

CONFIRMED
DECEMBER 2007

Specification for

Valves for cryogenic service

ICS 23.060.01

Committees responsible for this British Standard

The preparation of this British Standard was entrusted by the Mechanical Engineering Standards Committee (MEE/-) to Technical Committee MEE/191 upon which the following bodies were represented:

Amalgamated Union of Engineering Workers
 Associated Offices Technical Committee
 Association of Bronze and Brass Founders
 Association of Hydraulic Equipment Manufacturers
 British Chemical Engineering Contractors Association
 British Compressed Gases Association
 British Gas Corporation
 British Ship Research Association
 British Shipbuilders
 British Valve Manufacturers Association Ltd.
 Copper Development Association
 Copper Tube Fittings Manufacturers' Association
 Council of Ironfoundry Associations
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 Energy Industries Council
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 Gambica (BEAMA)
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 Health and Safety Executive
 Institution of Chemical Engineers
 Institution of Gas Engineers
 Institution of Mechanical Engineers
 Institution of Water Engineers and Scientists
 National Coal Board
 Society of British Gas Industries
 Steel Casting Research and Trade Association
 Water Companies Association
 Coopted members

Amendments issued since publication

Amd. No.	Date of issue	Comments
6591	April 1991	
9431	March 1997	
10115	September 1998	Indicated by a sideline in the margin

This British Standard, having been prepared under the direction of the Mechanical Engineering Standards Committee, was published under the authority of the Board of BSI and comes into effect on 29 February 1984

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ISBN 0 580 13786 4

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Foreword

This British Standard has been prepared under the direction of the Mechanical Engineering Standards Committee.

It is the first national standard for valves for cryogenic service but it is intended that it can only be used in conjunction with the appropriate valve product standard since the requirements and tests specified are additional to those specified in the valve product standards.

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.

Section 1. General

1 Scope

This British Standard specifies the requirements for the design, manufacture and testing of valves for cryogenic service. It is a requirement of this standard that the valves comply with the appropriate valve product British Standards, i.e.:

- steel wedge gate valves: BS 1414;
- steel check valves: BS 1868;
- steel globe and globe stop and check valves: BS 1873;
- steel ball valves: BS 5351;
- steel wedge gate, globe and check valves DN 50 and smaller: BS 5352;
- copper alloy globe, globe stop and check, check and gate valves: BS 5154;
- testing of valves: BS 6755;
- butterfly valves for general purposes: BS 5155.

The size range covered by this standard is DN 15 to a maximum nominal size appropriate to the above product standards, in the temperature range $-50\text{ }^{\circ}\text{C}$ to $-196\text{ }^{\circ}\text{C}$, yet capable of operation at ambient conditions to allow for start-up and run-down.

NOTE 1 For marine applications where design temperatures are below $-165\text{ }^{\circ}\text{C}$ attention is drawn to the need to check requirements with the relevant Statutory Authority.

Appendix C lists the information to be supplied by the purchaser.

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

2 Definitions

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

2.1

nominal size (DN)

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

NOTE 1 It is designated by DN followed by a number.

NOTE 2 This definition is in accordance with ISO 6708.

2.2

nominal pressure (PN)

a numerical designation relating to pressure that is a convenient round number for reference purposes

it is intended that all equipment of the same nominal size (DN) designated by the same PN number shall have the same mating dimensions appropriate to the type of end connections the permissible working pressure depends upon materials, design and working temperature and has to be selected from the pressure/temperature rating tables in corresponding standards

NOTE 1 It is designated by PN followed by a number.

NOTE 2 This definition is in accordance with ISO 7268.

3 General requirements

Valves shall comply with the appropriate standards listed in clause 1 in addition to clauses 4 to 9 of this standard.

Section 2. Design

4 Requirements

4.1 Valves shall be supplied with extended bonnets/glands (see Figure 1). The length of the extension shall be sufficient to maintain the stem packing at a temperature high enough to permit operation within the normal temperature range of the packing material.

4.2 Valves on gas service shall be capable of operation with the valve stem at or above the horizontal position.

4.3 Valves in liquid service other than cold box applications shall be capable of operation with the valve stem at or above 45° above the horizontal position.

4.4 For cold box applications, valves shall be suitable for use with the valve stem at or above 15° above the horizontal position and in addition the minimum gland extension length as shown in Figure 1 shall be as given in Table 1.

NOTE If any special length of gland extension is required by the purchaser he should state this (see Appendix C).

4.5 For applications other than cold box applications the minimum gland extension length shall be 250 mm (see Figure 1).

4.6 Valves shall be designed to relieve pressures above normal working pressure that may build up in trapped cavities due to thermal expansion or evaporation of liquid.

NOTE For ball and gate valves this requirement can be met by the provision of a pressure relief hole or passage or other means, e.g. pressure relieving seats, to relieve pressure in the bonnet and body cavities to the upstream side of the valve. The means adopted will be determined by the manufacturer unless the purchaser exercises his option in accordance with Appendix C.