

Specification for

Pipe wrenches —

Part 1: Stillson type wrenches

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*	Gas Council*
Air Ministry	High Commission of India
Associated Offices' Technical Committee	Institute of Marine Engineers
Association of Consulting Engineers (Incorporated)	Institute of Petroleum
Association of Mining Electrical and Mechanical Engineers	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 Engineers' Association*	Institution of Mechanical Engineers (Automobile Division)
British Gear Manufacturers' Association	Institution of Production Engineers*
British Internal Combustion Engine Manufacturers' Association	Locomotive and Allied Manufacturers' Association of Great Britain
British Iron and Steel Federation	Machine Tool Trades Association
British Railways Board*	Ministry of Labour (H.M. Factory Inspectorate)
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Electricity Council, the Generating Board and the Area Boards in England and Wales	Ministry of Transport
Engineering Equipment Users' Association	National Coal Board*
	National Physical Laboratory (D.S.I.R.)
	Radio Industry Council
	War Office*

The Government departments and scientific and industrial organizations marked with an asterisk in the preceding list, together with the following, were directly represented on the committee entrusted with the preparation of this standard:

Association of U.K. Plier Manufacturers	Ministry of Aviation
Edge Tool Manufacturers' Association	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 Aircraft Constructors
Light Edge Tool and Allied Trades Association	Society of Motor Manufacturers and Traders Ltd.
London Transport Board	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 2 April 1963

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

BS 970, *Wrought steels. En series*.

BS 1133-6, *Temporary prevention of corrosion during transportation and storage*.

BS 1387, *Steel tubes and tubulars suitable for screwing to BS 21 pipe threads*.

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

BS 1449, *Steel plate, sheet and strip*.

This British Standard has been prepared under the authority of the Mechanical Engineering Industry Standards Committee. Its publication will be followed by Part 2, “*Footprint type wrenches*”, and then Part 3, “*Chain type wrenches*”.

Pipe wrenches are often used on scaffolding at considerable heights and in many other dangerous situations where failure of the tool could result in serious accident. The committee responsible for the preparation of this standard has given realistic consideration to these hazards, and in addition to requirements to be met in manufacture has laid down stringent static load and combined static/shock load tests which the finished wrench shall be capable of passing. The tests are related to functional proof loads established by experiment and not to unrealistic “failure loads” as are sometimes quoted.

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 8, 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 relates to the essential dimensions, quality, finish, testing and marking of pipe wrenches of the Stillson type as illustrated in Figure 1 and Figure 2 in nominal sizes as follows:

8 in; 10 in; 12 in; 14 in; 18 in; 24 in; 36 in and 48 in.

2 Nomenclature and definitions

For the purpose of this British Standard the nomenclature of Figure 1 has been adopted together with the following definitions:

- a) *Nominal size*. The nominal size of a Stillson type wrench is the overall length of the tool when the jaws are open to maximum capacity (see Figure 1).
- b) *Maximum capacity*. The maximum capacity of a Stillson type wrench is the distance between jaws measured when the end of the movable jaw is flush with the back face of the frame as shown in Figure 1 and Figure 2 (i.e. the maximum diameter of pipe that can be gripped with safety).

3 Materials

The components of Stillson type wrenches shall be manufactured from the following materials:

- a) *Handle*. From steel conforming to BS EN 10083-1¹⁾, 2C50 or 2C55 or from steel conforming to BS 970-1²⁾, 060 A62.
- b) *Movable jaw*. From steel conforming to BS EN 10083-1¹⁾, 2C50 or 2C55 or from steel conforming to BS 970-1²⁾, 060 A62.
- c) *Frame*. From Whiteheart malleable iron, or from Blackheart malleable iron conforming to BS 6681³⁾, or from spheroidal graphite iron, conforming to BS 2789.⁴⁾
- d) *Spring (or springs)*. From any spring steel selected from BS 1449⁵⁾ or BS 5216.⁶⁾
- e) *Adjusting nut*. From any carbon steel selected from BS 970-1.²⁾
- f) *Hinge pin*. From any carbon steel selected from BS 970-1.²⁾

Materials superior in mechanical properties to those specified above may be used, provided that the provisions of this specification are met in full.

4 Heat treatment and hardness

The heat treatment and hardness of components of Stillson type wrenches shall be as follows:

- a) *Handle and movable jaw*. After forging, the grain structure of the steel shall be suitably refined.

The jaws shall be locally hardened and tempered in order to provide hardness values within the range 600 to 700HV 30⁷⁾ when measured at any point within the triangular profile of any tooth.

At no point on the shank of the handle, nor on the shank of the movable jaw shall hardness values be in excess of 400HV 30.⁷⁾

The transitional hardness zone (see Figure 1) between 600 to 700HV 30 and 400HV 30⁷⁾, shall not extend beyond a point defined as twice the height of the teeth measured back from the tooth root.

¹⁾ BS EN 10083 "Quenched and tempered steels, Part 1, Technical delivery conditions for special steels".

²⁾ BS 970 "Specification for wrought steels for mechanical and allied engineering purposes, Part 1, General inspection and testing procedures and specific requirements for carbon, carbon manganese, alloy and stainless steels".

³⁾ BS 6681 "Specification for malleable cast iron".

⁴⁾ BS 2789 "Specification for spheroidal graphite or nodular graphite cast iron".

⁵⁾ BS 1449 "Steel plate, sheet and strip".

⁶⁾ BS 5216 "Specification for patented cold drawn steel wire for mechanical springs".

⁷⁾ BS 427 "Method for Vickers hardness test, Part 1, Testing of metals".