

Valves, gauges and other safety fittings for application to boilers and to piping installations for and in connection with boilers —

Part 1: Specification for valves, mountings and fittings

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- Associated Offices Technical Committee
- Association of Shell Boilermakers
- British Compressed Air Society
- British Compressed Gases Association
- British Electrical and Allied Manufacturers' Association (BEAMA)
- British Valve Manufacturers' Association Ltd.
- Combustion Engineering Association
- Department of Trade and Industry (Marine Division)
- Electricity Supply Industry in England and Wales
- Energy Industries Council
- Engineering Equipment and Materials Users' Association
- Gambica (BEAMA)
- Health and Safety Executive
- Institution of Chemical Engineers
- Institution of Mechanical Engineers
- Liquified Petroleum Gas Industry Technical Association (UK)
- Process Plant Association
- Spring Research and Manufacturers' Association
- Water-tube Boilermakers' Association

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Foreword

This British Standard has been prepared under the direction of the Pressure Vessel Standards Committee. It is a revision of BS 759:1975 incorporating such requirements as are necessitated by technical developments.

The decision taken to align the requirements for safety valves with those of ISO 4126 "Safety valves, general requirements", published by the International Organization for Standardization, has resulted in a change of format of this revision compared with that adopted for the 1975 edition.

Part 1 of this standard deals with valves, mountings and fittings, other than safety valves, for steam and hot water installations.

Section 5 of Part 1 dealing with requirements for automatic working draws attention to the recommendations contained in the Health and Safety Executive Guidance Note PM5.

The hydraulic pressure testing requirements for components complying with Part 1 of this standard are in many cases equal to or greater than those for the boiler to which they will be fitted, but in any case it can be taken that any valve or fitting supplied to this standard will be capable of sustaining, against a closed valve where appropriate, a hydraulic test pressure equal to 1.5 times the design pressure of the valve as specified to the valve supplier by the purchaser.

Part 1 deals with the materials and construction of valves, gauges and other fittings, but is not intended to cover all details of their installation, for which reference should be made to the appropriate British Standard.

It is recognized that clauses (reproduced in Appendix A) regarding inspecting facilities and testing facilities which have traditionally been incorporated into safety valve standards are a contractual matter. Nevertheless their importance is such that the purchaser in agreeing a contract should not overlook them.

Part 2 of this standard has been created by amendments to the requirements of the 1975 edition of BS 759. This Part is declared obsolescent and will be withdrawn in December 1987. Its retention is to give manufacturers a period of grace in which to align their products with BS 6759-1.

NOTE 1 In order to ensure the correct functioning of the fittings in this standard, it is essential that suitable equipment be provided to enable the proper condition of the feedwater to the boiler and the water in the boiler to be maintained.

NOTE 2 The use of asbestos is controlled by the Asbestos Regulations 1969 S.I. No. 690 made under the Factories Act, 1961, and particular attention is drawn to the danger associated with blue asbestos (crocidolite).

Further information is available in the Health and Safety Executive Guidance Note EH/10, Environmental Hygiene, Asbestos.

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 14, 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.

Section 1. General

1 Scope

This Part of this British Standard specifies requirements for steam and water fittings excluding safety valves for boiler installations where the steam pressure exceeds 1 bar gauge or, in the case of hot water boilers, the rating is 44 kW and above. It also specifies requirements for fittings for boilers used exclusively for the following:

- a) low pressure steam heating in which the whole of the condensate is returned to the boiler on a closed circuit;
- b) hot water central heating;
- c) hot water supply.

It deals with valves, boiler blowdown mountings, water level gauges, high and low water level alarms, pressure gauges, test connections and fusible plugs. Where appropriate, general recommendations relating to the installation of fittings are included for the guidance of users. Additional requirements specific to steam and hot water boilers, arranged for automatic working, are given in section 5.

This Part does not cover fittings for boilers used in open vented hot water systems working at temperatures not exceeding 100 °C nor for storage water heaters of the unvented type which normally operate at temperatures not exceeding 82 °C and at pressures not exceeding 10 bar¹⁾. For such boilers within the scope of BS 779 and BS 855 the requirements are incorporated in those standards.

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

2 Definitions

For the purposes of this Part of BS 759 the following definitions apply.

2.1

blowdown

the removal of liquid and/or entrained sediment, if present, from a pressure vessel or boiler

2.2

boiler blowdown fittings

valves or cocks used for controlling blowdown

2.3

boiler feed water valve

a valve in the feed system between the discharge of the feed pump and the inlet to the boiler

2.4

boiler main stop valve

the stop valve provided for the purpose of isolating the main outlet pipe from the boiler

2.5

boiler operating pressure

in the case of fully-flooded hot water boilers, not externally pressurized, the maximum operating pressure in the hot water system, including any static head

in the case of externally pressurized fully-flooded hot water boilers, the pressure at which the boiler operates

2.6

design pressure

the pressure used in calculating the thickness of a vessel or pipe system

2.7

drain mountings

valves or cocks fitted to pressure containing parts for drainage purposes. Such valves may be used to induce flow on initial pressure raising

2.8

fusible plug

a plug containing a metal of low melting point, screwed or otherwise secured into the wall of a vessel

2.9

gauge

an indicating device, e.g. pressure or water level

2.10

high and low water level alarm

an automatic device giving audible warning of an unacceptably high water level and an unacceptably low water level

2.11

inspecting authority

the competent independent authority or association which verifies compliance with this standard

2.12

low water level alarm

an automatic device giving audible warning when the water level drops below an unacceptably low water level

2.13

nominal pressure (PN)

a numerical designation of pressure which is a convenient round number for reference purposes

¹⁾ 1 bar = 10⁵ N/m² = 100 kPa.

2.14**nominal size (DN)**

a numerical designation of size which is common to all components in a piping system other than components designated by outside diameter or by thread size. It is a convenient round number for reference purposes and is only loosely related to manufacturing dimensions

2.15**pressure containing components**

those parts which, when assembled, form the pressure containment. Body, bonnet, stem, body bonnet fasteners, gland and gland fasteners are deemed pressure containing components

2.16**protector**

a device which protects personnel from the effects of failure of tubular glass and which does not obstruct the reading of the gauge

2.17**sequencing valve**

a valve which is only used in connection with float chambers of water level controls mounted external to the boiler. It is used for the testing of such controls and for blowing through separately the water connection and the float chamber of the controls. It is so arranged as to ensure that the float chamber is drained completely during the blow through sequence and that the water connection to the boiler cannot be shut off unless the drain connection to the float chamber is open

2.18**siphon pipe**

in the case of a pressure gauge, a pipe fitted below the gauge shaped so as to ensure that hot fluid is never in contact with the internal fittings of the pressure gauge

2.19**water level gauge**

a device permitting direct visual determination of water level in the boiler

2.20**water level gauge column**

a structural support to maintain the correct distance between the top and bottom arms of the water level gauge, and on which the water level gauge or gauges are mounted

2.21**water level gauge safety devices**

automatic shut-off valves which control the discharge of fluid should the transparent portion of the gauge fracture

2.22**water level indicator**

a device permitting indirect determination of water level in the boiler

3 Applicability of other valve standards

Subject to the limitations specified in this standard, it is permissible for valves complying with the following British Standards to be used

BS 4312, BS 5151 BS 5152, BS 5153, BS 5154, BS 5157, BS 5160.

Section 2. Material requirements and limitations**4 Pressure containing components**

4.1 Material specification. The materials used in the manufacture of bodies and bonnets and other similar pressure containing components of valves and fittings shall comply with whichever of the following is appropriate bearing in mind that fittings made of the less ductile materials are more likely to fail under shock conditions, e.g. water hammer.

a) Cast carbon steel to BS 1504-161, grade 480.

NOTE This material has a maximum carbon content of 0.30 %. For valves with butt welded ends less than 35 mm thick and intended for welding into pipelines subject to the requirements of BS 2633, the carbon content should be 0.25 % maximum. Alternatively, the material may be specified as BS 1504-161, grade 430.

b) Cast carbon $\frac{1}{2}$ % molybdenum steel to BS 1504-245.

c) Cast $1\frac{1}{4}$ % chromium $\frac{1}{2}$ % molybdenum steel to BS 1504-621.

d) Cast 2 $\frac{1}{4}$ % chromium 1 % molybdenum steel to BS 1504-622.

e) Cast austenitic chromium nickel steel to BS 1504-347C17 or, cast austenitic chromium nickel molybdenum steel to BS 1504-316C16.

f) Forged carbon steel to BS 970-1, 070M20.

g) Forged carbon steel to BS 1503 221-430.

h) Forged carbon $\frac{1}{2}$ % molybdenum steel to BS 1503 245-420

i) Forged 1 % chromium $\frac{1}{2}$ % molybdenum steel to BS 1503 620-440

j) Forged $1\frac{1}{4}$ % chromium $\frac{1}{2}$ % molybdenum steel to BS 1503 621-460.

k) Forged $2\frac{1}{4}$ % chromium 1 % molybdenum steel to BS 1503 622-560.

l) Forged chromium molybdenum vanadium steel to BS 1503 660-460.