

# SLOVENSKI STANDARD

## SIST EN 1555-2:2010

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Nadomešča:  
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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  
NORME EUROPÉENNE  
EUROPÄISCHE NORM

**EN 1555-2**

September 2010

ICS 23.040.20; 91.140.40

Supersedes EN 1555-2:2002

English Version

**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 30 July 2010.

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

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## Foreword

This document (EN 1555-2:2010) 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of an identical text or by endorsement, at the latest by March 2011, and conflicting national standards shall be withdrawn at the latest by March 2011.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. CEN [and/or CENELEC] shall not be held responsible for identifying any or all such patent rights.

This document supersedes EN 1555-2:2002.

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

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

EN 1555 consists of the following parts:

- EN 1555-1, *Plastics piping systems for the supply of gaseous fuels — Polyethylene (PE) — Part 1: General*;
- EN 1555-2, *Plastics piping systems for the supply of gaseous fuels — Polyethylene (PE) — Part 2: Pipes* (this standard);
- EN 1555-3, *Plastics piping systems for the supply of gaseous fuels — Polyethylene (PE) — Part 3: Fittings*;
- prEN 1555-4, *Plastics piping systems for the supply of gaseous fuels — Polyethylene (PE) — Part 4: Valves*;
- EN 1555-5, *Plastics piping systems for the supply of gaseous fuels — Polyethylene (PE) — Part 5: Fitness for purpose of the system*;
- CEN/TS 1555-7, *Plastics piping systems for the supply of gaseous fuels — Polyethylene (PE) — Part 7: Guidance for assessment of conformity*.

NOTE EN 12007-2:2000 [1] prepared by CEN/TC 234 "Gas infrastructure" deals with the recommended practice for installation of plastics pipes system in accordance with EN 1555 (all parts).

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

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**EN 1555-2:2010 (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 [7] and prEN 1555-4 [8].

Characteristics for fitness for purpose are covered in EN 1555-5. CEN/TS 1555-7 [2] gives guidance for assessment of conformity. Recommended practice for installation is given in EN 12007-2:2000 [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 Parts 1 and 3 to 5 of EN 1555, 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 <sup>1)</sup>;
- 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.

It covers three types of pipe:

- PE pipes (outside diameter  $d_n$ ) including any identification stripes;
- PE pipes with co-extruded layers on either or both the outside and/or inside of the pipe (total outside diameter  $d_n$ ) as specified in Annex A, where all layers have the same MRS rating;
- PE pipes (outside diameter  $d_n$ ) with a peelable, contiguous thermoplastics additional layer on the outside of the pipe ('coated pipe') as specified in Annex B.

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

The following referenced documents are indispensable for the application of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

EN 1555-1:2010, *Plastics piping systems for the supply of gaseous fuels — Polyethylene (PE) — Part 1: General*

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

EN 12106, *Plastics piping systems — Polyethylene (PE) pipes — Test method for the resistance to internal pressure after application of squeeze-off*

EN ISO 1133:2005, *Plastics — Determination of the melt mass-flow rate (MFR) and the melt volume-flow rate (MVR) of thermoplastics (ISO 1133:2005)*

EN ISO 1167-1:2006, *Thermoplastics pipes, fittings and assemblies for the conveyance of fluids — Determination of the resistance to internal pressure — Part 1: General method (ISO 1167-1:2006)*

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1) 1 bar = 0,1 MPa.

**EN 1555-2:2010 (E)**

EN ISO 1167-2, *Thermoplastics pipes, fittings and assemblies for the conveyance of fluids — Determination of the resistance to internal pressure — Part 2: Preparation of pipe test pieces (ISO 1167-2:2006)*

EN ISO 2505, *Thermoplastics pipes — Longitudinal reversion — Test method and parameters (ISO 2505:2005)*

EN ISO 3126, *Plastics piping systems — Plastics components — Determination of dimensions (ISO 3126:2005)*

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

EN ISO 9969, *Thermoplastics pipes — Determination of ring stiffness (ISO 9969:2007)*

EN 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 13477:2008)*

EN ISO 13478, *Thermoplastics pipes for the conveyance of fluids — Determination of resistance to rapid crack propagation (RCP) — Full scale test (FST) (ISO 13478:2007)*

EN ISO 13479:2009, *Polyolefin pipes for the conveyance of fluids — Determination of resistance to crack propagation — Test method for slow crack growth on notched pipes (ISO 13479:2009)*

EN ISO 13968, *Plastics piping and ducting systems — Thermoplastics pipes — Determination of ring flexibility (ISO 13968:2008)*

ISO 4065:1996, *Thermoplastics pipes — Universal wall thickness table*

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

ISO 11357-6, *Plastics — Differential scanning calorimetry (DSC) — Part 6: Determination of oxidation induction time (isothermal OIT) and oxidation induction temperature (dynamic OIT)*

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

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

For the purposes of this document the terms and definitions, symbols and abbreviations given in EN 1555-1:2010 apply.

## **4 Material**

### **4.1 Compound for pipes**

The pipes shall be made from virgin material or own reprocessable material from the same PE compound or a mixture of both materials. Reprocessable material from coextruded pipes or from pipes reprocessed with the peelable layer attached shall not be used. Own reprocessed material from the base pipe of peelable layer pipes can be used.

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

## 4.2 Compound for identification stripes

For black pipe with yellow or orange identifications stripes (see also 5.2), the compound used for these identification stripes shall be made from the same base polymer (PE) as one of the pipe compounds for which fusion compatibility has been proven.

## 4.3 External reprocessable and recyclable material

Reprocessable material obtained from external sources and recyclable material shall not be used.

# 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 (PE 80 or PE 100), yellow (PE 80) or orange (PE 100). In addition black PE 80 pipes may be identified by yellow stripes and black PE 100 pipes may be identified by yellow or orange stripes, according to national preference.

The outer coextruded layer of coextruded pipes (see Annex A) or the outer peelable layer of peelable layer pipes (see Annex B) shall be either black, yellow or orange. In addition identification stripes may be used according to national preference.

NOTE 1 In some countries pipes made out of non-pigmented compound in conjunction with an external peelable layer are permitted, providing the compound conforms to the requirements of this document. If this is allowed in a country, this should be clearly stated in the national foreword.

NOTE 2 National preference for colour should be stated in the national foreword.

# 6 Geometrical characteristics

## 6.1 Measurement of dimensions

The dimensions of the pipe shall be measured in accordance with EN ISO 3126, and rounded to the next 0.1 mm. In case of dispute the measurement shall not be made less than 24 h after manufacture after being conditioned for at least 4 h at  $(23 \pm 2) ^\circ\text{C}$ .

NOTE Indirect measurement at the stage of production is allowed at shorter time periods providing evidence is shown of correlation.

## 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.

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.