

Specification for
Cast iron gate valves

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 Water Services Association of England and Wales
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The following bodies were also represented in the drafting of the standard, through sub-committees and panels:

British Effluent and Water Association
 British Non-ferrous Metals Federation

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Foreword

This British Standard has been prepared under the direction of the Piping Systems Components Standards Policy Committee and constitutes the first revision of BS 5150:1974 which is withdrawn.

This British Standard takes into account ISO 5996 published by the International Organization for Standardization (ISO). It incorporates many of the requirements of ISO 5996 for flanged valves although not necessarily in the same format; the essential differences between this British Standard and ISO 5996 are as follows.

- a) The scope has been extended to cover valves of nominal sizes DN 10 to DN 1 000.
- b) Valves having threaded ends of sizes in the range $\frac{1}{2}$ to 6 have been included.
- c) Valves of nominal sizes DN 550, DN 650 and DN 750 have been omitted.
- d) Valves having nominal pressure designations PN 1, PN 1.6, PN 2.5, PN 4, PN 20, PN 40 and PN 50 have been omitted.
- e) Valves having Class 125 and Class 150 flanges have been included.
- f) Clamp pattern valves having the body-to-bonnet connection via a U bolt have been included.
- g) Greater details have been specified for trim materials.
- h) Operation has been given in greater detail.
- i) Marking requirements have been included in greater detail.
- j) Inspection requirements have been omitted.
- k) Information to be supplied by the purchaser has been included in a non-mandatory appendix (see appendix A).
- l) Reference to BS 6920-1 is made concerning requirements for valves when used to convey potable water.

The essential differences between this British Standard and BS 5150:1974 are as follows.

- 1) Valves having nominal pressure designations of PN 1.6, PN 2.5 and PN 4 have been omitted.
- 2) Short series valves for nominal pressures PN 10 are included for the first time.
- 3) Valves with bodies made from spheroidal graphite and malleable cast iron are included for the first time.
- 4) Clamp pattern valves having the body-to-bonnet connection via a U bolt are included for the first time.
- 5) A greater choice of trim materials is given.

Product certification. Users of this British Standard are advised to consider the desirability of third party certification of product conformity with this British Standard based on testing and continuing surveillance, which may be coupled with assessment of a supplier's quality systems against the appropriate Part of BS 5750.

Enquiries as to the availability of third party certification schemes will be forwarded by BSI to the Association of Certification Bodies. If a third party certification scheme does not already exist, users should consider approaching an appropriate body from the list of Association members.

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 16, 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 flanged, threaded end and clamp pattern cast iron gate valves for general purposes. The range of valve sizes covered is DN 10 to DN 1 000 for flanged valves and $\frac{1}{2}$ to 6 for threaded end valves for nominal pressures in the range PN 6 to PN 25 and for valves having Class 125 and Class 150 flanges.

NOTE 1 For cast iron gate valves for waterworks purposes reference should be made to BS 5163.

NOTE 2 The information to be supplied by the purchaser at the time of the enquiry and/or order is detailed in appendix A.

NOTE 3 The titles of 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 Nominal size is designated by the letters DN followed by the appropriate reference number, e.g. DN 150.

NOTE 2 This definition is identical to that given in ISO 6708:1980.

2.2

nominal pressure (PN)

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

all equipment of the same nominal size (DN) designated by the same PN number shall have compatible mating dimensions

NOTE 1 The maximum allowable working pressure depends on materials, design and working temperature and should be selected from the tables of pressure/temperature ratings in the appropriate standard.

NOTE 2 It is designated by the letters PN followed by the appropriate reference number, e.g. PN 16.

NOTE 3 This definition is identical to that given in ISO 7268:1973.

2.3

face-to-face dimension

the distance, expressed in millimetres, between two planes perpendicular to the valve axis located at the extremities of the body end ports

3 Types of valves

Valves shall be one of the following types, with either rising or non-rising stems:

- a) solid or split wedge;
- b) double disk.

NOTE The manufacturer should state in his enquiry and/or order whether the valve is to have rising or non-rising stems. (See appendix A.)

4 Nominal sizes

4.1 Flanged end PN designated valves

4.1.1 Flanged end PN designated non-clamp pattern valves. Flanged end valves other than those in **4.1.2** shall be one of the following nominal sizes.

DN 10, DN 15, DN 20, DN 25, DN 32, DN 40, DN 50, DN 65, DN 80, DN 100, DN 125, DN 150, DN 200, DN 250, DN 300, DN 350, DN 400, DN 450, DN 500, DN 600, DN 700, DN 800, DN 900, DN 1 000.

4.1.2 Flanged end, clamp pattern valves

4.1.2.1 PN designated valves. Flanged end, clamp pattern valves which are PN designated shall be one of the following nominal sizes.

DN 25, DN 40, DN 50, DN 65, DN 80, DN 100.

4.1.2.2 Class 125 valves. Flanged end, clamp pattern Class 125 valves shall be one of the following nominal sizes.

1, $1\frac{1}{2}$, 2, $2\frac{1}{2}$, 3, 4.

4.2 Threaded end valves

4.2.1 Threaded end non-clamp pattern valves.

Threaded end valves other than those in **1.0.0.1** shall be one of the following nominal sizes.

$\frac{1}{2}$, $\frac{3}{4}$, 1, $1\frac{1}{4}$, $1\frac{1}{2}$, 2, $2\frac{1}{2}$, 3, 4, 5, 6.

1.0.0.1 Threaded end, clamp pattern valves.

Threaded end, clamp pattern valves shall be one of the following nominal sizes.

$\frac{1}{2}$, $\frac{3}{4}$, 1, $1\frac{1}{4}$, $1\frac{1}{2}$, 2, $2\frac{1}{2}$, 3, 4.

4.3 Valves for use in Class rated flanged piping systems with Class 125 and Class 150 flanges

Valves for use in Class rated flanged piping systems with Class 125 and Class 150 flanges shall be one of the following nominal sizes.

$1\frac{1}{4}$ ¹⁾, $1\frac{1}{2}$, 2, $2\frac{1}{2}$ ¹⁾, 3, 4, 5, 6, 8, 10, 12, 14, 16, 18, 20 and 24.

¹⁾ These sizes have been retained only for the purpose of replacing existing valves. Their use for new construction in piping systems using BS 1560 flanges should be avoided.

5 Nominal pressures

5.1 Non-clamp pattern valves

5.1.1 General. Non-clamp pattern valves shall be selected from the following nominal pressure designations.

PN 6, PN 10, PN 16 and PN 25; or
Class 125 and Class 150.

5.1.2 Valves for use in Class rated flanged piping systems. Valves for use in Class rated flanged piping systems shall be designated:

a) Class 125 for grey cast iron and malleable cast iron;

b) Class 150 for spheroidal graphite (ductile) cast iron.

5.2 Clamp pattern valves

Clamp pattern valves shall be selected from the following nominal pressure designations.

PN 10 and PN 16 or Class 125.

6 Pressure/temperature ratings

The pressure/temperature ratings for PN designated valves shall be as given in Table 1. The pressure/temperature ratings for valves having Class 125 and Class 150 flanges shall be as given in Table 2.

Table 1 — Pressure/temperature ratings for PN designated values

Material ^a	Nominal pressure	Temperature				
		°C – 10 to 120	°C 150	°C 180	°C 200	°C 220
		Maximum permissible working pressure				
	PN	bar ^b	bar	bar	bar	bar
Grey cast iron ^c	6	6.0	5.4	—	—	—
	10	10.0	9.0	8.4	—	—
	16	16.0	14.4	13.4	12.8	—
	25	25.0	22.5	21.0	20.0	19.0
Spheroidal graphite cast iron grades 400/18, 420/12 and 414/18	6 ^d	6.0	5.8	—	—	—
	10	10.0	9.7	9.4	—	—
	16	16.0	15.5	15.0	14.7	—
	25	25.0	24.3	23.5	23.0	22.5
Spheroidal graphite cast iron grades 500/7 and 600/3	6 ^d	6.0	5.8	—	—	—
	10	10.0	9.5	9.2	—	—
	16	16.0	15.2	14.7	14.4	—
	25	25.0	23.8	23.0	22.5	21.5
Malleable cast iron ^c	6 ^e	6.0	5.8	—	—	—
	10 ^e	10.0	9.7	9.4	—	—
	16 ^e	16.0	15.5	15.0	14.7	—
	25	25.0	24.3	23.5	23.0	22.5

NOTE 1 Intermediate values may be obtained by linear interpolation.

NOTE 2 Restrictions on temperature may be placed by the manufacturer by reason of valve type, trim materials or other factors (see **20.3** for marking requirements).

^a See Table 10 for material identification.

^b 1 bar = 10^5 N/m² = 100 kPa.

^c Materials ASTM A126, grade B and grade B30-06 of BS 6681 are limited to PN 16 maximum.

^d PN 6 spheroidal graphite cast iron flanged valves have flange dimensions in accordance with grey cast iron flanges specified in BS 4504-3.2.

^e For nominal sizes DN 10 to DN 100 inclusive the pressure/temperature ratings given for grey cast iron apply.