

Specification for

**Steel check valves
(flanged and
butt-welding ends) for
the petroleum,
petrochemical and
allied industries**

ICS 75.180.99

Co-operating organizations

The Petroleum Equipment Industry Standards Committee, under whose supervision this British Standard was prepared, consists of representatives from the following Government department and scientific and industrial organizations:

British Gas Corporation
 British Mechanical Engineering Confederation
 British Rubber Manufacturers' Association Ltd.
 British Steel Industry*
 Council of British Manufacturers of Petroleum Equipment*
 Department of Energy
 Oil Companies Materials Association*

The 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 standard:

Association of Hydraulic Equipment Manufacturers
 British Chemical Engineering Contractors Association
 British Industrial Measuring and Control Apparatus Manufacturers' Association
 British Plastics Federation
 British Ship Research Association
 British Valve Manufacturers' Association
 Engineering Equipment Users Association
 Steel Castings Association

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Foreword

This British Standard is one of a series prepared under the authority of the Petroleum Equipment Industry Standards Committee. It was first published in 1952 when materials referred to in it were described by reference to ASTM specifications. In 1960 a revision of BS 1868 was published in order to bring it into alignment with the 1958 editions of BS 1501 to BS 1506 and BS 1560. This edition is the metric version of BS 1868, and wherever possible metric dimensions and references are given. The recognized metric nominal piping sizes have been used. The previous sections dealing with test have not been included in this standard as these are now the subject of a separate standard BS 6755 “Testing of valves. Part 1. Specification for production pressure testing requirements”.

NOTE Requirements for final inspection and supplementary inspection at all stages of manufacture, previously specified in BS 5146-1:1974 (now withdrawn) should be stated by the purchaser in his enquiry or order.

Disk type and angle pattern valves and butt-welding end versions of all types have been added and the range has been extended to incorporate larger sizes.

The face-to-face and end-to-end dimensions of valves complying with the requirements of this standard, where applicable, are in accordance with ANSI B16-10 but are not now included here, as these are in BS 2080 “Specification for face-to-face, centre-to-face, end-to-end and centre-to-end dimensions of flanged and butt-welding end steel valves for the petroleum, petrochemical and allied industries”. End flanges are in accordance with BS 1560-2 (which corresponds to ANSI B16-5) and butt-welding ends are in accordance with ANSI B16-25.

NOTE User requirements for valves generally in accordance with this standard, but suitable for use in piping systems with flanges complying with the requirements of BS 4504-1, are dealt with in appendix A.

The range of shell materials has been extended to align with the latest edition of BS 1560-2; also the range of materials for the trim and other components has been extended.

This standard does not cover valves suitable for the passage of spheres or pig scrapers.

It is drawn to the reader’s attention that at the time of publication of this standard proposals are under discussion in CEN/WG74, “Flanges”, effectively recommending that the use of BS 4504 (DIN) flanges be limited to 40 bar maximum ratings. Such proposals may possibly result in the publication of a European Standard.

Acknowledgement is made to the American Petroleum Institute and to the American National Standards Institute for data used.

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 to iv, pages 1 to 20, 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 British Standard specifies requirements for cast or forged steel check valves with flanged or butt-welding ends of the following types:

- a) swing, for vertical or horizontal flow (see Figure 1);
- b) lift:
 - i) piston type, for angle or horizontal flow (see Figure 2);
 - ii) ball type, for angle or horizontal flow (see Figure 3);
 - iii) ball type, for vertical flow (see Figure 4);
 - iv) disk type, for vertical flow (see Figure 5).

The terms “vertical”, “horizontal” and “angle” relate to the axes of the body ends.

When swing check valves are used in vertical lines the flow must be in an upward direction. For the purposes of this standard any line with a slope (upward or downward) of 5° or less is deemed to be horizontal. In the case of angle pattern valves the inlet should be vertical.

2 References

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

3 Definitions

nominal size

the nominal size (DN) is a numerical designation of size that is common to all components in a piping system other than those using valves, fittings, couplings or tubes that are designated by the outside diameter. It is a convenient round number for reference purposes and is normally only loosely related to manufacturing dimensions

4 Pressure classification

This standard applies to valves of the following class designations:

Classes 150, 300, 400, 600, 900, 1 500 and 2 500.

The numerals in these class designations represent the primary pressure ratings of the valves in pounds force per square inch.

5 Pressure/temperature ratings

The pressure/temperature ratings applicable to valves covered by this standard shall be in accordance with tables PE 1 to PE 12 as listed in BS 1560-2 for the particular shell material specified. There is, however, a temperature restriction on certain trim materials and soft seal ring (see clause 15 and 20.4).

If valves complying with the requirements of this standard are to be used at service temperatures below – 30 °C, reference should be made to BS 3351. (“Service temperature” refers to the temperature of the fluid in the line at the valve.)

6 Nominal sizes

This standard covers valves of the following nominal sizes.

mm	in	mm	in	mm	in	mm	in
15	(½)	50	(2)	200	(8)	450	(18)
20	(¾)	65	(2½) ^a	250	(10)	500	(20)
25	(1)	80	(3)	300	(12)	600	(24)
32	(1¼) ^a	100	(4)	350	(14)		
40	(1½)	150	(6)	400	(16)		

For each valve class and type, the range of sizes covered by this standard is shown in Table 1.

^a These sizes have been retained only for the purpose of replacing existing valves. Their use for new construction in piping systems using end flanges complying with the requirements of BS 1560-2 should be avoided.