

# SLOVENSKI STANDARD

## SIST EN 14758-1:2012

01-maj-2012

Nadomešča:

SIST EN 14758-1:2006+A1:2009

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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, fittinge 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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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

**Ta slovenski standard je istoveten z: EN 14758-1:2012**

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93.030	Zunanji sistemi za odpadno vodo	External sewage systems

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EUROPEAN STANDARD  
NORME EUROPÉENNE  
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**EN 14758-1**

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English Version

**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 drucklose  
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 22 January 2012.

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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-CENELEC 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

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**EN 14758-1:2012 (E)****Foreword**

This document (EN 14758-1:2012) 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 September 2012, and conflicting national standards shall be withdrawn at the latest by September 2012.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. CEN [and/or CENELEC] shall not be held responsible for identifying any or all such patent rights.

This document supersedes EN 14758-1:2005+A1:2009.

In this revised document the following changes are made:

- relevant test methods are changed from EN to ISO versions;
- the long term durability test are removed.

The System Standards are based on the results of the work undertaken in ISO/TC 138 "Plastics pipes, fittings and valves for the transport of fluids", which is a Technical Committee of the International Organization for Standardization (ISO).

The System Standards 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*

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

*Part 3: Guidance for installation (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, 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, Turkey and the 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 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 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 1167 (all parts), *Thermoplastics pipes, fittings and assemblies for the conveyance of fluids — Determination of the resistance to internal pressure*

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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)*

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

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

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

ISO 3127, *Thermoplastics pipes — Determination of resistance to external blows — Round-the-clock method*

ISO 11173, *Thermoplastics pipes — Determination of resistance to external blows — Staircase method*

ISO 13257, *Thermoplastics piping systems for non-pressure applications — Test method for resistance to elevated temperature cycling*

ISO 13259, *Thermoplastics piping systems for underground non-pressure applications — Test method for leaktightness of elastomeric sealing ring type joints*

ISO 13263, *Thermoplastics piping systems for non-pressure underground drainage and sewerage — Thermoplastics fittings — Test method for impact strength*

ISO 13264, *Thermoplastics piping systems for non-pressure underground drainage and sewerage — Thermoplastics fittings — Test method for mechanical strength or flexibility of fabricated fittings*

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### 3 Terms, definitions, symbols and abbreviations

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#### 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 1 to entry: 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  $\pi$  ( $\approx 3,142$ ), 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 [SOURCE: ISO 4065 (1)]

**3.1.2.10****standard dimension ratio**
 $SDR$ 

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,  $e_{min}$

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## 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 ( $\text{kN/m}^2$ ), 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 reprocessable 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 reprocessable 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 reprocessable 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
$\alpha$	nominal angle of a fitting

### 3.3 Abbreviations

$\text{CaCO}_3$	calcium carbonate
DN	nominal size
DN/OD	nominal size, outside diameter related
MFR	melt mass-flow rate
$\text{MgCO}_3$	magnesium carbonate
$\text{Mg}_3\text{Si}_4\text{O}_{10}(\text{OH})_2$	magnesium silicate
PP	polypropylene
PP-MD	mineral modified polypropylene

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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, using the test parameters:

temperature 230 °C and 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,  $\text{CaCO}_3$

or

— talc.

When it is calcium carbonate following apply:

- content of  $\text{CaCO}_3$   $\geq 96$  % by mass;
- content of  $\text{MgCO}_3$   $\leq 4$  % by mass;
- content of  $\text{CaCO}_3$  and  $\text{MgCO}_3$  in total  $\geq 98$  % by mass.

When it is talc following apply:

- content of magnesium silicate ( $\text{Mg}_3\text{Si}_4\text{O}_{10}(\text{OH})_2$ )  $\geq 97$  % by mass.

**NOTE** The addition of mineral modifiers is an effective way of increasing the E-modulus of the base polypropylene material.