

Specification for Bit braces

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Gas Council*	National Physical Laboratory (Ministry of Technology)
Institute of Marine Engineers	Radio Industry Council
Institution of Civil Engineers	Royal Institute of British Architects
Institution of Gas Engineers*	

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	Ministry of Aviation
Manufacturers of Edge Tools	National Association of Tool Dealers
Engineers and Allied Hand Tool Makers Association	National Union of Furniture Trade Operatives
Federation of British Hand Tool Manufacturers	Post Office
Institution of Engineering Inspection	Saw Trades Association
J.E.S.C. Sub-committee on Hand Tools	Society of British Aerospace Companies Ltd.
Light Edge Tool and Allied Trades Association	Society of Motor Manufacturers and Traders Ltd.
	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 1965

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Foreword

This standard makes reference to the following British Standards:

BS 309, *Whiteheart malleable iron castings*.

BS 310, *Blackheart malleable iron castings*.

BS 328, *Twist drills and combined drills and countersinks — Part 1: Twist drills*.

BS 427, *Method for Vickers hardness test — Part 1: Testing of metals*.

BS 970, *Wrought steels. En series*.

BS 1224, *Electroplated coatings of nickel and chromium*.

BS 1408, *Patented cold drawn steel spring wire*.

BS 2054, *Augers and auger bits*.

BS 2590, *Acceptance tests for sintered metal powder components*.

BS 2789, *Iron castings with spheroidal or nodular graphite*.

This British Standard, which was first published in 1953, has been revised under the authority of the Mechanical Engineering Industry Standards Committee.

The revision takes account of the latest manufacturing techniques including the use of chuck jaws manufactured by powder metallurgical methods.

Apart from materials, heat treatment and hardness, the standard includes clauses on nomenclature, definitions, finish and the nominal size range of the bit braces. The quality of the tools is further ensured by the inclusion of performance tests.

Chuck jaws of the alligator pattern only are provided for in this British Standard. It is recognized that chucks are available which incorporate universal type jaws, but these are considered to be more specialized in their application than the alligator type. In any case, such chucks are normally supplied as an integral part of a brace, designed to form a complete tool intended for some special purpose and for this reason details of such jaws, chucks or braces have been omitted from the standard.

The Type 2 brace, referred to in the Scope clause as a plain brace, relates to those often known as the “wagon-builder’s brace” and the “linesman’s brace”.

The differences between these two are so slight, being concerned with variations in the dimensions of the sweep and the materials forming the handles, as to render differentiation inadvisable in this British Standard.

The provisions which apply to the chucks and the jaws have been correlated with the dimensions of the round shank and square taper tangs of auger bits given in BS 2054, “*Augers and auger bits*”, thus ensuring that the two will function together efficiently. Similarly the square taper tangs of bit stock twist drills conforming to BS 328-1, “*Twist drills*”, are also accommodated.

NOTE A table from which metric equivalents can be calculated is given in an appendix. The figures in British units are to be regarded as the standard. More accurate conversions should be based on the tables in BS 350, “*Conversion factors and tables*”.

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 13 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.

Section 1. General

1 Scope

This British Standard relates to bit braces (sometimes referred to as carpenters' braces), of the following types and nominal sizes:

Type 1. Ratchet brace fitted with chuck (see Figure 1) having a range of nominal sizes as follows: 5 in, 8 in, 10 in, 12 in and 14 in.

Type 2. Plain brace, fitted with socket end (nose) which includes the types known as wagon-builder's brace, 14 in nominal size and linesman's brace, 9 in nominal size (see Figure 2).

2 Nomenclature and definitions

For the purposes of this British Standard the following definitions apply:

2.1

bit brace

a cranked hand tool designed primarily for rotating auger bits and bit stock drills. See Figure 1 and Figure 2

2.2

sweep

twice the throw of the crank of the frame. See Figure 1 and Figure 2

2.3

nominal size

a value which is equal to the sweep [see 2.2 above]

2.4

shell

the outer component of the chuck which is threaded internally to fit the screw end and formed externally for manual operation. The shell forms the outer housing for the hardened jaws and provides the means by which the jaws are caused to grip the tools. Three typical forms of shell are shown in Figure 1

2.5

jaws

the components designed to fit into and be operated by the shell, and intended to accommodate and grip the square taper tangs of bits and drills. Jaws are heat-treated; assembled in pairs and are for the purpose of giving an efficient grip on square taper tangs having dimensions within the limits given in Subclause 6 a) ii). See Figure 1

2.6

jaw spring

the spring which secures the jaws together in pairs and provides the tension necessary for the opening action. See Figure 1

2.7

screw end

the component threaded externally to accept the shell and designed to form the inner housing for the jaw assembly, the outer housing being formed by the shell. The screw end is fitted to the ratchet body sub-assembly. See Figure 1

2.8

knurled thrust washer

the knurled washer which acts as a wearing pad between the screw end and the ratchet body. See Figure 1

2.9 Ratchet body sub-assembly (See Figure 1)

A sub-assembly comprising the following components:

2.9.1

rack

the circular toothed member actuated by the pawls through which the torque is applied

2.9.2

ratchet body

the component designed to accommodate the screw end, rack, pawls and pawl spring

2.9.3

rack pin

the pin used for securing the rack to the screw end

2.9.4

pawls

the components controlled by the cam ring which actuate the rack

2.9.5

pawl spring

the helical spring which ensures that the pawls engage in the rack

2.9.6

pawl pins

the pins used to secure the pawls to the ratchet body

2.10

cam ring

the component having an eccentric groove in the bore for selecting the action of the pawls. It is knurled to provide for manual adjustment. See Figure 1

2.11

ratchet body to frame pin

the pin securing the ratchet body to the frame. See Figure 1

2.12

cam stop pin

the pin functioning as a positive stop during rotation of the cam ring. See Figure 1

2.13 Frame sub-assembly (See Figure 1)

A sub-assembly comprising the following components:

2.13.1

frame

the cranked component carrying the centre handle on which the ratchet body and head sub-assemblies are mounted

2.13.2

centre handle

the component set in the centre of the frame providing a freely revolving hand grip for rotating the brace

2.13.3

handle collars

the collars secured to the frame or handle which provide a correct location for the handle

2.14

ball cup

the component attached to the end of the frame which provides both a bearing surface and a housing for the hardened balls. See Figure 1 and Figure 2

2.15

hardened balls

the balls designed to take the thrust of the head, identical to those used in ball bearings. See Figure 1 and Figure 2