

Plastics piping systems for soil and waste discharge (low and high temperature) within the building structure - Polyethylene (PE) - Part 1: Requirements for pipes, fittings and the system

## EESTI STANDARDI EESSÕNA

## NATIONAL FOREWORD

See Eesti standard EVS-EN 1519-1:2019 sisaldab Euroopa standardi EN 1519-1:2019 ingliskeelset teksti.	This Estonian standard EVS-EN 1519-1:2019 consists of the English text of the European standard EN 1519-1:2019.
Standard on jõustunud sellekohase teate avaldamisega EVS Teatajas.	This standard has been endorsed with a notification published in the official bulletin of the Estonian Centre for Standardisation.
Euroopa standardimisorganisatsioonid on teinud Euroopa standardi rahvuslikele liikmetele kättesaadavaks 24.04.2019.	Date of Availability of the European standard is 24.04.2019.
Standard on kättesaadav Eesti Standardikeskusest.	The standard is available from the Estonian Centre for Standardisation.

Tagasisidet standardi sisu kohta on võimalik edastada, kasutades EVS-i veebilehel asuvat tagasiside vormi või saates e-kirja meiliaadressile [standardiosakond@evs.ee](mailto:standardiosakond@evs.ee).

ICS 23.040.01, 91.140.80

Standardite reprodutseerimise ja levitamise õigus kuulub Eesti Standardikeskusele

Andmete paljundamine, taastekitamine, kopeerimine, salvestamine elektroonsesse süsteemi või edastamine ükskõik millises vormis või millisel teel ilma Eesti Standardikeskuse kirjaliku loata on keelatud.

Kui Teil on küsimusi standardite autorikaitse kohta, võtke palun ühendust Eesti Standardikeskusega:  
Koduleht [www.evs.ee](http://www.evs.ee); telefon 605 5050; e-post [info@evs.ee](mailto:info@evs.ee)

The right to reproduce and distribute standards belongs to the Estonian Centre for Standardisation

No part of this publication may be reproduced or utilized in any form or by any means, electronic or mechanical, including photocopying, without a written permission from the Estonian Centre for Standardisation.

If you have any questions about copyright, please contact Estonian Centre for Standardisation:

Homepage [www.evs.ee](http://www.evs.ee); phone +372 605 5050; e-mail [info@evs.ee](mailto:info@evs.ee)

English Version

Plastics piping systems for soil and waste discharge (low  
and high temperature) within the building structure -  
Polyethylene (PE) - Part 1: Requirements for pipes, fittings  
and the system

Systèmes de canalisations en plastique pour  
l'évacuation des eaux-vannes et des eaux usées (à  
basse et à haute température) à l'intérieur de la  
structure des bâtiments - Polyéthylène (PE) - Partie 1 :  
Exigences pour tubes, raccords et le système

Kunststoff-Rohrleitungssysteme zum Ableiten von  
Abwasser (niedriger und hoher Temperatur) innerhalb  
der Gebäudestruktur - Polyethylen (PE) - Teil 1:  
Anforderungen an Rohre, Formstücke und das  
Rohrleitungssystem

This European Standard was approved by CEN on 26 November 2018.

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 CEN-CENELEC Management Centre 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 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, Former Yugoslav Republic of Macedonia, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Romania, Serbia, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey and United Kingdom.



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

CEN-CENELEC Management Centre: Rue de la Science 23, B-1040 Brussels

# Contents

Page

European foreword.....	4
<b>1 Scope.....</b>	<b>5</b>
<b>2 Normative references.....</b>	<b>6</b>
<b>3 Terms and definitions.....</b>	<b>7</b>
<b>4 Symbols and abbreviations.....</b>	<b>10</b>
4.1 Symbols.....	10
4.2 Abbreviations.....	10
<b>5 Material.....</b>	<b>10</b>
5.1 PE compound.....	10
5.2 Additional requirement for pipe and fitting material for application area BD.....	10
5.3 Utilization of non-virgin material.....	11
5.4 Melt mass-flow rate.....	11
5.5 Fusion compatibility.....	11
5.6 Thermal stability (OIT).....	11
5.7 Sealing ring retaining means.....	11
5.8 Fire behaviour.....	11
<b>6 General characteristics.....</b>	<b>12</b>
6.1 General.....	12
6.2 Colour.....	12
<b>7 Geometrical characteristics.....</b>	<b>12</b>
7.1 General.....	12
7.2 Dimensions of pipes.....	12
7.2.1 Outside diameters.....	12
7.2.2 Effective length of pipes.....	13
7.2.3 Chamfering.....	14
7.2.4 Wall thickness.....	14
7.3 Dimensions of fittings.....	16
7.3.1 Outside diameters.....	16
7.3.2 Design lengths.....	16
7.3.3 Wall thickness.....	16
7.4 Dimensions of sockets and pipe ends.....	17
7.4.1 Dimensions of ring seal sockets and spigot ends.....	17
7.4.2 Dimensions of electrofusion sockets.....	21
7.4.3 Dimensions of pipe ends for butt fusion joints.....	22
7.5 Types of fittings.....	23
<b>8 Mechanical characteristics.....</b>	<b>28</b>
8.1 Mechanical characteristics for pipes.....	28
8.2 Mechanical characteristics of fittings.....	28
<b>9 Physical characteristics.....</b>	<b>29</b>
9.1 Physical characteristics of pipes.....	29
9.2 Physical characteristics of fittings.....	30
<b>10 Performance requirements.....</b>	<b>30</b>
<b>11 Sealing rings.....</b>	<b>32</b>

<b>12</b>	<b>Marking .....</b>	<b>32</b>
<b>12.1</b>	<b>General .....</b>	<b>32</b>
<b>12.2</b>	<b>Minimum required marking of pipes .....</b>	<b>32</b>
<b>12.3</b>	<b>Minimum required marking of fittings.....</b>	<b>33</b>
<b>12.4</b>	<b>Additional marking.....</b>	<b>33</b>
<b>Annex A (normative)</b>	<b>Utilization of non-virgin PE material .....</b>	<b>34</b>
<b>A.1</b>	<b>Own reprocessed material from pipes and fittings.....</b>	<b>34</b>
<b>A.2</b>	<b>External non-virgin materials with an agreed specification .....</b>	<b>34</b>
<b>A.2.1</b>	<b>Material from PE pipes and fittings.....</b>	<b>34</b>
<b>A.2.2</b>	<b>Material from PE products other than pipes and fittings .....</b>	<b>35</b>
<b>Annex B (informative)</b>	<b>Product standards.....</b>	<b>36</b>
<b>Bibliography</b>	<b>.....</b>	<b>37</b>

## European foreword

This document (EN 1519-1:2019) 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 October 2019, and conflicting national standards shall be withdrawn at the latest by October 2019.

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

This document supersedes EN 1519-1:1999.

EN 1519, *Plastics piping systems for soil and waste discharge (low and high temperature) within the building structure - Polyethylene (PE)* consists of the following parts:

- *Part 1: Specifications for pipes, fittings and the system*
- *Part 2: Guidance for the assessment of conformity (Technical Specification)*

The main changes in comparison with the previous edition are:

- updating in accordance with the new template;
- updating of normative references;
- thermal stability (OIT) requirement is made valid in general;
- utilization of non-virgin PE materials are described in the new Annex A;
- Annex B has been deleted and the relevant text has been moved to the main standard;
- a new Annex B “Product standards” has been added.

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).

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.

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

# 1 Scope

This document specifies the requirements for solid-wall polyethylene (PE) pipes with smooth internal and external surfaces extruded from the same compound/formulation throughout the wall, fittings and the system for:

- soil and waste discharge applications (low and high temperature) inside buildings (application area code “B”);
- soil and waste discharge applications (low and high temperature) for both inside buildings and buried in the ground within the building structure (application area code “BD”).

NOTE 1 The intended use is reflected in the marking of products by “B” or “BD”.

NOTE 2 For use buried in the ground within the building structure are intended only those components marked with “BD”, with a nominal ring stiffness of at least SN4 for dimensions equal to or greater than 75 mm.

This document is also applicable to PE pipes and fittings and the system intended for the following purposes:

- ventilating part of the pipework in association with discharge applications;
- rainwater pipework within the building structure.

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

This document covers a range of nominal sizes, a range of pipes and fittings series and gives recommendations concerning colours.

NOTE 3 It is the responsibility of the purchaser or specifier to make the appropriate selections from these aspects, taking into account their particular requirements and any relevant national regulations and installation practices or codes, e.g. CEN/TR 13801 [1].

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, if applicable.

It applies to pipes and fittings, marked with “B”, which are intended to be used inside buildings and outside buildings fixed onto the wall.

It applies to pipes and fittings, marked with “BD”, which are intended to be used for both inside buildings and buried in the ground within the building structure.

This standard is applicable to PE pipes and fittings of the following types:

- plain-ended;
- with integral elastomeric ring seal socket;
- for butt fusion joints;
- for electrofusion joints;
- for mechanical joints

where the fittings can be manufactured by injection-moulding or can be fabricated from pipes and/or mouldings.

NOTE 5 EN 476[2] specifies the general requirements for components used in discharge pipes, drains and sewers for gravity systems. Pipes and fittings conforming to this standard fully meet these requirements.

NOTE 6 For information about the chemical resistance of PE, guidance is given in ISO/TR 10358[3] and for rubber materials in ISO/TR 7620[4].

## 2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements 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 12099, *Plastics piping systems - Polyethylene piping materials and components - Determination of volatile content*

EN ISO 472, *Plastics - Vocabulary (ISO 472)*

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

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

EN ISO 1133-1, *Plastics - Determination of the melt mass-flow rate (MFR) and melt volume-flow rate (MVR) of thermoplastics - Part 1: Standard method (ISO 1133-1)*

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)*

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)*

EN ISO 1183-2, *Plastics - Methods for determining the density of non-cellular plastics - Part 2: Density gradient column method (ISO 1183-2)*

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

EN ISO 3126, *Plastics piping systems - Plastics components - Determination of dimensions (ISO 3126)*

EN ISO 3451-1, *Plastics - Determination of ash - Part 1: General methods (ISO 3451-1)*

EN ISO 11357-6, *Plastics - Differential scanning calorimetry (DSC) - Part 6: Determination of oxidation induction time (isothermal OIT) and oxidation induction temperature (dynamic OIT) (ISO 11357-6)*

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

EN ISO 13254, *Thermoplastics piping systems for non-pressure applications - Test method for watertightness (ISO 13254)*

EN ISO 13255, *Thermoplastics piping systems for soil and waste discharge inside buildings - Test method for airtightness of joints (ISO 13255)*

EN ISO 13257:2018, *Thermoplastics piping systems for non-pressure applications - Test method for resistance to elevated temperature cycling (ISO 13257:2018)*



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

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

ISO 4065, *Thermoplastics pipes - Universal wall thickness table*

### 3 Terms and definitions

For the purposes of this document, the terms and definitions given in EN ISO 472, EN ISO 1043-1 and the following apply.

ISO and IEC maintain terminological databases for use in standardization at the following addresses:

- IEC Electropedia: available at <http://www.electropedia.org/>
- ISO Online browsing platform: available at <http://www.iso.org/obp>

#### 3.1

##### **application area code**

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

- B: application area code for components intended for use above ground inside the building, or for components outside buildings fixed onto the wall;
- D: application code for the area under and within 1 m from the building where the pipes and fittings are buried in ground and are connected to the underground drainage and sewerage system;
- BD: application area code for components intended for use for both code B and code D application areas

Note 1 to entry: In D application areas, the existence of external forces from the surroundings in addition to the hot water discharge is usual.

Note 2 to entry: Other application area codes U and UD not covered by this standard are defined elsewhere, e.g. in EN 12666-1 [5].

#### 3.2

##### **nominal size**

##### **3.2.1**

##### **nominal size**

DN

numerical designation of the size of a component, other than a component designated by thread size, which is approximately equal to the manufacturing dimension, in millimetres

##### **3.2.2**

##### **nominal size**

DN/OD

nominal size, related to the outside diameter

#### 3.3

##### **nominal outside diameter**

$d_n$

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