



SLOVENSKI STANDARD SIST EN 1555-3:2021

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Nadomešča:

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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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EUROPEAN STANDARD

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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 European Standard was approved by CEN on 7 June 2021.

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.

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EN 1555-3:2021 (E)

European foreword

This document (EN 1555-3:2021) 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of an identical text or by endorsement, at the latest by January 2022, and conflicting national standards shall be withdrawn at the latest by January 2022.

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 1555-3:2010+A1:2012.

In comparison with the previous version, the following technical modifications have been introduced:

- PE 100-RC type materials with enhanced resistance to slow crack growth have been added.
- Annex A of EN 1555-1:2021 now discusses the performance of this type of material and gives additional information for non-conventional installation techniques.
- Additional information for non-conventional installation techniques has been added.
- The size range has been increased to 800 mm diameter.
- Test methods have been updated.

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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). standards.iteh.ai/catalog/standards/sist/707cb98f-6950-4733-860a-24ad7230563a/sist-en-1555-3-2021

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*;
- 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 [1], 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, Turkey and the United Kingdom.

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EN 1555-3:2021 (E)**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 material and components, other than fittings, are specified in EN 1555-1:2021, EN 1555-2:2021 and EN 1555-4:2021.

Characteristics for fitness for purpose are covered in EN 1555-5:2021. CEN/TS 1555-7 [2] gives guidance for assessment of conformity. Recommended practice for installation is given in EN 12007-2 [1] prepared by CEN/TC 234.

This part of EN 1555 covers the characteristics of fittings.

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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.

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

In conjunction with Parts 1, 2, 4 and 5 of EN 1555, it is applicable to PE fittings, their joints and to 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 reference temperature of 20 °C for design purposes;
- b) an operating temperature between -20 °C and 40 °C.

NOTE 1 For operating temperatures between 20 °C and 40 °C, derating coefficients are defined in EN 1555-5:2021.

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.

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 socket fusion);
- d) mechanical fittings.

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

EN 1555-1:2021, *Plastics piping systems for the supply of gaseous fuels - Polyethylene (PE) - Part 1: General*

EN 1555-2:2021, *Plastics piping systems for the supply of gaseous fuels - Polyethylene (PE) - Part 2: Pipes*

EN 1555-5:2021, *Plastics piping systems for the supply of gaseous fuels - Polyethylene (PE) - Part 5: Fitness for purpose of the system*

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

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EN 1716, *Plastics piping systems - Polyethylene (PE) tapping tees - Test method for impact resistance of an assembled tapping tee*

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)*

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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 17885, *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, symbols and abbreviations given in EN 1555-1:2021 and the following apply.

ISO and IEC maintain terminological 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>

3.1

electrofusion socket fitting

polyethylene (PE) fitting which contains one or more integral 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

polyethylene (PE) fitting which contains one or more integral heating elements, that are capable of transforming electrical energy into heat to realise a fusion joint onto a pipe

3.2.1

tapping tee

electrofusion saddle fitting (top loading or wrap round) which contains an integral cutter, to cut through the wall of the main pipe, which remains in the body of this fitting

3.2.2

branch saddle

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

3.3

mechanical fitting

fitting, that generally includes a compression part to provide pressure integrity, leak tightness and resistance to end loads, for assembling polyethylene (PE) pipe to another PE pipe or any other element of the piping system

Note 1 to entry: A pipe-supporting sleeve providing a permanent support for a polyethylene (PE) pipe to prevent creep in the pipe wall under radial compressive forces, is applicable. The metallic parts of the fitting can be assembled to metallic pipes by screw-threads, compression joints, welded or flanged connections. In some cases the supporting sleeve at the same time constitutes a grip ring.

Note 2 to entry: The fitting can allow either a dismantable or permanently assembled joint.

Note 3 to entry: The mechanical fitting can be supplied for field assembly, typically as a material transition fitting, or pre-assembled by the manufacturer.

3.4

spigot end fitting

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

EN 1555-3:2021 (E)**4 Symbols and abbreviations**

For the purpose of this document the symbols and abbreviations given in EN 1555-1:2021 apply.

5 Material**5.1 Compound for fittings**

The PE compound from which the fittings are made shall be in accordance with EN 1555-1:2021.

The stress bearing parts shall only be made from virgin material conforming to EN 1555-1:2021.

Non-stress bearing PE parts shall be made from virgin material or reworked material from a compound with the same MRS or a mixture of both materials.

5.2 Material for non-polyethylene parts**5.2.1 General**

All components shall conform to the relevant EN standard(s). Alternative standards may be applied in cases where the suitable EN standard(s) do not exist. In all cases, fitness for purpose of the components shall be demonstrated.

The materials and the constituent elements used in making the fitting (including elastomers and any metal parts as may be used) shall be as resistant to the external and internal environments as the other elements of the piping system, and shall have an expected lifetime under the following conditions at least equal to that of the PE pipes conforming to EN 1555-2:2021 with which they are intended to be used:

- a) during storage;
- b) under the effect of the gas conveyed therein;
- c) with respect to the service environment and operating conditions.

The requirements for the level of material performance of non-polyethylene parts shall be at least as stringent as that of the PE compound for the piping system. Reworked materials shall not be used for stress bearing polymeric parts.

Non-stress bearing fitting parts, e.g. clamps for electrofusion saddle fittings, that only maintain a function during installation, are made from other materials or polyethylene.

Other materials used in fittings in contact with the PE pipe shall not adversely affect pipe performance or initiate stress cracking.

5.2.2 Metal parts

All metal parts susceptible to corrosion shall be adequately protected, providing this is necessary for the durability and function of the system.

When dissimilar metallic materials are used which can be in contact with moisture, steps shall be taken to avoid the possibility of galvanic corrosion.

5.2.3 Sealing materials

Elastomeric seals shall conform to EN 682.

If other sealing materials are used, they need to be proven for gas supply systems.