

Specification for

Augers and auger bits

Confirmed
January 2011

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:—

Admiralty*	High Commission of India
Air Ministry	Institute of Marine Engineers
Associated Offices Technical Committee	Institute of Petroleum
Association of Consulting Engineers (Incorporated)	Institution of Civil Engineers
British Chemical Plant Manufacturers’ Association	Institution of Gas Engineers*
British Compressed Air Society	Institution of Heating and Ventilating Engineers
British Electrical and Allied Manufacturers’ Association	Institution of Mechanical Engineers
British Electricity Authority and Area Boards	Institution of Mechanical Engineers (Automobile Division)
British Engineers’ Association*	Institution of Production Engineers*
British Internal Combustion Engine Manufacturers’ Association	Locomotive Manufacturers’ Association*
British Iron and Steel Federation	Machine Tool Trades’ Association
British Railways — The British Transport Commission*	Ministry of Fuel and Power
Crown Agents for the Colonies	Ministry of Labour and National Service (Factory Department)
D.S.I.R. — Mechanical Engineering Research Organization	Ministry of Supply*
Engineering Equipment Users’ Association*	Ministry of Transport*
Gas Council*	Ministry of Works
	National Physical Laboratory
	Radio Industry Council
	War Office

The Government departments and scientific and industrial organizations 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:—

Association of U.K. Plier Manufacturers	Light Edge Tool and Allied Trades Association
Edge Tool Manufacturers’ Association	London Transport Executive
Engineers and Allied Hand Tool Makers’ Association	National Association of Tool Dealers
English Joinery Manufacturers’ Association	National Coal Board
Federation of British Hand Tool Manufacturers	National Federation of Building Trades Employers
Furniture Development Council	National Union of Furniture Trade Operatives
General Post Office	Saw Trades Association
Incorporated British Institute of Certified Carpenters	Society of British Aircraft Constructors
Institution of Engineering Inspection	Society of Motor Manufacturers and Traders Ltd.
J.E.S.C. Sub-Committee on Hand Tools	Co-opted manufacturers

This British Standard, having been approved by the Mechanical Engineering Industry Standards Committee and endorsed by the Chairman of the Engineering Divisional Council, was published under the authority of the General Council on 26 November 1953

© BSI 12-1999

ISBN 0 580 34149 6

Amendments issued since publication

Amd. No.	Date of issue	Comments
4011	December 1960	Indicated by a sideline in the margin

Contents

	Page
Co-operating organizations	Inside front cover
Foreword	ii
Section 1. General	
1 Scope	1
2 Nomenclature	1
Section 2. Manufacture	
3 Material	1
a) Augers and auger bits	1
b) Auger eyes	1
c) Handles	1
4 Heat treatment and hardness	1
5 Accuracy	1
6 Auger handles	1
a) Quality of wood	1
b) Moisture content	1
c) Dimensions	1
7 Finish	2
a) Augers	2
b) Auger bits	2
c) Handles	2
d) General	2
8 Dimensions	2
a) General dimensions	2
b) Tangs	2
c) Screw lead	2
9 Marking	2
10 Soundness and performance tests	2
a) Twisting test on augers	2
b) Performance tests on augers and auger bits	2
Appendix Accuracy of auger bit in brace	15
Figure 1 — Nomenclature of augers and auger bits	3
Figure 2 — Scotch pattern eyed auger — round shank	4
Figure 3 — Solid centre auger bit	6
Figure 4 — Scotch pattern auger bit	8
Figure 5 — Jennings pattern auger bit	10
Figure 6 — Auger handles	12
Figure 7 — Sectional view of bit brace chuck with auger bit in position showing annular clearance	14
Table 1 — Scotch pattern eyed augers: round shanks	5
Table 2 — Solid centre auger bit (Jennings pattern nose)	7
Table 3 — Scotch pattern auger bit	9
Table 4 — Jennings pattern auger bit	11
Table 5 — Auger handles	13

Foreword

This standard makes reference to the following British Standards:—

BS 309, *Whiteheart malleable iron castings*.

BS 427, *Tables of diamond pyramid hardness numbers*.

BS 860, *Table of approximate comparison of hardness scales*.

BS 970, *Wrought steels*.

BS 1978, *Bit braces*.

This British Standard has been prepared under the authority of the Mechanical Engineering Industry Standards Committee and forms one of a series relating to the most commonly used hand tools.

As in related standards, the tools included are those intended for the use of craftsmen, amongst the provisions being the analysis of the steel used for their manufacture. The quality and soundness of manufacture of the tools are also further ensured by the clauses on heat treatment, hardness, finish and accuracy.

Tables of nominal sizes and dimensions relate to one type of auger and three types of auger bit and the standard is completed by the tests of soundness and performance.

As auger bits are required to function in bit braces, the diameter of the shanks and dimensions of the square taper tangs have been correlated with the design and dimensions of the chucks of bit braces as provided in BS 1978¹⁾, thus ensuring that the auger bits will be gripped, turned and released by the chucks in a satisfactory manner.

It is emphasized that the tools dealt with in this standard are those required by craftsmen for general purposes, for which reason those designed for special application, such as auger bits for dowelling, have not been included.

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 16, 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⁾ BS 1978, “*Bit braces*.”

Section 1. General

1 Scope

This British Standard gives the nominal sizes and dimensions of the following types of auger and auger bit:—

- Scotch pattern eyed auger, with round shank.
- Solid centre auger bit (Jennings pattern nose).
- Scotch pattern auger bit.
- Jennings pattern auger bit.

The nomenclature used is defined on an annotated drawing.

Provisions are given relating to steel analysis, heat treatment, hardness, finish, accuracy, soundness and performance tests.

2 Nomenclature

For the purposes of this British Standard the terms used for augers and auger bits shall be those shown on Figure 1.

Section 2. Manufacture

3 Material

a) *Augers and auger bits.* Augers and auger bits (with the exception of the auger eyes) to which this British Standard relates shall be manufactured from steel having the following analysis:—

	Percentages
Carbon	Not less than 0.60 and not more than 0.75
Silicon	Not less than 0.1 and not more than 0.30
Sulphur	Not more than 0.045
Phosphorus	Not more than 0.045
Manganese	Not less than 0.25 and not more than 0.65

b) *Auger eyes.* The eyes of the augers shall be manufactured from any one of the following materials:—

- Wrought iron
- Mild steel to any suitable mild steel specification in BS 970.²⁾
- Whiteheart malleable iron to BS 309.³⁾

c) *Handles.* Auger handles shall be manufactured from ash.

4 Heat treatment and hardness

The twist and the cutting edge of augers and auger bits shall be hardened and tempered to produce a hardness reading within the range 450/520 on the diamond pyramid scale,⁴⁾ using a load of 10 kg., except that the hardness reading at the commencement of the twist adjacent to the shank shall be within the range 360/420 on the same scale using a similar load. Alternatively, equivalent figures on other approved hardness scales may be used.⁵⁾

5 Accuracy

- a) The screw lead shall lie in the centre of the cutting edges which shall cut equally and simultaneously.
- b) The nose, the twist, the round shank and, in the case of auger bits, the tang, shall be concentric with the axis of the tool.

The concentricity accuracy of auger bits shall be such that when the bit is gripped in the chuck of a bit brace, which complies with the provisions of BS 1978,⁶⁾ there shall be an annular clearance between the end of the jaws at the outer end of the shell and the round shank of the auger bit (see Appendix). When the bit brace is turned the bit shall rotate concentrically with the axis of the chuck.

6 Auger handles

- a) *Quality of wood.* The timber from which handles are manufactured shall be straight grained and free from defects.
- b) *Moisture content.* The moisture content of the timber from which handles are manufactured, as determined by any suitable process, shall be not less than ten per cent and not more than fifteen per cent.
- c) *Dimensions.* The dimensions of the handles shall be those given in Table 5.

²⁾ BS 970, "Wrought steels."

³⁾ BS 309, "Whiteheart malleable iron castings."

⁴⁾ BS 427, "Tables of diamond pyramid hardness numbers."

⁵⁾ BS 860, "Table of approximate comparison of hardness scales."

⁶⁾ BS 1978, "Bit braces."

7 Finish

- a) *Augers.* The nose shall be cleanly finished. Nominal sizes up to and including 1 in. shall be bright through nose and nominal sizes above 1 in. shall be left black through nose. The complete twist and 2 in. of the shank adjacent to the twist shall be ground and glazed while the rest of the tool shall be smooth and painted.
- b) *Auger bits.* The nose shall be cleanly finished and all sizes shall be bright through nose. The complete twist and shank shall be ground and glazed but the tang shall be left as forged.
- c) *Handles.* Handles for use with augers shall be smoothly finished.
- d) *General.* Augers and auger bits shall be supplied sharpened and ready for use.

8 Dimensions

- a) *General dimensions.* The range of nominal sizes and the general dimensions of augers and auger bits (with the exception of the tang) to which this British Standard relates shall be those given in Table 1 to Table 4 inclusive.
- b) *Tangs.* The nominal dimensions of the tangs of auger bits shall be those given below:—
 - i) *Bits with shank diameter under $\frac{3}{8}$ in.* The tang shall be $\frac{3}{8}$ in. square tapering to $\frac{3}{16}$ in. square, with a length of $1\frac{1}{4}$ in.
 - ii) *Bits with shank diameter of $\frac{3}{8}$ in. and larger.* The tang shall be $\frac{13}{32}$ in. square tapering to $\frac{13}{64}$ in. square, with a length of $1\frac{1}{4}$ in.
 - iii) *Angle.* The nominal included angle of the taper shall be 9 degrees.
- c) *Screw lead.* The screw leads of augers and auger bits shall have a single or double start thread according to the provisions of Table 1 to Table 4 inclusive and the number of threads per inch shall be those given in Table 1 to Table 4 inclusive, but alternative threads may be provided by arrangement between the purchaser and the manufacturer.

9 Marking

The augers and auger bits shall be suitably marked, on the shank or tang, with the nominal size.

10 Soundness and performance tests

Augers and auger bits complying with the provisions of this British Standard shall be capable of passing the tests detailed below appropriate to their type. The shock test and twisting test are designed each to ensure the soundness of the weld between the eye and the auger shank. The performance test ensures satisfactory boring properties.

- a) *Soundness of weld test on augers.* The weld shall be completely sound upon completion of either of the following tests:
 - i) *Shock test.* With the twist of the auger held securely in the hand above a solid steel block supported on a bench or table, the auger shall be raised to a height of 18 in to 24 in above the upper face of the block and brought down quickly to cause the auger weld to strike a sharp blow against the upper face of the block. This blow shall be repeated three times consecutively.
 - ii) *Twisting test.* With the shank of the auger securely and positively gripped adjacent to the twist in a vice or other suitable fixture, a steel bar having a length equal to that of the appropriate handle and a diameter $\frac{1}{16}$ in smaller than the bore of the auger eye shall be disposed centrally in the auger eye and used to subject the auger shank to the maximum torque that can be applied manually. The torque shall act normally about the axis of the auger and the angle through which the shank is twisted shall in no case exceed 30°
 - b) *Performance tests on augers and auger bits.*
 - i) The tool shall bore satisfactorily across the grain to a minimum depth of 75 per cent of the length of its twist, into a piece of sound oak or similar hardwood of suitable dimensions. The tool shall not be withdrawn during the test.
 - ii) When the bore reaches the depth given in b) i) overleaf, the tool shall withdraw easily.
 - iii) In addition to the hardwood boring test described in b) i) and ii), auger bits with a Jennings pattern nose shall bore cleanly and smoothly through soft wood.
- Following these tests the augers and auger bits shall show no sign of damage, fracture or flaws.

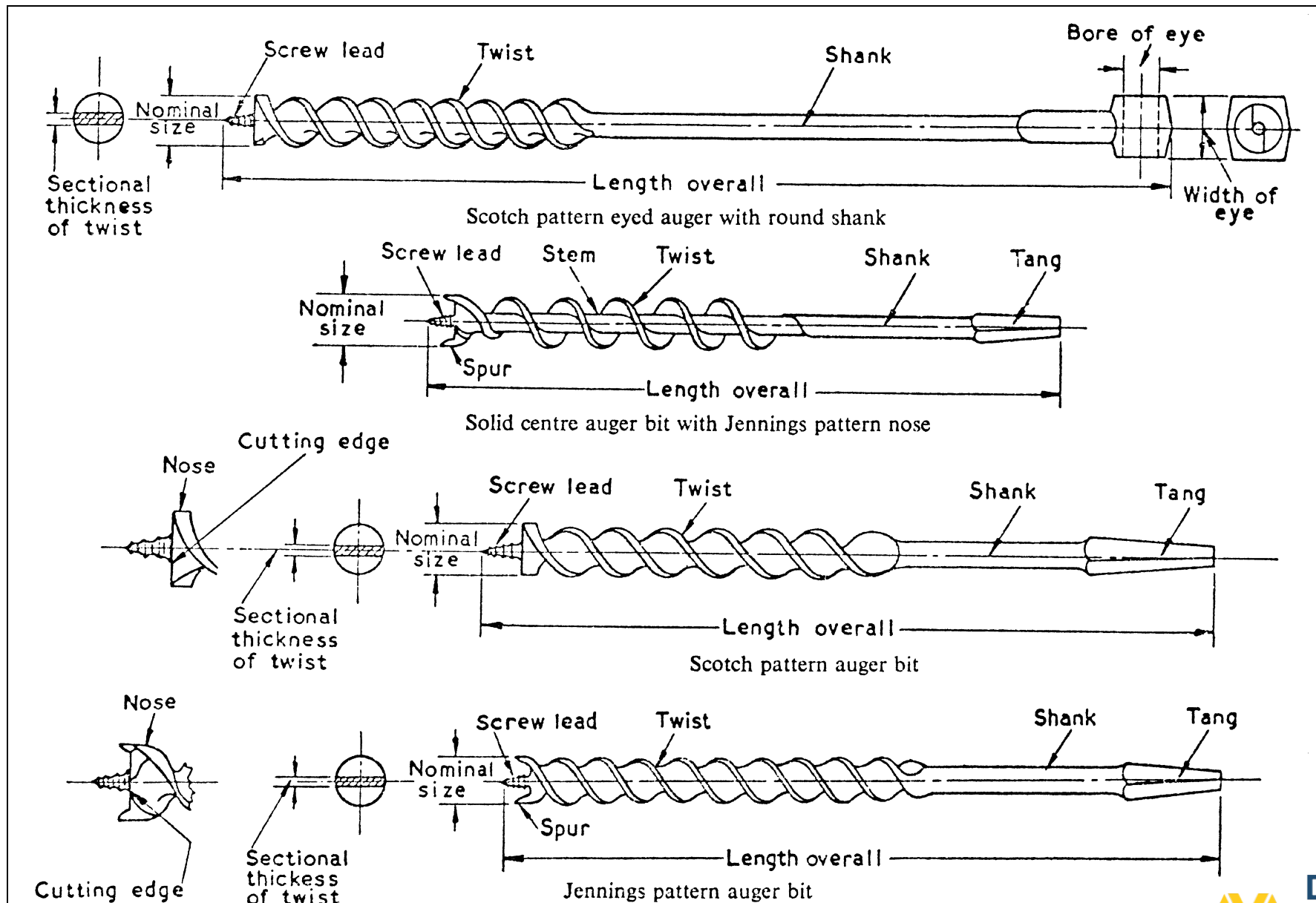


Figure 1 — Nomenclature of augers and auger bits