



SLOVENSKI STANDARD
oSIST prEN 15015:2011
01-junij-2011

Cevni sistemi iz polimernih materialov - Cevne komponente za vročo in hladno vodo - Zahteve in preskusi/metode ocenjevanja za cevi in fittinge

Plastics piping systems - Hot and cold water piping components - Requirements and test/assessment methods for pipes and fittings

Kunststoff-Rohrleitungssysteme - Bauteile für den Einsatz in Rohrleitungen für Warm- und Kaltwasser - Anforderungen und Prüf/Bewertungsverfahren für Rohre und Formstücke

(standards.iteh.ai)

Systèmes de canalisations en plastique - Composants de canalisations pour eau chaude et froide non destinée à la consommation humaine - Exigences et méthodes d'essais/d'évaluation pour tubes et raccords

Ta slovenski standard je istoveten z: prEN 15015

ICS:

23.040.20	Cevi iz polimernih materialov	Plastics pipes
23.040.45	Fitingi iz polimernih materialov	Plastics fittings
91.140.60	Sistemi za oskrbo z vodo	Water supply systems

oSIST prEN 15015:2011

en,fr,de

iTeh STANDARD PREVIEW
(standards.iteh.ai)

[oSIST prEN 15015:2011](https://standards.iteh.ai/catalog/standards/sist/322e6de4-fc17-4558-b688-b5d4990b7bb4/osist-pren-15015-2011)

<https://standards.iteh.ai/catalog/standards/sist/322e6de4-fc17-4558-b688-b5d4990b7bb4/osist-pren-15015-2011>

EUROPEAN STANDARD
NORME EUROPÉENNE
EUROPÄISCHE NORM

DRAFT
prEN 15015

March 2011

ICS 23.040.01

Will supersede EN 15015:2007

English Version

Plastics piping systems - Hot and cold water piping components - Requirements and test/assessment methods for pipes and fittings

Systèmes de canalisations en plastique - Composants de canalisations pour eau chaude et froide non destinée à la consommation humaine - Exigences et méthodes d'essais/d'évaluation pour tubes et raccords

Kunststoff-Rohrleitungssysteme - Bauteile für den Einsatz in Rohrleitungen für Warm- und Kaltwasser - Anforderungen und Prüf /Bewertungsverfahren für Rohre und Formstücke

This draft European Standard is submitted to CEN members for enquiry. It has been drawn up by the Technical Committee CEN/TC 155.

If this draft becomes a European Standard, 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.

This draft European Standard was established by CEN 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-CENELEC Management Centre has the same status as the official versions.

CEN members are the national standards bodies of 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 United Kingdom.

Recipients of this draft are invited to submit, with their comments, notification of any relevant patent rights of which they are aware and to provide supporting documentation.

Warning : This document is not a European Standard. It is distributed for review and comments. It is subject to change without notice and shall not be referred to as a European Standard.



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

Management Centre: Avenue Marnix 17, B-1000 Brussels

Contents

Page

Foreword.....	4
Introduction	5
1 Scope	6
2 Normative references	6
3 Terms and definitions	7
4 Requirements	8
4.1 Reaction to fire.....	8
4.2 Internal pressure strength	8
4.2.1 Determination of design pressure P_D	8
4.2.2 Verification of pressure strength	8
4.3 Dimensional tolerances	8
4.4 Tightness	8
4.5 Durability	9
4.5.1 Durability of internal pressure strength related to the material	9
4.5.2 Durability of the internal pressure strength of pipes and fittings	9
4.5.3 Durability of tightness of connections	9
4.6 Release of dangerous substances.....	9
5 Test methods.....	9
5.1 Reaction to fire.....	9
5.2 Determination of the design pressure.....	9
5.2.1 Determination of design pressure for thermoplastics pipes and plastic fittings	9
5.2.2 Determination of design pressure for multilayer pipes	10
5.3 Internal pressure strength	10
5.4 Dimensional tolerances	10
5.5 Tightness	10
5.6 Durability	10
5.6.1 Durability related to internal pressure strength related to material	10
6 Evaluation of conformity.....	11
6.1 General.....	11
6.2 Initial Type Testing – Type Testing	11
6.2.1 General.....	11
Tests previously performed in accordance with the provisions of this standard, respectively standards as listed in Annex B, may be taken into account provided that they were made to the same or a more rigorous test method, under the same system of attestation of conformity on the same product or products of similar design, construction and functionality, such that the results are applicable to the product in question.	13
6.2.2 Test samples, testing and compliance.....	13
6.2.3 Test reports	14
6.3 Factory production control (FPC)	14
6.3.1 General.....	14
6.3.2 Requirements.....	14
6.3.3 Product specific requirements	17
6.3.4 Procedure for modifications.....	18
6.3.5 One-off products, pre-production products (e.g. prototypes) and products produced in very low quantity.....	18
Annex A (normative) Overall service (design) coefficients.....	20
A.1 General.....	20

A.2	Overall service (design) coefficients	20
Annex B (normative) Application class S		
B.1	General	21
B.2	Test parameters for temperature cycling	21
Annex C (informative) Product standards for hot and cold water installations inside buildings		
Annex D (informative) Standards for assessment of conformity for hot and cold water installations inside buildings		
Annex ZA (informative) Clauses of this European Standard addressing the provisions of the EU Construction Products Directive (CPD)		
ZA.1.	Scope and relevant characteristics	25
ZA.2.	Procedure for attestation of conformity of plastics pipes and fittings	26
ZA.2.1	System of attestation of conformity	26
ZA.2.2.	CE Certificate and Declaration of conformity	28
ZA.3.	CE marking and labelling	29
ZA.3.1	CE marking requirements	29
Bibliography		33

iTeh STANDARD PREVIEW (standards.iteh.ai)

[oSIST prEN 15015:2011](https://standards.iteh.ai/catalog/standards/sist/322e6de4-fc17-4558-b688-b5d4990b7bb4/osist-pren-15015-2011)

<https://standards.iteh.ai/catalog/standards/sist/322e6de4-fc17-4558-b688-b5d4990b7bb4/osist-pren-15015-2011>

Foreword

This document (prEN 15015:2011) has been prepared by Technical Committee CEN/TC 155 “Plastics piping systems and ducting systems”, the secretariat of which is held by NEN.

This document is currently submitted to the CEN Enquiry.

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 relationship with EC 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 the United Kingdom.

iTeh STANDARD PREVIEW (standards.iteh.ai)

[oSIST prEN 15015:2011](https://standards.iteh.ai/catalog/standards/sist/322e6de4-fc17-4558-b688-b5d4990b7bb4/osist-pren-15015-2011)

<https://standards.iteh.ai/catalog/standards/sist/322e6de4-fc17-4558-b688-b5d4990b7bb4/osist-pren-15015-2011>

Introduction

This European Standard specifies only those characteristics of pipes and fittings for hot and cold water applications with the exception of water intended for human consumption that need to be known to determine if the works in which these are to be installed can satisfy the essential requirements of the EU Directive(s). Additional characteristics are specified in the documents listed in Annex A or in other appropriate product specifications.

This harmonised European Standard covers pipes and fittings for hot and cold water installations.

iTeh STANDARD PREVIEW (standards.iteh.ai)

[oSIST prEN 15015:2011](https://standards.iteh.ai/catalog/standards/sist/322e6de4-fc17-4558-b688-b5d4990b7bb4/osist-pren-15015-2011)

<https://standards.iteh.ai/catalog/standards/sist/322e6de4-fc17-4558-b688-b5d4990b7bb4/osist-pren-15015-2011>

prEN 15015:2011 (E)**1 Scope**

This European Standard specifies requirements for plastics pipes and fittings for hot and cold water installations.

It is intended to be used for distribution of hot and cold water and for heating systems inside buildings with the exception of water intended for human consumption.

It gives associated test/assessment methods. This standard does not cover adhesives joint sealings and gasket

NOTE 1 For this standard the term fitting includes the term joint as meant by mandate M 131.

NOTE 2 Products complying with this document may be used for the transport of water intended for human consumption if they comply with the relevant national, regional or local regulatory provisions applicable in place of use. Compliance of a product 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.

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

EN 16000, *Plastics piping systems — Systems within the building structure — Mounting and fixing of components in the test apparatus to thermal attack by a single burning item*

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 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 15874-2 *Plastics piping systems for hot and cold water installations — Polypropylene (PP) — Part 2: Pipes*

EN ISO 15874-3: *Plastics piping systems for hot and cold water installations — Polypropylene (PP) — Part 3: Fittings*

EN ISO 15875-2 *Plastics piping systems for hot and cold water installations — Crosslinked polyethylene (PE-X) — Part 2: Pipes*

EN ISO 15875-3 *Plastics piping systems for hot and cold water installations — Crosslinked polyethylene (PE-X) — Part 3: Fittings*

EN ISO 15876-2 *Plastics piping systems for hot and cold water installations — Polybutylene (PB) — Part 2: Pipes*

EN ISO 15876-3 *Plastics piping systems for hot and cold water installations — Polybutylene (PB) — Part 3: Fittings*

EN ISO 15877-2 *Plastics piping systems for hot and cold water installations — Chlorinated poly(vinyl chloride) (PVC-C) — Part 2: Pipes*

EN ISO 15877-3 *Plastics piping systems for hot and cold water installations — Chlorinated poly(vinyl chloride) (PVC-C) — Part 3: Fittings*

EN ISO 21003-2 *Multilayer piping systems for hot and cold water installations inside buildings — Part 2: Pipes (ISO 21003-2:2008/DAM 1:2010)*

EN ISO 22391-2, *Plastics piping systems for hot and cold water installations — Polyethylene of raised temperature resistance (PE-RT) — Part 2: Pipes*
EN ISO 22391-3 *Plastics piping systems for hot and cold water installations — Polyethylene of raised temperature resistance (PE-RT) — Part 3: Fittings*

ISO 1133 *Plastics—Determination of the melt mass-flow rate (MFR) and the melt volume-flow (MVR) of thermoplastics*

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

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

3 Terms and definitions

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

prEN 15015:2011 (E)**3.2****design pressure** P_D

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

3.3**Connection**

assembly of pipe(s) and fitting(s)

4 Requirements**4.1 Reaction to fire**

The contribution of fire development of products falling under the scope of this EN is verified according to the provisions of clause 5.1.

Test results shall be classified according to EN 13501-1

4.2 Internal pressure strength**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 4 bar, 6 bar, 8 bar or 10 bar for a given class of application according to ISO 10508:2006 and shall be 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 relevant dimensional tolerances for the connection of pipes and fittings by:

- a) reference to a specific European Standard listed in Clause 2
- b) in the absence of a) , reference to a specific European product specification published by a recognized European organization,
- c) in the absence of a) and b), reference to an International Standard,
- 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 tightness is required. Pipes and fittings covered by this standard and having passed the type testing in accordance with the assessment of conformity clause, are deemed to be tight. Connections between pipes and fittings shall be tested in accordance with 5.5. No leakage shall occur during the test period.

4.5 Durability

4.5.1 Durability of internal pressure strength related to the material

The durability of internal pressure strength related to the material, from which the pipes and fittings are manufactured, shall be assessed by testing in accordance with 5.6.1.

4.5.2 Durability of the internal pressure strength of pipes and fittings

The pipes and fittings for which the design pressure P_D is declared in accordance with 4.2.1 and which have been made of material meeting the requirements of 5.5.1, are deemed to have a reasonable economic working life.

4.5.3 Durability of tightness of connections

The tightness of connections is deemed to be durable when the requirements of 5.5 are met. Any sealing elements used, shall conform to EN 681-1 or EN 681-2, as applicable.

NOTE 1 The piping components are expected to last at least the lifetime of the network where they are installed.

4.6 Release of dangerous substances

The products covered by this standard should not contain or release any of the substances considered dangerous according to the existing national provisions.

5 Test methods

5.1 Reaction to fire

The reaction to fire is tested according to the applicable test methods

When tested in accordance with EN 13823 (SBI test), the mounting and fixing conditions of samples to be tested shall be in accordance with EN 16000.

5.2 Determination of the design pressure

5.2.1 Determination of design pressure for thermoplastics pipes and plastic fittings

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 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 and/or fittings 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 material standards ISO 3213^[2] for PP, ISO 10146^[3] for PE-X, ISO 12230^[4] for PB, EN 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)].

prEN 15015:2011 (E)

5.2.2 Determination of design pressure for multilayer pipes

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 can be calculated using the same procedure as in 5.2.1 but based on pressure instead of hydrostatic stress.

5.3 Internal pressure strength

For checking the internal pressure strength testing shall be done in accordance with the appropriate parts of EN ISO 1167 using temperatures and hoop stresses relevant for the material as given in the relevant product standards in clause 2-

5.4 Dimensional tolerances

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

5.5 Tightness

The leak tightness of connections between pipes and fittings 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. For class 1S and 5S, see Annex B. The S classes have a highest test temperature of 114°C instead of the ones in Table 1.

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).

5.6 Durability

5.6.1 Durability related to internal pressure strength related to material

Depending on the type of material from which the pipes or fittings are manufactured, the following tests shall be performed:

a) PP: Melt flow rate using the test method and conditions as given in EN ISO 15874-2 and EN ISO 15874-3, as applicable.