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Industrial valves - Cast iron plug valves

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Industrial valves - Cast iron plug valves

Robinetterie industrielle - Robinets à tournant cylindrique et conique en fonte

Industriearmaturen - Kegelhähne aus Gußeisen

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COMITÉ EUROPÉEN DE NORMALISATION
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Foreword

This document (prEN 12335:2004) has been prepared by Technical Committee CEN/TC 69 "Industrial valves", the secretariat of which is held by AFNOR.

This document is currently submitted to the CEN Enquiry.

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, see informative Annex ZA, which is an integral part of this document.

1 Scope

This European Standard specifies requirements for the valve seat and body pressure/temperature ratings and the design, including materials, dimensions, operation, performance, testing and marking of lubricated, soft seated and lined plug valves. It also specifies anti-static requirements and the option of a steel or cast iron plug.

This European Standard is applicable to short, regular or venturi pattern valves. The range of valves covered by this European Standard are given in Table 1.

Pressure/temperature ratings of the linings of lined valves are outside the scope of this European Standard.

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 ISO 228-1, *Pipe threads where pressure-tight joints are not made on the threads — Part 1: Dimensions, tolerances and designation (ISO 228-1:2000)*

EN 558-1, *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 558-2, *Industrial valves — Face-to-face and centre-to-face dimensions of metal valves for use in flanged pipe systems — Part 2: Class-designated valves*

EN 736-1, *Valves — Terminology — Part 1: Definitions 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 1503-3:2000, *Valves — Materials for bodies, bonnets and covers — Part 3: Cast irons specified in European Standards*

EN 1561:1997, *Founding — Grey cast irons*

EN ISO 5211, *Industrial valves — Part-turn valve actuator attachments (ISO 5211:2001)*

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

EN 12627, *Industrial valves — Isolating valves for LNG — Specification for suitability and appropriate verification tests*

ISO 7-1, *Pipe threads where pressure-tight joints are made on the threads — Part 1: Dimensions, tolerances and designation*

ISO 262, *ISO general purpose metric screw threads — Selected sizes for screws, bolts and nuts*

ISO 263, *ISO inch screw threads — General plan and selection for screws, bolts and nuts — Diameter range 0,06 to 6 in*

3 Terms and definitions

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

3.1
lubricated plug valve
valve having the mating surfaces of the plug and body separated from each other by a pressurised, renewable film of lubricant/sealant

3.2
soft seated plug valve
non-lubricated valve having soft seats of a low frictional material fitted between body and plug

3.3
lined plug valve
valve having a fully moulded, bonded or keyed non-removable lining on all internal wetted surfaces that may be lubricated or non-lubricated

3.4
short plug valve
valve having face-to-face dimensions corresponding with wedge gate valves

3.5
regular plug valve
valve generally having plug ports of greater area than short or venturi plug valves

3.6
venturi plug valve
valve having reduced plug port area and a body throat approximating to a venturi

3.7
threaded size
TS
fractional designation of size independent of any unitary system that is used to identify threaded connections in valves

4 Technical specification

4.1 Nominal sizes

Valves shall be of nominal sizes (DN) or threaded sizes (TS) according to type of end fitting as given in Table 1.

4.2 PN or Class designation

Designations of valves shall be as given in Table 1.

4.3 Pressure/temperature ratings

NOTE The pressure/temperature ratings of the linings of lined valves are outside the scope of this European Standard.

4.3.1 Metal seated valves

Pressure/temperature ratings for the valves shall be as specified for the appropriate material in the flange standards EN 1092-2.

NOTE The maximum or minimum operating temperature may be limited by the grade of lubricant/sealant used in the valve, see 4.8.9.

4.3.2 Soft seated valves

Minimum pressure/temperature seat ratings of soft seated valves shall be as given in Table 2. With the exception of the soft seats and primary seals all valve components shall be capable of withstanding the pressure/temperature ratings as specified in the flange standard EN 1092-2 as appropriate to the material of the valves shell.

Table 1 — Relationship between nominal size, thread size, PN or Class designation and body end connections

DN	TS	Class 125, Class 150, Class 250, Class 300, PN 10, PN 16 and PN 25
	¼	B
	3/8	B
15	½	AB
20	¾	AB
25	1	AB
32	1¼	AB
40	1½	AB
50	2	AB
65	2½	AB
80	3	AB
100	4	AB
150		A
200		A
250		A
300		A
350		A
400		A
450		A
500		A
600		A

NOTE A = flanged ends only, B = threaded ends only.

Table 2 — Minimum pressure/temperature ratings for soft seated valves

Pressure in bar

DN	Minimum non-shock pressure rating at service temperature							
	40 °C	50 °C	75 °C	100 °C	125 °C	150 °C	175 °C	200 °C
15 to 150	48	47	43	39	36	32	29	25
200 to 300	35	34	31	28	25	23	20	17

NOTE Pressure/temperature ratings given are for steady state conditions. Where pressure and/or temperature cycling occurs the manufacturer should be consulted. The minimum pressure/temperature ratings are based on seats made from polyytetrasfluoroethylene (PTFE) without fillers, of virgin material completely free of reclaimed processed materials (see 4.8.4).

See Table 1 for equivalent TS.

1 bar = 100 kN/m^2 = 100 kPa.

4.4 Dimensions

4.4.1 Flanged-end valves

4.4.1.1 Flanged dimensions shall comply with EN 1092-2.

NOTE Where the body design does not permit through clearance bolt holes, threaded holes may be provided.

4.4.1.2 Face-to-face dimensions shall be in accordance with EN 558-1 or EN 558-2 as appropriate.

4.4.2 Threaded end valves

4.4.2.1 The minimum wall thickness at the threaded end shall not be less than that given in 4.5.2.

Valves ends shall have internal taper or parallel threads in accordance with ISO 7-1 or EN ISO 228-1. Valves having parallel threads shall have flat end sealing faces with minimum outside diameter as given in Table A.1.

4.4.2.2 End-to-end dimensions shall be in accordance with EN 12627 (see Table A.1).

NOTE Other threads may be provided by agreement between manufacturer and purchaser.

4.4.3 Bolting

Bolting threads shall be in accordance with ISO 262 or ISO 263.

4.5 Design

4.5.1 General

Valves shall be short, regular or venturi pattern (see 3.4, 3.5 and 3.6). Valves shall be of the tapered or parallel plug type.

NOTE Typical plug valve constructions and nomenclature of parts are given in Figures B.1 to B.4.

4.5.2 Shell wall thickness

The minimum shell wall thickness of the pressure-containing shell, including covers or other closure members but excluding glands, shall be in accordance with EN 12627.

Drilling of or pinning to, or spot welding the wall of a pressure-containing part e.g. for nameplate fixings, shall not be used where it would reduce the effective thickness below the value established.

4.5.3 Body tappings

If body tappings are required, the design of valves DN 50 and larger shall be such that tappings of size given in Table 3 can be provided in the positions shown by arrows in Figure 1. Where the tapped hole needs reinforcement a boss shall be provided.

Tappings shall have taper or parallel threads in accordance with ISO 7-1 or EN ISO 228-1.

Other threads may be provided by agreement between purchaser and supplier.

Valves having parallel threads shall have flat sealing faces with minimum outside diameter as given in Table A.1.

NOTE A requirement for a body tapping should be specified in the enquiry and/or order for the valve(s) (see annex C).

Table 3 — Body tappings/sizes

DN	Tapping size
50, 65, 80, 100, 125	½
150, 200	¾
250 to 600	1

4.5.4 Stems, plug shanks, stem extensions

The drive end of stems, plug shanks (i.e. integral with the plug), stem extensions or other attachments to which an operating mechanism could be attached shall indicate the axis of the flow passage through the plug. This indication may be provided by the use of two flats parallel to the plug port or by marking.

4.5.5 Stem retention

The stem shall be anti-blowout as defined in EN 736-3.

4.5.6 Cover

4.5.6.1 Cover joint

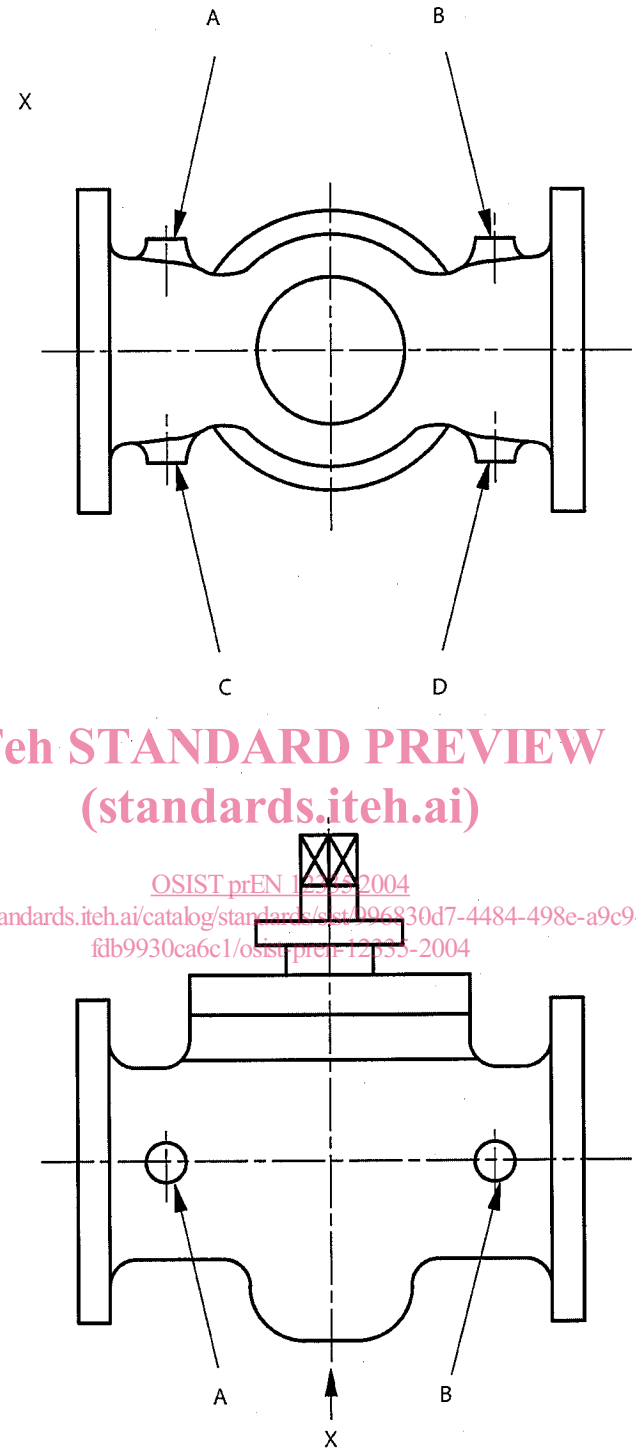
The joint between the cover and the body shall be able to withstand the appropriate pressure and temperature specified in 4.3. The following limitations shall apply :

a) threaded joints shall be limited to valves up to and including DN 100 ;

b) flat faced joints shall be limited to PN 10, PN 16, Class 125 and Class 150.

4.5.6.2 Cover bolting (where used)

The size and number of cover fastening shall be determined in accordance with EN 12627.



View on A

Figure 1 — Location of tappings

4.5.7 Packing gland

For valve sizes larger than DN 150 the gland shall be bolted. For sizes DN 150 and smaller the gland shall be bolted or threaded.