



# SLOVENSKI STANDARD

## SIST EN 10329:2006

01-april-2006

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### Jeklene cevi in fittingi za obalne in priobalne cevovode – Zunanje prevleke spojev

Steel tubes and fittings for onshore and offshore pipelines - External field joint coatings

Stahlrohre und -formstücke für erd- und wasserverlegte Rohrleitungen - Umhüllungen für Schweißverbindungen

Tubes et raccords en acier pour canalisations enterrées et immergées - Revêtements externes des assemblages réalisés sur site

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Ta slovenski standard je istoveten z: **EN 10329:2006**

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**en**

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EUROPEAN STANDARD  
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**EN 10329**

January 2006

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## Steel tubes and fittings for onshore and offshore pipelines - External field joint coatings

Tubes et raccords en acier pour canalisations enterrées et  
immergées - Revêtements externes des assemblages  
réalisés sur site

Stahlrohre und -formstücke für erd- und wasserverlegte  
Rohrleitungen - Umhüllungen für Schweißverbindungen

This European Standard was approved by CEN on 9 December 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.

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EN 10329:2006 (E)

## Foreword

This European Standard (EN 10329:2006) has been prepared by Technical Committee ECISS/TC 29 “Steel tubes and fittings for steel tubes”, the secretariat of which is held by UNI.

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of an identical text or by endorsement, at the latest by July 2006, and conflicting national standards shall be withdrawn at the latest by July 2006.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, Romania, Slovakia, Slovenia, Spain, Sweden, Switzerland and United Kingdom.

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## 1 Scope

This European Standard specifies the application and related testing of the corrosion protection coatings applied to steel surfaces left bare after the tubes and fittings (components) are joined by welding.

It defines the different types of coatings for buried and immersed pipelines defined in Table 1.

This European Standard applies to seamless or welded steel tubes used in the construction of pipelines for the conveyance of fluids.

Components coated with this type of coating may be further protected by means of cathodic protection.

## 2 Normative references

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

EN 10204, *Metallic products — Types of inspection documents*

EN 10288, *Steel tubes and fittings for onshore and offshore pipelines — External two layer extruded polyethylene based coatings*

EN 10289, *Steel tubes and fittings for onshore and offshore pipelines — External liquid applied epoxy and epoxy-modified coatings*

EN 10290, *Steel tubes and fittings for onshore and offshore pipelines — External liquid applied polyurethane and polyurethane-modified coatings*

EN 10310, *Steel tubes and fittings for onshore and offshore pipelines — Internal and external polyamide powder based coatings*

EN 12068, *Cathodic protection — External organic coatings for the corrosion protection of buried or immersed steel pipelines used in conjunction with cathodic protection — Tapes and shrinkable materials*

EN ISO 306, *Plastics — Thermoplastic materials — Determination of Vicat softening temperature (VST) (ISO 306:2004)*

EN ISO 527-3, *Plastics — Determination of tensile properties — Part 3: Test conditions for films and sheets (ISO 527-3:1995)*

EN ISO 868, *Plastics and ebonite — Determination of indentation hardness by means of a durometer (Shore hardness) (ISO 868:2003)*

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

EN ISO 1183-1, *Plastics — Methods for determining the density of non-cellular plastics — Part 1: Immersion method, liquid pycnometer method and titration method (ISO 1183-1:2004)*

EN ISO 2808, *Paints and varnishes — Determination of film thickness (ISO 2808:1997)*

EN ISO 2811-1, *Paints and varnishes — Determination of density — Part 1: Pycnometer method (ISO 2811-1:1997)*

EN ISO 2815, *Paints and varnishes — Buchholz indentation test (ISO 2815:2003)*

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EN ISO 8501-1, *Preparation of steel substrates before application of paints and related products — Visual assessment of surface cleanliness — Part 1: Rust grades and preparation grades of uncoated steel substrates and of steel substrates after overall removal of previous coatings (ISO 8501-1:1988)*

ISO 11357-2, *Plastics — Differential scanning calorimetry (DSC) — Part 2: Determination of glass transition temperature*

**3 Terms and definitions**

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

**3.1****manufacturer**

supplier of the coating material in a condition suitable for application to the product to be coated

**3.2****coater**

company that applies the coating material to the components to be coated in accordance with the provisions of this European Standard or the special requirements given in the tender specification and in the order

**3.3****purchaser**

company that buys the applied coating and/or coated pipeline

**3.4****maximum operating temperature**

maximum service temperature of the medium being carried by the buried or submersed coated pipeline

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**4 Information to be supplied by the purchaser**

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**4.1 Mandatory**

The purchaser shall state in the inquiry and order the following information:

- joints coated in accordance with this European Standard shall be designated by reference to this European Standard followed by the temperature class and the mechanical resistance class if applicable;

EXAMPLE 5 000 m of tube – EN 10224 of 406, 4-4,0 – coating of the joints EN 10329;

- type of coating material in accordance with Table 1;
- acceptability of repairs (see 6.6);
- maximum number and dimensions of repairs (if allowed – see 6.6);
- maximum operating temperature.

**4.2 Options to be indicated by the purchaser**

- type of test certificate when different from 5.3.2;
- repair procedure (see 6.6);
- minimum thickness of the coating (see 7.1.6.2 and 7.3.6.2);
- overlap of the factory applied coating (see 7.1.6.4, 7.2.6.4 and 7.3.6.4);



- qualification of the personnel applying the coating;
- conditions for testing the cathodic disbondment resistance.

## 5 Choice of coatings

### 5.1 Types of coating

The coatings of joints covered by this European Standard are classified into eight types in accordance with Table 1.

**Table 1 — Types of coating**

Item	Type of coating
1	Bituminous tape
2 <sup>a</sup>	Liquid epoxy resin
3 <sup>a</sup>	Liquid polyurethane
4	Petrolatum tapes
5	Plastic tapes
6	Heat shrinkable materials
7	Polypropylene
8	Epoxy powder
<sup>a</sup> The liquid epoxy resin and liquid polyurethane categories cover also modifications of these materials.	

NOTE It is intended for polyamide and polyethylene materials to be included in Table 1 in the next 5-year revision, when more experience with these coatings will be available.

### 5.2 Types of joint coatings depending on factory applied tube coating

The combinations of the joint coating materials with different factory applied coatings are given for information in Table 2. In each case, the products used shall be compatible and suitable for the service temperature of the pipeline. The tests to be carried out on the joint coating are described in the following subclauses.

The nature and the characteristics of the factory applied coating shall be known to the coater.

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Table 2 — Types of joint coating(s) depending on factory applied coating

Factory applied coatings		Types of coating for the welded joint							
European Standard	Type of factory applied coating	Bituminous tape	Liquid epoxy resin	Liquid polyurethane	Petrolatum tapes	Plastic tape	Heat shrinkable materials	Polypropylene	Epoxy powder
EN 10310	Polyamide coating	X	X	X	X	X	X		
	Polyethylene coating	X	X	X	X	X	X		
	Polypropylene coating	X	X	X	X	X	X	X	
	Bitumen	X			X	X	X		
	Epoxy powder	X	X	X	X	X	X		X
EN 10288	Extruded polyethylene (2-layer)	X	X	X	X	X	X		
	Fusion bonded powder polyethylene	X	X	X	X	X	X		
EN 10289	Liquid epoxy and epoxy-modified coatings	X	X	X	X	X	X		
EN 10290	Liquid polyurethane and polyurethane-modified coatings	X	X	X	X	X	X		

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### 5.3 Documents

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#### 5.3.1 Information for the coater

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Specific information on the coating materials will be given in the manufacturer's product data sheets.

An indication of the minimum amount of information required for a product data sheet is indicated in the chapter on the different coating materials.

#### 5.3.2 Test certificate for the coating

In case inspection operations are carried out as agreed by the purchaser and the coater at the time of enquiry and order, the inspection documents shall be according to EN 10204.

## 6 Application of the coating and general requirements

### 6.1 Preparation of the surface before coating

#### 6.1.1 General

Surface preparation shall be carried out in accordance with the recommendations of the manufacturer.

## 6.1.2 Preparation of the steel surface

### 6.1.2.1 General

At the time of application, the surface to be coated shall be dry and free from any contamination (such as earlier coatings, non-adherent particles, grease, oil, salt etc.) that could be detrimental to surface preparation or the adhesion of the coating to the steel.

The surface shall be cleaned to remove any greasy substances and salt. Filing or grinding shall be used to remove any weld spots, slag or burrs that could pierce the coating.

The preparation of the surface can be made either by brush cleaning or abrasive blast cleaning.

### 6.1.2.2 Brush cleaning

Rust and scale shall be removed, manually or mechanically, using wire brushes or any other suitable method that does not affect the quality of the surface to be coated; all dust and debris produced shall be removed correctly.

After brush cleaning, the steel surface shall correspond to grade St 3 as defined in EN ISO 8501-1 or better. The roughness of the cleaned surface shall be specified by the manufacturer and shall be measured using a method given in the coating application and repair procedure.

Oxidation and rust are removed by hand or mechanically using rotary steel brushes or any other appropriate means, which do not affect the quality of the part to be coated. The dust created by this operation shall be removed correctly.

### 6.1.2.3 Abrasive blast cleaning (standards.iteh.ai)

Rust and scale shall be removed by blast cleaning with a suitable abrasive to produce a surface that corresponds to Grade Sa 2½ as defined in EN ISO 8501-1 or better. The roughness of the cleaned surface, and the choice of abrasive, shall be specified by the manufacturer and shall be measured using a method given in the coating application and repair procedure.

After abrasive blast cleaning, the steel surface shall be inspected. By agreement with the customer, all slivers, laminations, weld spots or other imperfections exposed by the cleaning that may be detrimental to the quality of the coating shall be removed. After these imperfections have been removed, the residual thickness of the steel shall meet the minimum tolerance requirements of the tube standard.

### 6.1.2.4 Reconditioning

If the joint to be coated becomes contaminated or rusted after surface preparation, this area shall be subjected to further cleaning according to the requirements of this European Standard to give a suitable surface for the application of the coating.

## 6.1.3 Preparation of the adjoining factory applied coating

The factory coating adjacent to the joint area shall also be prepared to provide a suitable surface for the joint coating to adhere to. The methods for preparing this area are given in the clause covering the different joint coating materials.

## 6.2 Conditions before application

The temperature of the joint shall be at least 3 °C above the dew point.

Before the coating is applied, all residual abrasive dust and debris shall be removed from the surface of the joint by a method given in the coating application and repair procedure. By agreement with the purchaser, chemical pre-treatment may be used to supplement the surface preparation.

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Qualified personnel shall apply the coating according to the specified procedure that may have been qualified by the purchaser.

The joint shall not be exposed to conditions, such as high temperature, that would cause oxidation of the surface sufficient to be detrimental to the quality and adhesion of the coating.

At the time of application, the surface temperature of the joint shall be within the temperature range specified by the manufacturer. The temperature of the joint shall be monitored, using a suitable technique, to ensure that the application conditions on the steel substrate and factory applied coating are being met fully.

During bad weather, such as wind and rain, cleaning operations may only be carried out if suitable protective awnings, possibly heated depending on the type of the applied coating are installed.

**6.3 Appearance of the coating**

During the visual inspection, the appearance of the coating applied shall be homogenous across the entire surface, in particular no surface defects detrimental to the quality of the coating (grit, foreign particles, pitting, blisters...) shall be observed.

**6.4 Testing**

During production, there should be regular inspections of surface preparation and coating application; procedures are given in Annex I.

**6.5 Additional mechanical protection**

Additional mechanical protection (e.g. rockshield) is not covered in this European Standard.

**6.6 Repair**

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The acceptability of coating repair and the repair procedure is subject to agreement between the purchaser and the coater.

**6.7 Qualification of the application procedure and the coater**

Details of the application procedure and the coating material shall be supplied to the purchaser upon request. If requested, qualification testing to demonstrate the characteristics of the coating shall be carried out. This test shall use the coating materials, the procedure, equipment and personnel that will be used on site and will take into account specific application conditions found on site; recommendations for the procedure are given in Annex I.

**6.8 Preliminary quality inspection**

The coater shall ensure that:

- the products comply with the specification;
- the storage instructions are followed.

**7 Coatings****7.1 Bituminous tapes, petrolatum tapes, plastic tapes or heat shrinkable materials****7.1.1 General**

All coatings made by tapes or heat shrinkable materials shall meet the requirements of EN 12068.

## 7.1.2 Definition of the coating

### 7.1.2.1 Bituminous tapes

Bituminous tape coatings consist of a bonding primer and a single layer or multiple layers of fusible bituminous tape.

### 7.1.2.2 Petrolatum tapes

Petrolatum tape coatings may consist of a single layer or multiple layers of tape.

### 7.1.2.3 Plastic tapes

Plastic tape coatings may consists of a bonding primer and multiple layers of one or several plastics tapes.

### 7.1.2.4 Heat shrinkable materials

Heat shrinkable coatings consist of a polyolefin based backing with an adhesive on one side.

The heat shrinkable materials come in the form of the following:

- tubular sleeve;
- wrap around sleeve;
- pre-formed material (assembly for complex configuration parts).

Heat shrinkable materials may be applied with or without primer, depending on the nature of adhesive.

## 7.1.3 Information for the coater

The manufacturer shall supply data sheets giving information on the coating material that meets EN 12068.

## 7.1.4 Surface preparation

Surface preparation shall be carried out according to the provisions of this European Standard and the recommendations of the manufacturer (see the information required from the manufacturer according to EN 12068).

## 7.1.5 Application of the coating

### 7.1.5.1 General

Application of the coating shall be carried out in accordance with the recommendations of the manufacturer (see manufacturer's information, as required in EN 12068).

### 7.1.5.2 Application of the primer

Where applicable application of the primer shall be carried out in accordance with the recommendations of the manufacturer (see manufacturer's information, as required in EN 12068).

For petrolatum tapes normally there is no primer necessary.

### 7.1.5.3 Application of the tape or the heat shrinkable material

Application of the material shall be carried out in accordance with the recommendations of the manufacturer (see manufacturer's information, as required in EN 12068).