
7 Yj b]g]ghYa]n'dc`ja Yfb] `a UHf]Ucj ždcXnYa b]b`bUXnYa b]žnUñU bY`j cXcj cXY
gd`cýbYbUa Ya Vbcgh]žcXj cXb`Uj Ub`Y]b`_UbU]nUW]c`E`Dc`]Yh]Yb`fD9L!' "XY.
:]h]b[]

Plastics piping systems for buried and above-ground pressure systems for water for general purposes, drainage and sewerage - Polyethylene (PE) - Part 3: Fittings

Kunststoff-Rohrleitungssysteme für erd- und oberirdisch verlegte Druckrohrleitungen für Brauchwasser, Entwässerung und Abwasser - Polyethylen (PE) - Teil 3: Formstücke
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Systemes 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 3: Raccords
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EN 13244-3

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English version

**Plastics piping systems for buried and above-ground pressure systems for water for general purposes, drainage and sewerage
- Polyethylene (PE) - Part 3: Fittings**

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 3: Raccords

Kunststoff-Rohrleitungssysteme für erd- und oberirdisch verlegte Druckrohrleitungen für Brauchwasser, Entwässerung und Abwasser - Polyethylen (PE) - Teil 3: Formstücke

This European Standard was approved by CEN on 16 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
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EN 13244-3:2002 (E)**Foreword**

This document (EN 13244-3:2002) 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 installation practices.

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*
- *Part 3: Fittings (this standard)*
- *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 (normative): Socket fusion fittings;
- Annex B (informative): Examples of typical terminal connection for electrofusion fittings;
- Bibliography.

System Standards for piping systems of other plastics materials used for the conveyance of water, drainage and sewerage 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.

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EN 13244-3:2002 (E)**Introduction**

EN 13244, of which this is Part 3, 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 fittings, are specified in EN 13244-1, EN 13244-2 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 fittings.

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1 Scope

This Part of EN 13244 specifies the characteristics of fittings 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 fittings, their joints and to joints with components of PE and other materials intended to be used under the following conditions:

- 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.

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EN 13244 covers a range of maximum operating pressures and gives requirements concerning colours and additives.

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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.

These fittings can be of the following types:

- a) fusion fittings
 - 1) butt fusion fittings;
 - 2) socket fusion fittings;
 - 3) electrofusion fittings.
- b) mechanical fittings
 - 1) compression fittings.
- c) flanged fittings.

1) 1 bar = 10⁵ N/m².

EN 13244-3:2002 (E)**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 681-1, *Elastomeric seals — Material requirements for pipe joint seals used in water and drainage applications — Part 1: Vulcanized rubber.*

EN 681-2, *Elastomeric seals — Material requirements for pipe joint seals used in water and drainage applications — Part 2: Thermoplastics elastomers.*

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.*

EN 13244-2:2002, *Plastics piping systems for buried and above-ground pressure systems for water for general purposes, drainage and sewerage — Polyethylene (PE) — Part 2: Pipes.*

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.*

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).*

ISO 4059:1978, *Polyethylene (PE) pipes — Pressure drop in mechanical pipe-jointing systems — Method of test and requirements.*

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 9624, *Thermoplastics pipes for fluids under pressure — Mating dimensions of flange adapters and loose backing flanges.*

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.*

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

3 Definitions, symbols and abbreviations

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

3.1

electrofusion socket fitting

polyethylene (PE) fitting which contains one or more integral heating elements, that are capable of transforming electrical energy into heat to realise a fusion joint with a spigot end or a pipe

3.2

spigot end fitting

polyethylene (PE) fitting where the outside diameter of the spigot length is equal to the nominal outside diameter, d_n , of the corresponding pipe

3.3

mechanical fitting

fitting for assembling polyethylene (PE) pipe to an other PE pipe or any other element of the piping system. The mechanical fitting may be supplied for field assembly or pre-assembled by the manufacturer. The fitting generally includes a compression part to provide pressure integrity, leaktightness and resistance to end loads. A support sleeve inserted into the pipe bore provides a permanent support for the PE pipe to prevent creep in the pipe wall under radial compressive forces

NOTE 1 The metallic parts of the fitting can be assembled to metallic pipes by screw threads, compression joints, welded or flanged connections, including PE flanges. The fitting can allow either a dismantable or permanently assembled joint.

NOTE 2 In some cases the supporting ring can also act as a grip ring.

3.4

push-fit fitting

fitting which includes one or more integral sealing rings, located in a groove (or grooves) in a preformed socket, which is assembled by inserting a chamfered and lubricated spigot, in an axial direction, past the sealing ring(s), to a recommended depth. Both end-load-resistant and non-end-load-resistant designs are available

3.5

fabricated fitting

fitting produced from pipe conforming to EN 13244-2 and/or from injection moulded fittings conforming to this standard

3.6

voltage regulation

control of energy supplied, during the fusion process of an electrofusion fitting, by means of the voltage parameter

3.7

intensity regulation

control of energy supplied, during the fusion process of an electrofusion fitting, by means of the current parameter

4 Material

4.1 PE compound

The PE compound from which the fittings are made shall conform to EN 13244-1.

EN 13244-3:2002 (E)**4.2 Material for non-polyethylene parts****4.2.1 General**

All components shall conform to the relevant European Standard(s). Alternative standards may be utilised in cases where suitable European Standards do not exist provided a fitness for purpose can be demonstrated.

The materials and constituent elements used in making the fitting (including elastomers, greases, and any metal parts) shall be as resistant to the external and internal environments as the other elements of the piping system and shall have a life expectancy under the following conditions at least equal to that of the PE pipe conforming to EN 13244-2 with which they are intended to be used:

- a) during storage;
- b) under the effect of the fluids being conveyed;
- c) taking account of the service environment and operating conditions.

The requirements for the level of material performance for non-polyethylene parts shall be at least as stringent as that of the PE compound for the piping system.

Fittings material in contact with the PE pipe shall not adversely affect the pipe performance or initiate stress cracking.

4.2.2 Metal parts

All parts susceptible to corrosion shall be adequately protected.

When dissimilar metallic materials are used which may be in contact with moisture, steps shall be taken to avoid galvanic corrosion.

4.2.3 Elastomers

Elastomeric materials used for the manufacture of seals shall conform to EN 681-1 or EN 681-2, as applicable.

4.2.4 Other materials

Greases or lubricants shall not exude on to the fusion areas, and shall not affect the long-term performance of the fitting.

5 General characteristics**5.1 Appearance**

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

5.2 Design

The design of the fitting shall be such that, when assembling the fitting onto the pipe or other components, the electrical coils and/or seals are not displaced.

5.3 Colour

Unless other colours are specified by national regulations the colour of the PE fittings shall be black.

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.