

Specification for

Straightedges —

Part 1: Cast iron straightedges (bow shaped and I-section)

UDC 621.753.3:531.717.86:669.13

Confirmed February 2012

NO COPYING WITHOUT BSI PERMISSION EXCEPT AS PERMITTED BY COPYRIGHT LAW



Document Sharing Hub

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 professional and industrial organizations:

Associated Offices Technical Committee	Department of Trade
Association of Consulting Engineers	Electricity Supply Industry in England and Wales
Association of Hydraulic Equipment Manufacturers Ltd.	Engineering Equipment Users' Association
Association of Mining Electrical and Mechanical Engineers	Federation of Manufacturers of Construction Equipment and Cranes
British Compressed Air Society	Institution of Gas Engineers
British Electrical and Allied Manufacturers' Association	Institution of Heating and Ventilating Engineers
British Gas Corporation	Institution of Mechanical Engineers
British Gear Manufacturers' Association	Institution of Plant Engineers
British Internal Combustion Engine Manufacturers' Association	Institution of Production Engineers*
British Mechanical Engineering Confederation	London Transport Executive
British Pump Manufacturers' Association	Machine Tool Trades Association
British Steel Corporation	Ministry of Defence*
British Steel Industry	National Coal Board
Crown Agents for Oversea Governments and Administrations	Process Plant Association
Department of Employment (HM Factory Inspectorate)	Railway Industry Association of Great Britain
Department of the Environment	Royal Institute of British Architects
Department of Industry	Society of Motor Manufacturers and Traders Ltd.
Department of Industry — National Engineering Laboratory	Telecommunication Engineering and Manufacturing Association

The Government department and the 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.

British Calibration Service	Gauge and Toolmakers' Association
Department of Prices and Consumer Protection	Joint Equipment Standardization Committee

This British Standard, having been approved by the Mechanical Engineering Industry Standards Committee, was published under the authority of the Executive Board on 30 April 1975

© BSI 07-1999

The following BSI references relate to the work on this standard:
Committee reference MEE/59
Draft for comment 73/36833 DC

ISBN 0 580 08543 0

Amendments issued since publication

Amd. No.	Date of issue	Comments
4129	November 1982	Indicated by a sideline in the margin

Contents

	Page
Co-operating organizations	Inside front cover
Foreword	ii
1 Scope	1
2 References	1
3 Nomenclature and definitions	1
4 Material	2
5 Lengths of straightedges	2
6 General features	3
7 Finish	4
8 Flatness of working surfaces	5
9 Equality of depths	5
10 Flatness of side faces	6
11 Squareness of working surface and side faces	6
12 Marking	6
13 Protection against climatic conditions	6
14 Case	6
Appendix A Minimum general dimensions for straightedges	7
Appendix B Recommended methods of testing cast iron straightedges	7
Appendix C Recommended chemical compositions of plain and alloy cast irons and method of heat treatment	10
Figure 1 — Bow shaped straightedge	1
Figure 2 — I-section straightedge	1
Figure 3 — Exaggerated illustration of squareness deviation	2
Figure 4 — Alternative positions	3
Figure 5 — Design of supporting feet	3
Figure 6 — Alternative methods of using parallel blocks to support the straightedge in position (b) of Figure 4	4
Figure 7 — Test by inclination method	8
Figure 8 — Plotting of readings	8
Table 1 — Tolerances on flatness of working surfaces	5
Table 2 — Tolerances on equality of depth between working surface and faces of support feet (bow shaped): tolerances on uniformity of depth between working surfaces (I-section)	5
Table 3 — Minimum general dimensions for bow shaped straightedges	7
Table 4 — Minimum general dimensions for I-section straightedges	7
Publications referred to	12

Foreword

This Part of this British Standard is one of a series for engineers' precision measuring equipment that is now being revised and metricated to replace those in imperial units.

This standard replaces BS 818 "*Cast iron straightedges (bow shaped and I-section)*" which was first published in 1938 to cover the bow shaped type and revised in 1963 to include straightedges of I-section. BS 818 is now withdrawn.

Part 2¹⁾ of this standard will replace BS 863 "*Steel straightedges of rectangular section*" and will be in metric units.

Certification. Attention is drawn to the certification facilities described on the inside back cover of this standard.

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 12, 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⁾ In course of preparation.

1 Scope

This Part of this British Standard specifies requirements for cast iron straightedges of bow shaped design and of I-section in metric sizes. Two grades of accuracy are provided for each type, namely grade A and grade B.

Requirements applicable to both types are given in clauses 3 and 4 and 7 to 14 inclusive while clauses 5 and 6 specify particular requirements relating to bow shaped straightedges in lengths up to and including 8 000 mm and I-section straightedges in lengths up to and including 5 000 mm.

Recommended general dimensions, methods of testing and heat treatments are given in appendices.

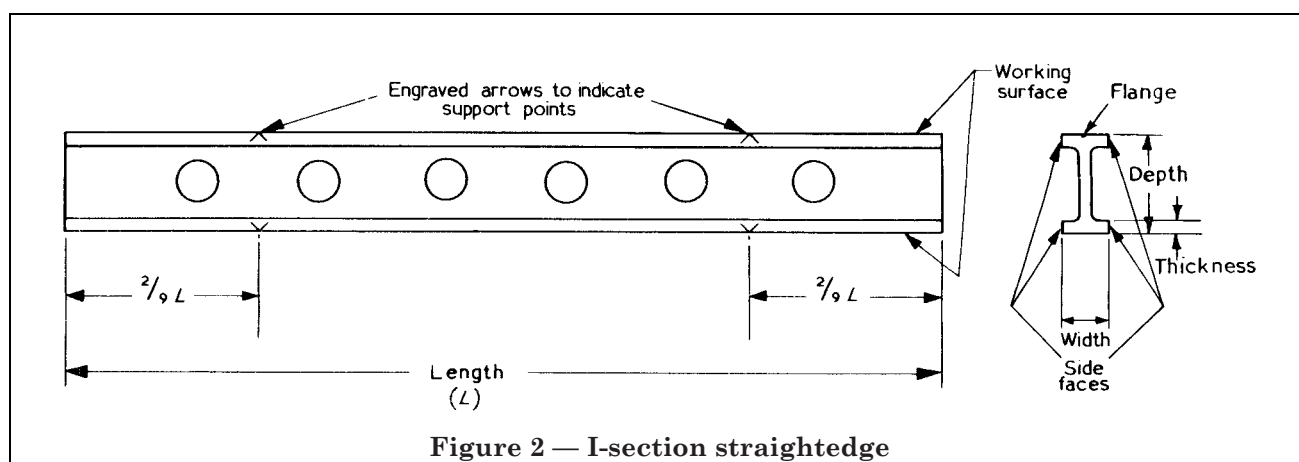
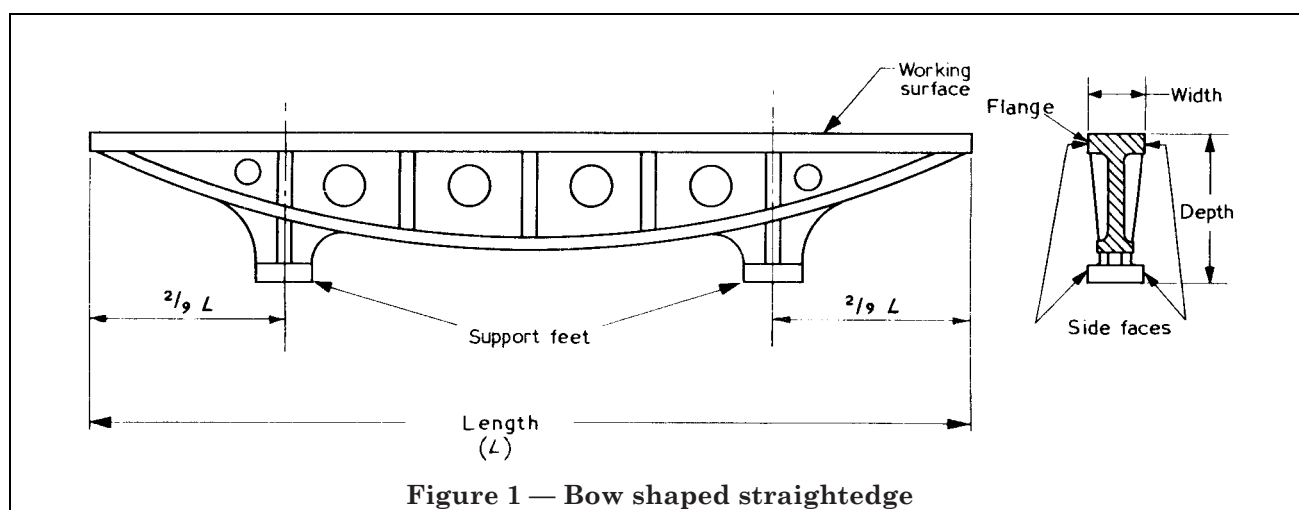
NOTE A straightedge complying fully with the requirements of a superseded standard continues to be operational but it should be brought into full association with this standard when convenient, i.e. when the surfaces are reconditioned and/or retested.

2 References

The titles of the British Standards referred to in this standard are listed on page 12.

3 Nomenclature and definitions

For the purposes of this Part of this British Standard the nomenclature indicated in Figure 1 and Figure 2 has been adopted and the following definitions apply.



3.1

deviation from flatness of the working surface

the minimum distance between two parallel planes which just envelope the working surface

NOTE It may be necessary to control the maximum slope of the surface deviations with respect to the enclosing planes.

3.2**flatness tolerance**

the maximum permissible value of the deviation from flatness

NOTE The working surfaces of straightedges covered by this standard are not strictly speaking straight edges; they are elongated surfaces for which it is appropriate to specify flatness tolerances.

3.3**deviation from squareness of two surfaces**

the minimum distance between two parallel planes which just enclose one surface and are perpendicular to a datum plane in contact with the other surface

NOTE See Figure 3.

3.4**squareness tolerance**

the maximum permissible value of the deviation from squareness

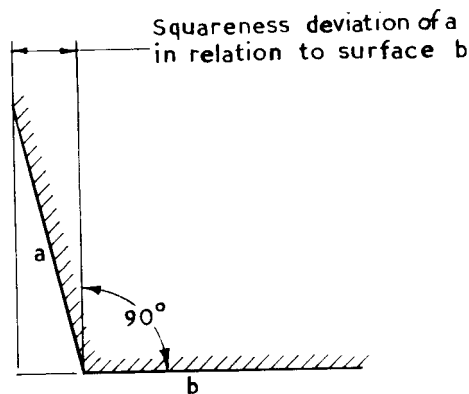


Figure 3 — Exaggerated illustration of squareness deviation

4 Material

The straightedges shall be of close-grained, plain or alloy cast iron in accordance with the minimum requirements for grade 12 as specified in BS 1452:1961.

NOTE Higher grades of cast iron are available which would be more resistant to possible mishandling than grade 12, but grade 12 is specified for this equipment because it offers the best combination of wear resistance and rigidity.

The material shall be sound and free from blowholes and porosity. Minor defects may, however, be repaired by plugging with material of similar composition to that from which the straightedge is made.

A suitable heat treatment to relieve internal stresses is given in Appendix C.

5 Lengths of straightedges

The recommended lengths of straightedges are as follows:

Bow shaped: 300, 500, 1 000, 2 000, 4 000, 6 000 and 8 000 mm,

I-section: 300, 500, 1 000, 2 000, 3 000, 4 000 and 5 000 mm.

Straightedges of intermediate lengths should be ordered only when it is not practicable to adopt one of the recommended lengths. Such straightedges shall conform to the same tolerances as those given for the next shorter recommended length.