



SLOVENSKI STANDARD

SIST EN 1555-2:2003

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Cevni sistemi iz polimernih materialov za oskrbo s plinastimi gorivi - Polietilen (PE) - 2. del: Cevi

Plastics piping systems for the supply of gaseous fuels - Polyethylene (PE) - Part 2: Pipes

Kunststoff-Rohrleitungssysteme für die Gasversorgung - Polyethylen (PE) - Teil 2: Rohre

Systemes de canalisations en plastique pour la distribution de combustibles gazeux - Polyéthylène PE - Partie 2: Tubes

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91.140.40	Sistemi za oskrbo s plinom	Gas supply systems

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EUROPEAN STANDARD

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Plastics piping systems for the supply of gaseous fuels - Polyethylene (PE) - Part 2: Pipes

Systèmes de canalisations en plastique pour la distribution
de combustibles gazeux - Polyéthylène PE - Partie 2:
Tubes

Kunststoff-Rohrleitungssysteme für die Gasversorgung -
Polyethylen (PE) - Teil 2: Rohre

This European Standard was approved by CEN on 1 November 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.

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EUROPEAN COMMITTEE FOR STANDARDIZATION
COMITÉ EUROPÉEN DE NORMALISATION
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EN 1555-2:2002 (E)

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Foreword

This document EN 1555-2:2002 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of an identical text or by endorsement, at the latest by June 2003, and conflicting national standards shall be withdrawn at the latest by December 2004.

It has been prepared in liaison with Technical Committee CEN/TC 234 "Gas supply".

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 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 1555 consists of the following parts, under the general title *Plastics piping systems for the supply of gaseous fuels – Polyethylene (PE)*:

— Part 1: General

— Part 2: Pipes (this standard)

— Part 3: Fittings

— Part 4: Valves

— Part 5: Fitness for purpose of the system

— Part 7: Guidance for assessment of conformity (to be published as CEN/TS).

NOTE The document dealing with recommended practice for installation which was initially submitted for CEN enquiry as prEN 1555-6 was withdrawn when EN 12007-2^[1], prepared by CEN/TC 234 Gas supply, was published with the title "Gas supply systems - Pipelines for maximum operating pressure up to and including 16 bar - Part 2: Specific functional recommendations for polyethylene (MOP up to and including 10 bar)".

This document includes an informative annex A and a Bibliography.

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, Iceland, Ireland, Italy, Luxembourg, Malta, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland and the United Kingdom.

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EN 1555-2:2002 (E)**Introduction**

The System Standard, of which this is Part 2, specifies the requirements for a piping system and its components made from polyethylene (PE) and which is intended to be used for the supply of gaseous fuels.

Requirements and test methods for material and components, other than pipes, are specified in EN 1555-1, EN 1555-3 and EN 1555-4 (for the titles see Foreword). Characteristics for fitness for purpose are covered in EN 1555-5. PrCEN/TS 1555-7 gives guidance for assessment of conformity. Recommended practice for installation is given in EN 12007-2^[1] prepared by CEN/TC 234.

This part of EN 1555 covers the characteristics of pipes.

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1 Scope

This part of EN 1555 specifies the characteristics of pipes made from polyethylene (PE) for piping systems in the field of the supply of gaseous fuels.

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

In conjunction with the other parts of EN 1555 (see Foreword) 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) a maximum operating pressure, MOP, up to and including 10 bar ¹⁾ ;
- b) an operating temperature of 20 °C as reference temperature.

NOTE 1 For other operating temperatures, derating coefficients should be used, see EN 1555-5.

EN 1555 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 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 743, *Plastics piping and ducting systems — Thermoplastics pipes — Determination of the longitudinal reversion.*

EN 921, *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 1555-1:2002, *Plastics piping systems for the supply of gaseous fuels — Polyethylene (PE) — Part 1: General.*

EN 1555-5:2002, *Plastics piping systems for the supply of gaseous fuels — Polyethylene (PE) — Part 5: Fitness for purpose of the system.*

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

prEN ISO 3126, *Plastics piping systems - Plastics piping components - Measurement and determination of dimensions (ISO/DIS 3126:1999).*

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

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

¹⁾ 1 bar = 0.1 MPa

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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 6259-3, *Thermoplastics pipes – Determination of tensile properties – Part 3: Polyolefin pipes*.

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

ISO 13480, *Polyethylene pipes - Resistance to slow crack growth - Cone test method*.

3 Terms and definitions, symbols and abbreviations

For the purposes of this European Standard, the terms and definitions, symbols and abbreviations given in EN 1555-1:2002 apply.

4 Material**4.1 Compound**

The pipes shall be made from virgin material or own reprocessable material from identical PE base polymer or a mixture of both materials.

The compound from which the pipes are made shall conform to EN 1555-1.

4.2 Compound for identification stripes

For black pipes with identification stripes, the compound used for these stripes shall be yellow and shall be manufactured from the identical PE base polymer as used for the compound for pipe production with additives necessary to fulfil the performance of the pipe.

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 shall be black, yellow or black with yellow identification stripes.

6 Geometrical characteristics**6.1 Measurement of dimensions**

Dimensions shall be measured in accordance with prEN ISO 3126 at (23 ± 2) °C, after being conditioned for at least 4 h. The measurement shall not be made less than 24 h after manufacture.

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

The mean outside diameters of the pipe, d_{em} shall conform to Table 1.

Pipes with tolerances of grade A given in ISO 11922-1:1997^[2] shall be used but if close tolerances are required, the tolerance grade B given in Table 1 shall apply.

For straight pipes, the maximum out-of-roundness shall conform to Table 1. For coiled pipes, the maximum out-of-roundness shall be specified by agreement between the manufacturer and the end-user.

Table 1 — Mean outside diameters and out-of-roundness

Dimensions in millimetres

Nominal size DN/OD	Nominal outside diameter d_n	Mean outside diameter			Maximum out-of-roundness for straight pipes ^{a b}
		$d_{em,min}$	$d_{em,max}$		
			Grade A ^c	Grade B ^c	
16	16	16,0	—	16,3	1,2
20	20	20,0	—	20,3	1,2
25	25	25,0	—	25,3	1,2
32	32	32,0	—	32,3	1,3
40	40	40,0	—	40,4	1,4
50	50	50,0	—	50,4	1,4
63	63	63,0	—	63,4	1,5
75	75	75,0	—	75,5	1,6
90	90	90,0	—	90,6	1,8
110	110	110,0	—	110,7	2,2
125	125	125,0	—	125,8	2,5
140	140	140,0	—	140,9	2,8
160	160	160,0	—	161,0	3,2
180	180	180,0	—	181,1	3,6
200	200	200,0	—	201,2	4,0
225	225	225,0	—	226,4	4,5
250	250	250,0	—	251,5	5,0
280	280	280,0	—	281,7	9,8
315	315	315,0	—	316,9	11,1
355	355	355,0	—	357,2	12,5
400	400	400,0	403,6	402,4	14,0
450	450	450,0	454,1	452,7	15,6
500	500	500,0	504,5	503,0	17,5
560	560	560,0	565,0	563,4	19,6
630	630	630,0	635,7	633,8	22,1

a Measurement of out-of-roundness shall be made at the point of manufacturing.
b If other values for the out-of-roundness than those given in this table are necessary, they shall be agreed between the manufacturer and the end-user.
c According to ISO 11922-1:1997^[2].

6.3 Wall thicknesses and related tolerances

6.3.1 Minimum wall thicknesses

The use of any SDR derived from the pipe series S given according to ISO 4065:1996^[3] is permitted.

The minimum wall thickness, e_{min} , of pipes with SDR 17,6 and SDR 11 shall conform to Table 2.

For existing piping systems of nominal sizes DN/OD 25 and DN/OD 32, a minimum wall thickness of $2,0^{+0,3}_0$ mm may be used for mechanical joints with elastomeric seals, for nominal pressures up to and including 0,1 bar.