SLOVENSKI STANDARD
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Industrijski ventili - Litoželezni zasuni

Industrial valves - Cast iron gate valves

Industriearmaturen - Schieber aus Gusseisen

Robinetterie industrielle - Robinets-vannes en fonte

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Industrial valves - Cast iron gate valves

Robinetterie industrielle - Robinets-vannes en fonte

Industriearmaturen - Schieber aus Gusseisen

This European Standard was approved by CEN on 1 August 2015.

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European foreword

This document (EN 1171:2015) 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of an identical text or by endorsement, at the latest by March 2016, and conflicting national standards shall be withdrawn at the latest by March 2016.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. CEN [and/or CENELEC] shall not be held responsible for identifying any or all such patent rights.

This document supersedes EN 1171:2002.

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 97/23/EC (PED).

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

In this new edition, the following modifications were made:

— the normative references were updated in Clause 2 and throughout the text;

— 4.1.1, 4.1.2.1, 4.1.2.3, 4.2.1, 8.1, Annex C and Table ZA.1 were revised to be in compliance with EU Directive 97/23/EC (PED).

According to the CEN-CENELEC Internal Regulations, the national standards organizations of the following countries are bound to implement this European Standard: Austria, Belgium, Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, Former Yugoslav Republic of Macedonia, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey 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 European 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

The following documents, in whole or in part, are normatively referenced in this document and are indispensable for its application. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

EN 19:2002, *Industrial valves — Marking of metallic valves*

EN 545:2010, *Ductile iron pipes, fittings, accessories and their joints for water pipelines — Requirements and test methods*

EN 558, *Industrial valves — Face-to-face and centre-to-face dimensions of metal valves for use in flanged pipe systems — PN and Class 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 1092-2:1997, *Flanges and their joints — Circular flanges for pipes, valves, fittings and accessories, PN designated —Part 2: Cast iron flanges*

EN 12266-1, *Industrial valves — Testing of metallic valves — Part 1: Pressure tests, test procedures and acceptance criteria - Mandatory requirements*

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

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

EN 12516-3:2002, *Valves — Shell design strength — Part 3: Experimental method*

EN 12516-4:2014, *Industrial valves — Shell design strength — Part 4: Calculation method for valve shells manufactured in metallic materials other than steel*

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

EN ISO 5210, *Industrial valves — Multi-turn valve actuator attachments (ISO 5210)*

ISO 185:2005, *Grey cast irons — Classification*

ISO 1083:2004, *Spheroidal graphite cast irons — Classification*

ISO 2531:2009, *Ductile iron pipes, fittings, accessories and their joints for water applications*

ISO 5922:2005, *Malleable cast iron*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in EN 736-1, EN 736-2 and EN 736-3 and the following 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 and designed in accordance with EN 12516-4:2014.

NOTE Materials listed in Table 1 comply with the requirements of EN 1561 for grey cast iron, EN 1562 for malleable cast iron and EN 1563 for spheroidal graphite cast iron.

Table 1 — Body and bonnet materials

Graphite structure	European Standard	Designation short name
Grey cast iron	EN 12516–4:2014	EN-GJL-200
	EN 12516–4:2014	EN-GJL-250
Spheroidal graphite cast iron	EN 12516–4:2014	EN-GJS-350-22-LT
	EN 12516–4:2014	EN-GJS-350–22-RT
	EN 12516–4:2014	EN-GJS-400–18-LT
	EN 12516–4:2014	EN-GJS-400–18-RT
	EN 12516–4:2014	EN-GJS-400–15
	EN 12516–4:2014	EN-GJS-500–7
	EN 12516–4:2014	EN-GJS-600–3
Malleable cast iron	EN 12516–4:2014	EN-GJMB-300–6
	EN 12516–4:2014	EN-GJMB-350–10

4.1.1.2 The body and bonnet materials may also be spheroidal graphite cast iron in accordance with the requirements of EN 545:2010, 4.4.

4.1.1.3 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.

4.1.1.4 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).

4.1.1.5 Welding and impregnation of castings of all materials are not permitted.

4.1.2 Pressure/temperature ratings

4.1.2.1 Isobaric series

The pressure/temperature ratings shall be in accordance with EN 1092-2:1997 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.

To determine the equivalent ISO material grades for the EN material grades specified in Table 1, refer to Annex C.

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 For TS < - 10 °C, the body and bonnet material grades shall be EN-GJS-350-22-LT or EN-GJS-400-18-LT. In this case, the TS minimum shall be not less than the temperature specified in EN 12516-4:2014, Table 7.

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)
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.