



SLOVENSKI STANDARD
SIST EN 12385-7:2003

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Steel wire ropes - Safety - Part 7: Locked coil ropes for mine shafts

Drahtseile aus Stahldraht - Sicherheit - Teil 7: Verschlossene Spiralseile für Schachtförderanlagen des Bergbaus

Câbles en acier - Sécurité - Partie 7: Câbles clos d'extraction pour puits de mine

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ICS:

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

This document (EN 12385-7:2002) has been prepared by Technical Committee CEN/TC 168, "Chains, ropes, webbing, slings and accessories – Safety", 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of an identical text or by endorsement, at the latest by April 2003, and conflicting national standards shall be withdrawn at the latest by April 2003.

The other Parts of EN 12385 are:

- Part 1: General requirements
- Part 2: Definitions, designation and classification
- Part 3: Information for use and maintenance
- Part 4: Stranded ropes for general lifting applications
- Part 5: Stranded ropes for lifts
- Part 6: Stranded ropes for mine shafts
- Part 8: Stranded hauling and carrying-hauling ropes for cableway installations designed to carry persons
- Part 9: Locked coil carrying ropes for cableway installations designed to carry persons
- Part 10: Spiral ropes for general structural applications

Part 1 provides the general requirements of Parts 4 to 10.

This is the first edition of this Part.

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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, Czech Republic, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Luxembourg, Malta, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland and the United Kingdom.

EN 12385-7:2002 (E)**Introduction**

During the preparation of this standard, it was assumed that a negotiation would take place between the purchaser and the manufacturer concerning the intended purpose of the rope.

Specifiers, purchasers and users should recognise that locked coil ropes for mine shafts are, more often than not, specially designed by the rope manufacturer to meet particular shaft conditions and machinery requirements.

1 Scope

This Part of this European Standard specifies the particular materials, manufacturing and testing requirements for full-locked coil hoist and half-locked and full-locked coil guide ropes for mine shafts.

The particular hazards covered by this Part are identified in Clause 4.

For information only, typical breaking forces for both full-locked coil hoist ropes and half-locked and full-locked coil guide ropes, based on one particular combination of wire tensile strength grades in each case, are given in annex B for some of the more common sizes.

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 10264-3, *Steel wire and wire products – Steel wire for ropes – Part 3: Cold drawn and cold shaped non-alloyed steel wire for heavy duty applications.*

EN 12385-1:2002, *Steel wire ropes – Safety – Part 1: General requirements.*

EN 12385-2, *Steel wire ropes – Safety – Part 2: Definitions, designation and classification.*

ISO 3156, *Stranded wire ropes for mine hoisting - Impregnation compounds, lubricants and service dressing – Characteristics and tests.*

DIN 21258, *Preservative compounds for koepe friction drive winding ropes in mining – Safety requirements and testing.*

3 Terms and definitions

For the purposes of this European Standard, the terms and definitions in EN 12385-2 apply.

4 List of hazards

For the purposes of this Part the hazards identified in clause 4 of Part 1 apply.

5 Safety requirements and/or measures

5.1 General

In addition to the requirements given in 5.2 to 5.8, the requirements shall also conform to those given in Part 1 of this standard.

5.2 Materials

5.2.1 Wire

Wires before ropemaking shall conform to:

- a) EN 10264-3 for full-locked coil hoist ropes and
- b) annex A for locked coil guide ropes.

The tensile strength grades of shaped wires of full-locked coil hoist ropes shall be in accordance with Table 1, with the exception that the centre wire may be of a lower grade. In this case it shall have torsion and bend values not less than those given for 1570 grade:

Table 1 — Tensile strength grades of wires

Round wire N/mm ²	Shaped wire N/mm ²
1570	1270
1770	1370
1860	1470
1960	1570
—	1670
—	1770

The tensile strength grades of all wires of half-locked and full-locked coil guide rope shall be 780, 880, 980, 1080, 1180, 1270, 1370 or 1470 N/mm². The tensile strength tolerance for wire for guide ropes shall not exceed +250 N/mm².

5.2.2 Lubricant

The lubricant(s) shall comply with ISO 3156.

The lubricant(s) for friction hoist ropes shall comply with DIN 21258, taking account of:

- a) the coefficient of friction between the rope and the drive sheave; and
- b) the chemical compatibility of the lubricant with the respective sheave linings.

NOTE The purchaser should specify any particular lubricant requirements (see introduction).

5.3 Rope manufacture

5.3.1 Wire finish

The finish of the wires shall be bright, zinc coated class D or a combination of both provided that in any one layer the finish is the same.

EN 12385-7:2002 (E)**5.3.2 Lubrication**

Ropes shall be lubricated at each closing operation except for full-locked coil friction hoist ropes.

NOTE The purchaser should specify any particular lubrication requirements (see Introduction).

5.3.3 Construction**5.3.3.1 Full-locked coil hoist rope**

The rope shall consist of one outer layer of full-lock wires laid over an underlying layer of half-lock and round wires and a strand centre of round wires.

NOTE 1 For the larger sizes of rope there can be more than one layer of half-lock and round wires.

NOTE 2 For practical manufacturing reasons the actual number of wires in the outer layer can vary but should not do so by more than one wire from that specified by the manufacturer.

5.3.3.2 Half-locked coil guide rope

The rope shall consist of an outer layer of alternate half-lock and round wires laid over an inner layer or layers of round wires, all laid over a centre wire.

For rope sizes up to and including 41 mm in rope grades up to and including 1080, the outer wire size (i.e. the height of the shaped wire and the diameter of the round wire) shall not be less than 17,5 % of the nominal rope diameter.

For ropes in excess of 41 mm diameter in rope grades above 1080, the minimum height of the shaped wire shall be 7,6 mm.

The diameter of the round wire in the outer cover shall be within ± 10 % of the height of the shaped wire.

5.3.3.3 Full-locked coil guide ropes

The rope shall consist of an outer layer of full-lock wires laid over an underlying layer of half-lock and round wires and a strand centre of round wires.

5.4 Diameter**5.4.1 Tolerances**

When measured in accordance with 6.3.1 of EN 12385-1:2002 the measured diameter shall be within ± 2 % of the nominal diameter.

NOTE Specifiers, purchasers and users should recognize that locked coil ropes for mine shafts are, more often than not, specially designed by the rope manufacturer to meet particular shaft conditions and machinery requirements and particular attention should be given to the selection of the correct size of rope and associated diameter tolerance.

5.4.2 Difference between diameter measurements

The difference between any two of the four measurements taken in accordance with 6.3.1 of EN 12385-1:2002 shall not exceed 4 % of the nominal rope diameter.

5.5 Breaking force

Only the minimum breaking force shall be specified as the breaking force.

The specified minimum value for a given rope size, construction and combination of wire tensile strength grades shall be determined by the rope manufacturer.

NOTE Typical minimum values of breaking force for full-locked coil hoist ropes, half-locked and full-locked coil guide ropes with one particular combination of wire tensile strength grades are given in annex B. The combination for hoist ropes is based on an outer full-lock wire of tensile strength grade 1270, an inner half-lock wire of tensile strength grade 1470 and inner round wires of tensile strength grade 1860 and for guide ropes is based on an outer half-lock of tensile strength grade 780 and round wires of tensile strength grade 880. Depending on the manufacturer's actual rope design, higher or lower values than those given in annex B can be specified.

Unless stated otherwise by the manufacturer, the spinning loss factor used in the determination of minimum breaking force shall be 0,835 for full-locked coil hoist ropes and 0,925 for half-locked coil guide ropes.

The manufacturer shall carry out a breaking force test in accordance with Method 1 as described in 6.4.1 of EN 12385-1:2002 on a sample of rope from each production length.

5.6 Length

The actual length of rope shall not be less than the specified length, nor shall it exceed it by more than 2 %.

5.7 Length mass

The nominal length mass shall be specified by the manufacturer.

When measured in accordance with clause 6 the measured length mass shall be in accordance with the specified value, subject to a tolerance of ± 4 %.

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5.8 Designation and classification

Rope designation and classification shall conform to EN 12385-2.

6 Verification of safety requirements and/or measures

6.1 General

Verification of safety requirements and/or measures shall be in accordance with that given in clause 6 of EN 12385-1 and the additional verification given in 6.2 to 6.5 below.

6.2 Lubricant

Compliance with the lubricant requirements shall be through a visual verification of the inspection documents supplied with the lubricant.

6.3 Lubrication

Compliance with the lubrication requirements shall be through a visual verification.

6.4 Construction

Compliance with the construction requirements shall be through a visual verification.