



SLOVENSKI STANDARD
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Cevni sistemi iz polimernih materialov za oskrbo s plinastimi gorivi - Polietilen (PE) - 2. del: Cevi

Plastics piping systems for the supply of gaseous fuels - Polyethylene (PE) - Part 2: Pipes

Kunststoff-Rohrleitungssysteme für die Gasversorgung - Polyethylen (PE) - Teil 2: Rohre

Systèmes de canalisations en plastique pour la distribution de combustibles gazeux - Polyéthylène (PE) - Partie 2 : Tubes

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Plastics piping systems for the supply of gaseous fuels - Polyethylene (PE) - Part 2: Pipes

Systèmes de canalisations en plastique pour la
distribution de combustibles gazeux - Polyéthylène
(PE) - Partie 2 : Tubes

Kunststoff-Rohrleitungssysteme für die Gasversorgung
- Polyethylen (PE) - Teil 2: Rohre

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.

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prEN 1555-2:2024 (E)**European foreword**

This document (prEN 1555-2:2024) has been prepared by Technical Committee CEN/TC 155 “Plastics piping systems 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 1555-2:2021.

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

In addition, the following document provides guidance on the assessment of conformity:

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

The revision of this System Standard has been carried out to add reference to information related to the suitability of PE pipe systems for 100 % hydrogen and its admixtures with natural gas.

NOTE EN 12007-2 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

The EN 1555 series specifies the requirements for a piping system and its components made from polyethylene (PE) compounds, which is intended to be used for the supply of gaseous fuels.

This document covers the characteristics of pipes.

Requirements and test methods for materials and components, other than pipes, are specified in EN 1555-1, EN 1555-3 and EN 1555-4.

Characteristics for fitness for purpose of the system are covered in EN 1555-5. CEN/TS 1555-7 gives guidance for assessment of conformity.

Recommended practice for design, handling and installation is given in EN 12007-2.

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prEN 1555-2:2024 (E)

1 Scope

This document specifies the characteristics of pipes made from polyethylene (PE) for piping systems in the field of the supply of gaseous fuels.

NOTE 1 Additional information related to the installation of PE 100-RC systems is given in prEN 1555-1:2024, Annex A.

NOTE 2 Additional information about the suitability of PE pipe systems for hydrogen and its admixtures is given in prEN 1555-1:2024, Annex B.

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

In conjunction with EN 1555-1, EN 1555-3, EN 1555-4 and EN 1555-5, this document is applicable to PE pipes, fittings and valves, their joints, and joints with components of PE and other materials intended to be used under the following conditions:

- a) a maximum operating pressure (MOP), up to and including 10 bar¹ at a design reference temperature of 20 °C;
- b) an operating temperature between –20 °C and 40 °C.

For operating temperatures between 20 °C and 40 °C derating coefficients are defined in EN 1555-5.

The EN 1555 series covers a range of MOPs and gives requirements concerning colours.

This document is applicable to three types of pipe:

- PE pipes (outside diameter d_n) including any identification stripes;
- PE pipes with co-extruded layers on either or both the outside and/or inside of the pipe (total outside diameter d_n) as specified in Annex A, where all PE layers have the same MRS rating;
- PE pipes (outside diameter d_n) with a peelable and contiguous thermoplastics additional layer on the outside of the pipe ("coated pipe") as specified in Annex B.

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 guidance or regulations and installation practices or codes.

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.

prEN 1555-1:2024, *Plastics piping systems for the supply of gaseous fuels — Polyethylene (PE) — Part 1: General*

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

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)*

¹ bar = 0,1 MPa. = 10⁵ Pa; 1 MPa = 1 N/mm².

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

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

ISO 11922-1:2018, *Thermoplastics pipes for the conveyance of fluids — Dimensions and tolerances — Part 1: Metric series*

ISO 13479:2022, *Polyolefin pipes for the conveyance of fluids — Determination of resistance to crack propagation — Test method for slow crack growth on notched pipes*

ISO 18488, *Polyethylene (PE) materials for piping systems — Determination of Strain Hardening Modulus in relation to slow crack growth — Test method*

ISO 18489:2015, *Polyethylene (PE) materials for piping systems — Determination of resistance to slow crack growth under cyclic loading — Cracked Round Bar test method*

3 Terms and definitions

For the purposes of this document the terms and definitions, symbols and abbreviations given in prEN 1555-1:2024 and the following apply.

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

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

prEN 1555-2:2024 (E)**3.1****squeeze-off**

restriction of the gas flow to an acceptable rate through mechanical compression of the pipe

Note 1 to entry: See Annex C.

4 Symbols and abbreviated terms

For the purpose of this document the symbols and abbreviated terms given in EN 1555-1 apply.

5 Material**5.1 Compound for pipes**

The PE compound from which the pipes are made shall conform to EN 1555-1.

The pipes shall be made from:

- virgin material, or
- reworked material from the extrusion process from the same PE compound from any of the manufacturer's own plants, or
- reworked material from the injection moulding process from the same PE compound from any of the manufacturer's own plants, or
- a mixture of two or more of the above, all from the same PE compound.

Reworked material may be used from:

- the base pipe of peelable layer pipe (coated pipe);
- pipes with or without identification stripes.

Reworked material from co-extruded pipes shall only be used for co-extruded pipes, see Annex A.

Reworked material from pipes reworked with the peelable layer attached shall not be used.

A pipe can only be designated as an PE 100-RC pipe if it is produced from PE 100-RC materials, which fulfil the requirements of prEN 1555-1:2024, Table 1 and Table 2, and is declared as PE 100-RC by the raw material manufacturer, and fulfils the requirements of Table 3 and Table 5 of this document for PE 100-RC. A co-extruded pipe made of a combination of PE 100 and PE 100-RC layers shall be regarded as PE 100 and marked accordingly.

5.2 Compound for identification stripes

The stripe compound (see 6.2) shall be manufactured from a PE base polymer in accordance with EN 1555-1, which is used for a pipe compound for which fusion compatibility has been proven.

The compound used for identification stripes in the form of a pipe shall conform to the decohesion test requirement of resistance to weathering as described in prEN 1555-1:2024, Table 2.

The OIT of the stripe compound shall be ≥ 20 min at 210 °C, measured by the compound supplier in accordance with EN ISO 11357-6 (table footnote ^b of Table 6 applies).

5.3 External reworked and recycled material

Reworked material obtained from external sources, and recycle (pre-consumer and post-consumer) material shall not be used.

6 General characteristics

6.1 Appearance

When viewed without magnification, the internal and external surfaces of pipes shall be smooth and clean, and shall have no scoring, cavities and other surface defects to an extent that would prevent conformity to this document.

The ends of the pipe shall be cut cleanly and square to the axis of the pipe.

6.2 Colour

Pipes shall be black (PE 80, PE 100 and PE 100-RC), yellow (PE 80) or orange (PE 100 and PE 100-RC). In addition, black PE 80 pipes may be identified by yellow stripes and black PE 100 and PE 100-RC pipes may be identified by yellow or orange stripes, according to national preference.

The outer co-extruded layer of co-extruded pipes (see Annex A) or the outer peelable layer of peelable-layer pipes (see Annex B) shall be either black, yellow or orange. In addition, identification stripes may be used according to national preference.

National preference for colour can be stated in the National Foreword.

7 Geometrical characteristics

7.1 Measurement of dimensions

The dimensions of the pipe shall be measured in accordance with EN ISO 3126, and rounded to the next 0,1 mm. In case of dispute, the measurements of dimensions shall be made directly after conditioning for at least 4 h (23 ± 2) °C and at least 24 h after manufacturer.

Indirect measurement at the stage of production is allowed at shorter time periods, provided that evidence is shown of correlation.

7.2 Mean outside diameters, out-of-roundness (ovality) and tolerances

The mean outside diameters of the pipe, d_{em} , shall conform to Table 1.

For straight pipes, the maximum out-of-roundness shall conform to Table 1. For coiled pipes, the maximum out-of-roundness shall be specified by agreement between the manufacturer and the end-user.

Care should be taken that packaging and storage does not lead to an increased out-of-roundness and flattening of the pipe.

Table 1 — Mean outside diameters and out-of-roundness

Dimensions in millimetres

Nominal size DN/OD	Nominal outside diameter d_n	Mean outside diameter		Maximum out- of-roundness for straight pipes ^b
		$d_{em,min}$	$d_{em,max}$ ^a	
16	16	16,0	16,3	1,2
20	20	20,0	20,3	1,2
25	25	25,0	25,3	1,2
32	32	32,0	32,3	1,3
40	40	40,0	40,4	1,4