



SLOVENSKI STANDARD
oSIST prEN 1555-3:2024
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Cevni sistemi iz polimernih materialov za oskrbo s plinastimi gorivi - Polietilen (PE) - 3. del: Fitingi

Plastics piping systems for the supply of gaseous fuels - Polyethylene (PE) - Part 3: Fittings

Kunststoff-Rohrleitungssysteme für die Gasversorgung - Polyethylen (PE) - Teil 3: Formstücke

Systèmes de canalisations en plastique pour la distribution de combustibles gazeux - Polyéthylène (PE) - Partie 3 : Raccords

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Plastics piping systems for the supply of gaseous fuels - Polyethylene (PE) - Part 3: Fittings

Systèmes de canalisations en plastique pour la
distribution de combustibles gazeux - Polyéthylène
(PE) - Partie 3 : Raccords

Kunststoff-Rohrleitungssysteme für die Gasversorgung
- Polyethylen (PE) - Teil 3: Formstücke

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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EUROPEAN COMMITTEE FOR STANDARDIZATION
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Contents	Page
European foreword	4
Introduction	5
1 Scope.....	6
2 Normative references.....	6
3 Terms and definitions	8
4 Symbols and abbreviated terms.....	9
5 Material	10
5.1 PE compound for fittings.....	10
5.2 Material for non-polyethylene parts.....	10
5.2.1 General.....	10
5.2.2 Metal parts.....	10
5.2.3 Sealing materials.....	11
5.2.4 Other materials.....	11
6 General characteristics	11
6.1 Appearance	11
6.2 Colour	11
6.3 Design.....	11
6.4 Appearance of factory-made joints	11
6.5 Electrical characteristics for electrofusion fittings	11
7 Geometrical characteristics	12
7.1 Measurement of dimensions.....	12
7.2 Dimensions of electrofusion socket fittings.....	12
7.2.1 Diameters and lengths of electrofusion sockets.....	12
7.2.2 Wall thicknesses.....	15
7.2.3 Out-of-roundness of the bore of a fitting (at any point).....	15
7.2.4 Spigots.....	15
7.2.5 Other dimensions.....	15
7.3 Dimensions of electrofusion saddle fittings.....	15
7.4 Dimensions of spigot end fittings.....	16
7.4.1 Diameters and lengths	16
7.4.2 Wall thickness of the fusion end.....	19
7.4.3 Wall thickness of the fitting body.....	19
7.4.4 Other dimensions.....	19
7.5 Design and dimensions of mechanical fittings.....	19
7.5.1 General.....	19
7.5.2 Mechanical fittings with polyethylene spigot ends	20
7.5.3 Mechanical fittings with polyethylene electrofusion sockets.....	20
7.5.4 Threads.....	20
8 Mechanical characteristics	20
8.1 General.....	20
8.2 Requirements.....	20
8.3 Performance requirements.....	24
9 Physical characteristics	25
9.1 Conditioning	25
9.2 Requirements.....	25

10	Performance requirements	26
11	Technical information	27
12	Marking	27
12.1	General	27
12.2	Minimum required marking of fittings.....	28
12.3	Additional marking.....	28
12.4	Fusion system recognition	28
13	Delivery conditions.....	29
Annex A	(informative) Examples of typical terminal connections for electrofusion fittings.....	30
Annex B	(normative) Short-term pressure test method	33
Annex C	(normative) Tensile test for fitting/pipe assemblies.....	35
Bibliography	37

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prEN 1555-3:2024 (E)

European foreword

This document (prEN 1555-3:2024) 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 supersedes EN 1555-3:2021.

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

Requirements and test methods for materials and components, other than fittings, are specified in EN 1555-1, EN 1555-2 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 1555-3:2024 (E)

1 Scope

This document specifies the characteristics of fusion fittings made from polyethylene (PE) as well as of mechanical fittings 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 1555-2, 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 for fittings of the following types:

- a) electrofusion socket fittings;
- b) electrofusion saddle fittings;
- c) spigot end fittings (for butt fusion using heated tools and electrofusion);
- d) mechanical fittings.

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.

NOTE 3 The fittings can be, for example, in the form of couplers, saddles, equal and reduced tees, reducers, elbows, bends or end caps.

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 682, *Elastomeric Seals — Materials requirements for seals used in pipes and fittings carrying gas and hydrocarbon fluids*

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

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

prEN 1555-2:2024, *Plastics piping systems for the supply of gaseous fuels — Polyethylene (PE) — Part 2: Pipes*

EN 1555-5:2024, *Plastics piping systems for the supply of gaseous fuels — Polyethylene (PE) — Part 5: Fitness for purpose of the system*

EN 10226-1, *Pipe threads where pressure tight joints are made on the threads — Part 1: Taper external threads and parallel internal threads — Dimensions, tolerances and designation*

EN 10226-2, *Pipe threads where pressure tight joints are made on the threads — Part 2: Taper external threads and taper internal threads — Dimensions, tolerances and designation*

EN ISO 228-1, *Pipe threads where pressure-tight joints are not made on the threads — Part 1: Dimensions, tolerances and designation (ISO 228-1)*

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 1167-1:2006, *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 1167-4, *Thermoplastics pipes, fittings and assemblies for the conveyance of fluids — Determination of the resistance to internal pressure — Part 4: Preparation of assemblies (ISO 1167-4)*

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

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 17778, *Plastics piping systems — Fittings, valves and ancillaries — Determination of gaseous flow rate/pressure drop relationships (ISO 17778)*

ISO 12176-5, *Plastics pipes and fittings — Equipment for fusion jointing polyethylene systems — Part 5: Two-dimensional data coding of components and data exchange format for PE piping systems*

ISO 13950, *Plastics pipes and fittings — Automatic recognition systems for electrofusion joints*

ISO 13951, *Plastics piping systems — Test method for the resistance of plastic pipe/pipe or pipe/fitting assemblies to tensile loading*

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 13955, *Plastics pipes and fittings — Crushing decohesion test for polyethylene (PE) electrofusion assemblies*

ISO 13956, *Plastics pipes and fittings — Decohesion test of polyethylene (PE) saddle fusion joints — Evaluation of ductility of fusion joint interface by tear test*

ISO 13957, *Plastics pipes and fittings — Polyethylene (PE) tapping tees — Test method for impact resistance*

prEN 1555-3:2024 (E)

ISO 17885:2021, *Plastics piping systems — Mechanical fittings for pressure piping systems — Specification*

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

3 Terms and definitions

For the purposes of this document, the terms and definitions given in prEN 1555-1:2024 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**electrofusion socket fitting**

fitting which contains one or more integrated heating elements, that are capable of transforming electrical energy into heat to realize a fusion joint with a spigot end or a pipe

3.2**electrofusion saddle fitting**

fitting which contains one or more integrated heating elements, that are capable of transforming electrical energy into heat to realize a fusion joint onto a pipe

3.2.1**tapping tee**

electrofusion saddle fitting (3.2) (top loading or wrap round) that contains a cutter to tap through the wall of the main pipe and remains in the body of this fitting

3.2.2**branch saddle**

electrofusion saddle fitting (3.2) (top loading or wrap round) that requires an ancillary cutting tool for drilling a hole in the adjoining main pipe

3.3**spigot end fitting**

fitting where the outside diameter of the spigot end is equal to the nominal outside diameter, d_n , of the corresponding pipe

3.4**mechanical fitting**

fitting for assembling plastics pipes with each other or with a metal pipe or fitting, that includes one or more compression zones to provide pressure integrity, leak tightness and resistance to end loads

[SOURCE: ISO 17885:2021, 3.1.1]

4 Symbols and abbreviated terms

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

A	contact area of the terminal for terminal connections of electrofusion fittings
A_d	percentage of decohesion (area)
C_1	outside diameter of the terminal shroud
C_2	diameter of the contact area of the terminal
C_3	internal diameter of the terminal shroud
C_4	maximum overall diameter of the base of the contact area
D_1	mean inside diameter in the fusion zone for electrofusion socket fittings mean outside diameter of fusion end piece for spigot end fittings
D_2	bore, i.e. the minimum diameter of the flow channel through the body of the fitting, for electrofusion socket fittings bore, i.e. the minimum diameter of the flow channel through the body of the fitting, for spigot end fittings
E_1	fusion face wall thickness
H	height of the saddle, which comprises the distance from the top of the main pipe to the top of the tapping tee or saddle for electrofusion saddle fittings internal depth of the terminal for terminal connections of electrofusion fittings
H_1	height of service pipe, which comprises the distance from the axis of the main pipe to the axis of the service pipe for electrofusion saddle fittings distance between the upper part of the terminal shroud and the contact area for terminal connections of electrofusion fittings
H_2	height of service pipe, which comprises the distance from the top of the main pipe to the axis of the service pipe for electrofusion saddle fittings height of the contact area for terminal connections of electrofusion fittings
L_d	percentage of decohesion (length)
L	width of the tapping tee, which comprises the distance between the axis of the main pipe and the plane of the mouth of the service tee for electrofusion saddle fittings
L_1	depth of penetration of the pipe or male end of a spigot fitting for electrofusion socket fittings cut-back length of fusion end piece for spigot end fittings
L_2	heated length within a socket as declared by the manufacturer to be the nominal length of the fusion zone for electrofusion socket fittings tubular length of fusion end piece for spigot end fittings