SLOVENSKI STANDARD
oSIST prEN 1555-1:2019

01-december-2019

Cevni sistemi iz polimernih materialov za oskrbo s plinastimi gorivi - Polietilen (PE) - 1. del: Splošno

Plastics piping systems for the supply of gaseous fuels - Polyethylene (PE) - Part 1: General

Kunststoff-Rohrleitungssysteme für die Gasversorgung - Polyethylen (PE) - Teil 1: Allgemeines

Systèmes de canalisations en plastique pour la distribution de combus-tibles gazeux - Polyéthylène (PE) - Partie 1 : Généralités

Ta slovenski standard je istoveten z: **prEN 1555-1**

ICS:

83.140.30	Polimerne cevi in fitingi za snovi, ki niso tekočine	Plastics pipes and fittings for non fluid use
91.140.40	Sistemi za oskrbo s plinom	Gas supply systems

oSIST prEN 1555-1:2019 **en,fr,de**

EUROPEAN STANDARD

NORME EUROPÉENNE

EUROPÄISCHE NORM

DRAFT
prEN 1555-1

October 2019

ICS 23.040.01

Will supersede EN 1555-1:2010

English Version

Plastics piping systems for the supply of gaseous fuels - Polyethylene (PE) - Part 1: General

Systèmes de canalisations en plastique pour la distribution de combustibles gazeux - Polyéthylène (PE) - Partie 1 : Généralités

Kunststoff-Rohrleitungssysteme für die Gasversorgung - Polyethylen (PE) - Teil 1: Allgemeines

This draft European Standard is submitted to CEN members for enquiry. It has been drawn up by the Technical Committee CEN/TC 155.

If this draft becomes a European Standard, 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.

This draft European Standard was established by CEN 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, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Republic of North Macedonia, Romania, Serbia, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey and United Kingdom.

Recipients of this draft are invited to submit, with their comments, notification of any relevant patent rights of which they are aware and to provide supporting documentation.

Warning : This document is not a European Standard. It is distributed for review and comments. It is subject to change without notice and shall not be referred to as a European Standard.

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

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

Ref. No. prEN 1555-1:2019 E

Contents

Page

European foreword

This document (prEN 1555-1:2019) has been prepared by Technical Committee CEN/TC 155 “Plastics piping and ducting systems”, the secretariat of which is held by NEN.

This document is currently submitted to the CEN Enquiry.

This document will supersede EN 1555-1:2010.

It has been prepared in liaison with Technical Committee CEN/TC 234 “Gas infrastructure”.

System Standards are based on the results of the work being 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.

EN 1555 consists of the following parts:

— EN 1555-1, *Plastics piping systems for the supply of gaseous fuels - Polyethylene (PE) — Part 1: General* (this document);

— EN 1555-2, *Plastics piping systems for the supply of gaseous fuels - Polyethylene (PE) — Part 2: Pipes;*

— EN 1555-3, *Plastics piping systems for the supply of gaseous fuels - Polyethylene (PE) — Part 3: Fittings;*

— EN 1555-4, *Plastics piping systems for the supply of gaseous fuels - Polyethylene (PE) — Part 4: Valves;*

— EN 1555-5, *Plastics piping systems for the supply of gaseous fuels - Polyethylene (PE) — Part 5: Fitness for purpose of the system;*

— CEN/TS 1555-7, *Plastics piping systems for the supply of gaseous fuels — Polyethylene (PE) — Part 7: Guidance for assessment of conformity.*

NOTE EN 12007-2:2012 [3] prepared by CEN/TC 234 “Gas infrastructure” deals with the recommended practice for installation of plastics pipes system in accordance with EN 1555 (all parts).

Introduction

This document specifies the requirements for a piping system and its components made from polyethylene (PE) and which is intended to be used for the supply of gaseous fuels.

Requirements and test methods for components of the piping system are specified in prEN 1555-2:2019, prEN 1555-3:2019 and prEN 1555-4:2019.

Characteristics for fitness for purpose are covered in prEN 1555-5:2019 [1]. CEN/TS 1555-7:2019 [2] gives guidance for assessment of conformity. Recommended practices for installation re given in EN 12007-2:2012 [3], prepared by CEN/TC 234.

This part of EN 1555 covers the general aspects of the plastics piping system.

1 Scope

This document specifies the general aspects of polyethylene (PE) piping systems in the field of the supply of gaseous fuels.

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

In conjunction with Parts 2 to 5 of EN 1555, this document is applicable to PE pipes, fittings, and valves, their joints and to joints with components of other materials intended to be used under the following conditions:

a) a maximum operating pressure, MOP, up to and including 10 bar [1];

b) an operating temperature of 20 °C as reference temperature.

NOTE 1 For other operating temperatures, derating coefficients can be used, see prEN 1555-5:2019 [1].

EN 1555 (all parts) covers a. range of maximum operating pressures and gives requirements concerning colours.

NOTE 2 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.

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.

prEN 1555-2:2019, *Plastics piping systems for the supply of gaseous fuels — Polyethylene (PE) — Part 2: Pipes*

prEN 1555-3:2019, *Plastics piping systems for the supply of gaseous fuels — Polyethylene (PE) — Part 3: Fittings*

prEN 1555-4:2019, *Plastics piping systems for the supply of gaseous fuels — Polyethylene (PE) — Part 4: Valves*

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

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 the melt volume-flow rate (MVR) of thermoplastics — Part 1: Standard method (ISO 1133-1)*

EN ISO 1167-1:2006, *Thermoplastics pipes, fittings and assemblies for the conveyance of fluids — Determination of the resistance to internal pressure — Part 1: General method (ISO 1167-1:2006)*

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 1183-1, *Plastics — Methods for determining the density of non-cellular plastics — Part 1: Immersion method, liquid pyknometer method and titration method (ISO 1183-1)*

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

[1] 1 bar = 0,1 MPa.

EN ISO 6259-1, *Thermoplastics pipes — Determination of tensile properties — Part 1: General test method (ISO 6259-1)*

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

EN ISO 9080, *Plastics piping and ducting systems — Determination of the long-term hydrostatic strength of thermoplastics materials in pipe form by extrapolation (ISO 9080)*

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 12162, *Thermoplastics materials for pipes and fittings for pressure applications — Classification, designation and design coefficient (ISO 12162)*

EN ISO 13477, *Thermoplastics pipes for the conveyance of fluids — Determination of resistance to rapid crack propagation (RCP) — Small-scale steady-state test (S4 test) (ISO 13477)*

EN ISO 13478, *Thermoplastics pipes for the conveyance of fluids — Determination of resistance to rapid crack propagation (RCP) — Full-scale test (FST) (ISO 13478)*

EN ISO 13479, *Polyolefin pipes for the conveyance of fluids — Determination of resistance to crack propagation — Test method for slow crack growth on notched pipes (ISO 13479)*

EN ISO 15512, *Plastics — Determination of water content (ISO 15512)*

EN ISO 16871, *Plastics piping and ducting systems — Plastics pipes and fittings — Method for exposure to direct (natural) weathering (ISO 16871)*

ISO 6964, *Polyolefin pipes and fittings — Determination of carbon black content by calcination and pyrolysis — Test method*

ISO 11413:2018, *Plastics pipes and fittings — Preparation of test piece assemblies between a polyethylene (PE) pipe and an electrofusion fitting*

ISO 11414:2009, *Plastics pipes and fittings — Preparation of polyethylene (PE) pipe/pipe or pipe/fitting test piece assemblies by butt fusion*

ISO 13953, *Polyethylene (PE) pipes and fittings — Determination of the tensile strength and failure mode of test pieces from a butt-fused joint*

ISO 13954, *Plastics pipes and fittings — Peel decohesion test for polyethylene (PE) electrofusion assemblies of nominal outside diameter greater than or equal to 90 mm*

ISO 18553, *Method for the assessment of the degree of pigment or carbon black dispersion in polyolefin pipes, fittings and compounds*

3 Terms and definitions, symbols and abbreviations

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

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

3.1 Terms and definitions

3.1.1 Geometrical definitions

3.1.1.1
nominal size
DN/OD
numerical designation of by thread the size of a component related to the outside diameter

Note 1 to entry: It is a convenient round number approximately equal to the manufacturing dimension in millimetres (mm). It is not applicable to component designated size.

3.1.1.2
nominal outside diameter
d_n
specified outside diameter assigned to a nominal size DN/OD

Note 1 to entry: Nominal outside diameter is expressed in millimetres.

3.1.1.3
outside diameter at any point
d_e
value of the measurement of the outside diameter through its cross-section at any point of the pipe, rounded to the next greater 0,1 mm

3.1.1.4
mean outside diameter
d_{em}
value of the measurement of the outer circumference of the pipe or spigot end of a fitting in any cross-section divided by π (= 3,142), rounded to the next greater 0,1 mm

3.1.1.5
minimum mean outside diameter
$d_{em,min}$
minimum value for the mean outside diameter as specified for a given nominal size

3.1.1.6
maximum mean outside diameter
$d_{em,max}$
maximum value for the mean outside diameter as specified for a given nominal size

3.1.1.7
out-of-roundness
ovality
difference between the maximum and the minimum outside diameter in the same cross-section of a pipe or spigot

3.1.1.8
nominal wall thickness
e_n
numerical designation of the wall thickness of a component, which is a convenient round number, approximately equal to the manufacturing dimension in millimetres (mm)

Note 1 to entry: For thermoplastics components conforming to the different parts of EN 1555, the value of the nominal wall thickness, e_n, is identical to the specified minimum wall thickness at any point, e_{min}.

3.1.1.9
wall thickness at any point
e
wall thickness at any point around the circumference of a component rounded to the next greater 0,1 mm

Note 1 to entry: The symbol for the wall thickness of the fittings and valves body at any point is *E*.

3.1.1.10
minimum wall thickness at any point
e_{min}
minimum value for the wall thickness at any point around the circumference of a component, as specified

3.1.1.11
maximum wall thickness at any point
e_{max}
maximum value for the wall thickness at any point around the circumference of a component, as specified

3.1.1.12
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

3.1.1.13
tolerance
permitted variation of the specified value of a quantity, expressed as the difference between the permitted maximum and the permitted minimum value

3.1.1.14
wall thickness tolerance
t_y
permitted difference between the wall thickness at any point, *e*, and the nominal wall thickness, e_n

Note 1 to entry: $e_n \le e \le e_n + t_y$

3.1.1.15
standard dimension ratio
SDR
numerical designation of a pipe series, which is a convenient round number, approximately equal to the dimension ratio of the nominal outside diameter, d_n, and the nominal wall thickness, e_n

3.1.1.16
pipe series
S
number for pipe designation, conforming to ISO 4065 [10]

Note 1 to entry: The relationship between the pipe series S and the standard dimension ratio SDR is given by the following equation as specified in ISO 4065 [10].

$$S = \frac{SDR - 1}{2}$$

3.1.2 Material definitions

3.1.2.1
virgin material
compound in a form such as granules that has not been subjected to use or processing other than that required for its manufacture and to which no reprocessed or recyclable materials have been added

3.1.2.2
own reprocessed material
material prepared from clean rejected unused pipes, fittings or valves, including trimmings from the production of pipes, fittings or valves, that will be reprocessed in a manufacturer's plant after having been previously processed by the same manufacturer in the production of components by, for example, injection-moulding or extrusion

3.1.2.3
compound
homogenous extruded mixture of base polymer (PE) and additives, i.e. anti-oxidants, pigments, carbon black, UV-stabilizers and others, at a dosage level necessary for the processing and use of components conforming to the requirements of this document

3.1.3 Definitions related to material characteristics

3.1.3.1
lower confidence limit of the predicted hydrostatic strength
σLPL
quantity, with the dimensions of stress, which represents the 97,5 % lower confidence limit of the predicted hydrostatic strength at a temperature θ and time t

Note 1 to entry: It is expressed in megapascals.

3.1.3.2
minimum required strength
MRS
value of σLPL at 20 °C and 50 years, rounded down to the next smaller value of the R10 series when σLPL is below 10 MPa, or to the next lower value of the R20 series when σLPL is 10 MPa or greater

Note 1 to entry: The R10 series conforms to ISO 3 [8] and the R20 series conforms to ISO 497 [9].

3.1.3.3
design coefficient
C
coefficient with a value greater than 1, which takes into consideration service conditions as well as properties of the components of a piping system other than those represented in the lower confidence limit