



SLOVENSKI STANDARD

SIST EN 15015:2008

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Cevni sistemi iz polimernih materialov - Sistemi za vročo in hladno nepitno vodo - Lastnosti cevi, fittingov in njihovih spojev

Plastics piping systems - Systems for hot and cold water not intended for human consumption - Performance characteristics for pipes, fittings and their joints

Kunststoff-Rohrleitungssysteme - Rohrleitungssysteme für Warm- und Kaltwasser nicht für den menschlichen Gebrauch - Eigenschaften für die Gebrauchstauglichkeit von Rohren, Formstücken und deren Verbindungen

Systemes de canalisations en plastique - Systemes pour eau chaude et froide non destinée a la consommation humaine - Caractéristiques de performance pour tubes, raccords et leurs assemblages

Ta slovenski standard je istoveten z: EN 15015:2007

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EUROPEAN STANDARD

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Plastics piping systems - Systems for hot and cold water not intended for human consumption - Performance characteristics for pipes, fittings and their joints

Systèmes de canalisations en plastique - Systèmes pour eau chaude et froide non destinée à la consommation humaine - Caractéristiques de performance pour tubes, raccords et leurs assemblages

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This European Standard was approved by CEN on 23 August 2007.

CEN members are bound to comply with the CEN/CENELEC Internal Regulations which stipulate the conditions for giving this European Standard the status of a national standard without any alteration. Up-to-date lists and bibliographical references concerning such national standards may be obtained on application to the CEN Management Centre or to any CEN member.

This European Standard exists in three official versions (English, French, German). A version in any other language made by translation under the responsibility of a CEN member into its own language and notified to the CEN Management Centre has the same status as the official versions.

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EUROPEAN COMMITTEE FOR STANDARDIZATION
COMITÉ EUROPÉEN DE NORMALISATION
EUROPÄISCHES KOMITEE FÜR NORMUNG

Management Centre: rue de Stassart, 36 B-1050 Brussels

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Foreword

This document (EN 15015:2007) has been prepared by Technical Committee CEN/TC 155 "Plastics piping systems and ducting systems", the secretariat of which is held by NEN.

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 April 2008, and conflicting national standards shall be withdrawn at the latest by July 2009.

This document has been prepared under the mandate M/131 "Pipes, tanks and ancillaries not in contact with water intended for human consumption" given to CEN by the European Commission and the European Free Trade Association and support essential requirements of EU Directives.

For the relationship with EU Directives, 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 United Kingdom.

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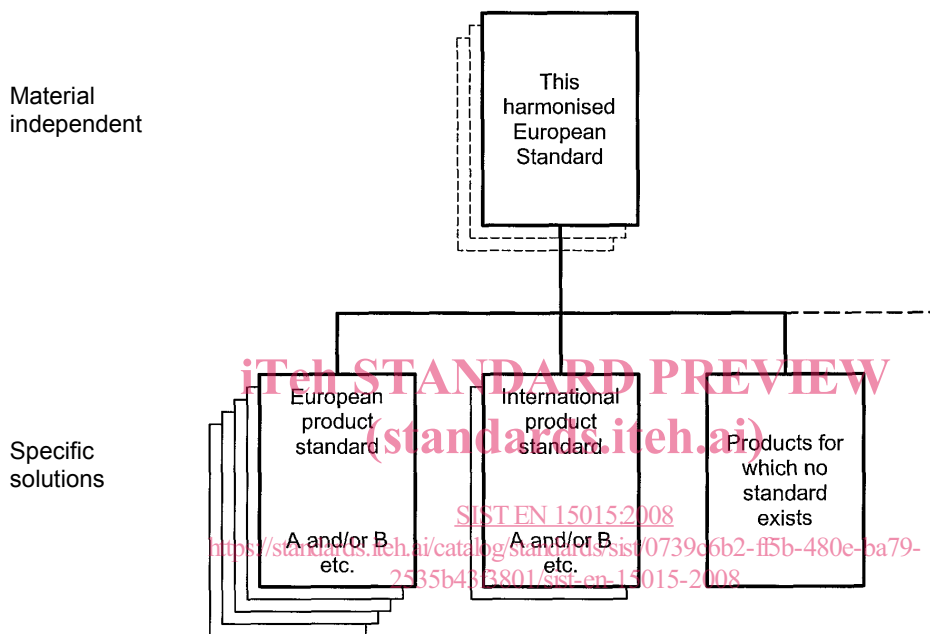
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EN 15015:2007 (E)

Introduction

This European Standard contains only the performance characteristics needed to meet the essential requirements of EU Directive(s). It does not cover all characteristics of the products. These are specified in the standards listed in Annex A or in other appropriate product specifications.

This harmonised European Standard is part of a family of cluster standards addressing plastics piping systems. The relationship is shown below.



For the harmonisation of plastics piping systems for hot and cold water (this European Standard) the following applies:

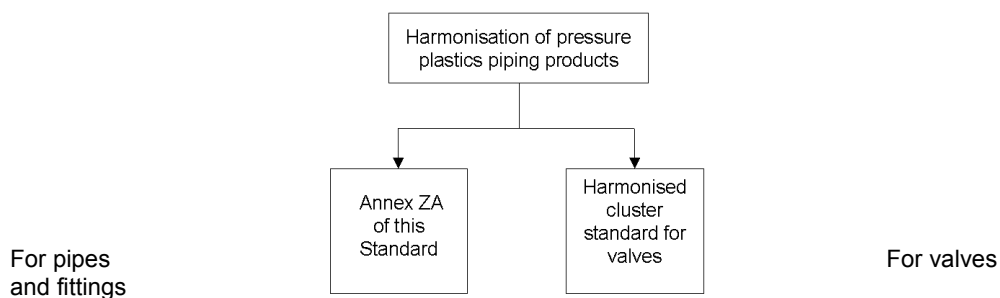


Figure 1

1 Scope

This European Standard specifies performance requirements for plastics pipes, fittings and their joints intended for hot and cold water installations for the conveyance of water and for heating systems with the exception of drinking water distribution for human consumption, and gives associated test methods for verification and evaluation of conformity with this European Standard.

NOTE Compliance of pipes, fittings and their joints with this document does not confer a presumption of fitness of the product for the transport of water intended for human consumption within the meaning of the Directive 89/106/EEC. However, until the operation of the envisaged European Acceptance Scheme for construction products in contact with water intended for human consumption and the revision of this standard, products conforming to this standard could be used for the transport of water intended for human consumption if they conform to the relevant national, regional or local regulatory provisions or recommendations applicable in the place of use.

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 681-1, *Elastomeric seals — Materials requirements for pipe joint seals used in water and drainage applications — Part 1: Vulcanized rubber*

EN 681-2, *Elastomeric seals — Materials requirements for pipe joint seals used in water and drainage applications — Part 2: Thermoplastic elastomers*

EN 12293, *Plastics piping systems — Thermoplastics pipes and fittings for hot and cold water — Test method for the resistance of mounted assemblies to temperature cycling*

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

EN 15012:2007, *Plastics piping systems — Soil and waste discharge systems within the building structure — Performance characteristics for pipes, fittings and their joints*

EN ISO 1167-1, *Thermoplastics pipes, fittings and assemblies for the conveyance of fluids — Determination of the resistance to internal pressure — Part 1: General method (ISO 1167-1:2006)*

EN ISO 1167-2, *Thermoplastics pipes, fittings and assemblies for the conveyance of fluids — Determination of the resistance to internal pressure — Part 2: Preparation of pipe test pieces (ISO 1167-2:2006)*

prEN ISO 1167-3, *Thermoplastics pipes, fittings and assemblies for the conveyance of fluids — Determination of the resistance to internal pressure — Part 3: Preparation of components (ISO/DIS 1167-3:2005)*

prEN ISO 1167-4, *Thermoplastics pipes, fittings and assemblies for the conveyance of fluids — Determination of the resistance to internal pressure — Part 4: Preparation of assemblies (ISO/DIS 1167-4:2006)*

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)*

ISO 10508:2006, *Plastics piping systems for hot and cold water installations — Guidance for classification and design*

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ISO 17456, *Plastics piping systems — Multilayer pipes — Determination of the long-term strength*

BS 7291-1:2006, *Thermoplastics pipes and associated fittings for hot and cold water for domestic purposes and heating installations in buildings — Part 1: General requirements*

3 Terms, definitions and symbols

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

3.1**nominal outside diameter**
 d_n

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

3.2**design pressure**
 P_D

highest pressure related to the circumstances for which the system has been designed and is intended to be used

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 Internal pressure strength and resistance to high temperature**4.2.1 Determination of design pressure P_D**

When determined in accordance with 5.2, the internal pressure strength of the pipe and fitting shall be expressed as a design pressure P_D of preferably 4 bar, 6 bar, 8 bar or 10 bar for a given class of application according to ISO 10508:2006 or class S according to BS 7291-1:2006 and declared by the manufacturer.

4.2.2 Verification of pressure strength

The verification of the internal pressure strength of pipes and fittings shall be done in accordance with 5.2.3.

4.3 Dimensional tolerances

The manufacturer shall declare the dimensional tolerances for the jointing of the components, either by means of:

- a) reference to a specific European Standard listed in Clause 2 or in Annex B, or
- b) in the absence of a European Standard, reference to a specific European product specification published by a recognized European organization, or
- c) in the absence of a) and b), reference to an International Standard, or
- d) in the absence of a), b) and c), by stating the values of his own specification and associated jointing method.

Dimensions shall be measured in accordance with 5.3 and shall be within the declared tolerances.

4.4 Tightness

For products in accordance with this standard leaktightness is required. Products covered by one of the standards listed in Annex B and having passed the type testing in accordance with the assessment of conformity part, are deemed to be leaktight (for standards with separate assessment of conformity parts see Annex C). Tests shall be carried out in accordance with 5.4. No leakage shall occur during the test period.

Sealing rings (and gaskets) shall conform to EN 681-1 or EN 681-2, as applicable.

4.5 Durability

4.5.1 Durability of pipes and fittings

Pipes and fittings meeting the requirements of 4.2.1 shall be deemed to have a reasonable economic working life.

NOTE 1 Current extrapolated tests indicate an economic working life time of plastics pipes and fittings covered by this European Standard to be in the region of 50 years.

NOTE 2 The manufacturer of plastics pipes and fittings should give guidance on type of water treatment required and on aspects of applications such as oxygen permeation.

4.5.2 Long-term joint tightness

The long-term joint tightness shall be tested in accordance with 5.4. No leakage shall occur during the test period.

4.5.3 Durability of elastomeric sealing joints

Elastomeric sealing joints shall be deemed to be durable if the sealing element conforms to EN 681-1 or EN 681-2, as applicable.

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4.6 Dangerous substances

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

NOTE Mandate M/366 "Development of horizontal standardised assessment methods for harmonised approaches relating to dangerous substances under the Construction Products Directive (CPD)" as issued by the European Commission, will require specifications relating to dangerous substance once applicable to the covered products.

5 Test methods

5.1 Reaction to fire

Classification shall be done in accordance with EN 13501-1.

Mounting and fixing of pipes shall conform to Annex A of EN 15012:2007.

NOTE In case where e.g. the given dimensions do not exist the choice of dimensions and the mounting and fixing should be agreed between the manufacturer and the notified body.

EN 15015:2007 (E)**5.2 Determination of the design pressure****5.2.1 Pipes where the design stress requirements are totally met by the base polymer**

The hydrostatic stress properties of the material shall be determined by testing in accordance with EN ISO 9080. Alternatively the hydrostatic stress properties may be determined by proving that the material conforms to the reference lines specified in the basic material standards. The test results from EN ISO 9080 or the reference lines from the basic material standards shall be used to calculate the design pressure by using an established method for calculating or determining the maximum allowable hoop stress applicable to pipes exposed to a range of internal pressures and/or temperatures during their expected lifetime with the service coefficients given in Annex A. One established method is described in EN ISO 13760 [1] taking into account an applicable class of service condition according to ISO 10508:2006 and service coefficients according to Annex A. Other national established methods may be used.

NOTE For advice see the basic material standards ISO 3213 [2] for PP, ISO 10146 [3] for PE-X, ISO 12230 [4] for PB, ISO 24033 for PE-RT^[5] and product standard EN ISO 15877-2 (see Annex B) for PVC-C.

For material not covered by Annex A the manufacturer shall declare overall service coefficients with appropriate verification methods, e.g. by making reference to a European product specification [see 4.3 b)].

5.2.2 Other pipe designs

For multi-layer pipes the hydrostatic stress properties shall be determined according to ISO 17456. The result shall then be used as described in 5.2.1.

The design pressure for designs where single dimensions are pressure rated at specific temperatures shall be calculated using the same procedure as in 5.2.1 but based on pressure instead of hydrostatic stress.

5.2.3 Internal pressure strength

For checking the internal pressure strength testing shall be done in accordance with the appropriate parts of EN ISO 1167 using hoop stresses relevant for the material, which were established when determining the design pressure P_D in accordance with 5.2.1 or 5.2.2.

5.3 Dimensional tolerances

The dimensions shall be measured in accordance with EN ISO 3126.

5.4 Tightness and durability

The tightness of joints and the durability shall be tested in accordance with EN 12293 taking the design pressure P_D and the declared classification of service conditions as in ISO 10508:2006, using parameters given in Table 1 or BS 7291-1:2006.

Table 1 — Test parameters for service classes (ISO 10508:2006)

	Class 1	Class 2	Class 3	Class 4	Class 5
Highest test temperature, in °C	90	90	60	80	95
Lowest test temperature, in °C	20	20	20	20	20
Test pressure, in bar	P_D	P_D	P_D	P_D	P_D
Number of cycles ^a	5 000	5 000	5 000	5 000	5 000
Number of test pieces	One set of fittings in accordance with the configuration shown in EN 12293				
Pre-stress force	b	b	b	b	b

^a Each cycle shall comprise of 15₀⁺¹ min at the highest test temperature and 15₀⁺¹ min at the lowest test temperature.

^b The tensile stress to calculate the pre-stress force is calculated using the following equation:

$$\sigma_t = \alpha \times \Delta T \times E$$

where

- σ_t is the tensile stress, expressed in megapascals (MPa);
- α is the coefficient of thermal expansion, expressed per Kelvin (1/K);
- ΔT is the temperature difference, expressed in Kelvins (K);
- E is the modulus of elasticity, expressed in megapascals (MPa).

6 Evaluation of conformity

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6.1 General

The conformity of pipes and fittings with the requirements of this 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, pipes and fittings 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.

NOTE 1 A product can be in more than one family for different characteristics.

For type testing the following family groups applies.

- a) Pressure groups for pipes and fittings as given in Table 2.

Table 2 — Pressure groups

Pressure group	Design pressure, P_D bar
1	≤ 6
2	> 6

- b) Size groups for pipes and fittings as given in Table 3.

Table 3 — Size groups

Size group	Range of nominal diameters, d_n
1	$d_n \leq 63$
2	$63 < d_n \leq 160$

c) Fitting groups for fittings as given in Table 4.

Table 4 — Fitting groups

Fitting group	Fittings
1	Elbows and tees
2	Reducers, couplers, end caps
3	All fittings except those included in group 1 and group 2.

6.2 Initial type testing

6.2.1 General

Relevant 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 certain limits are not considered as a change of material. Guidance for these limits can be found in the standards given in Annex C.

For tests previously performed in accordance with the provisions of the standards listed in Annex B, or the recognized European specification, 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, except 4.5.3, where the characteristics of the components used have already been determined by the component manufacturer on the basis of conformity with other product standards. However this does not relieve the manufacturer of the piping system from the responsibility of ensuring that the system conforms to the requirements of this document.

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 under type tests (TT) of the applicable product specific standards for assessment of conformity as given in Annex C. If the standard does not contain one or the other of the characteristics, then testing as given in Table 5 shall apply.

For products where no such standard exists Table 5 shall apply.