# SLOVENSKI STANDARD
# SIST EN 10257-2:2012

**01-januar-2012**

**Nadomešča:**

**SIST EN 10257-2:2000**

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**S cinkom ali cinkovimi zlitinami prevlečena žica iz nelegiranega jekla za armiranje močnostnih in telekomunikacijskih kablov - 2. del: Podvodni kabli**

Zinc or zinc alloy coated non-alloy steel wire for armouring either power cables or telecommunication cables - Part 2: Submarine cables

Mit Zink oder Zinklegierung überzogener unlegierter Stahldraht zur Bewehrung von Strom- und Fernmeldekabeln- - Teil 2: Unterseekabel



Fils en acier non allié, revêtu de zinc ou d'alliage de zinc, pour armure de câbles destinés au transport d'énergie ou aux télécommunications - Partie 2: Câbles sous-marins

**Ta slovenski standard je istoveten z: EN 10257-2:2011**

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**ICS:**

| | | |
|---|---|---|
| 29.060.20 | Kabli | Cables |
| 77.140.65 | Jeklene žice, jeklene vrvi in verige | Steel wire, wire ropes and link chains |

**SIST EN 10257-2:2012 en**

EUROPEAN STANDARD

NORME EUROPÉENNE

EUROPÄISCHE NORM

# EN 10257-2

October 2011

ICS 77.140.65

Supersedes EN 10257-2:1998

English Version

# Zinc or zinc alloy coated non-alloy steel wire for armouring either power cables or telecommunication cables - Part 2: Submarine cables

Fils en acier non allié revêtus de zinc ou d'alliage de zinc pour l'armure des câbles destinés au transport d'énergie ou aux télécommunications - Partie 2: Câbles sous-marins

Mit Zink oder Zinklegierung überzogener unlegierter Stahldraht zur Bewehrung von Strom- und Fernmeldekabeln- - Teil 2: Unterseekabel

This European Standard was approved by CEN on 10 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.



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 CEN-CENELEC Management Centre has the same status as the official versions.

CEN members are the national standards bodies of 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 United Kingdom.



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

**Management Centre: Avenue Marnix 17, B-1000 Brussels**



Ref. No. EN 10257-2:2011: E

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## Foreword

This document (EN 10257-2:2011) 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 10257-2:1998.

The European Standard will comprise the following parts:

— *Part 1: Land cables*;

— *Part 2: Submarine cables*.

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.

## 1 Scope

This European Standard specifies requirements for the properties of non-alloy zinc or zinc alloy coated steel wires used for the armouring of either submarine power or telecommunication cables.

## 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, *General technical delivery conditions for steel products*

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

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

EN 10218-2:1996, *Steel wire and wire products — General — Part 2: Wire dimensions and tolerances*

EN 10244-1, *Steel wire and wire products — Non-ferrous metallic coatings on steel wire — Part 1: General principles*

EN 10244-2:2009, *Steel wire and wire products — Non-ferrous metallic coatings on steel wire — Part 2: Zinc or zinc alloy coatings*



EN ISO 16120-1, *Non-alloy steel wire rod for conversion to wire - Part 1: General requirements (ISO 16120-1:2011)*



EN ISO 16120-2, *Non-alloy steel wire rod for conversion to wire - Part 2: Specific requirements for general-purpose wire rod (ISO 16120-2:2011)*

EN ISO 16120-3, *Non-alloy steel wire rod for conversion to wire - Part 3: Specific requirements for rimmed and rimmed substitute, low-carbon steel wire rod (ISO 16120-3:2011)*

## 3 Terms and definitions

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

**3.1**
**coil**
reel
spool
continuous length of wire wound in approximately concentric rings

**3.2**
**batch**
quantity of finished wire presented for examination and tested at any one time

## 4 Information to be supplied by the purchaser

When ordering wire to this European Standard, the purchaser shall specify:

a) the designation (see Clause 5);

b) the quantity in appropriate units;

c) the unit weight of coils (kg);

d) instructions for strapping and packaging;

e) surface condition (see Clause 7.3);

f) agreed quality characteristics (see Clause 8);

g) inspection document requirements.

And if required:

h) coating uniformity;

i) identity for traceability.

## 5 Designation

The steel wire for submarine cable shall be designated by:

a) number of this European Standard i.e. EN 10257-2;

b) tensile strength grade;

c) nominal wire diameter;

d) wire coating type.



EXAMPLE Wire for submarine cable to EN 10257-2, grade 85, 2,24 mm diameter zinc coated to EN 10244-2:2009, class A.

EN 10257-2 - 85 - 2,24 Zn EN 10244-2:2009, class A.

## 6 Manufacture

### 6.1 Non-alloy steel

The steel wire shall be cold drawn from plain carbon steel rod produced to EN 10016-1, EN 10016-2 or EN 10016-3 and capable of achieving the physical properties required by this standard. The steel rod shall be capable of being satisfactorily butt-welded.

### 6.2 Welds in coils

For grades 34 and 65 only, one dressed weld per coil shall be allowed after drawing and before coating. Such a weld shall not be less than 100 m from either end of the coil.

No weld shall be made after drawing on grades 85, 105, 125, 145 and 165.

# 7 Requirements

## 7.1 Mechanical properties

### 7.1.1 Tensile strength

The tensile strength of the wires measured on the actual diameter shall be as given in Table 1 for the appropriate grade.

**Table 1 — Tensile strength of wire grades**

| Grade | Tensile strength range<br>N/mm$^2$ |
|---|---|
| 34 | $340 < R_m \leq 540$ |
| 65 | $650 < R_m \leq 850$ |
| 85 | $850 < R_m \leq 1\,050$ |
| 105 | $1\,050 < R_m \leq 1\,250$ |
| 125 | $1\,250 < R_m \leq 1\,450$ |
| 145 | $1\,450 < R_m \leq 1\,650$ |
| 165 | $1\,650 < R_m \leq 1\,900$ |

NOTE 1 If other minima are ordered a 200 N/mm$^2$ range shall apply.

NOTE 2 If tensile strength minima are ordered other than those specified and the tensile strength of the ordered grade is less than or equal to 100 N/mm$^2$ above the minimum tensile strength of the nearest lower specified grade then the properties of that grade shall apply. If the minimum tensile strength of the required grade is more than 100 N/mm$^2$ above the minimum tensile strength of the nearest lower specified grade then the higher grade properties shall apply.



### 7.1.2 Elongation

Elongation measured after fracture shall be not less than that given in Tables 2, 3 or 4 for the grade and diameter of wire being tested.

### 7.1.3 Torsion

When tested in accordance with 10.3.1, the wire shall withstand without breaking not less than the minimum number of turns given in Tables 2, 3 and 4 for the wire being tested.

### 7.1.4 Steel ductility wrap test

When subjected to a steel ductility wrap test, test samples of grade 85, 105, 125, or 145 shall withstand being closely wrapped by 8 turns around their own diameter. A test sample of grade 165 shall withstand being closely wrapped around two times its own diameter. No sign of fracture of the base metal shall be evident.

## 7.2 Nominal diameters and tolerances

The preferred nominal diameters of finished wire and the tolerances on diameter shall be as specified in Tables 2, 3 and 4, depending on the tensile grades.

The tolerances correspond to T1 of EN 10218-2:1996, Table 1.

It is recognized that thick coatings, obtained in the hot dip process, may not be entirely free from surface irregularities, and, provided the latter do not go beyond the limits of good practice (i.e. isolated and not of a repetitive nature), they shall not be a cause for rejection. Persistent lumpy galvanizing or bambooing shall be cause for rejection.

**Table 2 — Preferred nominal diameters, tolerances and mechanical properties of grade 34 steel wire**

| Nominal wire diameter<br>mm | Tolerance on diameter<br>mm | Minimum elongation on gauge length<br>$L_0$ = 250 mm<br>% | Torsion test minimum number of turns[a] on gauge length<br>$L_0$ = 150 mm |
|---|---|---|---|
| 3,35 | ± 0,07 | | 18 |
| 4,00 | ± 0,07 | | 15 |
| 4,25 | ± 0,08 | | 14 |
| 4,50 | ± 0,08 | 10 | 13 |
| 4,75 | ± 0,08 | | 13 |
| 5,00 | ± 0,08 | | 12 |
| 5,30 | ± 0,09 | | 11 |
| 5,6 | ± 0,09 | | 11 |
| 6,0 | ± 0,09 | | 10 |
| 6,3 | ± 0,09 | 10 | 10 |
| 6,7 | ± 0,10 | | 9 |
| 7,1 | ± 0,10 | | 8 |
| 7,5 | ± 0,10 | | 8 |
| 8,0 | ± 0,10 | 10 | 8 |
| 8,5 | ± 0,12 | | 7 |

[a] Based on 40 turns in a length of 100 wire diameters.

NOTE 1 For intermediate sizes the properties to be achieved shall be those for the next larger size listed.

NOTE 2 Grade 34 steel wire may in time exhibit changes in mechanical properties after manufacture, particularly tensile strength and elongation. These changes result from a phenomenon known as strain ageing or strain age hardening, and lead to an increase in tensile strength and a decrease in elongation, compared to the wire immediately after coating with zinc.

It is customary to carry out tests immediately after manufacture. At ordinary temperatures, strain ageing may proceed slowly. Therefore, results of tests performed by the purchaser may be at variance with those reported by the supplier.