by being covered with a hard-drying lanolin or other suitable non-corrosive preparation.

10 Marking

Each straightedge shall have legibly and permanently engraved upon it the manufacturer's name or trade mark.

Appendix Testing of toolmakers' straightedges

The National Physical Laboratory is prepared to accept straightedges for examination for conformity with this British Standard. Full particulars of the tests and fees charged may be obtained on application to the Director, The National Physical Laboratory, Teddington, Middlesex.

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