SLOVENSKI STANDARD
SIST EN 593:2009+A1:2014

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Nadomešča:
SIST EN 593:2009

Industrijski ventili - Kovinske lopute

Industrial valves - Metallic butterfly valves

Industriearmaturen - Metallische Klappen

Robinetterie industrielle - Robinets métalliques à papillon

Ta slovenski standard je istoveten z: **EN 593:2009+A1:2011**

ICS:

23.060.30 Zapirni ventili (zasuni) Gate valves

SIST EN 593:2009+A1:2014 **en,fr,de**

EUROPEAN STANDARD

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ICS 23.060.30

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English Version

Industrial valves - Metallic butterfly valves

Robinetterie industrielle - Robinets métalliques à papillon

Industriearmaturen - Metallische Klappen

This European Standard was approved by CEN on 7 May 2009 and includes Amendment 1 approved by CEN on 17 January 2011.

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Foreword

This document (EN 593:2009+A1:2011) 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of an identical text or by endorsement, at the latest by September 2011 and conflicting national standards shall be withdrawn at the latest by September 2011.

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.

〚A1〛 This document supersedes EN 593:2009. 〈A1〉

This document includes Amendment 1, approved by CEN on 2011-01-17.

The start and finish of text introduced or altered by amendment is indicated in the text by tags 〚A1〛 〈A1〉.

Informative Annexes A, B and C can be used for the practical application of this European Standard.

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 〚A1〛 EU Directive 97/23/EC 〈A1〉.

For relationship with 〚A1〛 EU Directive 97/23/EC 〈A1〉, see informative Annex ZA, which is an integral part of this document.

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, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, Switzerland and the United Kingdom.

1 Scope

This European Standard specifies requirements for butterfly valves having metallic bodies for use in flanged or butt welding piping systems and used for isolating, regulating or control applications.

The PN and Class ranges are:

PN 2,5 ; PN 6 ; PN 10 ; PN 16 ; PN 25 ; PN 40 ; Class 150 ; Class 300.

The DN range is:

— 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 750 ; DN 800 ; DN 900 ; DN 1000 ; DN 1200 ; DN 1400 ; DN 1600 ; DN 1800 ; DN 2000 ; DN 2200 ; DN 2400.

DN 750 is used only for Class 150 and Class 300.

For special application as industrial process control valves, see EN 1349 and EN 60534-2-1.

2 Normative references

The following referenced documents are indispensable for the application of this document. 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 287-1, *Qualification test of welders — Fusion welding — Part 1: Steels*

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 736-1:1995, *Valves — Terminology — Part 1: Definition of types of valves*

EN 736-2:1997, *Valves — Terminology — Part 2: Definition of components of valves*

EN 736-3:2008, *Valves — Terminology — Part 3: Definition of terms*

EN 1092-1, *Flanges and their joints — Circular flanges for pipes, valves, fittings and accessories, PN designated — Part 1: Steel flanges*

EN 1092-2:1997, *Flanges and their joints — Circular flanges for pipes, valves, fittings and accessories, PN designated — Part 2: Cast iron flanges*

EN 1092-3:2003, *Flanges and their joints — Circular flanges for pipes, valves, fittings and accessories, PN designated — Part 3: Copper alloy flanges*

EN 1092-4:2002, *Flanges and their joints — Circular flanges for pipes, valves, fittings and accessories, PN designated — Part 4: Aluminium alloy flanges*

EN 1267, *Valves — Test of flow resistance using water as test fluid*

EN 1418, *Welding personnel — Approval testing of welding operators for fusion welding and resistance weld setters for fully mechanized and automatic welding of metallic materials*

EN 1759-1, *Flanges and their joints — Circular flanges for pipes, valves, fittings and accessories, Class designated — Part 1: Steel flanges, NPS 1/2 to 24*

EN 1759-3:2003, *Flanges and their joints — Circular flanges for pipes, valves, fittings and accessories, Class designated — Part 3: Copper alloy flanges*

EN 1759-4:2003, *Flanges and their joints — Circular flanges for pipes, valves, fittings and accessories, Class designated — Part 4: Aluminium alloy flanges*

EN 10269, *Steels and nickel alloys for fasteners with specified elevated and/or low temperature properties*

EN 12266-1:2003, *Industrial valves — Testing of valves — Part 1: Pressure tests, test procedures and acceptance criteria — Mandatory requirements*

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

EN 12516-1:2005, *Industrial valves — Shell design strength — Part 1: Tabulation method for steel valve shells*

EN 12516-2:2004, *Industrial valves — Shell design strength — Part 2: Calculation method for steel valve shells*

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

EN 12516-4:2008, *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 12627, *Industrial valves — Butt welding ends for steel valves*

EN 12982, *Industrial valves — End-to-end and centre-to-end dimensions for butt welding end valves*

EN 60534-2-3, *Industrial-process control valves — Part 2-3: Flow capacity — Test procedures (IEC 60534-2-3:1997)*

EN ISO 1043-1, *Plastics — Symbols and abbreviated terms — Part 1: Basic polymers and their special characteristics (ISO 1043-1:2001)*

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

prEN ISO 10497[1)], *Testing of valves — Fire type-testing requirements (ISO/DIS 10497:2008)*

EN ISO 15607, *Specification and qualification of welding procedures for metallic materials — General rules (ISO 15607:2003)*

ISO 1629:1995, *Rubber and lattices — Nomenclature*

ASME B1.1:2003, *Unified inch screw threads, UN and UNC thread form*

1) Under preparation.

3 Terms and definitions

For the purposes of this document, the terms and definitions given in EN 736-1:1995, EN 736-2:1997, EN 736-3:2008 and the following apply.

3.1
maximum allowable pressure, PS
maximum pressure for which the equipment is designed, as specified by the manufacturer

3.2
maximum allowable temperature, TS
maximum temperature for which the equipment is designed, as specified by the manufacturer

3.3
end of line service
condition that occurs when the downstream side of the valve is opened to atmosphere

3.4
driving shaft
shaft connected to the obturator to operate the valve in the case of a multi-shaft valve

3.5
double flanged butterfly valve
butterfly valve having double flanged body ends for connection to flanges of adjacent components by individual bolting (see Figure 1)

Figure 1 — Double flanged body

3.6
wafer butterfly valve
butterfly valve intended for clamping between flanges of adjacent components

NOTE Different body shapes are possible (see Figures 2, 3 and 4).

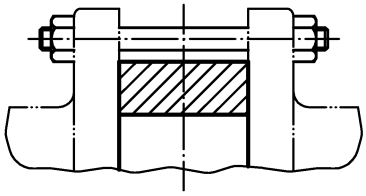

Figure 2 — Flangeless wafer body

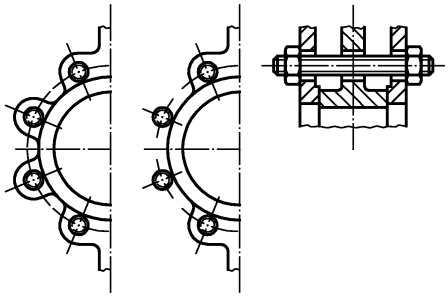

Figure 3a) — Valve with central lugs

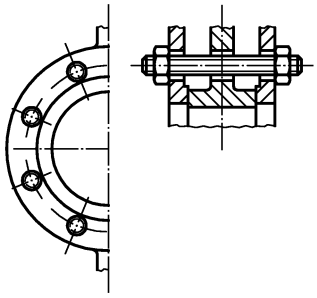

Figure 3b) — Central single flange valve

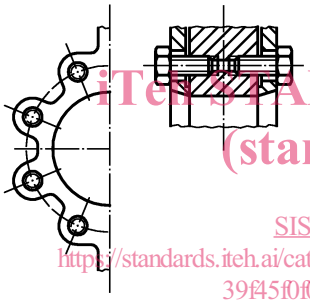

Figure 3c) — Valve with lugs with internally threaded holes

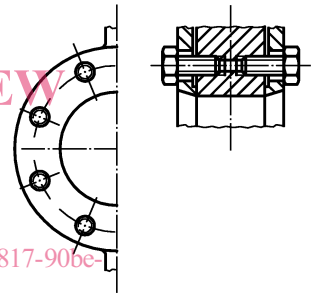

Figure 3d) — Single-flange valve with internally threaded holes

Figure 3 — Single flange or lugged wafer body

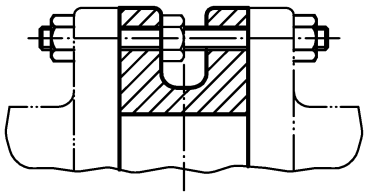

Figure 4 — "U" section wafer body

3.7
butt welding end butterfly valve
butterfly valve intended for butt welding into a pipeline (see Figure 5)

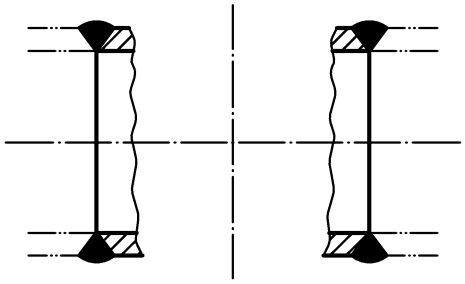

Figure 5 — Butt welding end body

3.8
trim
parts in contact with the fluid as defined in EN 736-2

4 Requirements

4.1 Design

4.1.1 Construction

4.1.1.1 General

The valve shall be of either concentric design (see Figure 6) or eccentric design (see Figure 7). The offset may be single, double or triple.

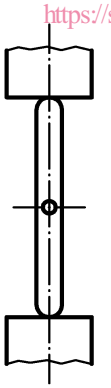

Figure 6 — Concentric design

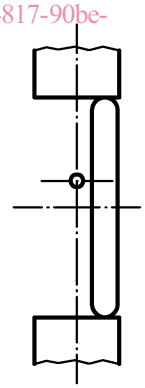

Figure 7 — Eccentric design (example of double offset design)

The design details are the responsibility of the manufacturer.

4.1.1.2 Body

Flanges of double flanged valves and single flange wafer valves shall have bolt holes in accordance with the relevant standard as specified in 4.1.4.2. Threaded holes can be provided where the design of the valve precludes through flange bolting.

Flangeless wafer valves (see Figure 2) are intended for clamping between pipe flanges using through bolting. The shape of wafer valve bodies shall be such that centring of the valves within the appropriate flange bolt

circle is ensured. Where through bolting is not practicable due to the valve design, e.g. close to shaft passages, threaded holes can be provided for individual bolting.

Lugged or single flange wafer valves (see Figure 3) are supplied with threaded or through holes for installation between two flanged components or at the end of a pipeline (i.e. end of line service or downstream dismantling).

Threaded holes shall allow full thread engagement to a depth at least equal to the nominal bolt diameter and at least 0,67 of the bolt diameter when the bolt hole is adjacent to the valve shaft.

For Class designed valves threaded body flange holes for bolts 1 inch or less in diameter shall be drilled and tapped in accordance with ASME B1.1, UNC coarse thread series, Class 2B. For bolts 1 1/8 inches or more in diameter, such holes shall be drilled and tapped in accordance with ASME B1.1, UN 8 eight thread series, Class 2B. Threads according to other standards shall be specified.

The manufacturer's literature shall be consulted to determine if through bolting or/and end of line assembly is possible. Any limitation regarding end of line service condition shall be indicated.

Elastomeric or plastic linings and liners can be extended over the flange faces of the body to form a gasket for the flange.

4.1.1.3 Obturator (disc)

The valve manufacturer's technical documentation shall specify all necessary dimensions showing the protrusion of the obturator in the open position beyond the faces of the valve.

4.1.1.4 Seat seal or body liner

The valve manufacturer's technical documentation shall specify whether the seat seal or body liner is replaceable or non-replaceable.

4.1.1.5 Driving shaft

The external end of the driving shaft shall indicate the orientation of the obturator.

The shaft shall indicate by design or marking the position of the obturator. Where required by the design of valve, the manufacturer's operating instructions shall specify the method to preserve the indication of the obturator position, during and after re-assembly of the obturator to the shaft, e.g. for routine maintenance.

The sealing of the shaft shall remain leak tight to atmosphere when the operating device is removed.

The shaft shall be retained in the valve, so it cannot be ejected out of the body when external parts are removed.

When anti-blow out design is required, it shall be in accordance with EN 736-3.

External parts as stated in 3.3.7 of EN 736-3:2008, are parts which are not included in the bare shaft valve e.g. bracket, lever, actuator.

4.1.1.6 Other requirements

a) Fire type tested design: valves designated as fire type tested design shall be in accordance with prEN ISO 10497.

   If valves are required to be a fire type tested design, this shall be specified (see Annex A).