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**Cevni sistemi iz polimernih materialov - Odvodni sistemi v zgradbah - Lastnosti cevi, fittingov in njihovih spojev**

Plastics piping systems - Soil and waste discharge systems within the building structure - Performance characteristics for pipes, fittings and their joints

Kunststoff-Rohrleitungssysteme - Rohrleitungssysteme zum Ableiten von Abwasser innerhalb der Gebäudestruktur - Eigenschaften für die Gebrauchstauglichkeit von Rohren, Formstücken und deren Verbindungen

Systemes de canalisations en plastique - Systemes pour l'évacuation des eaux-vannes et des eaux usées a l'intérieur de la structure des bâtiments - Caractéristiques de performance pour tubes, raccords et leurs assemblages

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English Version

Plastics piping systems - Soil and waste discharge systems  
within the building structure - Performance characteristics for  
pipes, fittings and their joints

Systèmes de canalisations en plastique - Systèmes pour  
l'évacuation des eaux-vannes et des eaux usées à  
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zum Ableiten von Abwasser innerhalb der Gebäudestruktur  
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Formstücken und deren Verbindungen

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

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## Foreword

This document (EN 15012:2007) 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of an identical text or by endorsement, at the latest by April 2008, and conflicting national standards shall be withdrawn at the latest by July 2009.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 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 supports 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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## Introduction

This document 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 B or in other appropriate product specifications.

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

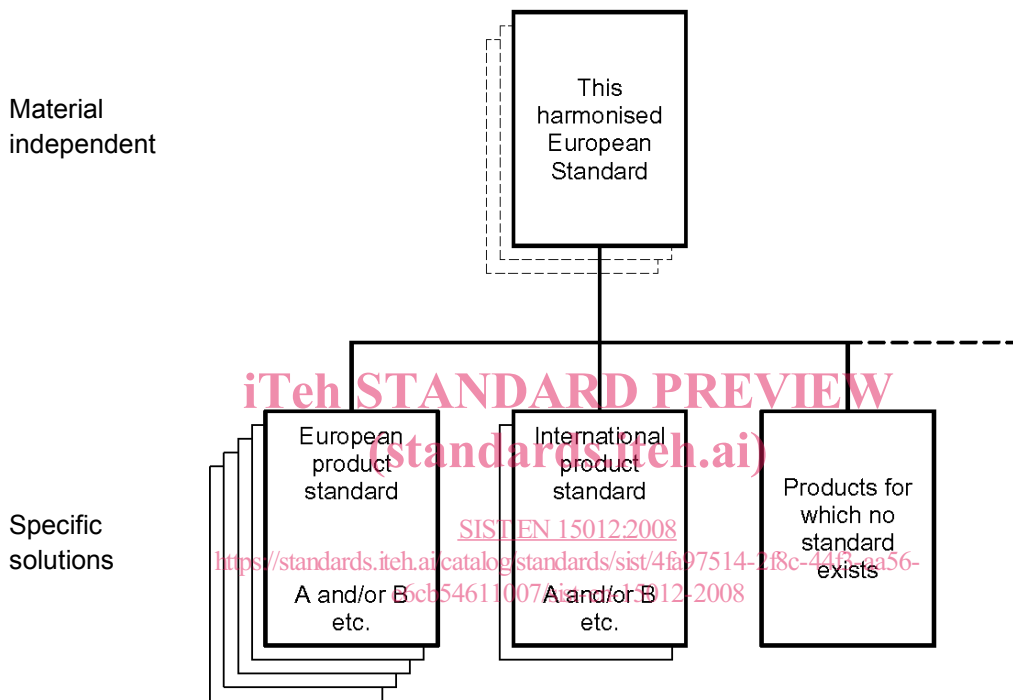


Figure 1

## 1 Scope

This document specifies performance requirements for non-pressure plastics pipes, fittings and their joints intended for soil and waste applications:

- inside the building (application area code "B"),
- buried in ground within the building structure (application area code "BD") and with a diameter greater than or equal to 75 mm,

and gives associated test methods for verification and evaluation of conformity with this document.

## 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: Vulcanised 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 1053, *Plastics piping systems — Thermoplastics piping systems for non-pressure applications — Test method for watertightness*

EN 1054, *Plastics piping systems — Thermoplastics piping systems for soil and waste discharge — Test method for airtightness of joints*

EN 1055, *Plastics piping systems — Thermoplastics piping systems for soil and waste discharge inside buildings — Test method for resistance to elevated 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 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 9969, *Thermoplastics pipes — Determination of ring stiffness (ISO 9969:1994)*

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

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

### 3 Terms, definitions and symbols

For the purposes of this document, the following terms, definitions and symbols 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 outside diameter, in millimetres, assigned to a nominal size DN

**3.3 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 It is designated by the letters "SN" followed by the appropriate number.

### 4 Performance requirements

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#### 4.1 Reaction to fire for applications inside building

Products conforming to this document shall be classified according to 5.1.  
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#### 4.2 Dimensional tolerances

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

- reference to an appropriate European product standard given in Annex B, or
- in the absence of a European Standard, reference to a specific European product specification published by a recognized European organization, or
- in the absence of a) and b) reference to an International Standard, or
- 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 5.2 and shall be within the declared tolerances.

#### 4.3 Tightness (air and liquid)

##### 4.3.1 Tightness of elastomeric sealing ring joints

The tightness of the jointed system shall be tested in accordance with 5.3 for sealing ring joints and the following shall apply:

- no water leakage shall occur;
- no air leakage shall occur.



### 4.3.2 Tightness of joints made by using adhesive bonding or fusion techniques

Joining systems using adhesive bonding or fusion techniques shall be deemed to be tight provided the joining work is executed in accordance with the manufacturer's instructions. Such instructions shall be made available by the manufacturer.

## 4.4 Durability

### 4.4.1 Durability of pipes and fittings

The durability of the piping components shall be addressed as the resistance to elevated temperature cycling.

The resistance to elevated temperature cycling shall be tested in accordance with 5.4. The piping system shall not show any leakage before and after the test. The sagging shall not exceed the following values:

- DN ≤ 50: ≤ 3 mm;
- DN > 50:  $0,05 \times d_n$  mm.

### 4.4.2 Durability of elastomeric sealing joints

The tightness of elastomeric sealing joints shall be deemed to be durable if the sealing element conforms to EN 681-1, EN 681-2, EN 681-3 or EN 681-4, as applicable.

## 4.5 Maximum load for admissible deformation for pipes and fittings for applications buried in ground within the building structure

### 4.5.1 General

For the intended end use buried in ground within the building structure, the maximum load for admissible deformation shall be addressed as ring stiffness.

Ring stiffness shall be determined either by calculation or as described in 4.5.2 and 4.5.3.

### 4.5.2 Ring stiffness of pipes

The ring stiffness of a thermoplastics pipe shall be determined in accordance with 5.5.1 and shall be expressed either as SN 2, SN 4, SN 8 or SN 16 following ISO 13966, as applicable, or as the actual value obtained in the test, expressed in kN/m<sup>2</sup>.

### 4.5.3 Stiffness of fittings

The stiffness of a fitting made from the same material and having the same wall thickness and design as a corresponding pipe shall because of its geometry be deemed to have at least the same as the stiffness as that pipe.

For other constructions the ring stiffness of bends and branches with the largest side branch shall be measured in accordance with 5.5.2. Based on the obtained lowest value of the result other fittings of the same design family can be classified with the same stiffness class.

The ring stiffness of a thermoplastics fitting shall be expressed either as SN 2, SN 4, SN 8 or SN 16 following ISO 13966, as applicable, or as the actual value obtained in the test, expressed in kN/m<sup>2</sup>.

The fittings manufacturer shall declare for which pipe stiffness classes the product is suitable.

NOTE This clause is only applicable for components intended to be used buried in ground within the building structure and with a nominal outside diameter greater than or equal to 75 mm.

## 4.6 Dangerous substances

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

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

## 5 Test methods

### 5.1 Reaction to fire for applications inside building

Classification shall be in accordance with EN 13501-1.

Mounting and fixing of pipes shall conform to Annex A. If no pipes are available, testing of fittings may be done in form of a linear assembly, e.g. couplers.

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.

### 5.2 Dimensional tolerances

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

### 5.3 Tightness

The piping system shall be tested according to EN 1053 and EN 1054, whereby the sampling procedure is free and the number of test pieces is one (see 6.1).

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### 5.4 Durability

The piping system shall be tested according to EN 1055.

### 5.5 Ring stiffness for applications buried in ground within the building structure

#### 5.5.1 Ring stiffness of thermoplastics pipes

For thermoplastics pipes the ring stiffness shall be determined in accordance with EN ISO 9969.

#### 5.5.2 Stiffness of thermoplastics fittings

For thermoplastics fittings with structured wall the ring stiffness of bends and branches shall be determined in accordance with ISO 13967.

## 6 Evaluation of conformity

### 6.1 General

The conformity of pipes and fittings 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, 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 A product can be in more than one family for different characteristics.

For type testing the following family groups apply:

- a) Size groups for pipes and fittings as given in Table 1.

**Table 1 — Size groups**

Size group	Range of nominal diameters, $d_n$
1	$32 < d_n \leq 63$
2	$63 < d_n \leq 180$
3	$d_n > 180$

- b) Type groups for thermoplastics piping components as given in Table 2.

**Table 2 — Type groups**

Type group	Thermoplastics piping components
1	Bends
2	Branches
3	Other fittings

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## 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 documents 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 4.4.2 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.