SLOVENSKI STANDARD
SIST EN 12201-2:2011

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Nadomešča:
SIST EN 12201-2:2003
SIST EN 13244-2:2003

Cevni sistemi iz polimernih materialov za oskrbo z vodo in za odvodnjavanje in kanalizacijo pod tlakom - Polietilen (PE) - 2. del: Cevi

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

Kunststoff-Rohrleitungssysteme für die Wasserversorgung und für Entwässerungs- und Abwasserdruckleitungen - Polyethylen (PE) - Teil 2: Rohre

Systèmes de canalisations en plastique pour l'alimentation en eau et pour les branchements et les collecteurs d'assainissement avec pression - Polyéthylène (PE) - Partie 2: Tubes

Ta slovenski standard je istoveten z: **EN 12201-2:2011**

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91.140.60	Sistemi za oskrbo z vodo	Water supply systems
93.030	Zunanji sistemi za odpadno vodo	External sewage systems

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EUROPEAN STANDARD

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English Version

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

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This European Standard was approved by CEN on 8 July 2011.

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.

This European Standard exists in three official versions (English, French, German). A version in any other language made by translation under the responsibility of a CEN member into its own language and notified to the CEN-CENELEC Management Centre has the same status as the official versions.

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COMITÉ EUROPÉEN DE NORMALISATION
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Contents

Foreword

This document (EN 12201-2:2011) 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 March 2012, and conflicting national standards shall be withdrawn at the latest by March 2012.

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 supersedes EN 12201-2:2003, EN 13244-2:2002.

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 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* (this standard);

— EN 12201-3:, *Plastics piping systems for water supply, and for drainage and sewerage under pressure — Polyethylene (PE) — Part 3: Fittings*;

— 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 scope of this standard includes two additional types of pipe;-

— PE pipes with co-extruded layers on either or both the outside and/or inside of the pipe as specified in Annex B, where all layers have the same MRS rating;

— PE pipes with a peelable, contiguous thermoplastics additional layer on the outside of the pipe (‘coated pipe’) as specified in Annex C.

In this revision, pipe diameters specified have been increased to 2500 mm. 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 organizations 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, Romania, Slovakia, Slovenia, Spain, Sweden, Switzerland and the United Kingdom.

Introduction

The System Standard, of which this is Part 2, specifies the requirements for a piping system and its components when made from polyethylene (PE). The piping system is 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 standard provides no information as to whether the product 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.

Requirements and test methods for material and components, other than pipes, are specified in EN 12201-1:2011, EN 12201-3:2011 [1] and prEN 12201-4:2011 [2].

Characteristics for fitness of purpose are covered in EN 12201-5:2011 and CEN/TS 12201-7 [3] gives guidance for the assessment of conformity.

This Part of EN 12201 covers the characteristics of pipes.

1 Scope

This part of EN 12201 specifies the characteristics of pipes made from polyethylene (PE 100, PE 80 and PE 40) for buried and above ground applications, 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 5.3 of this European Standard. Components manufactured for water for general 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 Part 1 and Parts 3 to 5 of EN 12201, it is applicable to PE pipes, 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 [1)];

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 temperatures greater than 20 °C and up to 40 °C, see Annex A of EN 12201-1:2011.

NOTE 3 Pipes constructions including barrier layers are not covered by this document.

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

It covers three types of pipe:

— PE pipes (outside diameter d_n) including any identification stripes;

— PE pipes with co-extruded layers on either or both the outside and/or inside of the pipe (total outside diameter d_n) as specified in Annex B, where all layers have the same MRS rating;

— PE pipes (outside diameter d_n) with a peelable, contiguous thermoplastics additional layer on the outside of the pipe ('coated pipe') as specified in Annex C.

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.

NOTE 5 Assessment of the resistance to slow crack growth of the PE pipe compound used for the manufacture of products to this document is required in accordance with Table 2 of EN 12201-1:2011.

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

2 Normative references

The following referenced documents are indispensable for the application 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 12201-1:2011, *Plastics piping systems for water supply, and for drainage and sewerage under pressure — Polyethylene (PE) — Part 1: General*

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 1167-2, *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 1167-2:2006)*

EN ISO 2505, *Thermoplastics pipes – Longitudinal reversion – Test method and parameters (ISO 2505:2005)*

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

EN ISO 6259-1, *Thermoplastics pipes — Determination of tensile properties — Part 1: General test method (ISO 6259-1:1997)*

EN ISO 9969, *Thermoplastics pipes — Determination of ring stiffness (ISO 9969:2007)*

EN ISO 13968, *Plastics piping and ducting systems —Thermoplastics pipes — Determination of ring flexibility (ISO 13968:2008)*

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 6259-3:1997, *Thermoplastics pipes — Determination of tensile properties — Part 3: Polyolefin pipes*

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

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 apply.

4 Material

4.1 Compound

The pipes shall be made from virgin material or own reprocessable material from the same PE compound or a mixture of both materials. Reprocessable material from pipes reprocessed with the peelable layer attached shall not be used. Own reprocessed material from the base pipe of peelable layer pipes can be used. For information on reprocessed material from coextruded pipe see B.1.

The compound(s) from which the pipes are made shall conform to EN 12201-1.

4.2 Compound for identification stripes

For black pipe with identification stripes (see 5.2), the compound used for these identification stripes shall be made from the same base polymer (PE) as one of the pipe compounds for which fusion compatibility has been proven.

5 General characteristics

5.1 Appearance

When viewed without magnification the internal and external surfaces of pipes shall be smooth and clean and shall have no scoring, cavities, and other surface defects to an extent that would prevent conformity to this standard.

The ends of the pipe shall be cut cleanly and square to the axis of the pipe.

5.2 Colour

Pipes intended for the conveyance of water for human consumption shall be black or blue. In addition, black pipes may be identified by blue stripes, according to national preference.

Blue pipes or black pipes with blue stripes are intended for the conveyance of water for human consumption only.

Pipes intended for other purposes, drainage and sewerage shall be black or black with brown stripes or according to national preference.

The outer coextruded layer of coextruded pipes (see Annex B) or the outer peelable layer of peelable layer pipes (see Annex C) for pipe intended for the conveyance of water for human consumption shall be either black or blue. In addition identification stripes may be used according to national preference for the application.

The outer coextruded layer of coextruded pipes (see Annex B) or the outer peelable layer of peelable layer pipes (see Annex C) for pipe intended for other purposes shall be either black or black with brown stripes or brown or according to national preference. In addition identification stripes of a different colour may be used according to national preference for the application.

NOTE 1 In some countries, pipes made from non-pigmented compound in conjunction with an external peelable layer are permitted, providing the compound conforms to the requirements of this standard. If this is allowed in a country, this should be clearly stated in the national foreword.

NOTE 2 For above ground installations, all components other than black should be protected from direct UV light.

NOTE 3 The national preference for colour should be stated in the National Foreword.

5.3 Effect on water quality

For compounds intended to be used for components in contact with water for human consumption, attention is drawn to the requirements of national regulations.

6 Geometrical characteristics

6.1 Measurements

The dimensions of the pipe shall be measured in accordance with EN ISO 3126 and rounded to the next 0,1 mm. In the case of dispute the measurements of dimensions shall be made not less than 24 h after manufacture after being conditioned for at least 4 h at (23 ± 2) °C.

NOTE 1 Indirect measurement during the stage of production is allowed at shorter time periods providing evidence is shown of correlation.

NOTE 2 The national preference for pipe size and PN rating may be given in the National Foreword.

6.2 Mean outside diameter, out-of-roundness (ovality) and tolerances

The mean outside diameters, d_{em}, and the out-of-roundness (ovality) shall be in accordance with Table 1. For coiled pipes, the maximum out-of roundness shall be specified by agreement between the manufacturer and the end-user.

Pipe extruded from PE 40 materials shall be limited to diameters up to and including 63 mm.

NOTE 1 In some countries pipe in PE 40 materials may be used in diameters up to and including 90 mm. If this is the case this should be stated in the National Foreword.