

Steel boiler and superheater tubes —

**Part 1: Specification for low tensile
carbon steel tubes without specified
elevated temperature properties**

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The preparation of this British Standard was entrusted by the Iron and Steel Standards Committee (ISM/-) to Technical Committee ISM/73, upon which the following bodies were represented:

- Associated Offices Technical Committee
- BEAMA Ltd. (Power Generation Association)
- British Compressed Air Society
- British Gas plc
- British Shipbuilders
- British Steel Industry
- Electricity Supply Industry in England and Wales
- Engineering Equipment and Materials Users' Association
- High Pressure Pipework Consultative Committee
- Lloyd's Register of Shipping
- Process Plant Association
- Seamless Steel Tube Association
- Water-tube Boilermakers' Association
- Welding Institute
- Coopted members

The following bodies were also represented in the drafting of the standard, through subcommittees and panels:

- British Fluid Power Association
- British Forging Industry Association
- British Industrial Truck Association
- British Welded Steel Tube Association
- Confederation of British Industry
- Energy Industries Council
- Coopted member

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Contents

	Page
Committees responsible	Inside front cover
Foreword	ii
1 Scope	1
2 Information to be supplied by the purchaser and options to be documented	1
3 Designation	1
4 Manufacture of the steel	1
5 Manufacture of the product	2
6 Chemical analysis	2
7 Final supply conditions	2
8 Mechanical properties	2
9 Visual inspection and appearance	4
10 Tolerances	4
11 Tests	5
12 Number, selection and preparation of samples and test pieces	5
13 Test methods	5
14 Retests	6
15 Test certificate	6
16 Protective coating	7
17 Marking	7
Appendix A Designation of steel tubes in BS 3059-1:1987 and the nearest equivalent designations in BS 3059-1:1978 and ISO 2604-2 and ISO 2604-3	8
Appendix B Minimum 0.2 % proof stress ($R_{p0.2}$) values at elevated temperatures	8
Appendix C Physical properties of steel grade 320	8
Appendix D Preferred outside diameters and thicknesses for tubes appropriate to this standard and masses per unit length	9
Appendix E Eddy current testing of tubes for verification of leak tightness	10
Table 1 — Method of manufacture of tube and reference	1
Table 2 — Chemical composition and mechanical properties at room temperature	3
Table 3 — Permitted deviations of the product analysis from the specified ladle analysis	4
Table 4 — Tube manufacturing process and final supply conditions	4
Table 5 — Designation of steel tubes in BS 3059-1:1987 and the nearest equivalent designations in BS 3059-1:1978 and ISO 2604-2 and ISO 2604-3	8
Table 6 — Minimum 0.2 % proof stress ($R_{p0.2}$) values at elevated temperatures	8
Table 7 — Physical properties of steel grade 320	8
Table 8 — Preferred outside diameters and thicknesses for tubes appropriate to this standard and masses per unit length	9
Table 9 — Drill diameter sizes for method A	10
Table 10 — Notch dimensions for method B	10
Publications referred to	Inside back cover

Foreword

This Part of BS 3059 has been prepared under the direction of the Iron and Steel Standards Committee and supersedes BS 3059-1:1978 which is withdrawn.

As with the previous edition, this standard is published in two Parts, as follows, to assist users of the standard in selecting tubes for particular duties.

— *Part 1: Specification for low tensile carbon steel tubes without specified elevated temperature properties;*

— *Part 2: Carbon, alloy and austenitic stainless steel tubes with specified elevated temperature properties.*

This Part of BS 3059 is aligned as far as possible with corresponding material requirements and test procedures now agreed for incorporation in documents by the International Organization for Standardization (ISO).

The designations of steel tubes in this specification and their nearest equivalent designations in ISO 2604-2 and ISO 2604-3 are given in Appendix A for information.

Most of the dimensions for tubes and also the tube tolerances are taken from ISO 1129 but the range of dimensions in this standard is wider than that in ISO 1129.

The main technical differences between this edition and the previous edition are that changes have been made to the specified ladle analysis to take into account current steelmaking practice and the length tolerance for “exact” or “cut” lengths has been changed to align with other standards covering steel tubes for pressure purposes. Also, typical physical properties of steel 320 are given in an Appendix C for information only.

Whilst this standard does not specify elevated temperature properties, the proof stress values at temperatures up to 400 °C are given in Appendix B for information but they are not subject to verification.

The steel covered by this standard is generally regarded as being weldable. However, care should be taken and welding should be carried out in accordance with the requirements of the appropriate British Standards for welding, e.g. BS 2633.

The appropriate British Standard for the design and construction of boilers should be consulted for requirements relating to the application and permissible design stresses for products made in accordance with this Part of BS 3059.

Purchasers ordering to this British Standard are advised to specify in their purchasing contract that the supplier operates a quality system in compliance with BS 5750-2 to assure themselves that products claimed to comply with BS 3059-1 consistently achieve the required level of quality.

It is outside the scope of this standard to specify formal qualifications for personnel engaged in testing but it is emphasized that the operation of all equipment should be supervised by competent, trained personnel.

For the purpose of this standard, no difference is intended in the meaning between “pipe” and “tube” though idiomatic use prefers sometimes the one and sometimes the other.

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 10, 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 Part of BS 3059 specifies requirements for plain end, seamless and welded, low tensile carbon steel tubes, not exceeding 127 mm outside diameter and not exceeding 12.5 mm thickness for use in boilers and superheaters.

Only one grade of steel is included in the specification and is designated 320.

In addition to the definitive requirements, this Part of BS 3059 requires the items detailed in 2.1 to be documented. It also requires options selected by the purchaser from those detailed in 2.2 to be documented. For compliance with this Part of BS 3059 both the definitive requirements and the documented items have to be satisfied.

NOTE 1 The preferred outside diameters and thicknesses appropriate to this standard are given and masses per unit length included in Appendix D for information.

NOTE 2 The titles of the publications referred to in this standard are listed on the inside back cover.

2 Information to be supplied by the purchaser and options to be documented

2.1 Information to be supplied by the purchaser

The following information shall be supplied by the purchaser and fully documented:

- a) the number of this British Standard, i.e. BS 3059-1, the method of manufacture of the product, and the grade of steel as expressed by the appropriate designation in clause 3, e.g. BS 3059-1:HFS 320;
- b) the tube outside diameter and thickness;
- c) the tube length, if exact (see 2.2 e) and 10.3);
- d) the quantity in metres or number of lengths.

2.2 Options to be documented

A number of options are permitted by this Part of BS 3059 as listed below and where the purchaser identifies the option it shall be fully documented. Both the definitive requirements specified throughout this Part of BS 3059 and the following documented items shall be satisfied before a claim of compliance with the standard can be made and verified. In the event that the purchaser does not indicate his requirements at the time of enquiry or order the manufacturer shall select the options.

- a) Whether the steelmaking process used has to be reported [see 4.2 and clause 15 1)].
- b) Whether a product analysis is required [see 6.2 and clause 15 2)].

c) Whether selected chemical elements additional to those specified are to be reported [see 6.3 and clause 15 3)].

d) The final supply condition (see clause 7).

e) Whether lengths other than random lengths are required (see 10.3).

f) Whether the method of leak tightness test to be carried out is the hydraulic test or the eddy current test [see 12.3 and clause 15 5)].

g) Whether the hydraulic test, if specified, is to be carried out at a pressure in excess of 70 bar¹⁾ and the pressure required [see 13.4 and clause 15 5)].

h) Whether the tubes are to be supplied uncoated or with the manufacturer's normal mill coating (see clause 16).

i) Whether marking requirements to BS 5383 are required (see 17.1 and 17.4).

3 Designation

The tubes shall be designated by the number of this British Standard, i.e. BS 3059-1, and, from Table 1, by one of the references which indicates the method of manufacture (see clause 5) and by the number 320, which indicates the grade of steel.

Table 1 — Method of manufacture of tube and reference

Method of manufacture of tube	Reference
Hot finished seamless	HFS
Cold finished seamless	CFS
Electric resistance welded including induction welded	ERW
Cold finished electric resistance welded including induction welded	CEW

Example. BS 3059-1:HFS 320 denotes hot finished seamless tube made from steel 320.

NOTE The designations for tubes in this Part of BS 3059 and their nearest equivalent designations in ISO 2604-2 and ISO 2604-3 are listed in Appendix A for information.

4 Manufacture of the steel

4.1 General

The steelmaking process within the provisions of 4.2 and the deoxidation practice within the provisions of 4.3 shall be at the option of the manufacturer.

4.2 Steelmaking process

The steel shall be produced by an electric or one of the basic oxygen processes. If he so requires [see 2.2 a)], the purchaser shall be informed of the steelmaking process used.

¹⁾ 1 bar = 10⁵ N/m² = 100 kPa.