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

EESTI STANDARDI EESSÕNA

NATIONAL FOREWORD

<p>See Eesti standard EVS-EN 1555-1:2025 sisaldab Euroopa standardi EN 1555-1:2025 ingliskeelset teksti.</p> <p>Standard on jõustunud sellekohase teate avaldamisega EVS Teatajas.</p> <p>Euroopa standardimisorganisatsioonid on teinud Euroopa standardi rahvuslikele liikmetele kättesaadavaks 08.10.2025.</p> <p>Standard on kättesaadav Eesti Standardimis- ja Akrediteerimiskeskusest.</p>	<p>This Estonian standard EVS-EN 1555-1:2025 consists of the English text of the European standard EN 1555-1:2025.</p> <p>This standard has been endorsed with a notification published in the official bulletin of the Estonian Centre for Standardisation and Accreditation.</p> <p>Date of Availability of the European standard is 08.10.2025.</p> <p>The standard is available from the Estonian Centre for Standardisation and Accreditation.</p>
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ICS 23.040.01

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EUROPEAN STANDARD

EN 1555-1

NORME EUROPÉENNE

EUROPÄISCHE NORM

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Supersedes EN 1555-1:2021

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 European Standard was approved by CEN on 11 August 2025.

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

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Contents	Page
European foreword	3
Introduction	5
1 Scope	6
2 Normative references	6
3 Terms and definitions	8
3.1 Terms related to material characteristics	8
3.2 Terms related to service conditions	9
3.3 Terms related to joints	10
4 Symbols and abbreviated terms	10
4.1 Symbols	10
4.2 Abbreviated terms	11
5 Material	12
5.1 Material of the components	12
5.2 Compound	12
5.2.1 Additives and pigments	12
5.2.2 Colour	12
5.2.3 Characteristics	12
5.3 Fusion compatibility	18
5.4 Classification and designation	18
5.5 Design coefficient and design stress	19
Annex A (informative) Additional information related to the installation of PE 100-RC systems	20
A.1 Pipe material	20
A.2 Installation conditions	21
Annex B (informative) Additional information related to the suitability of PE pipe systems for 100 % hydrogen and its admixtures with natural gas	23
B.1 General	23
B.2 Chemical resistance	23
B.3 Permeation	24
Bibliography	28

European foreword

This document (EN 1555-1:2025) has been prepared by Technical Committee CEN/TC 155 “Plastics piping 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 April 2026, and conflicting national standards shall be withdrawn at the latest by April 2026.

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 1555-1:2021.

The main changes are as follows:

- terms and definitions have been distributed over EN 1555-1, EN 1555-2 and EN 1555-3;
- a conversion and normalisation step has been included to the requirement for the CRB;
- EN ISO 1183-3 has been introduced as alternative test method for the compound density;
- recommended stress ranges for the CRB and stress levels for the AFNCT have been added;
- the strip-bend test (ISO 21751) and the crush test (ISO 13955) have been added as alternative to ISO 13954;
- a requirement for the electrofusion compatibility has been added;
- information related to the suitability of PE pipe systems for 100 % hydrogen and its admixtures with natural gas has been added.

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*;

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.*

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).

Any feedback and questions on this document should be directed to the users’ national standards body. A complete listing of these bodies can be found on the CEN website.

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, 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, Türkiye and the United Kingdom.

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 materials and the general aspects of the plastics piping system.

Requirements and test methods for components of the piping system are specified in EN 1555-2, 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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1 Scope

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

NOTE For the purpose of this document the term gaseous fuels include for example natural gas, methane, butane, propane, hydrogen, manufactured gas, biogas, and mixtures of these gases.

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

In conjunction with EN 1555-2, 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 specified in EN 1555-5.

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

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.

EN 1555-2:2025, *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 12099, *Plastics piping systems — Polyethylene piping materials and components — Determination of volatile content*

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

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

- 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 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 13479:2022, *Polyolefin pipes for the conveyance of fluids — Determination of resistance to crack propagation — Test method for slow crack growth on notched pipes (ISO 13479:2022)*
- 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 11413:2019, *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 16770, *Plastics — Determination of environmental stress cracking (ESC) of polyethylene — Full-notch creep test (FNCT)*
- 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*

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

For the purposes of this document, the terms and definitions given in EN 1555-2, EN 1555-3 and the following apply.

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

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

3.1 Terms related to material characteristics

3.1.1

lower confidence limit of the predicted hydrostatic strength

σ_{LPL}

quantity that represents the 97,5 % lower confidence limit of the predicted hydrostatic strength at temperature θ and time t

Note 1 to entry: It is expressed in megapascals (MPa).

3.1.2

minimum required strength

MRS

value of the *lower confidence limit of the predicted hydrostatic strength* (3.1.1) at 20 °C and 50 years, rounded down to the next smaller value of the R10 series or the R20 series

Note 1 to entry: Only compounds with an MRS of 8 MPa or 10 MPa are specified in this document.

Note 2 to entry: The R10 series and the R20 series conform to ISO 3 [11].

Note 3 to entry: It is expressed in megapascals (MPa).

[SOURCE: EN ISO 12162:2009, 3.3, modified — Note 1 to entry has been removed and replaced with new Notes 1 to 3 to entry.]

3.1.3

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 of the predicted hydrostatic strength* (3.1.1)

3.1.4

design stress

σ_s

allowable stress for a given application at 20 °C, that is derived from the *minimum required strength*, MRS (3.1.2), by dividing it by the design coefficient, C (3.1.3)