



SLOVENSKI STANDARD

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Cevni sistemi iz polimernih materialov za odvodnjavanje in kanalizacijo, ki delujejo po težnostnem principu - Polipropilen z mineralnimi modifikatorji (PP-MD) – 1. del: Specifikacije za cevi, fitinge in cevni sistem

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

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Kunststoff-Rohrleitungssysteme für erdverlegte Abwasserkanäle und -leitungen - Polypropylen mit mineralischen Additiven (PP-MD) - Teil 1: Anforderungen an Rohre, Formstücke und das Rohrleitungssystem

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Systemes de canalisations en plastique pour les branchements et les collecteurs d'assainissement enterrés sans pression - Polypropylène avec modificateurs minéraux (PP-MD) - Partie 1: Spécifications pour les tubes, les raccords et le système

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**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**

Systèmes de canalisations en plastique pour les
branchements et les collecteurs d'assainissement enterrés
sans pression - Polypropylène avec modificateurs minéraux
(PP-MD) - Partie 1: Spécifications pour les tubes, les
raccords et le système

Kunststoff-Rohrleitungssysteme für erdverlegte
Abwasserkanäle und -leitungen - Polypropylen mit
mineralischen Additiven (PP-MD) - Teil 1: Anforderungen
an Rohre, Formstücke und das Rohrleitungssystem

This European Standard was approved by CEN on 24 November 2005.

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 Central Secretariat 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 Central Secretariat has the same status as the official versions.

CEN members are the national standards bodies of Austria, Belgium, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Slovakia, Slovenia, Spain, Sweden, Switzerland and United Kingdom.



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EN 14758-1:2005 (E)**Foreword**

This European Standard (EN 14758-1:2005) 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 June 2006, and conflicting national standards shall be withdrawn at the latest by June 2006.

This European Standard is a part of a system standard for plastics piping systems of a particular material for a specified application. There are a number of such system standards.

They are supported by separate standards on test methods to which references are made throughout the system standard.

The system standards are consistent with general standards on functional requirements and on recommended practice for installation.

EN 14758 consists of the following parts under the general title *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 (this document)

Part 2: Guidance for the assessment of conformity (intended to be published as CEN/Technical Specification)

Part 3: Guidance for installation (intended to be published as CEN/Technical Specification).

According to the CEN/CENELEC Internal Regulations, the national standards organizations of the following countries are bound to implement this European Standard: Austria, Belgium, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Slovakia, Slovenia, Spain, Sweden, Switzerland and United Kingdom.

1 Scope

This European Standard specifies the requirements for solid-wall pipes, fittings and the system of piping systems made from mineral modified polypropylene materials (PP-MD) in the field of non-pressure underground drainage and sewerage outside the building structure (application area code "U"), and non-pressure underground drainage and sewerage for both buried in ground within the building structure (application area code "D") and outside the building structure.

This is reflected in the marking of products by "U" and "UD".

It also specifies the test parameters for the test methods referred to in this European Standard.

This European Standard covers a range of nominal sizes, a range of pipe series/stiffness classes and gives recommendations concerning colours.

NOTE 1 It is the responsibility of the purchaser or specifier to make the appropriate selection from these aspects, taking into account their particular requirements and any relevant national regulations and installation practices or codes.

In conjunction with Part 2 and Part 3 of EN 14758 (see Foreword) it is applicable to PP-MD pipes and fittings, their elastomeric sealing ring joints and to joints with components of other plastics and non-plastics materials intended to be used for buried piping systems for non-pressure underground drainage and sewerage.

This European Standard is applicable to PP-MD pipes with or without an integral socket.

NOTE 2 The fittings can be manufactured by injection-moulding or be fabricated from pipes and/or mouldings.

NOTE 3 Requirements and limiting values for application area code "D" are given in Table 4, Table 7 and Table 13.

NOTE 4 Pipes, fittings and other components conforming to any of the plastics product standards listed in Annex B can be used with pipes and fittings conforming to this European Standard, when they conform to the requirements for joint dimensions given in Clause 6 and to the requirements of Table 13.

2 Normative references

The following referenced documents are indispensable for the application of this European Standard. 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 — Material requirements for pipe joint seals used in water and drainage applications — Part 1: Vulcanized rubber*

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

EN 744:1995, *Plastics piping and ducting systems — Thermoplastics pipes — Test method for resistance to external blows by the round-the-clock method*

EN 921:1994, *Plastics piping systems — Thermoplastics pipes — Determination of resistance to internal pressure at constant temperature*

EN 1055:1996, *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*

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EN 1411, *Plastics piping and ducting systems — Thermoplastics pipes — Determination of resistance to external blows by the staircase method*

EN 1446, *Plastics piping and ducting systems — Thermoplastics pipes — Determination of ring flexibility*

EN 1989, *Thermoplastics piping and ducting systems — Joints for buried non-pressure sewerage applications — Test method for long-term sealing performance of joints with thermoplastic elastomer (TPE) seals by estimating the sealing pressure*

EN 12061, *Plastics piping systems — Thermoplastics fittings — Test method for impact resistance*

EN 12256, *Plastics piping systems — Thermoplastics fittings — Test method for mechanical strength or flexibility of fabricated fittings*

EN ISO 472:2001, *Plastics — Vocabulary (ISO 472:1999)*

EN ISO 580:2005, *Plastics piping and ducting systems - Injection-moulded thermoplastics fittings - Methods for visually assessing the effects of heating (ISO 580:2005)*

EN ISO 1043-1:2001, *Plastics — Symbols and abbreviated terms — Part 1: Basic polymers and their special characteristics (ISO 1043-1:2001)*

EN ISO 1133:2005, *Plastics — Determination of the melt mass-flow rate (MFR) and the melt volume-flow rate (MVR) of thermoplastics (ISO 1133:2005)*

EN ISO 2505:2005, *Thermoplastics pipes — Longitudinal reversion - Test method and parameters (ISO 2505:2005)*

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

EN ISO 9969, *Thermoplastics pipes — Determination of ring stiffness (ISO 9969:1994)*

ISO 6259-3, *Thermoplastics pipes — Determination of tensile properties — Part 3: Polyolefin pipes*

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

3 Terms, definitions, symbols and abbreviations

3.1 Terms and definitions

For the purposes of this European Standard, the terms, definitions and symbols given in EN ISO 472:2001 and EN ISO 1043-1:2001 and the following apply.

3.1.1

application area code

code used in the marking of pipes and fittings to indicate the application area for which they are intended, as follows:

- U: code for the area more than 1 m from the building to which the buried piping system is connected;
- D: code for the area under and within 1 m from the building where the pipes and the fittings are buried in ground and are connected to the soil and waste discharge system of the building

NOTE In code D application areas, the existence of hot water discharge in addition to the external forces from the surroundings is usual.

3.1.2 Geometrical definitions

3.1.2.1

nominal size

DN

numerical designation of the size of a component, which is a convenient round number approximately equal to the manufacturing dimension, in millimetres

3.1.2.2

nominal size

DN/OD

nominal size, related to the outside diameter

3.1.2.3

nominal outside diameter

d_n

specified outside diameter, in millimetres, assigned to a nominal size (DN/OD)

3.1.2.4

outside diameter

d_e

value of the measurement of the outside diameter through its cross section at any point of a pipe or spigot end of a fitting, rounded up to the next greater 0,1 mm

3.1.2.5

mean outside diameter

d_{em}

value of the measurement of the outer circumference of a pipe or spigot end of a fitting in any cross section, divided by π ($\approx 3,142$), rounded to the next greater 0,1 mm

3.1.2.6

mean inside diameter of a socket

$d_{s,m}$

arithmetical mean of a number of measurements of the inside diameter of a socket in the same cross section

3.1.2.7

wall thickness

e

value of the measurement of the wall thickness at any point around the circumference of a component

3.1.2.8

mean wall thickness

e_m

arithmetical mean of a number of measurements of the wall thickness, regularly spaced around the circumference and in the same cross section of a component, including the measured minimum and the measured maximum values of the wall thickness in that cross section

3.1.2.9

pipes series

S

number for pipe designation (see ISO 4065 [1])

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SDR

numerical designation of a pipe series, which is a convenient round number approximately equal to the ratio of the nominal outside diameter, d_n , and the minimum wall thickness, e_{\min}

3.1.2.11**nominal ring stiffness**

SN

numerical designation of the ring stiffness of a pipe or fitting, which is a convenient round number, relative to the determined stiffness in kiloNewtons per square metre (kN/m^2), indicating the minimum ring stiffness of a pipe or fitting

3.1.2.12**design length**

Z

length of a fitting (e.g. the main pipe of a branch) excluding any spigot or socket length. In case of a change in direction (e.g. in case of a bend or the service pipe of a branch), it is the length from one end to the intersection of the straight axis of this end with the straight axis of the other end of the fitting, excluding any spigot or socket length (see the dimensions Z_1 and Z_2 in e.g. Figures 7 and 11)

3.1.3 Material definitions**3.1.3.1****virgin material**

material in a form such as granules or powder that has not been subjected to use or processing other than that required for its manufacture and to which no reprocessible or recyclable material has been added

3.1.3.2**mineral modified material (PP-MD)**

material to which has been added minerals during specific processing operation(s) which during such processing is well distributed in the material

3.1.3.3**mean particle size**

D50

diameter which 50 % by mass of the particles of a mineral modifier is smaller than

3.1.3.4**particle top cut**

D98

diameter which 98 % by mass of the particles of a mineral modifier is smaller than

3.1.3.5**own reprocessible material**

material prepared from rejected unused pipes or fittings including trimmings from the production of pipes or fittings, that will be reprocessed in a manufacturer's plant after having been previously processed by the same manufacturer by a process such as moulding or extrusion, and for which the complete formulation is known

3.1.3.6**external reprocessible material**

material comprising either one of the following forms:

- a) material from rejected unused pipes or fittings or trimmings there from, that will be reprocessed and that were originally processed by another manufacturer;

- b) material from the production of unused products other than pipes and fittings, regardless of where they are manufactured

3.1.3.7

recyclable material

material comprising either one of the following forms:

- a) material from used pipes or fittings which have been cleaned and crushed or ground;
b) material from used products other than pipes or fittings which have been cleaned and crushed or ground

3.2 Symbols

A	length of engagement
C	depth of sealing zone
D50	mean particle size
D98	particle top cut
d_e	outside diameter
d_{em}	mean outside diameter
d_{im}	mean inside diameter
d_n	nominal outside diameter
d_{sm}	mean inside diameter of a socket
e	wall thickness
e_m	mean wall thickness
e_2	wall thickness of a socket
e_3	wall thickness in the groove area
l	effective length of a pipe
L_1	length of spigot
M	length of spigot of a plug
R	radius of swept fittings
Z	design length of (a part) of a fitting
α	nominal angle of a fitting

3.3 Abbreviations

CaCO ₃	calcium carbonate
DN	nominal size
DN/OD	nominal size, outside diameter related
MFR	melt mass-flow rate

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MgCO ₃	magnesium carbonate
Mg ₃ Si ₄ O ₁₀ (OH) ₂	magnesium silicate
PP	polypropylene
PP-MD	mineral modified polypropylene
SDR	standard dimension ratio
SN	nominal ring stiffness
TIR	true impact rate

4 Material**4.1 PP-MD material**

The base material for PP-MD pipes and fittings shall be a polypropylene base material to which are added mineral modifier(s) of known specification and containing those other additives that are needed to facilitate the manufacture of components conforming to the requirements of this European Standard.

4.2 Reprocessable and recyclable material

In addition to virgin material the use of the manufacturer's own reprocessable material obtained during the production and testing of products conforming to this European Standard and by using material from piping components of own production is permitted. External reprocessable or recyclable material shall not be used.

4.3 Melt mass-flow rate

Pipes and fittings shall be made from PP-MD materials where the PP base material has an MFR as follows:

$$\text{MFR (230/2,16)} \leq 1,5 \text{ g/10 min.}$$

The MFR of the base material shall be tested in accordance with EN ISO 1133:2005, Annex A, condition M (temperature: 230 °C; loading mass: 2,16 kg).

4.4 Mineral modifiers**4.4.1 Types of mineral modifiers**

The mineral modifiers shall be of following types:

— coated calcium carbonate, CaCO₃

or

— talc.

When it is calcium carbonate following apply:

— content of CaCO₃ ≥ 96 % by mass;

— content of MgCO₃ ≤ 4 % by mass;

— content of CaCO₃ and MgCO₃ in total ≥ 98 % by mass.