SLOVENSKI STANDARD
SIST EN 15389:2008

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Industrijski ventili - Zahteve glede primernosti uporabe ventilov iz plastomerov kot gradbenih elementov

Industrial valves - Performance characteristics of thermoplastic valves when used as construction products

Industriearmaturen - Anforderungen an die Gebrauchstauglichkeit von Armaturen aus Thermoplasten bei Verwendung als Bauprodukte

Robinetterie industrielle - Caractéristiques de performance des appareils de robinetterie thermoplastiques utilisés comme produits de construction

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Industrial valves - Performance characteristics of thermoplastic valves when used as construction products

Robinetterie industrielle - Caractéristiques de performance des appareils de robinetterie thermoplastiques utilisés comme produits de construction

Industriearmaturen - Anforderungen an die Gebrauchstauglichkeit von Armaturen aus Thermoplasten bei Verwendung als Bauprodukte

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Contents

Page

Foreword

This document (EN 15389:2008) 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of an identical text or by endorsement, at the latest by November 2008, and conflicting national standards shall be withdrawn at the latest by November 2008.

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.

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For relationship with EU Directive(s), 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, 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 performance requirements and means for evaluation of conformity for valves of thermoplastic material, by reference to product standards, for use in building and civil engineering applications for the delivery of liquid and gaseous fluids.

It also contains information required for the purposes of regulatory marking.

NOTE For information, thermoplastic valves in conformity with this European Standard should be considered suitable for drinking water applications subject to either:

a) compliance with any national regulations in the country of intended destination, which can include testing if this is the demonstration of fitness for drinking water applications;

b) internal coating of the Product and subsequent testing if required by the national regulations in the intended country of destination.

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 13501-1, *Fire classification of construction products and building elements — Part 1: Classification using data from reaction to fire tests*

EN 13823, *Reaction to fire tests for building products — Building products excluding floorings exposed to the thermal attack by a single burning item*

EN ISO 3126, *Plastics piping systems — Plastics components — Determination of dimensions (ISO 3126:2005)*

EN ISO 9001:2000, *Quality management systems — Requirements (ISO 9001:2000)*

EN ISO 9080, *Plastics piping and ducting systems — Determination of the long-term hydrostatic strength of thermoplastics materials in pipe form by extrapolation (ISO 9080:2003)*

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

EN ISO 16135:2006, *Industrial valves — Ball valves of thermoplastics materials (ISO 16135:2006)*

EN ISO 16136:2006, *Industrial valves — Butterfly valves of thermoplastic materials (ISO 16136:2006)*

EN ISO 16137:2006, *Industrial valves — Check valves of thermoplastic materials (ISO 16137:2006)*

EN ISO 16138:2006, *Industrial valves — Diaphragm valves of thermoplastic materials (ISO 16138:2006)*

EN ISO 16139:2006, *Industrial valves — Gate valves of thermoplastic materials (ISO 16139:2006)*

EN ISO 21787:2006, *Industrial valves — Globe valves of thermoplastic materials (ISO 21787:2006)*

ISO 9393-2:2005, *Thermoplastics valves for industrial applications — Pressure test methods and requirements — Part 2: Test conditions and basic requirements*

3 Terms and definitions

For the purposes of this document, the following terms and definitions apply.

3.1
nominal size
DN
numerical designation of the size of a component, other than a component designated by thread size, which is a convenient round number approximately equal to the manufacturing dimension in millimetres (mm)

NOTE This can apply to either the internal diameter (DN/ID) or external diameter (DN/OD).

3.2
nominal outside diameter
d_n
specified diameter, in millimetres, assigned to a nominal size

3.3
nominal pressure
PN
numerical designation used for reference purposes related to the mechanical characteristics of the component of a piping system

NOTE For plastic piping systems conveying water it corresponds to the maximum continuous operating pressure in bar, which can be sustained with water at 20 °C for thermoplastics and 35 °C for thermosetting materials, based on the minimum design coefficient.

4 Performance requirements

4.1 Reaction to fire

Where subject to regulatory requirements, the product shall be tested and classified in accordance with 5.1.

4.2 External pressure strength

The external pressure strength of pressure piping systems is deemed to be satisfied by the internal pressure strength as given in 4.3.

4.3 Mechanical strength: Internal pressure strength

4.3.1 Determination of nominal pressure PN

For thermoplastics materials the internal pressure strength of thermoplastics valves shall be determined in accordance with 5.2 and shall be declared by the manufacturer as nominal pressure PN.

4.3.2 Verification of pressure strength

The verification of the internal pressure strength of thermoplastics valves shall be in accordance with 5.3.

4.4 Dimensional tolerances

The manufacturer shall declare the dimensional tolerances for thermoplastics valves and their connection dimensions by reference to the relevant specific European Product Standard as given in Annex A.
Dimensions shall be measured in accordance with 5.4 and shall be within the specified tolerances.

4.5 Effectiveness: tightness (gas and liquid)

Thermoplastics valves shall be tested in accordance with 5.5. No leakage shall occur during the test period.

4.6 Durability of valves

Thermoplastics valves meeting the requirements of this European Standard are deemed to have a reasonable economic working life.

NOTE The valves are expected to last at least the lifetime of the network where they are installed.

If the nature of the fluid is different from water or this fluid or water has a higher temperature than 20 °C, de-rating the pressure shall be in accordance with the following European Standard, as appropriate to the valve type: EN ISO 16135 to EN ISO 16139 and EN ISO 21787.

4.7 Dangerous substances

Materials used in products shall not release any dangerous substances in excess of the maximum permitted levels specified in a relevant European Standard for the material or permitted in the national regulations of the member state of destination.

NOTE Attention is drawn to NOTE 1 and NOTE 2 in ZA.1.

4.8 Resistance to high temperature

The resistance to high temperature shall be taken from the tabulated values listed in 4.3 of the valve product standards as given in EN ISO 16135:2006 to EN ISO 16139:2006 and EN ISO 21787:2006, as applicable.

4.9 Safeguard against overloading of handle

The safeguard against overloading of handle shall be tested in accordance with 5.7.

4.10 Noise level

The noise emission is dependent on the flow conditions in the pipe system; the manufacturer shall declare the maximum designed flow velocity for the pipe system in which his valve is tested and which is the basis of his declaration. The limitation shall be published in the relevant operating instruction.

NOTE The measurement of noise emission is a regulatory requirement in some, but not all, member states of the European Economic Area (EEA).

5 Calculation and test methods

5.1 Reaction to fire

Classification shall be in accordance with EN 13501-1.

If a higher classification than class E is required, testing shall be performed in accordance with EN 13823.

5.2 Determination of the nominal pressure PN for thermoplastics materials

For thermoplastics materials the nominal pressure PN shall be determined as follows:

a) determine the σ_{LPL} value in accordance with EN ISO 9080. Data provided by either the compound manufacturer or the product manufacturer shall be taken into account;

b) classify the material (MRS) in accordance with EN ISO 12162;

c) determine the PN for a chosen pipe series (SDR series) in accordance with ISO 9393-2:2005, Clauses 5 and 6.

5.3 Internal pressure strength

Internal pressure strength testing shall be in accordance with ISO 9393-2:2005, Clauses 5 and 6.

5.4 Dimensional tolerances

Shall be measured in accordance with EN ISO 3126.

5.5 Effectiveness: tightness gas and liquid

The leak tightness of thermoplastics valves shall be tested in accordance with ISO 9393-2:2005, Clause 7.

5.6 Durability

Thermoplastics Valves conforming with the requirements of this document and with a declared nominal pressure, which is determined according to 5.2 of this European Standard, shall be deemed to be durable for a reasonable economic working life.

5.7 Safeguard against overloading of handle

The Safeguard against overloading of handle shall be tested in accordance with 4.6.5 of the valve product standards as given in Annex A, as applicable.

6 Evaluation of conformity

6.1 General

The conformity of thermoplastics valves with the requirements of this European Standard and with the declared values (including classes) shall be demonstrated by:

— initial type testing;

— factory production control by the manufacturer, including product assessment.

For the purposes of testing, valves may be grouped into families, where it is considered that the results for one or more characteristics from any product within the family are representative for the same characteristics for all products within that family.

A product may be in more than one family for different characteristics.

For type testing the following family groups apply.

a) Size groups for valves as given in Table 1.

Table 1 — Size groups

Size group	Range of nominal diameters, d_n for thermoplastics material
1	DN ≤ 50
2	50 < DN ≤ 300
3	300 < DN

b) Type groups for valves as given in Table 2.

Table 2 — Type groups

Fitting group	Type of valves
1	Ball valves
2	Diaphragm valves
3	Butterfly valves
4	Other valves

6.2 Initial type testing

6.2.1 General

Type tests shall be carried out on new products and whenever there is a change in design, in material and/or in production method, other than routine in-process adjustment and extension of the product range (see Table 3). A change of supplier of a material or stabiliser does not lead to a change in performance if the chemical composition remains the same.

Material modifications within limits may be considered as a not change of material. The limits are as defined in the relevant material standards given in Annex B.

For tests previously performed in accordance with the provisions of the standards listed in Annex A, as applicable, (same product, same characteristic(s), same test method, same system of attestation, etc.) the results may be taken into account.

All characteristics given in Clause 4 shall be subject to calculation and/or initial type testing.

6.2.2 Initial type test requirements

The initial type testing of the characteristics according to Clause 4 shall be performed in accordance with the sampling procedure given in Table 3.

Table 3 — Type testing of valves

Essential characteristics	Requirement Clause of this European Standard	Testing relevant to [a]			Sampling procedure (minimum sampling)	Acceptance
		I	M	E		
Reaction to fire	4.1	+	+	—	Once/compound or formulation [b]	see classification in EN 13501-1
External pressure strength	4.2	+	+	+	See internal pressure strength	Pass/fail
Mechanical strength: Internal pressure strength	4.3	+	+	+	One diameter/size group/ valve type group/compound or formulation	Pass/fail
Dimensional tolerances	4.4	+	—	+	Once/size/valve/compound or formulation	Pass/fail
Effectiveness: tightness gas and liquid	4.5	+	+	+	One diameter/size group/ valve type	Pass/fail
Durability of valves	4.6	+	+	+	Once/compound or formulation	By the classification of the long-term strength performance
Dangerous substances	4.7	+	+	—	See notes in Table ZA.1	Pass/fail
Resistance to high temperature	4.8	+	+	+	One diameter/size group/ valve group	Declared values
Safeguard against overloading of handle	4.9	+	—	+	One diameter/size group/ valve group	Pass/fail
Noise level	4.10	+	—	+	One diameter/size group/ valve group	Noise emission declared as decibels

a I is initial type test in case of new system;
M is change of material;
E is extension of the product range with new size group or fitting group.
\+ denotes testing relevant for the characteristic-occurrence-combination.

b In case of single burning item (SBI) test the vertical part is size 110 and the horizontal part size 40, which is then representative for all dimensions.

Test reports shall be kept by the manufacturer for at least 10 years after discontinuation of the product.

6.3 Factory production control

6.3.1 General

The manufacturer shall establish, document and maintain an FPC system to ensure that the products placed on the market conform to the stated performance characteristics. The FPC system shall consist of procedures, regular inspections and tests and/or assessments and the use of the results to control raw and other incoming materials or components, equipment, the production process and the product.

If the manufacturer has the component designed, manufactured, assembled, packed, processed and labelled by subcontracting, FPC of the original manufacturer may be taken into account. However, where subcontracting takes place, the manufacturer shall retain the overall control of the component and ensure that