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Industrial valves - Butterfly valves of thermoplastic materials (ISO/DIS 16136:2004, IDT)

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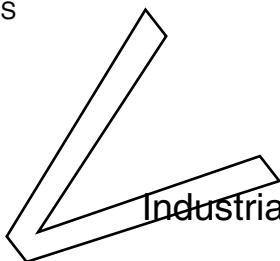
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May 2004

ICS



English version

**Industrial valves - Butterfly valves of thermoplastic materials
(ISO/DIS 16136:2004)**

Robinetterie industrielle - Robinets à papillon en matériaux
thermoplastiques (ISO/DIS 16136:2004)

Industriearmaturen - Klappen aus Thermoplasten (ISO/DIS
16136:2004)

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Foreword

This document (prEN ISO 16136:2004) has been prepared by Technical Committee CEN/TC 69 "Industrial valves", the secretariat of which is held by AFNOR, in collaboration with Technical Committee ISO/TC 138 "Plastics pipes, fittings and valves for the transport of fluids".

This document is currently submitted to the third parallel Enquiry.

This European Standard 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 annexes ZA and ZB, which are integral parts of this standard.

prEN ISO 16136:2004
Preview

1 Scope

1.1 Valves for general use

This European Standard specifies requirements and tests for butterfly valves of thermoplastic materials for isolating and control service.

This standard is applicable to hand or power operated valves to be installed in industrial pipe systems, irrespective of the field of application and the fluids to be conveyed.

NOTE 1 Industrial pipe systems include systems for water supply for general purposes, drainage and sewerage.

NOTE 2 Special requirements may apply to systems for water for human consumption.

The range of DN is:

— 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 and DN 600.

The range of PN and Class is:

— PN 6; PN 10; PN 16 and Class 150.

The requirements specified by this standard concern the design, functional characteristics and manufacture of butterfly valves, their connection to the pipe system, the body materials and their pressure/temperature rating between $-40\text{ }^{\circ}\text{C}$ up to $+120\text{ }^{\circ}\text{C}$, for a lifetime of 25 years.

1.2 Valves for special use

Additional regulatory requirements, see 4.2.2, 4.3.2 and 4.8.4 are included in this standard for valves installed in

- drainage systems for liquids from highways,
- drainage and disposal systems for buildings,
- supply to and distribution in buildings of liquids, including liquid fuels,
- supply to and distribution in buildings of gas, including gaseous fuels.

Valves of thermoplastic materials shall not be used in fire extinguishing pipe systems installed in buildings.

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 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: 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 805, *Water supply — Requirements for systems and components outside buildings.*

EN ISO 898-1, *Mechanical properties of fasteners made of carbon steel and alloy steel — Part 1: Bolts, screws and studs (ISO 898-1:1999).*

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

EN 1267:1997, *Valves — Test of flow resistance using water as test fluid.*

EN 1333, *Pipework components — Definition and selection of PN.*

prEN 1759-1:1997, *Flanges and their joints — Circular flanges for pipes, valves, fittings and accessories, class designated — Part 1: Steel flanges, NPS ½ to 24.*

prEN 1759-3:1994, *Flanges and their joints — Circular flanges for pipes, valves, fittings and accessories, class designated — Part 3: Copper alloy and composite flanges.*

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

EN ISO 6708, *Pipework components — Definition and selection of DN (nominal size) (ISO 6708:1995).*

EN 12107, *Plastics piping systems — Injection-moulded thermoplastics fittings, valves and ancillary equipment — Determination of long-term hydrostatic strength of thermoplastics materials for injection-moulding of piping components.*

EN ISO 12162, *Thermoplastics materials for pipes and fittings for pressure applications — Classification and designation — Overall service (design) coefficient (ISO 12162:1995).*

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

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

prEN ISO 15493:2002, *Plastics piping systems for industrial application — ABS, PVC-U and PVC-C — Specifications for components and piping systems — Part 1: Metric series (ISO/DIS 15493-1:1999).*

prEN ISO 15494:2002, *Plastics piping systems for industrial applications — PE, PB and PP — Specifications for components and piping systems — Part 1: Metric series (ISO/DIS 15494-1:1999).*

EN 28233, *Thermoplastics valves — Torque — Test method (ISO 8233:1988).*

EN 28659, *Thermoplastic valves — Fatigue strength — Test method (ISO 8659:1989).*

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

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

ISO 9393-2:1997, *Thermoplastics valves — Pressure test methods and requirements — Part 2: Test conditions and basic requirements for PE, PP, PVC-U and PVDF valves.*

ISO 10931-1, *Plastics piping systems for industrial applications — Poly(vinylidene fluoride) (PVDF) — Part 1: General.*

ISO 12092, *Fittings, valves and other piping system components, made of unplasticized poly(vinyl chloride) (PVC-U), chlorinated poly(vinyl chloride) (PVC-C), acrylonitrile-butadiene-styrene (ABS) and acrylonitrile-styrene-acrylester (ASA) for pipes under pressure — Resistance to internal pressure — Test method.*

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
DN
see EN ISO 6708

3.2
PN
see EN 1333

3.3
Class
see prEN 1759-3:1997

3.4
PMA
see EN 805

NOTE EN 805 defines PMA as maximum allowable pressure at 20 °C. The PED designates PS (maximum allowable pressure) irrespective of temperature. The values of PMA and PS are identical at 20 °C.

3.5
trim
trim (see EN 736-2) is all inside parts of the valve in contact with the fluid

3.6
 f_r
is the rating factor used in the relationship between PMA and PN or Class. It is used to calculate the maximum allowable pressure PMA at temperatures other than 20 °C

3.7
 F and F_s
see EN 12570

Additional definitions for thermoplastic materials are given in prEN ISO 15493:2002 and prEN ISO 15494:2002.

4 Requirements

4.1 Design

4.1.1 Valve function

Butterfly valves in accordance with this standard shall be suitable for isolating service and may be used for control service.

4.1.2 Design characteristics

4.1.2.1 The valve type design shall be the responsibility of the manufacturer.

4.1.2.2 Valves shall have the following design characteristics:

- a) A seat of soft material for the obturation.

If the tight obturation is preferred in one direction, then this shall be marked by an arrow at the body outside as specified in clause 8, Table 2, No 10.

- b) A seat diameter, which is — according to EN 736-3 —
- either full bore, i.e. not less than 90 % of DN expressed in millimetres (mm);
 - or reduced bore in which case the manufacturer shall publish the pressure loss factor of the valve.
- c) A disc which shall be turned by a spindle 90°, the stroke shall be limited by the actuating device in the end positions and fixed in all intermediate positions, so that the hydraulic forces of the flow cannot turn the disc from the actual position.
- d) An actuating shaft, that
- is fixed in the body and blow-out proof according to EN 736-3;
 - has a stem sealing system by self-sealing elastic elements;
 - indicates at the visible end by design or by marking the orientation of the disc;
 - is connected to the disc in such design that the orientation of the disc cannot be changed, even after disassembling and re-assembling.

4.1.3 Types of valve end connections

The types of valve end connections shall be chosen from the following alternatives:

- butt fusion ends;
- spigot ends for cementing;
- socket ends for electro-fusion;
- socket ends for heated tool welding;
- socket ends for cementing;
- socket ends for/with elastomeric seal rings;
- flanged ends;
- wafer type ends;
- threaded ends;
- union ends.

All valve ends shall be an integral part of or threaded onto the valve body. Different types of end connections at one body are possible.

In the case of valve ends for welding or cementing with solvents, the user shall ensure that the same materials are used for the valve end connection and the end of the connecting parts of the piping.

4.2 Materials

4.2.1 Materials for the shell

The valve body and bonnet/cover materials shall be selected from prEN ISO 15493:2002 or prEN ISO 15494:2002 or ISO 10391-1, they shall be in accordance with the requirements of these standards:

- ABS
- PE 80
- PP-H
- PVC-C
- PVC-U
- PVDF

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