
Cevni sistemi iz polimernih materialov - Podzemne cevne komponente za odvodnjavanje in kanalizacijo, ki delujejo po težnostnem principu - Zahteve in preskusi/metode ocenjevanja za cevi in fittinge

Plastics piping systems - Non-pressure drainage and sewerage piping components buried in ground - Requirements and test/assessment methods for pipes and fittings

Kunststoff-Rohrleitungssysteme - Rohrleitungsteile für drucklose erdverlegte Abwasserkanäle und -leitungen - Anforderungen und Prüf-/Bewertungsverfahren für Rohre und Formstücke

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Systèmes de canalisations en plastique - Composant de canalisation enterrés pour assainissement sans pression — Exigences et méthodes d'essais/d'évaluation pour tubes et raccords

Ta slovenski standard je istoveten z: prEN 15013

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Plastics piping systems - Non-pressure drainage and sewerage piping components buried in ground - Requirements and test/assessment methods for pipes and fittings

Systèmes de canalisations en plastique - Composant de
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und Formstücke

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prEN 15013:2014 (E)

Foreword

This document (prEN 15013:2014) 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 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 informative Annex ZA, which is an integral part of this document.

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Introduction

This European Standard specifies only those characteristics of pipes and fittings for non-pressure underground applications for drainage and sewerage 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 clause 2 or in other appropriate product specifications.

Chambers and manholes for non-pressure underground sewers are covered by EN 15229 [1] and EN 15383 [2] under mandate M/118.

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prEN 15013:2014 (E)**1 Scope**

This European Standard specifies product characteristics for thermoplastics and glass-reinforced thermosetting pipes and fittings for underground drainage and sewerage applications.

Pipes and fittings covered by this standard are intended to be used for conveyance of drainage and sewerage water without pressure:

- underground in the U area (more than 1 m from the building structure)
- underground in the D area (connected to the soil and waste discharge system and buried within or under the building structure).

This standard gives the associated test/assessment methods.

This standard does not cover adhesives, joint sealings and gaskets.

This standard does not apply to perforated engineering drainage pipes nor to highway drainage pipes, perforated or non-perforated.

2 Normative references

The following documents, in whole or in part, are normatively referenced in this document and are indispensable for its application. 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 681-3, *Elastomeric seals — Materials requirements for pipe joint seals used in water and drainage applications — Part 3: Cellular materials of vulcanised rubber*

EN 681-4, *Elastomeric seals — Materials requirements for pipe joint seals used in water and drainage applications — Part 4: Cast polyurethane sealing elements*

EN 1055, *Plastics piping systems — Thermoplastics piping systems for soil and waste discharge inside buildings — Test method for resistance to elevated temperature cycling*

EN 1277:2003, *Plastics piping systems — Thermoplastics piping systems for buried non-pressure applications — Test methods for leaktightness of elastomeric sealing ring type joints*

EN 1401-1:2009, *Plastics piping systems for non-pressure underground drainage and sewerage — Unplasticized poly(vinyl chloride) (PVC-U) — Part 1: Specifications for pipes, fittings and the system*

EN 1852-1:2009, *Plastics piping systems for non-pressure underground drainage and sewerage — Polypropylene (PP) — Part 1: Specifications for pipes, fittings and the system*

EN 12666-1:2005+A1:2011, *Plastics piping systems for non-pressure underground drainage and sewerage — Polyethylene (PE) — Part 1: Specifications for pipes, fittings and the system*

EN 13476-2:2007, *Plastics piping systems for non-pressure underground drainage and sewerage — Structured-wall piping systems of unplasticized poly(vinyl chloride) (PVC-U), polypropylene (PP) and polyethylene (PE) — Part 2: Specifications for pipes and fittings with smooth internal and external surface and the system, Type A*

EN 13476-3:2007+A1:2009, *Plastics piping systems for non-pressure underground drainage and sewerage — Structured-wall piping systems of unplasticized poly(vinyl chloride) (PVC-U), polypropylene (PP) and polyethylene (PE) — Part 3: Specifications for pipes and fittings with smooth internal and profiled external surface and the system, Type B*

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 14364:2013, *Plastics piping systems for drainage and sewerage with or without pressure — Glass-reinforced thermosetting plastics (GRP) based on unsaturated polyester resin (UP) — Specifications for pipes, fittings and joints*

EN 14758-1:2012, *Plastics piping systems for non-pressure underground drainage and sewerage — Polypropylene with mineral modifiers (PP-MD) — Part 1: Specifications for pipes, fittings and the system*

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

EN ISO 9967, *Plastics pipes — Determination of creep ratio (ISO 9967:1994)*

EN ISO 9969, *Thermoplastics pipes — Determination of ring stiffness (ISO 9969:2007)*

EN ISO 13967, *Thermoplastics fittings — Determination of ring stiffness*

EN ISO 13968, *Plastics piping and ducting systems - Thermoplastics pipes - Determination of ring flexibility (ISO 13968:2008)*

ISO 13966, *Thermoplastics pipes and fittings — Nominal ring stiffnesses*

3 Terms, definitions and abbreviations

3.1 Terms and definitions

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

3.1.1

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

Note 1 to entry: This can apply to either the internal diameter (DN/ID) or external diameter (DN/OD).

Note 2 to entry: The nominal size is expressed in millimetres (mm).

3.1.2

nominal outside diameter

d_n

specified diameter, in millimetres, assigned to a nominal size (for thermoplastics pipes and fittings only)

prEN 15013:2014 (E)**3.1.3****nominal ring stiffness****SN**

numerical designation of the ring stiffness of a pipe or fitting, which is a convenient round number indicating the minimum required ring stiffness of the pipe or fitting

Note 1 to entry: It is designated by the letters "SN" followed by the appropriate number.

3.1.4**connection**

assembly of pipe or fitting to another pipe(s) or fitting

NOTE 1 to entry: For this standard, the term fitting includes also the term joint.

3.2 Abbreviations

For the purposes of this document, the following abbreviations apply.

GRP:	glass-reinforced thermosetting plastics
GRP UP:	glass-reinforced thermosetting plastics based on unsaturated polyester resin
PE:	polyethylene
PP:	polypropylene
PP-MD:	polypropylene with mineral modifiers
PVC-U:	unplasticized poly(vinyl chloride)
SN:	nominal ring stiffness
CWFT:	classified without further testing
FPC:	factory production control
NPD:	no performance determined

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4 Requirements

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4.1 Reaction to fire of pipes and fittings

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

Test results shall be expressed by classification.

4.2 Maximum load for admissible deformation of pipes and fittings**4.2.1 General**

Pipes and fittings must have the ability to withstand the loads created by the surrounding soil as well as loads created by traffic above the installation.

NOTE The maximum load for admissible deformation is addressed as ring stiffness.

4.2.2 Ring stiffness of pipes**4.2.2.1 Thermoplastics pipes**

The ring stiffness of a thermoplastics pipe shall be determined in accordance with 5.2.1 and shall be expressed either:

- a) as SN 2, SN 4, SN 8 or SN 16 in accordance with ISO 13966, or

- b) for dimensions $DN \geq 600$ as the declared minimum value based on the test, expressed in kN/m^2 .

4.2.2.2 Glass-reinforced thermosetting pipes

The ring stiffness of a glass-reinforced thermosetting pipe shall be determined in accordance with 5.2.2. The SN and shall be declared either:

- a) as SN 1250, SN 2500, SN 5000 or SN 10000, or
- b) as an SN value based on the test, expressed in N/m^2 .

4.2.3 Ring stiffness of fittings

4.2.3.1 General

The manufacturer shall declare the ring stiffness of the fitting in accordance with 4.2.3.2 or 4.2.3.3, as applicable.

4.2.3.2 Thermoplastics fittings

The ring stiffness of the body of thermoplastics fittings shall be expressed either:

- a) as SN 2, SN 4, SN 8 or SN 16 in accordance with ISO 13966, or
- b) as the actual value obtained, expressed in kN/m^2 . The ring stiffness of a fitting made from the same material and having the same wall thickness and design as the corresponding pipe may, because of the geometry, be declared to have the same stiffness as that of the associated pipe.

For thermoplastics fittings with structured wall the ring stiffness of bends and branches with the largest side branch shall be determined in accordance with 5.2.3. Based on the obtained lowest value of the result other fittings of the same design family shall be classified with the same stiffness class.

4.2.3.3 Glass-reinforced thermosetting fittings

The ring stiffness of glass-reinforced thermosetting fittings shall be expressed either:

- a) as the nominal ring stiffness of the pipe for which the fitting is designed, in accordance with 4.2.2.2 a), or
- b) as the actual value of the nominal ring stiffness SN used for the design of the fitting, where the manufacturer shall be able to show conformity with this value.

The ring stiffness of a fitting made from the same material and having the same wall thickness and design as the corresponding pipe may, because of the geometry, be declared to have the same stiffness as that of the associated pipe.

4.3 Dimensional tolerances of pipes and fittings

Dimensions including the dimensional tolerances are assuring the proper functioning of the connections when installing the pipes and fittings:

- a) Dimensions shall be measured in accordance with 5.3. The dimensions and the dimensional tolerances shall comply with what is declared by the manufacturer. This shall be done by using the values given in one of the documents listed hereafter: a specific European standard as given in Clause 2, as applicable,
- b) only in the absence of a), a specific publicly available product specification,
- c) only in the absence of a) and b), an International Standard,

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- d) only in the absence of a), b), and c), by stating the values of his own specification and associated connecting method.

For thermoplastics pipes and fittings, the test results shall be expressed as a DN/OD or DN/ID value, as applicable and nominal wall thickness, if applicable.

For thermosetting pipes and fittings, the test result shall be expressed as a DN value with the appropriate diameter series.

4.4 Tightness: Gas and liquid**4.4.1 General**

Pipes, fittings and their connections shall be tight.

4.4.2 Tightness of sealing ring connections of thermoplastics piping systems

Sealing ring connections between pipes and fittings shall be assembled according to the manufacturer's instructions and:

- a) tightness under deformation shall be tested in accordance with 5.4.1.1.
- b) tightness under angular deflection shall be tested in accordance with 5.4.1.2.

In order to enable the declaration of leak-tightness of sealing ring connections, the following applies:

- no water leakage may occur;
- the loss of partial vacuum shall not exceed 3 kPa (10 %).

4.4.3 Tightness of connections made by using adhesive bonding or fusion techniques

Connection systems using adhesive bonding or fusion techniques are considered to be tight when assembled in accordance with the manufacturer's instructions. Such instructions shall be made available by the manufacturer.

4.4.4 Tightness of connections of glass-reinforced thermosetting piping systems

Tightness of connections of glass-reinforced thermosetting piping systems shall be tested in accordance with 5.4.2.

No leakage shall occur during the test period.

4.5 Release of dangerous substances of pipes and fittings

National regulations on dangerous substances may require verification and declaration on release, and sometimes content, when construction products covered by this standard are placed on those markets. In the absence of European harmonized test methods, verification and declaration on release/content should be done taking into account national provisions in the place of use.

NOTE An informative database covering European and national provisions on dangerous substances is available at the Construction web site on EUROPA accessed through: <http://ec.europa.eu/enterprise/construction/cpd-ds/>.

4.6 Durability of pipes and fittings

4.6.1 Durability of pipes and fittings related to maximum load for deformation

4.6.1.1 Durability of thermoplastics pipes and fittings

The durability of the ability to withstand maximum load for deformation shall be assessed by testing in accordance with 5.6.1.1 with the conditions and requirements as given in the relevant standard referenced in clause 2, as applicable.

- no decrease of the measured force during the test;
- no cracking in any part of the wall structure except in ends of cut structures;
- no wall delamination or other type of ruptures except possible delamination in ends of cut structures;
- no permanent buckling in any part of the structure of the pipe wall.
- a creep ratio not exceeding 4,0.

The requirement shall be met.

4.6.1.2 Durability of glass-reinforced thermosetting pipes and fittings

The durability of the ability of glass-reinforced pipes and fittings to withstand maximum load for deformation shall be assessed by testing in accordance with 5.6.1.2 with the conditions and requirements as given in the relevant clauses in EN 14364, as applicable.

The requirement shall be met.

4.6.2 Durability of tightness of pipes and fittings

The durability of tightness of elastomeric sealing connections shall be assessed by control of the seal material quality in accordance with 5.6.2.

4.6.3 Durability of tightness after temperature cycling test of thermoplastics pipes and fittings for area D

The durability of tightness after temperature cycling of thermoplastics pipes and fittings used for D area shall be tested in accordance with 5.6.3.

The connections between pipes and/or fittings shall not show any leakage before and after the test.

5 Testing, assessment and sampling methods

5.1 Reaction to fire

The reaction to fire is tested according to the test method relevant for the claimed class.

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

Test results shall be classified according to EN 13501-1.