SLOVENSKI STANDARD
SIST EN 10264-4:2003

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Jeklena žica in žični izdelki - Jeklena žica za vrvi - 4. del: Nerjavna jeklena žica

Steel wire and wire products - Steel wire for ropes - Part 4: Stainless steel wire

Stahldraht und Drahterzeugnisse - Stahldraht für Seile - Teil 4: Draht aus nichtrostendem Stahl

Fils et produits tréfilés en acier - Fils pour câbles - Partie 4: Fils tréfilés en acier inoxydable

Ta slovenski standard je istoveten z: **EN 10264-4:2002**

ICS:

77.140.20	Visokokakovostna jekla	Stainless steels
77.140.65	Jeklene žice, jeklene vrvi in verige	Steel wire, wire ropes and link chains

SIST EN 10264-4:2003 **en**

EUROPEAN STANDARD

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English version

Steel wire and wire products - Steel wire for ropes - Part 4: Stainless steel wire

Fils et produits tréfilés en acier - Fils pour câbles - Partie 4: Fils tréfilés en acier inoxydable

Stahldraht und Drahterzeugnisse - Stahldraht für Seile - Teil 4: Draht aus nichtrostendem Stahl

This European Standard was approved by CEN on 4 May 2002.

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 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 Management Centre has the same status as the official versions.

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

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COMITÉ EUROPÉEN DE NORMALISATION
EUROPÄISCHES KOMITEE FÜR NORMUNG

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Contents

Foreword

This document EN 10264-4:2002 has been prepared by Technical Committee ECISS/TC 30 "Steel wires", the secretariat of which is held by BSI.

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 February 2003, and conflicting national standards shall be withdrawn at the latest by February 2003.

This European Standard for wire for ropes is made up of the following parts:

Part 1: General requirements.

Part 2: Cold drawn non alloy steel wire for ropes for general applications.

Part 3: Cold drawn and cold shaped non alloy steel wire for high duty applications.

Part 4: Stainless steel wire.

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

1 Scope

This Part of this European Standard specifies the characteristics of stainless steel wire for the manufacture of ropes that are exposed to corrosion and in some cases to a moderate temperature.

This part of this European Standard specifies the following for stainless steel wire for ropes

— dimensional tolerances;

— mechanical characteristics;

— requirements relating to the chemical composition of the stainless steel wire;

— conditions to be satisfied by any coating.

2 Normative references

This European Standard incorporates by dated or undated reference, provisions from other publications. These normative references are cited at the appropriate places in the text, and the publications are listed hereafter. For dated references, subsequent amendments to or revisions of any of these publications apply to this European Standard only when incorporated in it by amendment or revision. For undated references the latest edition of the publication referred to applies (including amendments).

EN 10088-3, *Stainless steels — Part 3: Technical delivery conditions for semi-finished products, bars, rods and sections for general purposes.*

EN 10095, *Heat resisting steels and nickel alloys.*

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

EN 10264-1, *Steel wire and wire products — Steel wire for ropes — Part 1: General requirements.*

ASTM A342, *Standard test methods for permeability of feebly magnetic materials.*

3 Designation of product

The designation of the product is based on the nominal diameter, chemical composition and minimum tensile strength of the wire.

EXAMPLE Stainless steel wire for rope, diameter 1,5 mm - grade X4CrNi18-12 - strength 1 450 MPa.

Wire for rope EN 10264-4 - 1,5 - X4CrNi18-12 -1 450

NOTE The grade of steel can be designated numerically, see Table 1.

4 General conditions of manufacture

4.1 Main steel grades and characteristic applications

The grades given in Table 1 are widely used mainly in accordance with EN 10088-3 and EN 10095 with requirements as specified in this part of EN 10264. However, for other specific applications other steel grades specified in EN 10088-3 or EN 10095 may be used with requirements to be agreed between the parties.

Table 1 gives an informative indication of characteristic applications of the mentioned steel grades.

Table 1 — Main steel grades and characteristic applications

Grades of steel		Application
Steel number	Steel name	
1.4301	X5CrNi18-10	for general use in a corrosive environment
1.4310	X10CrNi18-8	as 1.4301 for general use for greater mechanical strength
1.4401	X5CrNiMo17-12-2	for highly corrosive environment particularly in marine atmosphere
1.4303	X4CrNi18-12	for low permeability requirements
1.4841	X15CrNiSi25-21	for ropes also subjected to a moderate temperature

4.2 Chemical composition

In accordance with EN 10088-3 and EN 10095, the chemical composition of the stainless steels shall comply with Table 2.

Table 2 — Chemical analysis in % by mass

Grades of steel		C	Si	Mn	P	S	Cr	Mo	Ni	N
Steel number	Steel name		max.	max.	max.	max.				
1.4301	X5CrNi18-10	≤ 0,07	1,00	2,00	0,045	0,015	17,00-19,50		8,00-10,50	≤ 0,11
1.4310	X10CrNi18-8	0,05-0,15	2,00	2,00	0,045	0,015	16.00-19.00	≤ 0,80	6,00-9,50	≤ 0,11
1.4401	X5CrNiMo17-12-2	≤ 0,07	1,00	2,00	0,045	0,015	16,50-18,50	2,00-2,50	10,00-13,00	≤ 0,11
1.4303	X4CrNi18-12	≤ 0,06	1,00	2,00	0,045	0,015	17,00-19,00		11,00-13,00	≤ 0,11
1.4841	X15CrNiSi25-21	≤ 0,20	1,50-2,50	2,00	0,045	0,030	24,00-26,00		19,00-22,00	≤ 0,11

4.3 Surface condition

Stainless steel wire for ropes shall be supplied either matt (dry drawn) or shiny (surface condition achieved either by polishing or by wet drawing). If a particular appearance is required, it shall be stipulated at the time of enquiry and order.

As an indication, wire of diameter **<** 0,50 mm is normally wet drawn and supplied shiny while wire with a diameter greater than 1,00 mm is commonly dry drawn and supplied matt. For intermediate sizes there is no preference and it will be pending of the manufacturer.

5 Characteristics and requirements

5.1 Tensile strength

The wire is characterized by a minimum tensile strength. The minimum tensile strength depends on the steel grade and the diameter of the wire. Table 3 specifies the minimum tensile strength for each steel grade. The maximum value shall not exceed the minimum value plus 15 %.

Table 3 — Tensile strength requirements

Nominal diameter *d* mm	Minimum tensile strength [a] – MPa[b]				
	1.4301 LT [c]	1.4310 NT [d]	1.4303	1.4401	1.4841
$d \leq 0,20$	2 050	2 200	1 600	1 725	1 700
$0,20 \leq d < 0,30$	2 000	2 150	1 575	1 700	1 650
$0,30 \leq d < 0,40$	1 950	2 100	1 550	1 675	1 600
$0,40 \leq d < 0,50$	1 900	2 050	1 550	1 650	1 575
$0,50 \leq d < 0,65$	1 850	2 000	1 525	1 625	1 575
$0,65 \leq d < 0,80$	1 800	1 950	1 525	1 600	1 550
$0,80 \leq d < 1,00$	1 750	1 900	1 500	1 575	1 550
$1,00 \leq d < 1,25$	1 700	1 850	1 475	1 550	1 525
$1,25 \leq d < 1,50$	1 650	1 800	1 450	1 500	1 500
$1,50 \leq d < 1,75$	1 600	1 750	1 425	1 450	1 475
$1,75 \leq d < 2,00$	1 550	1 700	1 400	1 400	1 450
$2,00 \leq d < 2,50$	1 500	1 650	1 350	1 350	1 400
$2,50 \leq d \leq 3,00$	1 450	1 600	1 300	1 300	1 350

[a] For ropes for specific applications, lower strengths may be requested.
[b] 1 MPa = 1 N/mm^2.
[c] Low level of tensile strength.
[d] Normal level of tensile strength.

5.2 Diameter tolerances

The diameter measured shall comply with the tolerances specified in Table 4. The out of roundness shall not be greater than half the tolerance on diameter.

Table 4 — Diameter tolerances

Dimensions in millimetres

Nominal diameter *d*	Tolerance (±)
0,12 ≤ *d* < 0,22	0,006
0,22 ≤ *d* < 0,37	0,008
0,37 ≤ *d* < 0,65	0,010
0,65 ≤ *d* < 1,01	0,015
1,01 ≤ *d* < 1,78	0,020
1,78 ≤ *d* < 2,78	0,025
2,78 ≤ *d* ≤3,00	0,030

5.3 Ductility

Because of the specific nature of this material and its deformation structure (by drawing), conventional ductility tests show a wide spread. When they are required, the following ductility tests shall be carried out: reverse bending test, tensile strength test on knotted wire or wrapping test. The parties shall agree upon the required ductility tests and on the minimum required results.

5.4 Magnetic permeability

When the grade X4CrNi18-12 (1.4303) is required with a very low permeability (non-magnetic), the magnetic permeability shall be less than 1,05.

The grade X4CrNiMo17-12-2 (1.4401) may also be requested with low permeability. In this case, the requirements shall be agreed between the parties.

6 Test methods

6.1 General

Tests shall be carried out in accordance with EN 10218-1 and EN 10264-1 with the following observations.

6.2 Dimension of wire

The diameter of the wire shall be measured with a micrometer with an accuracy of at least 0,001 mm for dimensions below 0,65 mm. For larger wire, an accuracy of 0,01 mm is acceptable.

6.3 Tensile test

The tensile test shall be carried out in accordance with EN 10264-1.