SLOVENSKI STANDARD
SIST EN 13244-2:2003

01-oktober-2003

Cevni sistemi iz polimernih materialov, podzemni in nadzemni, za tlaļne vodovode sploģne namembnosti, odvodnjavanje in kanalizacijo ï Polietilen (PE) - 2. del: Cevi

Plastics piping systems for buried and above-ground pressure systems for water for general purposes, drainage and sewerage - Polyethylene (PE) - Part 2: Pipes

Kunstoff-Rohrleitungssysteme für erd- und oberirdisch verlegte Druckrohrleitungen für Brauchwasser, Entwässerung und Abwasser - Polyethylen (PE) - Teil 2: Rohre

Systemes de canalisations en plastique pour les applications générales de transport d'eau, de branchement et de collecteurs d'assainissement, enterrés sous pression - Polyéthylene (PE) - Partie 2: Tubes

Ta slovenski standard je istoveten z: **EN 13244-2:2002**

ICS:

23.040.20	Cevi iz polimernih materialov	Plastics pipes
93.030	Zunanji sistemi za odpadno vodo	External sewage systems

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Plastics piping systems for buried and above-ground pressure systems for water for general purposes, drainage and sewerage - Polyethylene (PE) - Part 2: Pipes

Systèmes de canalisations en plastique pour les applications générales de transport d'eau, de branchement et de collecteurs d'assainissement, enterrés sous pression - Polyéthylène (PE) - Partie 2: Tubes

Kunstoff-Rohrleitungssysteme für erd- und oberirdisch verlegte Druckrohrleitungen für Brauchwasser, Entwässerung und Abwasser - Polyethylen (PE) - Teil 2: Rohre

This European Standard was approved by CEN on 23 October 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, Iceland, Ireland, Italy, Luxembourg, Malta, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland and United Kingdom.

EUROPEAN COMMITTEE FOR STANDARDIZATION
COMITÉ EUROPÉEN DE NORMALISATION
EUROPÄISCHES KOMITEE FÜR NORMUNG

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Contents

Foreword

This document (EN 13244-2:2002) 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.

For components which have conformed to the relevant national standard before December 2002, as shown by the manufacturer or by a certification body, the national standard may continue to be applied until December 2004.

It has been prepared in liaison with CEN/TC 165 "*Waste water engineering*".

This European 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 practices for installation.

EN 13244 consists of the following Parts, under the general title *Plastics piping systems for buried and above-ground pressure systems for water for general purposes, drainage and sewerage — 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 the assessment of conformity* (to be published as a CEN/TS)

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 13244 includes the following:

— Annex A (informative): Relationship between PN, MRS, S and SDR

— Annex B (normative): Pipe stiffness

— Bibliography

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

prEN 14364, *Plastics piping systems for pressure and non-pressure drainage and sewerage — Glass-reinforced thermosetting (GRP) plastics based on polyester resin (UP).*

EN 1456, *Plastics piping systems for buried and above-ground drainage and sewerage under pressure — Unplasticized poly(vinyl chloride) (PVC-U).*

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.

Introduction

EN 13244, of which this is Part 2, specifies the requirements for a piping system and its components when made from polyethylene (PE), intended to be used for buried and above-ground pressure systems for water for general purposes, drainage and sewerage, including vacuum systems.

Requirements and test methods for material and components, other than pipes, are specified in EN 13244-1, EN 13244-3 and EN 13244-4. Characteristics for fitness for purpose are covered in EN 13244-5 and prCEN/TS 13244-7 gives guidance for the assessment of conformity.

This Part of EN 13244 covers the characteristics of pipes.

1 Scope

This Part of EN 13244 specifies the characteristics of pipes made from polyethylene (PE) intended for buried and above-ground pressure systems for water for general purposes, drainage and sewerage. It is also applicable for vacuum sewer systems.

NOTE 1 Water for general purposes is not intended for human consumption and components conforming to this standard should not be used in systems conveying water for human consumption. For PE components intended for the conveyance of water intended for human consumption and raw water prior to treatment, see EN 12201.

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

In conjunction with other Parts of EN 13244 (see Foreword), it is applicable to PE pipes, their joints and to joints with components of PE and other materials intended to be used as follows:

— buried in the ground;

— sea outfalls;

— laid in water;

— above-ground, including pipes suspended below bridges;

— a maximum operating pressure, MOP, up to and including 25 bar [1)];

— an operating temperature of 20 °C as a reference temperature.

NOTE 2 For applications operating at constant temperatures greater than 20 °C and up to 40 °C, see annex A of EN 13244-1:2002.

EN 13244 covers a range of maximum 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.

NOTE 4 Assessment of the resistance to slow crack growth of the PE pipe compound used for the manufacture of products to this specification is required in accordance with Table 2 of EN 13244-1:2002.

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 13244-1:2002, *Plastics piping systems for buried and above-ground pressure systems for water for general purposes, drainage and sewerage — Polyethylene (PE) — Part 1: General.*

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1) 1 bar = 10^5 N/m^2 .

EN 13244-5:2002, *Plastics piping systems for buried and above-ground pressure systems for water for general purposes, drainage and sewerage — Polyethylene (PE) — Part 5: Fitness for purpose of the system.*

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).*

prEN ISO 3126:1999, *Plastics piping systems — Plastics piping components — Measurement and determination of dimensions (revision of prEN 496:1991 and ISO 3126:1974) (ISO/DIS 3126:1999).*

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

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.*

3 Definitions, symbols and abbreviations

For the purposes of this European Standard the terms, definitions, symbols and abbreviations given in EN 13244-1 apply.

4 Material

4.1 Compound

The material from which the pipes are made shall conform to EN 13244-1.

4.2 Identification compound

Where applicable, the compound used for identification stripes (see 5.2) shall be made from a PE polymer manufactured from the same type of base polymer as used in the compound for pipe production.

5 General characteristics

5.1 Appearance

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

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

5.2 Colour

The pipes shall be black or black with brown stripes unless other colours or forms of identification are specified by national regulations.

NOTE 1 Where national regulations require an alternative colour to black, pipes coloured blue or black with blue stripes should not be used for this application. The blue colour indicates that the components are suitable for the conveyance of water intended for human consumption as specified in EN 12201[1].

NOTE 2 For above ground installations non-black pipes should be protected from direct UV light.

6 Geometrical characteristics

6.1 Measurement of dimensions

The dimensions of the pipe shall be measured in accordance with prEN ISO 3126. 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.

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

The mean outside diameter, d_{em}, and the out-of-roundness (ovality) of the pipe shall be in accordance with Table 1.

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

Dimensions in millimetres

Nominal size DN/OD	Nominal outside diameter	Mean outside diameter [a]		Maximum out-of-roundness (ovality)[b]
	d_n	$d_{em,min}$	$d_{em,max}$	
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	402,4	14,0
450	450	450,0	452,7	15,6
500	500	500,0	503,0	17,5
560	560	560,0	563,4	19,6
630	630	630,0	633,8	22,1
710	710	710,0	716,4	-
800	800	800,0	807,2	-
900	900	900,0	908,1	-
1000	1000	1000,0	1009,0	-
1200	1200	1200,0	1210,8 *)	-
1400	1400	1400,0	1412,6 *)	-
1600	1600	1600,0	1614,4 *)	-

[a] In accordance with ISO 11922-1[2] grade B for sizes ≤ 630 and grade A for sizes ≥ 710.
[b] In accordance with ISO 11922-1[2] grade N for sizes ≤ 630 and is measured at the point of manufacture.
*) Tolerance calculated as 0,009 d_{em} and does not conform to grade A of ISO 11922-1[2].

For coiled pipe and straight lengths with diameters ≥ 710 mm the maximum out-of-roundness shall be agreed between the manufacturer and the purchaser.

NOTE Tolerance bands in accordance with ISO 11922-1[2] are calculated using following formulae, as applicable:

a) Grade A: $0{,}009d_n$ rounded to the next greater 0,1 mm with a minimum value of 0,3 mm and a maximum value of 10,0 mm;

b) Grade B: $0{,}006d_n$ rounded up to the next greater 0,1 mm with a minimum value of 0,3 mm and a maximum value of 4,0 mm;

c) Grade N: for diameters ≤ 75 mm: $[0{,}008d_n + 1]$ mm;
for diameters ≥ 90 mm and ≤ 250 mm: $[0{,}02d_n]$ mm;
for diameters > 250 mm: $[0{,}035d_n]$ mm,
rounded to next greater 0,1 mm.

6.3 Wall thicknesses and their tolerances

The wall thickness *e* shall be in accordance with Table 2.

NOTE The relationship between PN, MRS, S and SDR are given in Table A.1.