



# SLOVENSKI STANDARD

## SIST EN 12201-3:2011+A1:2013

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Nadomešča:  
SIST EN 12201-3:2011

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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 drainage and sewerage under pressure - Polyethylene (PE) - Part 3: Fittings

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

Systemes 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

Ta slovenski standard je istoveten z: EN 12201-3:2011+A1:2012

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NORME EUROPÉENNE  
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**EN 12201-3:2011+A1**

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## Plastics piping systems for water supply, and for drainage and sewerage under pressure - Polyethylene (PE) - Part 3: Fittings

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

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

This European Standard was approved by CEN on 8 July 2011 and includes Amendment 1 approved by CEN on 4 September 2012.

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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Management Centre: Avenue Marnix 17, B-1000 Brussels

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## EN 12201-3:2011+A1:2012 (E)

## Foreword

This document (EN 12201-3:2011+A1:2012) 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 May 2013, and conflicting national standards shall be withdrawn at the latest by May 2013.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. CEN [and/or CENELEC] shall not be held responsible for identifying any or all such patent rights.

This document includes Amendment 1 approved by CEN on 4 September 2012.

This document supersedes <sup>A1</sup> EN 12201-3:2011 <sup>A1</sup>.

The start and finish of text introduced or altered by amendment is indicated in the text by tags <sup>A1</sup> <sup>A1</sup>.

<sup>A1</sup> Due to Amendment 1 to EN 12201-3:2011, this document comprises technical changes to:

— Subclause 7.3, Requirements. <sup>A1</sup>

## ITh STANDARD PREVIEW

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).

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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 drainage and sewerage under pressure — Polyethylene (PE) — Part 1: General*;
- EN 12201-2, *Plastics piping systems for water supply, and for drainage and sewerage under pressure — Polyethylene (PE) — Part 2: Pipes*;
- EN 12201-3, *Plastics piping systems for water supply, and for drainage and sewerage under pressure — Polyethylene (PE) — Part 3: Fittings (this standard)*;
- EN 12201-4, *Plastics piping systems for water supply, and for drainage and sewerage under pressure — Polyethylene (PE) — Part 4: Valves for water supply systems*;
- EN 12201-5, *Plastics piping systems for water supply, and for drainage and sewerage under pressure — Polyethylene (PE) — Part 5: Fitness for purpose of the system*;
- CEN/TS 12201-7, *Plastics piping systems for water supply — Polyethylene (PE) — Part 7: Guidance for the assessment of conformity*.

In this revision the test methods have been updated as appropriate and in accordance with other parts of this standard.

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, Former Yugoslav Republic of Macedonia, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey and the United Kingdom.

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**EN 12201-3:2011+A1:2012 (E)****Introduction**

The System Standard, of which this is Part 3, specifies the requirements for a piping system and its components when made from polyethylene (PE), intended to be used for water supply intended for human consumption, including the conveyance of raw water prior to treatment, drainage and sewerage 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 EN 12201 (all parts):

- a) this European Standard provides no information as to whether the products may be used without restriction in any of the Member States of the EU or EFTA;
- b) products intended for use in water supply systems must comply, when existing, with national regulations and testing arrangements that ensure fitness for contact with drinking water.

NOTE On April 2006, EC Commission set up a revised mandate (M/136) asking CEN to propose harmonised product standards and support standards for test methods which could be used for assessing the fitness for contact with drinking water. In parallel, EC Commission has launched processes for a regulation of construction products (CPR) to be substituted to CP directive (89/106/EEC) and for the revision of drinking water directive (98/83/EC). If relevant, when the outputs of these processes will be known, European Product Standards will be amended by the addition of an Annex Z under Mandate M136 which will contain formal references to the applicable requirements. Until such amendments, the current national regulations remain applicable.

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Requirements and test methods for material and components, other than fittings, are specified in EN 12201-1, EN 12201-2 and prEN 12201-4:2011.

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Characteristics for fitness of purpose 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.



## 1 Scope

This <sup>A1</sup> European Standard <sup>A1</sup> specifies the characteristics of fittings made from polyethylene (PE 100 and PE 80) intended for the conveyance of water for human consumption, raw water prior to treatment, drainage and sewerage under pressure, vacuum sewer systems, and water for other purposes.

NOTE 1 For PE components intended for the conveyance of water for human consumption and raw water prior to treatment, attention is drawn to 5.6 of this part of EN 12201. Components manufactured for water for other purposes, drainage and sewerage may not be suitable for water supply for human consumption.

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

In conjunction with Parts 1, 2, 4 and 5 of EN 12201, 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) allowable operating pressure, PFA, up to 25 bar <sup>1)</sup>;
- b) an operating temperature of 20 °C as a reference temperature;
- c) buried in the ground;
- d) sea outfalls;
- e) laid in water;
- f) above ground, including pipes suspended below bridges.

NOTE 2 For applications operating at constant temperature greater than 20 °C and up to 40 °C, see Annex A of EN 12201-1:2011.

EN 12201 (all parts) covers a range of allowable operating pressures and gives requirements concerning colours and additives.

NOTE 3 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:

- a) fusion fittings;
  - 1) electrofusion fittings;
  - 2) spigot end fittings (for butt fusion using heated tools and electrofusion socket fusion);
  - 3) socket fusion fittings (see Annex A);
- b) mechanical fittings;
  - 1) compression fittings;
  - 2) flanged fittings;
- c) fabricated fittings (see Annex B).

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1) 1 bar = 0,1 MPa = 10<sup>5</sup> Pa; 1 MPa = 1 N/mm<sup>2</sup>.

## EN 12201-3:2011+A1:2012 (E)

## 2 Normative references

<sup>[A1]</sup> The following documents, in whole or in part, are normatively referenced in this document and are indispensable for its application. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies. <sup>[A1]</sup>

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

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

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

EN 12201-2:2011, *Plastics piping systems for water supply, and for drainage and sewerage under pressure — Polyethylene (PE) — Part 2: Pipes*

EN 12201-5, *Plastics piping systems for water supply, and for drainage and sewerage 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, *Plastics — Determination of the melt mass-flow rate (MFR) and the melt volume-flow rate (MVR) of thermoplastics (ISO 1133:2005)*

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 1167-1:2006)*

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 1167-3:2007)*

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 1167-4:2007)*

EN ISO 3126, *Plastics piping systems — Plastics components — Determination of dimensions (ISO 3126:2005)*

ISO 4059:1978, *Polyethylene (PE) pipes — Pressure drop in mechanical pipe-jointing systems — Method of test and requirements*

ISO 4433-1:1997, *Thermoplastics pipes — Resistance to liquid chemicals — Classification — Part 1: Immersion test method*

ISO 4433-2:1997, *Thermoplastics pipes — Resistance to liquid chemicals — Classification — Part 2: Polyolefin pipes*

ISO 9624, *Thermoplastics pipes for fluids under pressure — Mating dimensions of flange adapters and loose backing flanges*

ISO 11357-6, *Plastics — Differential scanning calorimetry (DSC) — Part 6: Determination of oxidation induction time (isothermal OIT) and oxidation induction temperature (dynamic OIT)*

ISO 12176-1, *Plastics pipes and fittings — Equipment for fusion jointing polyethylene systems — Part 1: Butt fusion*

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

ISO 13951, *Plastics piping systems — Test method for the resistance of polyolefin 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 14236, *Plastics pipes and fittings — Mechanical-joint compression fittings for use with polyethylene pressure pipes in water supply systems*

### 3 Terms and definitions, symbols and abbreviations

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

#### 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 produce a fusion joint with a spigot end or 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 produce a fusion joint with the pipe

#### 3.2.1

##### **tapping tee**

electrofusion saddle fitting (top-loading or wraparound) which contains an integral cutter used for cutting through the wall of the main pipe, which remains in the body of the tapping tee after installation

#### 3.2.2

##### **branch saddle**

electrofusion saddle fitting (top loading or wrap round) which requires an ancillary cutting tool for drilling the 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, that generally includes a compression part to provide pressure integrity, leaktightness and resistance to end loads, for assembling polyethylene (PE) pipe to another PE pipe or any other element of the piping system

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

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NOTE 2 The fitting can allow either a dismantable or permanently assembled joint.

NOTE 3 The mechanical fitting can be supplied for field assembly or pre-assembled by the manufacturer.

**3.5 fabricated fitting**  
fitting produced from pipe conforming to EN 12201-2 and/or from injection-moulded fittings in accordance with this part of EN 12201

**3.6 voltage regulation**  
control of energy supplied, during the fusion process of an electrofusion fitting, by means of the voltage parameter

**3.7 intensity regulation**  
control of energy supplied, during the fusion process of an electrofusion fitting, by means of the current parameter

**4 Material****4.1 PE compound**

The PE compound from which the fittings are made shall conform to EN 12201-1.

The stress bearing parts shall only be made from virgin material conforming to EN 12201-1.

**4.2 Material for non-polyethylene parts****4.2.1 General**

All components shall conform to the relevant European Standard(s). Alternative standards may be utilised in cases where suitable European Standards do not exist provided that the fitness for purpose can be demonstrated.

The materials and constituent elements used in making the fitting (including elastomers, greases, and any metal parts) shall be as resistant to the external and internal environments as the other elements of the piping system and shall have a life expectancy under the following conditions at least equal to that of the PE pipe 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;
- c) taking account of the service environment and operating conditions.

The requirements for the level of material performance for non-polyethylene parts shall be at least as stringent as that of the PE compound for the piping system.

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

NOTE Subclause 4.2 does not apply to non-stress bearing fitting parts.

#### 4.2.2 Metal parts

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

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

#### 4.2.3 Elastomers

Elastomeric materials used for the manufacture of seals shall conform to EN 681-1.

#### 4.2.4 Other materials

Greases or lubricants shall not exude on to the fusion areas, and shall not affect the long-term performance of the fitting nor have any adverse effect on the quality of the water.

### 5 General characteristics

#### 5.1 Appearance

When viewed without magnification, the internal and external surfaces of the fitting shall be smooth, clean and free from scoring, cavities and other surface defects to an extent that would prevent conformity of the fitting to this standard.

No component of the fitting shall show any signs of damage, scratches, pitting, bubbles, blisters, inclusions or cracks to an extent that would prevent conformity of the fittings to the requirements of this standard.

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#### 5.2 Design

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The design of the fitting shall be such that, when assembling the fitting onto the pipe or other components, the electrical coils and/or seals are not displaced.

#### 5.3 Colour

The fitting shall be black or blue. For fabricated fittings the colour characteristics of pipes according to EN 12201-2 applies.

NOTE For above ground installations, all blue components should be protected from direct UV light.

#### 5.4 Electrical characteristics for electrofusion fittings

The electrical protection that shall be provided by the system depends on the voltage and the current intensity used and on the characteristics of the electrical power source.

For voltages greater than 25 V, direct human contact with the energised parts shall not be possible when the fitting is in the fusion cycle during assembly in accordance with the instructions of the manufacturer of the fittings and the assembly equipment, as applicable.

NOTE 1 This type of fitting is a part of an electrical system as defined in EN 60335-1 [3], IEC 60364-1 [5] and IEC 60449 [6]. A protection against direct contacts with active parts (live conductors) is required for conformity to EN 60529 [4]. This protection is a function of the work site conditions.

NOTE 2 See Annex C for examples of typical electrofusion terminal connectors.