



SLOVENSKI STANDARD

SIST EN 12201-5:2003

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Cevni sistemi iz polimernih materialov za oskrbo z vodo - Polietilen (PE) - 5. del: Ustreznost sistema namenu

Plastics piping systems for water supply - Polyethylene (PE) - Part 5: Fitness for purpose of the system

Kunststoff-Rohrleitungssysteme für die Wasserversorgung - Polyethylen (PE) - Teil 5:
Gebrauchstauglichkeit des Systems

Systemes de canalisations en plastique pour l'alimentation en eau - Polyéthylène (PE) -
Partie 5 : Aptitude a l'emploi

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EUROPEAN STANDARD
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English version

Plastics piping systems for water supply - Polyethylene (PE) - Part 5: Fitness for purpose of the system

Systèmes de canalisations en plastique pour alimentation
en eau - Polyéthylène (PE) - Partie 5: Aptitude à l'emploi

Kunststoff-Rohrleitungssysteme für die Wasserversorgung
- Polyethylen (PE) - Teil 5: Gebrauchstauglichkeit des
Systems

This European Standard was approved by CEN on 4 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 12201-5:2003 (E)

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Foreword

This document EN 12201-5:2003 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, which is a standard for plastics piping of a particular material for a specified application. There are a number of such Systems 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 installation practices.

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

— Part 1: General.

— Part 2: Pipes.

— Part 3: Fittings.

— Part 4: Valves.

— Part 5: Fitness for purpose of the system (this standard).

— Part 7: Guidance for the assessment of conformity¹⁾

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

This Part of EN 12201 includes a Bibliography

System Standards for piping systems of other plastics materials used for the conveyance of water 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 resins (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.

¹⁾ to be published as as a CEN/TS

EN 12201-5:2003 (E)**Introduction**

The System Standard, of which this is Part 5, 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 product covered by this standard:

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

Requirements and test methods for components of the piping system are specified in EN 12201-1, EN 12201-2^[1], EN 12201-3^[2] and EN 12201-4^[3]. PrCEN/TS 12201-7^[4] gives guidance for the assessment of conformity.

This Part of this European Standard covers the characteristics of the fitness for purpose of the system.

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1 Scope

This Part of this European Standard specifies the characteristics of the fitness for purpose of the assembled piping systems intended for the conveyance of water intended 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 (see Foreword) 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 ²⁾ ;
- b) an operating temperature of 20 °C as a reference temperature.

NOTE 1 For applications operating at constant temperatures greater than 20 °C up to 40 °C, see annex A of EN 12201-1:2003.

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 712, *Thermoplastics piping systems — End-load-bearing mechanical joints between pressure pipes and fittings — Test method for resistance to pull-out under constant longitudinal force.*

EN 713, *Plastics piping systems — Mechanical joints between fittings and polyolefin pressure pipes — Test method for leaktightness under internal pressure of assemblies subjected to bending.*

EN 715, *Thermoplastics piping systems — End-load bearing joints between small diameter pressure pipes and fittings - Test method for leaktightness under internal water pressure, including end thrust.*

EN 911, *Plastics piping systems — Elastomeric sealing ring type joints and mechanical joints for thermoplastics pressure piping — Test method for leaktightness under external hydrostatic pressure.*

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

EN 12201-1:2003, *Plastics piping systems for water supply — Polyethylene (PE) — Part 1: General.*

ISO 11413:1996, *Plastics pipes and fittings — Preparation of test piece assemblies between a polyethylene (PE) pipe and an electrofusion fitting.*

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

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 13954:1997, *Plastics pipes and fittings — Peel decohesion test for polyethylene (PE) electrofusion assemblies of nominal outside diameter greater than or equal to 90 mm.*

2) 1 bar = 10⁵ N/m².

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ISO 13955:1997, *Plastics pipes and fittings — Crushing decohesion test for polyethylene (PE) electrofusion assemblies.*

ISO/DIS 13956:1996, *Plastics pipes and fittings — Determination of cohesive strength — Tear test for polyethylene (PE) assemblies.*

3 Terms and definitions, symbols and abbreviations

For the purposes of this European Standard, the terms and definitions, symbols and abbreviations given in EN 12201-1:2003 together with the following apply.

3.1**electrofusion joint**

joint between a PE socket or saddle electrofusion fitting and pipe or fitting with spigotted ends. The electrofusion fittings are heated by the Joule effect of the heating element incorporated at their jointing surfaces, causing the material adjacent to them to melt and the pipe and fitting surfaces to fuse

3.2**butt fusion joint**

joint made by heating the planed ends of matching surfaces by holding them against a flat heating plate until the PE material reaches fusion temperature quickly removing the heating plate and pushing the two softened ends against one another

3.3**saddle fusion joint**

joint made by heating the curved surface of a saddle and the outside surface of a pipe by holding them against a heated tool until the PE material reaches fusion temperature, quickly removing the heated tool and pushing the two softened surfaces against each other

3.4**mechanical joint**

joint made by assembling a PE pipe to an other PE pipe or any other element of the piping system that generally includes a compression part to provide for pressure integrity, leaktightness and resistance to end loads. A support sleeve inserted into the pipe bore may be used to provide a permanent support for the PE pipe to prevent creep in the pipe wall under radial compressive forces

NOTE Metallic parts of these fittings or valves can be assembled to metallic pipes by screw threads, compression joints, welded or flanged connections, including PE flanges. The fitting or valve can allow either a dismantable or permanently assembled joint.

3.5**fusion compatibility**

ability of two similar or dissimilar polyethylene (PE) materials to be fused together to form a joint which conforms to the performance requirements of this standard

4 Fitness for purpose of the system**4.1 General**

This clause details the preparation of test assemblies and the tests required to verify the fusion process under normal and extreme conditions and compatibility.

4.2 Preparation of assemblies for testing

4.2.1 General

This clause specifies the methods for preparing test assemblies taking into account the extremes of pipe/fitting manufacturing tolerances, field assembly, equipment tolerances, ambient temperature variations during installation and where appropriate sealing and component material and tolerances. Test pieces for pressure testing shall be closed with pressure tight end-load-bearing caps, plugs or flanges, which shall be provided with connections for the entry of water and release of air.

4.2.2 Grouping

For purpose of this standard the following groups for pipes, fittings and valves given in Table 1 shall apply.

Table 1 — Size groups for pipes, fittings and valves

	Size group			
	1	2	3	4
Nominal outside diameter d_n	≥ 16 and < 75	≥ 75 and < 250	≥ 250 and < 710	≥ 710

4.2.3 Fitting types

- a) Fittings with spigot ends;
- b) Electrofusion socket fittings;
- c) Electrofusion saddle fittings;
- d) Mechanical fittings. <https://standards.iteh.ai/catalog/standards/sist/e92ce7a9-7f95-4d02-a4f1-573c0a7d0fe8/sist-en-12201-5-2003>

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4.3 Butt fusion joints

4.3.1 Assemblies under extreme conditions

Testing shall be carried out if requested by the purchaser or end user.

- a) The assemblies shall be prepared using pipe and or fittings with spigot ends having the same MRS and SDR in accordance with ISO 11414:1996 under minimum and maximum conditions listed in Table B.1 of ISO 11414:1996 and including misalignment requirements given in item a) of clause 6 of ISO 11414:1996;
- b) The number of test pieces shall be as follows : One diameter from the manufacturer's own product range per product type;
- c) The assembly shall conform to the requirements specified in Table 3 for the characteristics hydrostatic strength (165 h at 80 °C) and tensile strength for butt fusion joints.

4.3.2 Assemblies between components of different MRS

Testing shall be carried out if requested by the purchaser or the end user:

- a) The assemblies shall be prepared using pipe and or fittings with spigot ends of the same SDR having different MRS in accordance with ISO 11414:1996 under normal conditions at 23 °C;
- b) The number of test pieces shall be as follows : one diameter from the manufacturer's product range per product type;
- c) The assembly shall conform to the requirements specified in Table 3 for the characteristic tensile strength for butt fusion joints.