



SLOVENSKI STANDARD

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Cevni sistemi iz polimernih materialov za oskrbo z vodo in za odvodnjavanje in kanalizacijo pod tlakom - Polietilen (PE) - 3. del: Fitingi

Plastics piping systems for water supply, and for drains and sewers under pressure -
Polyethylene (PE) - Part 3: Fittings

Kunststoff-Rohrleitungssysteme für die Wasserversorgung und für Entwässerungs- und
Abwasserdruckleitungen - Polyethylen (PE) - Teil 3: Formstücke

Systèmes de canalisations en plastique pour l'alimentation en eau et pour les
branchements et les collecteurs d'assainissement avec pression - Polyéthylène (PE) -
Partie 3 : Raccords

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Plastics piping systems for water supply, and for drains and sewers under pressure - Polyethylene (PE) - Part 3: Fittings

Systèmes de canalisations en plastique pour
l'alimentation en eau et pour les branchements et les
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Wasserversorgung und für Entwässerungs- und
Abwasserdruckleitungen - Polyethylen (PE) - Teil 3:
Formstücke

This European Standard was approved by CEN on 10 December 2023.

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EN 12201-3:2024 (E)**European foreword**

This document (EN 12201-3:2024) has been prepared by Technical Committee CEN/TC 155 “Plastics piping systems and ducting systems”, the secretariat of which is held by NEN.

This 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of an identical text or by endorsement, at the latest by July 2024, and conflicting national standards shall be withdrawn at the latest by July 2024.

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 12201-3:2011+A1:2012.

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 12201 consists of the following parts:

- EN 12201-1, *Plastics piping systems for water supply, and for drains and sewers under pressure — Polyethylene (PE) — Part 1: General*;
- EN 12201-2, *Plastics piping systems for water supply, and for drains and sewers under pressure — Polyethylene (PE) — Part 2: Pipes*;
- EN 12201-3, *Plastics piping systems for water supply, and for drains and sewers under pressure — Polyethylene (PE) — Part 3: Fittings* (this document);
- EN 12201-4, *Plastics piping systems for water supply, and for drains and sewers under pressure — Polyethylene (PE) — Part 4: Valves for water supply systems*;
- EN 12201-5, *Plastics piping systems for water supply, and for drains and sewers under pressure — Polyethylene (PE) — Part 5: Fitness for purpose of the system*.

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

- CEN/TS 12201-7, *Plastics piping systems for water supply, and for drainage and sewerage under pressure — Polyethylene (PE) — Part 7: Guidance for the assessment of conformity*.

The revision of this System Standard has been carried out principally to add the PE 100-RC type materials with enhanced resistance to slow crack growth. EN 12201-1:2024, Annex C discusses the performance of this type of material and gives additional information for non-conventional installation techniques. In addition, the size range has been increased for fabricated fittings, test methods have been updated.

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.

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EN 12201-3:2024 (E)**Introduction**

This document specifies the requirements for a piping system and its components made from polyethylene (PE), intended to be used for water supply intended for human consumption, including the conveyance of raw water prior to treatment, drains and sewers under pressure, vacuum sewer systems, and water for other purposes.

In respect of potential adverse effects on the quality of water intended for human consumption, caused by the product covered by the EN 12201 series:

- this document provides no information as to whether the products may be used without restriction in any of the Member States of the EU or EFTA.

NOTE Attention is drawn to the presence of national regulations and testing arrangements in relation to products intended for use in water supply to ensure fitness for contact with drinking water.

Requirements and test methods for material and components, other than fittings, are specified in EN 12201-1, EN 12201-2 and EN 12201-4 [1].

Characteristics for fitness of purpose of the system are covered in EN 12201-5. CEN/TS 12201-7 [2] gives guidance for the assessment of conformity.

This part of EN 12201 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 buried and above ground applications, intended for the conveyance of water for human consumption, raw water prior to treatment, drains and sewers under pressure, vacuum sewer systems, and water for other purposes, with the exception of industrial application.

NOTE 1 For PE components intended for the conveyance of water for human consumption and raw water prior to treatment, attention is drawn to subclause 6.6 of this document. Components manufactured for water for other purposes, drains and sewers, and vacuum sewer systems are possibly not suitable for water supply for human consumption.

NOTE 2 Industrial application is covered by EN ISO 15494 [4].

The intended uses include sea outfalls, laid in water and pipes suspended below bridges.

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

In conjunction with EN 12201-1, EN 12201-2, EN 12201-4 and EN 12201-5, 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) allowable operating pressure, PFA, up to 25 bar ¹;
- b) an operating temperature of 20 °C as a reference temperature.

NOTE 3 For applications operating at constant temperature greater than 20 °C and up to and including 50 °C, see EN 12201-1:2024, Annex A.

The EN 12201 series covers a range of allowable operating pressures and gives requirements concerning colours.

NOTE 4 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.

These fittings can be of the following types:

- electrofusion socket fittings;
- electrofusion saddle fittings;
- spigot end fittings (for butt fusion using heated tools and electrofusion socket fusion);
- socket fusion fittings (see Annex A);
- mechanical fittings;
- fabricated fittings (see Annex B).

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

EN 12201-3:2024 (E)**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 681-1, *Elastomeric seals — Materials requirements for pipe joint seals used in water and drainage applications — Part 1: Vulcanized rubber*

EN 12201-1:2024, *Plastics piping systems for water supply, and for drains and sewers under pressure — Polyethylene (PE) — Part 1: General*

EN 12201-2:2024, *Plastics piping systems for water supply, and for drains and sewers under pressure — Polyethylene (PE) — Part 2: Pipes*

EN 12201-5, *Plastics piping systems for water supply, and for drains and sewers under pressure — Polyethylene (PE) — Part 5: Fitness for purpose of the system*

CEN/TR 15438, *Plastics piping systems — Guidance for coding of products and their intended uses*

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 1167-3, *Thermoplastics pipes, fittings and assemblies for the conveyance of fluids — Determination of the resistance to internal pressure — Part 3: Preparation of components (ISO 1167-3)*

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)*

ISO 4433-1, *Thermoplastics pipes — Resistance to liquid chemicals — Classification — Part 1: Immersion test method*

ISO 4433-2, *Thermoplastics pipes — Resistance to liquid chemicals — Classification — Part 2: Polyolefin pipes*

ISO 9624, *Thermoplastics piping systems for fluids under pressure — Flange adapters and loose backing flanges — Mating dimensions*

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*

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

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 EN 12201-1 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

polyethylene (PE) 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

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

3.2.1

tapping tee

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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

polyethylene (PE) 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]

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3.5

fabricated fitting

fitting produced from pipe conforming to EN 12201-2 and/or from injection-moulded fittings in accordance with this document

4 Symbols and abbreviated terms

For the purposes of this document, the symbols and abbreviations given in EN 12201-1 apply.

5 Material

5.1 PE compound for fittings

The stress-bearing PE parts of injection moulded fittings or compression moulded plates, for example the main body of the fitting, shall only be made from virgin material conforming to EN 12201-1. The stress-bearing PE parts of fittings made from pipe shall be made from pipe conforming to EN 12201-2, except for the geometrical characteristics.

Other materials may be used for non-stress bearing parts, e.g. clamps for electrofusion saddles fittings, that only maintain a function during installation.

A fitting can only be designated as a PE 100-RC fitting if it is produced from PE 100-RC materials, which fulfil the requirements of EN 12201-1:2024 Tables 1 and 2, and is declared as PE 100-RC by the raw material producer, and fulfil the requirements of Table 4 of this document for PE 100-RC.

5.2 Material for non-polyethylene parts

5.2.1 General

All components shall conform to the relevant European Standard(s). Alternative standards may be applied in cases where suitable European Standards do not exist. In all cases, fitness for purpose of the system 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 12201-2 with which they are intended to be used:

- a) during storage;
- b) under the effect of the fluids being 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 parts.

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

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, steps shall be taken to avoid the possibility of galvanic corrosion.