



SLOVENSKI STANDARD

SIST EN 14628:2006

01-marec-2006

Litoželezne cevi, fazonski kosi in pribor – Zunanji polietilenski premaz cevi za zelo agresivna tla – Zahteve in preskusne metode

Ductile iron pipes, fittings and accessories - External polyethylene coating for pipes - Requirements and test methods

Rohre, Formstücke und Zubehörteile aus duktilem Gusseisen - Polyethylenumhüllung von Rohren - Anforderungen und Prüfverfahren

Tuyaux, raccords et accessoires en fonte ductile - Revêtement extérieur en polyéthylène pour tuyaux - Exigences et méthodes d'essai

Ta slovenski standard je istoveten z: EN 14628:2005

ICS:

23.040.10	Železne in jeklene cevi	Iron and steel pipes
23.040.40	Kovinski fitingi	Metal fittings
25.220.01	Površinska obdelava in prevleke na splošno	Surface treatment and coating in general

SIST EN 14628:2006

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EUROPEAN STANDARD
NORME EUROPÉENNE
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EN 14628

October 2005

ICS 23.040.10; 23.040.40

English Version

Ductile iron pipes, fittings and accessories - External polyethylene coating for pipes - Requirements and test methods

Tuyaux, raccords et accessoires en fonte ductile -
Revêtement extérieur en polyéthylène de tuyaux -
Exigences et méthodes d'essai

Rohre, Formstücke und Zubehör aus duktilem Gusseisen -
Polyethylenumhüllung von Rohren - Anforderungen und
Prüfverfahren

This European Standard was approved by CEN on 29 August 2005.

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 Central Secretariat 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 Central Secretariat has the same status as the official versions.

CEN members are the national standards bodies of Austria, Belgium, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Slovakia, Slovenia, Spain, Sweden, Switzerland and United Kingdom.

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Foreword

This European Standard (EN 14628:2005) has been prepared by Technical Committee CEN/TC 203 "Cast iron pipes, fittings and their joints", the secretariat of which is held by AFNOR.

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 April 2006, and conflicting national standards shall be withdrawn at the latest by April 2006.

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

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Introduction

This European Standard is in conformity with the general requirements already established by CEN/TC 164 in the field of water supply (e.g. potable water) and CEN/TC 165 in the field of waste water.

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 European 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.

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1 Scope

This European Standard defines the requirements and test methods applicable to factory applied extruded polyethylene coatings for the external corrosion protection of ductile iron pipes conforming to EN 545, EN 598 and EN 969 for use at operating temperatures up to 50 °C.

This European Standard does not cover ductile iron pipes protected with thin PE sleeve. Special works at site like drilling, tapping etc. may influence the corrosion protection properties. Those job steps shall be included in the instructions of pipe saddle and accessory manufacturers and all other essential installation instructions. These instructions are not part of this European Standard.

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 545, *Ductile iron pipes, fittings, accessories and their joints for water pipelines – Requirements and test methods.*

EN 598, *Ductile iron pipes, fittings, accessories and their joints for sewerage application – Requirements and test methods.*

EN 969, *Ductile iron pipes, fittings, accessories and their joints for gas pipelines – Requirements and test methods.*

EN 1238, *Adhesives – Determination of the softening point of thermoplastic adhesives (ring and ball).*

EN ISO 527-1, *Plastics – Determination of tensile properties - Part 1: General principles (ISO 527-1:1993 including Corr 1:1994).*

EN ISO 527-2, *Plastics – Determination of tensile properties - Part 2: Test conditions for moulding and extrusion plastics (ISO 527-2:1993 including Corr 1:1994).*

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

EN ISO 3681, *Binders for paints and varnishes – Determination of saponification value – Titrimetric method (ISO 3681:1996).*

EN ISO 4892-2, *Plastics – Methods of exposure to laboratory light sources – Part 2: Xenon-arc sources (ISO 4892-2:1994).*

3 Terms and definitions

For the purposes of this European Standard, the following terms and definitions apply.

3.1

ductile iron

cast iron used for pipes, fittings and accessories in which graphite is present substantially in spheroidal form

3.2

elongation at break

relative change in length of the specimen of the polyethylene material when it breaks in a tensile test

EN 14628:2005 (E)**3.3****heat ageing**

artificial ageing of the polyethylene under the effects of hot air at a given temperature and over a given period

3.4**impact strength**

impact energy which a coating can withstand without damage under defined test conditions

3.5**indentation resistance**

resistance of the coating to the penetration of a punch under defined test conditions

3.6**light ageing**

artificial ageing of the polyethylene under the effects of xenon arc radiation at an elevated temperature and at a given level of atmospheric humidity using a xenon test apparatus

3.7**minimum coating thickness**

lower limit specified for the polyethylene coating thickness

3.8**non-porosity**

absence of holidays in a high voltage test under defined test conditions

3.9**peel resistance**

force required to peel off a strip of polyethylene coating over a defined peeling path under defined test conditions

3.10**polyethylene coating**

coating which generally consists of two factory applied layers:

- an adhesive layer applied by extrusion or by hot spraying; and
- an extruded polyethylene compound outer layer applied either by the tubular extrusion method (cross head extrusion) or by the flat die wrapping extrusion method.

3.11**specific coating resistance**

surface related electric resistance of the coating perpendicular to the pipe wall

3.12**performance test**

test which is done once and is repeated only after change of polymer supplier, polymer material or relevant change in process application

3.13**routine test**

test carried out to control the manufacturing process with a frequency defined by the manufacturer

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4 Ordering information

4.1 General The following information shall be supplied to the manufacturer by the purchaser:

4.2 Mandatory

Ductile iron pipes according to EN 545, EN 598 or EN 969, but coated in accordance with this European Standard shall be specified in the purchasers enquiry and order by reference to this standard:

EXAMPLE 5 000 m of ductile iron pipe DN 300 according to EN 545;
external polyethylene coating according to EN 14628.

4.3 Options to be indicated by the purchaser

One of the following options shall be specified by the purchaser:

- a) standard thickness, pipe not zinc-coated: PE-A;
- b) increased thickness, pipe not zinc-coated: PE-B;
- c) standard thickness, pipe zinc-coated: PE-C;
- d) increased thickness, pipe zinc-coated: PE-D.

In the event that no option is stipulated option a) shall apply.

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5 Technical Requirements

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5.1 Surface preparation

The polyethylene coating shall be applied to the works' standard oxide skin surface, blast cleaned surface or zinc coated surface of ductile iron pipes. Immediately prior to application the surface of the pipes shall be substantially free of rust (individual incipient rust spots are permissible), loose constituent materials, dirt, oil, grease and moisture.

5.2 Material properties

5.2.1 Polyethylene

Only the use of virgin material is permitted.

5.2.2 Adhesive

The adhesive consists generally of a blend of rubber and high molecular weight resins and its physical properties shall conform to the values specified in Table 1.

Table 1 — Adhesive physical properties

Property	Standard	Requirements
Softening point	EN 1238	70 °C to 112 °C
Saponification value	EN ISO 3681	< 3 mg KOH/g

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5.3 Finished polyethylene coating

5.3.1 Appearance and continuity

The polyethylene coating shall be of:

- uniform colour, except for permitted marking;
- uniform appearance and smoothness, except admissible repairs.

5.3.2 Minimum coating thickness

The minimum coating thickness shall comply with the values given in Table 2 for the standard thickness or for the increased thickness (see 4.2.).

Table 2 — Polyethylene thickness

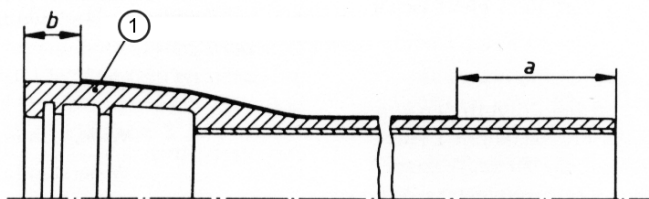
Nominal size DN	Minimum coating thickness mm	
	Standard thickness	Increased thickness
80 to 100	1,8	2,5
125 to 250	2,0	2,5
300 to 450	2,2	3,0
500 to 700	2,5	3,5
800 to 1 400	3,0	3,5
1 500 to 2 000	3,5	4,0

The polyethylene coating thickness shall be measured in accordance with the method defined in 7.2.

Localised areas where the minimum coating thickness is not attained are permissible if these do not exceed a total area of 5 cm² over one metre length of pipe and the thickness of the coating is not less than 90 % of the specified minimum coating thickness.

5.3.3 Ends of pipes

The spigot shall be not covered by the polyethylene coating over a free length "a" (see Figure 1).



Key

- 1 Push in socket

Figure 1 — Ends of pipe

The uncoated spigot length “a” depends on the type of joint. It is the responsibility of the manufacturer to define the appropriate uncoated length for each type of joint.

The front end of sockets may be uncoated on a length “b” depending on the application method (see Annex B):

- tubular extrusion: < 5 mm, (15 mm after storage outside);
- flat die wrapping extrusion: < 50 mm.

The pipe ends surfaces not covered by the polyethylene coating (spigot, front end of socket and internal section of socket) shall be coated with filled bituminous paint or other suitable coating(s). Where such coatings are in contact with water intended for human consumption, these shall comply with the relevant requirements stated in the introduction of this European Standard.

NOTE The pipe parts not covered by PE will be protected after laying using appropriate measures, e.g. heat shrinkable sleeves, which are in compliance with EN 545, EN 598 or EN 969.

5.4 Repairs

In case of holidays or damage, repairs shall be carried out in accordance with the manufacturer’s written instructions. All repairs shall subsequently meet the non-porosity test requirements.

5.5 Marking

All pipes shall be marked legibly and durably according to the pipe standard EN 545, EN 598 or EN 969 with the addition: PE-A, PE-B, PE-C or PE-D (see 4.3). The transported medium can be denoted by appropriate markings, e.g. by coextruded coloured stripes.

5.6 Peeling strength

Experience with the transport, laying and operation of polyethylene-coated pipes and pipelines has shown that good bonding is necessary in order to avoid mechanical damage. It is, however, not necessary to ensure the corrosion protection properties of polyethylene coating if the thickness and the quality of the coating comply with the requirements of this European Standard.

When tested in accordance with method 1 as defined in 7.1.2, the adhesive shall be selected in order to provide a mean peel resistance of at least 10 N per cm strip width (zinc coating) or 20 N per cm strip width (oxide skin) of polyethylene coating.

When tested in accordance with method 2 defined in 7.1.3, the peeling time shall be at least 0,04. *DN* in minutes. The mean peeling rate is thus 10 mm/min.

5.7 Non-porosity

The polyethylene coating shall be free from pores extending through the coating, so, no electrical puncture shall occur according to the test method defined in 7.3.

6 Performance requirements

6.1 Impact strength

The minimum impact strength shall be determined in accordance with the test method defined in 7.4.

The number of electrical punctures in the test shall be confined to range A as defined in Figure 2.