SLOVENSKI STANDARD
SIST EN 1171:2003

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Industrijski ventili - Litoželezni zasuni

Industrial valves - Cast iron gate valves

Industiearmaturen - Schieber aus Gusseisen

Robinetterie industrielle - Robinets-vannes en fonte

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23.060.30 Zapirni ventili (zasuni) Gate valves

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Robinetterie industrielle - Robinets-vannes en fonte

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This European Standard was approved by CEN on 2 September 2002.

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This European Standard exists in three official versions (English, French, German). A version in any other language made by translation under the responsibility of a CEN member into its own language and notified to the Management Centre has the same status as the official versions.

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EUROPEAN COMMITTEE FOR STANDARDIZATION
COMITÉ EUROPÉEN DE NORMALISATION
EUROPÄISCHES KOMITEE FÜR NORMUNG

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Contents

Foreword

This document (EN 1171:2002) has been prepared by Technical Committee CEN/TC 69 "Industrial valves", the secretariat of which is held by AFNOR.

This European Standard shall be given the status of a national standard, either by publication of an identical text or by endorsement, at the latest by April 2003, and conflicting national standards shall be withdrawn at the latest by April 2003.

This document has been prepared under a mandate given to CEN by the European Commission and the European Free Trade Association, and supports essential requirements of EU Directive(s).

For relationship with EU Directive(s), see informative annex ZA, which is an integral part of this document.

In this European Standard the annex A is informative and the annexes B and C are normative.

According to the CEN/CENELEC Internal Regulations, the national standards organizations of the following countries are bound to implement this European Standard: Austria, Belgium, Czech Republic, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Luxembourg, Malta, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland and the United Kingdom.

1 Scope

This European Standard specifies the requirements for cast iron gate valves with flanged ends, socket ends or spigot ends.

This standard is applicable to cast iron gate valves mainly used for industrial and general-purpose applications. However, they can be used for other applications provided the requirements of the relevant performance standards are met.

The range of nominal sizes covered is:

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.

The range of pressure designations covered is:

— isobaric PN 6; PN 10; PN 16; PN 25;

— isomorphic, PS 10 bar to PS 1 bar at room temperature.

2 Normative references

This European Standard incorporates by dated or undated reference, provisions from other publications. These normative references are cited at the appropriate places in the text, and the publications are listed hereafter. For dated references, subsequent amendments to or revisions of any of these publications apply to this European Standard only when incorporated in it by amendment or revision. For undated references the latest edition of the publication referred to applies (including amendments).

EN 19, *Industrial valves – Marking of metallic valves.*

EN 545:2002, *Ductile iron pipes, fittings, accessories and their joints for water pipelines – Requirements and test methods.*

EN 558-1:1995, *Industrial valves – Face-to-face and centre-to-face dimensions of metal valves for use in flanged pipe systems – Part 1: PN-designated valves.*

EN 736-1, *Valves – Terminology – Part 1: Definition of types of valves.*

EN 736-2, *Valves – Terminology – Part 2: Definition of components of valves.*

EN 736-3, *Valves – Terminology – Part 3: Definition of terms.*

EN 1092-2, *Flanges and their joints – Circular flanges for pipes, valves, fittings and accessories, PN designated – Part 2: Cast iron flanges.*

EN 1561:1997, *Founding – Grey cast irons.*

EN 1562:1997, *Founding – Malleable cast irons.*

EN 1563:1997, *Founding – Spheroidal graphite cast irons.*

prEN 12266-1[1], *Industrial valves – Testing of valves - Part 1: Pressure tests, test procedures and acceptance criteria – Mandatory requirements.*

[1] To be published.

EN 12266-2, *Industrial valves – Testing of valves – Part 2: Tests, test procedures and acceptance criteria - Supplementary requirements.*

EN 12351, *Industrial valves – Protective caps for valves with flanged connections.*

EN 12516-3, *Valves – Shell design strength – Part 3: Experimental Method.*

EN 12570, *Industrial valves – Method for sizing the operating element.*

EN ISO 5210, *Industrial valves – Multi-turn valve actuator attachments (ISO 5210:1991).*

ISO 185:1988, *Grey cast iron - Classification.*

ISO 1083:1987, *Spheroidal graphite cast iron - Classification.*

ISO 5922:1981, *Malleable cast iron.*

NOTE This European Standard supports some of the essential requirements of the Pressure Equipment Directive 97/23/EC. The essential requirements covered are listed in annex ZA. It should be noted that this standard is not self-sufficient and should be used with the normative references listed herein. Reference should also be made to annex ZA in the relevant normative reference.

3 Terms and definitions

For the purposes of this European Standard, the definitions of types of valves and components and the definitions of terms given in EN 736-1, EN 736-2 and EN 736-3 and the following terms and definitions apply.

NOTE The terms maximum allowable pressure, *PS*, and test pressure, *PT*, defined in EU Directive 97/23/EC (PED) are equivalent to the terms allowable pressure, p_s, and test pressure, p_t, defined in EN 736-3.

3.1
isomorphic series
series of cast iron gate valves of a specified type and design having maximum allowable pressures which tend to decrease as the nominal size increases (see Table 2) and having specific flanged end connections (see 4.1.3.2.1)

3.2
isobaric series
series of cast iron gate valves of a specified type and design having the same maximum allowable pressure for all nominal sizes

3.3
strength torque
torque applied directly to the operating mechanism or, when fitted, the operating device, which the valve is capable of withstanding

4 Requirements

4.1 Design

4.1.1 Materials

4.1.1.1 The body and bonnet materials shall be selected from Table 1. The limits of use given in the material standard shall be taken into account.

Table 1 — Body and bonnet materials

Graphite structure	European Standard	R_m N/mm^2	Designation	
			Short name	Number
Grey cast iron	EN 1561:1997	200 [a]	EN-GJL-200	EN-JL1030
	EN 1561:1997	250	EN-GJL-250	EN-JL1040
Spheroidal graphite cast iron	EN 1563:1997	350	EN-GJS-350-22-LT	EN-JS1015
	EN 1563:1997	350	EN-GJS-350-22-RT	EN-JS1014
	EN 1563:1997	400	EN-GJS-400-18-LT	EN-JS1025
	EN 1563:1997	400	EN-GJS-400-18-RT	EN-JS1024
	EN 1563:1997	400	EN-GJS-400-15	EN-JS1030
	EN 1563:1997	500	EN-GJS-500-7	EN-JS1050
	EN 1563:1997	600	EN-GJS-600-3	EN-JS1060
	EN 545:2002	420-5	EN-545-420-5	-
Malleable cast iron	EN 1562:1997	300	EN-GJMB-300-6	EN-JM1110
	EN 1562:1997	350	EN-GJMB-350-10	EN-JM1130

[a] Grade 200 shall not be used for valves with PN 25 flanged end connections.

4.1.1.2 All the internal parts in contact with the fluid shall be made of a material whose corrosion resistance to the fluid being carried is at least equal to the body and bonnet material.

4.1.1.3 Trim materials shall have a chemical composition and mechanical properties, which ensure the mechanical integrity of the valve and shall be stated in the manufacturer's technical documentation.

The trim comprises the following:

a) stem;

b) obturator seat;

c) body seat;

d) back seat (for valves DN 50 and above, when fitted).

4.1.1.4 Welding of grey cast iron and impregnation of castings of all materials is not permitted.

4.1.2 Pressure/temperature ratings

4.1.2.1 Isobaric series

The pressure/temperature ratings shall be in accordance with EN 1092-2 for the equivalent ISO material grade except that valves with metallic seats shall not be used above 230 °C and valves with soft seats shall not be used above 70 °C.

Annex C shall be used to determine the equivalent ISO material grade for the EN material grades specified in Table 1.

4.1.2.2 Isomorphic series

The pressure/temperature ratings shall be as given in Table 2.

Table 2 — Pressure/temperature ratings for isomorphic series

DN	Maximum allowable pressure *PS* (bar) at				
	– 10 °C/120 °C	150 °C	180 °C	200 °C	230 °C
40 to 80 100 125 150	10,0	9,0	8,4	8,0	7,4
200 250 300	6,0	5,4	5,0	4,8	4,4
350 400 450 500	4,0	3,6	3,4	3,2	3,0
600 700	2,5	2,3	2,1	2,0	1,9
800	1,6	1,4	1,3	1,3	1,2
900 1 000	1,0	0,9	0,8	0,8	0,7

4.1.2.3 The use of isobaric valves at lower temperatures than shown in the pressure/temperature rating tables in EN 1092-2 and of isomorphic valves at temperatures below those shown in Table 2 is permitted, providing that the body and bonnet is manufactured from spheroidal graphite cast iron material grades EN-GJS-350-22-LT or EN-GJS-400-18-LT. For temperatures below the lowest temperature shown in the rating tables the service pressure shall be no greater than the pressure corresponding to the lowest temperature in the rating tables. The lowest scheduled operating temperature shall be not less than the temperature specified in EN 1563 for the Charpy impact tests.

4.1.3 Dimensions

4.1.3.1 Face-to-face and end-to-end dimensions

The face-to-face dimensions of flanged valves shall be in accordance with the basic series given in Table 3.

Table 3 — Basic series of face-to-face dimensions

Series	DN	Basic series (according to EN 558-1:1995)
Isomorphic	40 to 1 000	14
PN 6, PN 10, PN 16	40 to 500	14
	40 to 1 000	3, 15, 29, 30
PN 25	40 to 600	19, 4, 15, 26
	40 to 400	45

The end-to-end dimensions of valves with socket or spigot ends are given in the manufacturer's technical documentation.

4.1.3.2 Body ends

4.1.3.2.1 General

The manufacturer's technical documentation shall indicate the type and dimensions of valve body ends, and reference to the relevant European Standard.

4.1.3.2.2 Flange end connections

Flanges shall be in accordance with EN 1092-2.

Flanges can be an integral part of the valve body or adjustable flanges on a collar. Flanges, which are an integral part of the body, may have supports, which permit a stable installation of the valve.

For isomorphic gate valves, the flange facing and mating dimensions shall be PN 10.

4.1.3.2.3 Spigot end connections

Spigot ends shall be compatible with the adjacent piping.

4.1.3.2.4 Socket end connections

The socket ends shall be compatible with the adjacent piping. They may have a seal housing with clearance to allow angular displacement after assembly.

4.1.3.3 Body end port inside diameter

The body end port shall be circular. For unlined valves, the body end port inside diameter shall be not less than the nominal inside diameter specified in Table 4.

For isomorphic gate valves the dimensions for PN 10 shall be used.

Table 4 — Nominal inside diameter of the body end port

Dimensions in millimetres

DN	PN 6, PN 10	PN 16	PN 25
40	40	40	38
50	50	50	50
65	63	63	63
80	78	78	76
100	100	100	100
125	125	125	125
150	150	150	150
200	200	200	200
250	250	250	250
300	300	300	300
350	343	343	336
400	394	394	387
450	445	445	438
500	495	495	488
600	597	597	590
700	695	695	692
800	800	793	788
900	900	889	889
1 000	1 000	991	991

4.1.4 Operation

4.1.4.1 Maximum height

The maximum height of gate valves without gearbox, actuator or position indicator (see Figure 1), shall be as given in Table 5.