



SLOVENSKI STANDARD

SIST EN 10245-1:2012

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SIST EN 10245-1:2002

Jeklena žica in žični izdelki - Organske prevleke na jekleni žici - 1. del: Splošna pravila

Steel wire and wire products - Organic coatings on steel wire - Part 1: General rules

Stahldraht und Drahterzeugnisse - Organische Beschichtungen auf Draht - Teil 1: Allgemeine Regeln

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Fils et produits tréfilés en acier - Revêtements organiques sur fils d'acier - Partie 1: Principes généraux

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77.140.65	Jeklene žice, jeklene vrvi in verige	Steel wire, wire ropes and link chains

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EUROPEAN STANDARD
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Steel wire and wire products - Organic coatings on steel wire - Part 1: General rules

Fils et produits tréfilés en acier - Revêtements organiques
sur fils d'acier - Partie 1: Principes généraux

Stahldraht und Drahterzeugnisse - Organische
Beschichtungen auf Stahldraht - Teil 1: Allgemeine Regeln

This European Standard was approved by CEN on 17 September 2011.

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 CEN-CENELEC Management Centre or to any CEN member.

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

Management Centre: Avenue Marnix 17, B-1000 Brussels

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EN 10245-1:2011 (E)**Foreword**

This document (EN 10245-1:2011) has been prepared by Technical Committee ECISS/TC 106 "Wire rod and wires", 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of an identical text or by endorsement, at the latest by April 2012, and conflicting national standards shall be withdrawn at the latest by April 2012.

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 10245-1:2001.

This standard is made up of the following parts:

— *Part 1: General Rules;*

— *Part 2: PVC finished wire;*

— *Part 3: PE coated wire;*

— *Part 4: Polyester coated wire;*

— *Part 5: Polyamide coated wire.*

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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.

Introduction

This European Standard for organic coatings for steel wire covers the requirements of a general nature and applies also to coatings for which no specific requirements have been established in the subsequent parts of this standard.

The subsequent parts of this standard deal more specifically with clearly defined coatings or groups of coatings. These coatings may have their own particular methods of application and their individual requirements which are specified in these parts of this standard, in other standards or in manufacturers data sheets.

Because the standard specifies requirements and tests not only for the coating but also for the coating material, it has proved not practical to put all the requirements in one clause and all the tests in another one. Following structure has been chosen in order to limit complexity and to facilitate the use.

In writing this series of standards consideration has been given to the nomenclature and transformation of organic coating materials as applied to steel wire products. These organic coating materials may, on application to wire and by their integration into the finished wire product, change their characteristics and properties.

This standard specifies characteristics and tests not only for the organic coating but also for the coating materials both before and after their application to steel wire and wire products. In addition it specifies the requirements for performance levels and testing methods on organic coating material which have become an integral and permanent part of the finished wire product. Therefore it has proven not to be practical to put all requirements in one clause and all the tests in another one.

To aid continuity and in order to limit complexity, the following structure has been chosen for this standard:

- **Clause 4** deals with the characteristics and testing methods of organic coating material as supplied by the manufacturer for the purposes of its application to the wire product.

Tests described in this section are intended to be carried out by the organic coating material manufacturer or the applicator **before** the coating operation.

- **Clause 5** relates to the characteristics and testing methods for the "organic coating" when the organic coating material has been applied to and has become an integral part of the finished wire. Consequently tests are intended to be in the main carried out by the coating "applicators".
- **Clause 6** defines the performance requirements and testing methods on the "organic coating" of the finished wire product, and where this is not possible, tests will be carried out on "coated" panels.

1 Scope

This European Standard specifies the requirements for the characteristics and testing methods for organic coatings made of organic coating material suitable for the application on to steel wire and wire products of circular or other sections.

Other organic materials which are applied intentionally or otherwise such as oils, greases, waxes and temporary finishes which do not become integral or a permanent part of the finished wire product are excluded from this standard

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This European Standard is divided in a number of parts, with Part 1 covering the requirements of a general nature and applies to organic coatings and coating material for which no specific requirements have been established in the subsequent parts of prEN 10245.

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 10021:2006, *General technical delivery conditions for steel products*

EN 10218-1, *Steel wire and wire products — General — Part 1: Test methods*

EN 10218-2, *Steel wire and wire products — General — Part 2: Wire dimensions and tolerances*

EN 50395, *Electrical test methods for low voltage energy cables*

EN 50396, *Non electrical test methods for low voltage energy cables*

EN ISO 105-A08:2002, *Textiles — Tests for colour fastness — Part A08: Vocabulary used in colour measurement (ISO 105-A08:2001)*

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

EN ISO 877 (all parts), *Plastics — Methods of exposure to solar radiation*

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 1183-2, *Plastics — Methods for determining the density of non-cellular plastics — Part 2: Density gradient column method (ISO 1183-2:2004)*

EN ISO 1183-3, *Plastics — Methods for determining the density of non-cellular plastics — Part 3: Gas pycnometer method (ISO 1183-3:1999)*

EN ISO 2808, *Paints and varnishes — Determination of film thickness (ISO 2808:2007)*

EN ISO 2811-1, *Paints and varnishes — Determination of density — Part 1: Pycnometer method (ISO 2811-1:2011)*

EN ISO 2811-2, *Paints and varnishes — Determination of density — Part 2: Immersed body (plummet) method (ISO 2811-2:2011)*

EN ISO 2811-3, *Paints and varnishes — Determination of density — Part 3: Oscillation method (ISO 2811-3:2011)*

EN ISO 2811-4, *Paints and varnishes — Determination of density — Part 4: Pressure cup method (ISO 2811-4:2011)*

EN ISO 2813, *Paints and varnishes — Determination of specular gloss of non-metallic paint films at 20°, 60° and 85° (ISO 2813:1994, including Technical Corrigendum 1:1997)*

EN ISO 3668, *Paints and varnishes — Visual comparison of the colour of paints (ISO 3668:1998)*

EN ISO 4892-1, *Plastics — Methods of exposure to laboratory light sources — Part 1: General guidance (ISO 4892-1:1999)*

EN ISO 4892-2, *Plastics — Methods of exposure to laboratory light sources — Part 2: Xenon-arc lamps (ISO 4892-2:2006)*

EN ISO 4892-3, *Plastics — Methods of exposure to laboratory light sources — Part 3: Fluorescent UV lamps (ISO 4892-3:2006)*

EN ISO 6270-1, *Paints and varnishes — Determination of resistance to humidity — Part 1: Continuous condensation (ISO 6270-1:1998)*

EN ISO 6270-2, *Paints and varnishes — Determination of resistance to humidity — Part 2: Procedure for exposing test specimens in condensation-water atmospheres (ISO 6270-2:2005)*

EN ISO 6988, *Metallic and other non-organic coatings — Sulfur dioxide test with general condensation of moisture (ISO 6988:1985)*

EN ISO 9227, *Corrosion tests in artificial atmospheres — Salt spray tests (ISO 9227:2006)*

ISO 1512, *Paints and varnishes — Sampling of products in liquid or paste form*

ISO 4582, *Plastics — Determination of changes in colour and variations in properties after exposure to daylight under glass, natural weathering or laboratory light sources*

ISO 7724-2, *Paints and varnishes — Colorimetry — Part 2: Colour measurement*

ISO 7724-3, *Paints and varnishes — Colorimetry — Part 3: Calculations of colour differences*

3 Terms and definitions

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

3.1

organic coating

layer of organic coating material when deposited intentionally onto the wire/wire product substrate in a clearly specified manner

NOTE On becoming an integral part of the wire product the "organic coating" will impart specific functional and performance characteristics. The organic coating material may be applied directly to the surface of the steel wire or subsequent to a pre-treatment of the steel wire surface with a primary coating which can consist of inorganic or organic materials. For the purpose of this definition the steel wire/wire product may be coated with a non-ferrous metallic coating or not.

3.2

organic coating material

material made essentially of organic compounds capable of covering the steel wire surface after suitable preparation

NOTE The "organic coating materials" generally contain other matter such as pigments, fillers, plasticisers, lubricants and other additives which are specific to each organic coating material composition.

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The organic coating materials may be applied using a liquid solution containing organic products capable of covering the surface with the desired organic coating material.

The organic coating material may also be applied in the solid form, e.g. powder or in the form of granules. A powder coating is generally applied by depositing the powder on the wire/wire product and then sintering by melting the powder onto the wire product. Granules are applied to a wire by feeding them into an extruder and extruding the "organic coating" onto the wire substrate.

Organic coating materials can be subdivided into several groups each having its own characteristic method of application.

3.2.1**thermoplastics materials**

materials having the specific property of softening when heated and hardening or solidifying when cooled, which as a process is reversible and allows a certain degree of recycling or reprocessing of the material

NOTE These materials include PVC, nylon, polyethylene, polypropylene and the copolymer vinyl ethylene acetate.

These materials may be applied by one of the following methods: electrostatic spraying, fluidized bed or extrusion.

3.2.2**thermosetting materials**

materials having the property of changing into much more infusible and insoluble product when hot polymerized by methods such as radiation, catalysts. etc.

NOTE Once polymerized and made insoluble they cannot be remelted. These materials include polyester and epoxy coatings. These materials are typically applied by electrostatic powder spray.

3.2.3**plastisols/organosols**

suspension of fine particles of inorganic materials such as resins, PVC, etc carried in an organic fluid or solvents

NOTE After immersion or spraying, exposure to heat causes the plastisol to melt to form a solid continuous flexible organic coating.

3.2.4**paint**

material coloured with organic and sometimes inorganic components, dispersed in oils or water

NOTE They are applied in liquid form to the surface of the wire and after air drying they form a continuous adherent film on the wire. Application is by brush, roller or spray (electrostatic or atmospheric) or by immersion.

3.2.5**varnish**

generally organic materials which are transparent or coloured with an oil, resin and solvent base, which are then air dried

NOTE Application is the same as for paints (see 3.2.4).

3.2.6**lacquer**

synthetic organic transparent or coloured coating which generally dries to form a film after evaporation of the solvent

3.3**test piece**

part of the sample, with specified dimensions, machined or un-machined, brought to a required condition for submission to a given test

NOTE In certain cases, the test piece can be the sample itself or the rough specimen.

3.4**significant surface**

part of the total surface over which it shall be ensured that the "organic coating" complies with the specific requirements of the Standard

3.5**pre-treatment**

operation carried out on the wire/wire products before the final application of the organic coating material

3.6**shelf life**

period during which an organic coating material, securely packaged and stored according to the manufacturer's recommendations, may be kept from the time of manufacture to the actual use by the applicator and still retain the characteristics and properties as specified

3.7**meltflow index**

rate of extrusion of molten resins through a die of specified length and diameter under prescribed conditions of load and piston position in the barrel as the timed measurement is being made

3.8**manufacturer**

organisation which manufactures the organic coating material

3.9**applicator**

organisation which applies the organic coating material to the wire/wire product and transforms it into an organic coating which is an integral part of the finished wire product

3.10**specifier**

organisation issuing a contract specifying the particular properties and performance requirements of a finished wire/wire products covered with an organic coating

NOTE The specifier is usually the purchaser of the finished wire product.

4 Requirements and testing methods for the organic coating material

4.1 General

Many characteristics of organic coating materials prove difficult to measure. This is why a good number of characteristics in this European Standard relate to requirements for organic coating materials as supplied by the manufacturer. The manufacturer's data sheet may supply many of these characteristics. They shall also give the necessary information for traceability of the materials.

4.2 Requirements

4.2.1 Composition

The manufacturer shall supply reference data for the qualification of the material. The organic coating material shall comply with the compositional characteristics specified at the time of the order. The specifications commonly include quantities and type of pigments, plasticizers, lubricants and other organic and inorganic materials agreed mutually.

The manufacturer shall immediately notify the applicator of any subsequent change in the type and quantity of the constituent parts of the composition once this has been agreed between the two parties. The manufacturer shall also provide appropriate information for easy identification of the batches supplied.