



# SLOVENSKI STANDARD

## SIST EN 12201-1:2003

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**Cevni sistemi iz polimernih materialov za oskrbo z vodo - Polietilen (PE) - 1. del:  
Splošno**

Plastics piping systems for water supply - Polyethylene (PE) - Part 1: General

Kunststoff-Rohrleitungssysteme für die Wasserversorgung - Polyethylen (PE) - Teil 1:  
Allgemeines

Systemes de canalisations en plastiques pour alimentation en eau - Polyéthylène (PE) -  
Partie 1: Généralités

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**SIST EN 12201-1:2003**

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EUROPEAN STANDARD  
NORME EUROPÉENNE  
EUROPÄISCHE NORM

**EN 12201-1**

March 2003

ICS 23.040.01; 91.140.60

English version

**Plastics piping systems for water supply - Polyethylene (PE) -  
Part 1: General**

Systèmes de canalisations en plastiques pour alimentation  
en eau - Polyéthylène (PE) - Partie 1: Généralités

Kunststoff-Rohrleitungssysteme für die Wasserversorgung -  
Polyethylen (PE) - Teil 1: Allgemeines

This European Standard was approved by CEN on 27 December 2002.

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 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 Management Centre has the same status as the official versions.

CEN members are the national standards bodies of Austria, Belgium, Czech Republic, Denmark, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Luxembourg, Malta, Netherlands, Norway, Portugal, Slovakia, Spain, Sweden, Switzerland and United Kingdom.

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## EN 12201-1:2003 (E)

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## Foreword

This document EN 12201-1:2003 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 September 2003, and conflicting national standards shall be withdrawn at the latest by March 2005.

This standard is a Part of a System Standard for plastics piping systems of a particular material for a specified application. There are a number of such System Standards.

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 standards on general functional requirements and standards on recommended practice for installation.

This European Standard consists of the following Parts, under the general title *Plastics piping systems for water supply — Polyethylene (PE)*:

— Part 1: General (this standard).

— Part 2: Pipes.

— Part 3: Fittings.

— Part 4: Valves.

— Part 5: Fitness for purpose of the system.

— Part 7: Guidance for the assessment of conformity.<sup>1)</sup>

NOTE It was decided not to publish a Part 6: Recommended practice for installation. Instead, existing national practices would be applicable.

This Part of this European Standard includes the following:

— Annex A (informative): Pressure reduction coefficients;

— Bibliography.

System Standards for piping systems of other plastics materials used for the conveyance of water under pressure include the following:

EN 1452, *Plastics piping systems for water supply — Unplasticized poly(vinyl chloride) (PVC-U)*.

prEN 1796, *Plastics piping systems for water supply with or without pressure — Glass-reinforced thermosetting plastics (GRP) based on polyester resin (UP)*.

For components which have conformed to the relevant national standard before [DAV], as shown by the manufacturer or by a certification body, the national standard may continue to be applied until the [DAV + 24 months].

According to the CEN/CENELEC Internal Regulations, the national standards organizations of the following countries are bound to implement this European Standard : Austria, Belgium, Czech Republic, Denmark, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Luxembourg, Malta, Netherlands, Norway, Portugal, Slovak Republic, Spain, Sweden, Switzerland and the United Kingdom.

<sup>1)</sup> to be published as a Technical Specification

**EN 12201-1:2003 (E)****Introduction**

The System Standard, of which this is Part 1, specifies the requirements for a piping system and its components when made from polyethylene (PE). It is intended to be used for water supply intended for human consumption, including the conveyance of raw water prior to treatment.

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

- a) this 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) it should be noted that, while awaiting the adoption of verifiable European criteria, existing national regulations concerning the use and/or the characteristics of these products remain in force.

Requirements and test methods for components of the piping system are specified in EN 12201-2, EN 12201-3 and EN 12201-4.

Characteristics for fitness for purpose are covered in EN 12201-5. PrCEN/TS 12201-7 gives guidance for the assessment of conformity.

This Part of EN 12201 covers the general aspects of the plastics piping system.

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## 1 Scope

This Part of this European Standard specifies the general aspects of polyethylene (PE) piping systems (mains and service pipes) intended for the conveyance of water for human consumption, including raw water prior to treatment.

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

In conjunction with other Parts of this European Standard it is applicable to PE pipes, fittings, valves, their joints and to joints with components of other materials intended to be used under the following conditions:

- a) a maximum operating pressure, MOP, up to 25 bar <sup>2)</sup>;
- b) an operating temperature of 20 °C as a reference temperature.

NOTE 1 For applications operating at constant temperatures greater than 20 °C and up to 40 °C, see annex A.

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

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 guidance or regulations and installation practices or codes.

## 2 Normative references

This European Standard incorporates by dated or undated reference, provisions from other publications. These normative references are cited at the appropriate places in the text, and the publications are listed hereafter. For dated references, subsequent amendments to or revisions of any of these publications apply to this European Standard only when incorporated in it by amendment or revision. For undated references the latest edition of the publication referred to applies (including amendments).

EN 728, *Plastics piping and ducting systems — Polyolefin pipes and fittings — Determination of oxidation induction time*.

EN 921:1994, *Plastics piping systems — Thermoplastics pipes — Determination of resistance to internal pressure at constant temperature*.

EN 1056, *Plastics piping and ducting systems — Plastics pipes and fittings - Method for exposure to direct (natural) weathering*.

EN 12099, *Plastics piping systems — Polyethylene piping materials and components — Determination of volatile content*.

EN 12107, *Plastics piping systems — Injection-moulded thermoplastics fittings, valves and ancillary equipment — Determination of the long-term hydrostatic strength of thermoplastics materials for injection moulding of piping components*.

EN 12118, *Plastics piping systems — Determination of moisture content in thermoplastics by coulometry*.

EN 12201-2:2003, *Plastics piping systems for water supply — Polyethylene (PE) — Part 2: Pipes*.

EN ISO 472:2001, *Plastics — Vocabulary (ISO 472:1999)*.

EN ISO 1043-1:2001, *Plastics — Symbols and abbreviated terms — Part 1: Basic polymers and their special characteristics (ISO 1043-1:2001)*.

EN ISO 1133:1999, *Plastics — Determination of the melt mass-flow rate (MFR) and the melt volume-flow rate (MVR) of thermoplastics (ISO 1133:1997)*.

EN ISO 6259-1:2001, *Thermoplastics pipes — Determination of tensile properties — Part 1: General test method (ISO 6259-1:1997)*.

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2) 1 bar = 10<sup>5</sup> N/m<sup>2</sup>

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EN ISO 12162:1995, *Thermoplastics materials for pipes and fittings for pressure applications — Classification and designation — Overall service (design) coefficient (ISO 12162: 1995).*

EN ISO 13478:1997, *Thermoplastics pipes for the conveyance of fluids — Determination of resistance to rapid crack propagation (RCP) — Full-scale test (FST) (ISO 13478:1997).*

EN ISO 13479:1997, *Polyolefin pipes for the conveyance of fluids — Determination of resistance to crack propagation — Test method for slow crack growth on notched pipes (notch test) (ISO 13479:1997).*

ISO 3:1973, *Preferred numbers — Series of preferred numbers.*

ISO 1183:1987, *Plastics — Methods for determining the density and relative density of non-cellular plastics.*

ISO 4065, *Thermoplastics pipes — Universal wall thickness table.*

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

ISO 6964:1986, *Polyolefin pipes and fittings — Determination of carbon black content by calcination and pyrolysis — Test method and basic specification.*

ISO/TR 9080:1992, *Thermoplastics pipes for the transport of fluids — Methods of extrapolation of hydrostatic stress rupture data to determine the long-term hydrostatic strength of thermoplastics pipe materials.*

ISO 11414:1996, *Plastics pipes and fittings — Preparation of polyethylene (PE) pipe/pipe or pipe/fitting test piece assemblies by butt fusion.*

ISO 13477:1997, *Thermoplastics pipes for the conveyance of fluids — Determination of resistance to rapid crack propagation (RCP) — Small-scale steady-state test (S4 test).*

ISO 13953:2001, *Polyethylene (PE) pipes and fittings — Determination of the tensile strength and failure mode of test pieces from a butt-fused joint.*

ISO 18553:2002, *Method for the assessment of the degree of pigment or carbon black dispersion in polyolefin pipes, fittings and compounds.*

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**3 Terms and definitions, symbols and abbreviations****3.1 Terms and definitions**

For the purposes of this European Standard, the terms and definitions given in ISO 3:1973, EN ISO 472:2001, and EN ISO 1043-1:2001 together with the following apply.

NOTE The symbols  $d_e$ ,  $e$ ,  $e_{\min}$  and  $e_{\max}$  in EN 12201 are equivalent to  $d_{ey}$ ,  $e_y$ ,  $e_{y,\min}$  and  $e_{y,\max}$  respectively in ISO 11922-1 [1].

**3.1.1 Geometrical characteristics****3.1.1.1****nominal size DN**

numerical designation of the size of a component, other than a component designated by a thread size, which is a convenient round number, approximately equal to the manufacturing dimension in millimetres (mm)

**3.1.1.2****nominal size DN/OD**

nominal size, related to the outside diameter

**3.1.1.3****nominal outside diameter ( $d_n$ )**

specified outside diameter, in millimetres, assigned to a nominal size DN/OD



**3.1.1.4****outside diameter at any point ( $d_e$ )**

value of the measurement of the outside diameter through its cross-section at any point of the pipe, rounded to the next greater 0,1 mm

**3.1.1.5****mean outside diameter ( $d_{em}$ )**

value of the measurement of the outer circumference of the pipe or spigot end of a fitting in any cross section divided by  $\pi$  (= 3,142), rounded to the next greater 0,1 mm

**3.1.1.6****minimum mean outside diameter ( $d_{em,min}$ )**

minimum value of the outside diameter as specified for a given nominal size

**3.1.1.7****maximum mean outside diameter ( $d_{em,max}$ )**

maximum value of the outside diameter as specified for a given nominal size

**3.1.1.8****out-of-roundness (ovality)**

difference between the measured maximum outside diameter and the measured minimum outside diameter in the same cross-section of the pipe or spigot end of a fitting

**3.1.1.9****nominal wall thickness ( $e_n$ )**

numerical designation of the wall thickness of a component, which is a convenient round number, approximately equal to the manufacturing dimension in millimetres

**3.1.1.10****wall thickness at any point ( $e$ )**

value of the measurement of the wall thickness at any point around the circumference of a component

**3.1.1.11****minimum wall thickness at any point ( $e_{min}$ )**

minimum value of the wall thickness at any point around the circumference of a component as specified

**3.1.1.12****maximum wall thickness at any point ( $e_{max}$ )**

maximum value of the wall thickness at any point around the circumference of a component as specified

**3.1.1.13****mean wall thickness ( $e_m$ )**

arithmetic mean of a number of measurements regularly spaced around the circumference of the component in the same cross section of the component, including the measured minimum and the measured maximum values of the wall thickness

**3.1.1.14****pipe series S**

number for pipe designation conforming to ISO 4065 [2]

NOTE The relationship between the pipe series S and the standard dimension ratio SDR is given by the following equation as specified in ISO 4065 [2].

$$S = \frac{SDR - 1}{2}$$

**3.1.1.15****standard dimension ratio (SDR)**

ratio of the nominal outside diameter  $d_n$  of a pipe to its nominal wall thickness  $e_n$