SLOVENSKI STANDARD
oSIST prEN 12385-5:2018

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Jeklene žične vrvi - Varnost - 5. del: Pramenaste vrvi za dvigala (lifte)

Steel wire ropes - Safety - Part 5: Stranded ropes for lifts

Drahtseile aus Stahldraht - Sicherheit - Teil 5: Litzenseile für Aufzüge

Câbles en acier - Sécurité - Partie 5: Câbles à torons pour ascenseurs

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English Version

Steel wire ropes - Safety - Part 5: Stranded ropes for lifts

Câbles en acier - Sécurité - Partie 5: Câbles à torons pour ascenseurs

Drahtseile aus Stahldraht - Sicherheit - Teil 5: Litzenseile für Aufzüge

This draft European Standard is submitted to CEN members for enquiry. It has been drawn up by the Technical Committee CEN/TC 168.

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Recipients of this draft are invited to submit, with their comments, notification of any relevant patent rights of which they are aware and to provide supporting documentation.

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

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European foreword

This document (prEN 12385-5:2018) 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 document is currently submitted to the CEN Enquiry.

This document will supersede EN 12385-5:2002.

This document has been prepared under a mandate given to CEN by the European Commission and the European Free Trade Association, and supports essential requirements of EU Directive(s).

For relationship with EU Directive(s), see informative Annex ZA and Annex ZB, which are integral parts of this document.

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 6: Stranded ropes for mine shafts
- Part 7: Locked coil 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.

Introduction

This European Standard is a type C standard as stated in EN ISO 12100.

This document has been prepared to be a harmonized standard to provide a means of complying with the essential safety requirements of the Lifts Directive and the Machinery Directive.

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.

Although tables of breaking forces and masses are provided for a number of the more common classes, diameters and rope grades, this Part of this standard is not limited to those given, providing all of the other requirements are met.

When provisions of this type C standard are different from those which are stated in type A or B standards, the provisions of this type C standard take precedence over the provisions of the other standards for wire ropes that have been designed and produced according to the provisions of this type C standard.

1 Scope

This document specifies the particular materials, manufacturing and testing requirements for stranded ropes for suspension, compensating and governor duties for traction drive and hydraulic lifts moving between guides and similar applications.

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

This document does not establish requirements for information for use other than those given in Clause 7 of Part 1. Neither does it cover the requirements for ropes fitted with terminations.

Minimum breaking force values for the more common classes, sizes and grades of rope are provided in Tables 6 to 10.

2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements 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 10264-2:2012, *Steel wire and wire products — Steel wire for ropes — Part 2: Cold drawn non alloy steel wire for ropes for general applications*

EN 12385-1:2002+A1:2008, *Steel wire ropes — Safety — Part 1: General requirements*

EN 12385-2:2002+A1:2008, *Steel wire ropes — Safety — Part 2: Definitions, designation and classification*

EN ISO 12100:2010, *Safety of machinery — General principles for design — Risk assessment and risk reduction (ISO 12100:2010)*

ISO 4346:1977, *Steel wire ropes for general purposes — Lubricants — Basic requirements*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in EN ISO 12100:2010 and EN 12385-2 apply.

ISO and IEC maintain terminological databases for use in standardization at the following addresses:

- IEC Electropedia: available at http://www.electropedia.org/
- ISO Online browsing platform: available at http://www.iso.org/obp

4 List of hazards

In addition to the general hazards identified in Clause 4 of Part 1, Table 1 contains all the particular hazards which require action to reduce risk as being specific and significant for steel wire ropes for lifts.

Table 1— Hazards and associated requirements

Hazards relevant to this standard identified by reference to EN ISO 12100:2010	Relevant clause of this standard
Inadequate mechanical strength	5.1 5.2 5.3 5.5 6 Annex A
Inadequate dimensional tolerances	5.4
Inadequate information about the handling, storage, cutting and packaging of the wire rope	7
Inadequate information about the specification, designation and performance of the wire rope	5.6 6 7
Inadequate information for the selection of ropes suitable for the particular application	Annex B

NOTE For the purposes of this Part of EN 12385, insufficient strength of parts means failure to achieve the minimum breaking force of the rope.

5 Safety requirements and/or measures

5.1 General

In addition to the requirements given in 5.2 to 5.6, the requirements shall also conform to those given in part 1 of this standard.

5.2 Materials

5.2.1 Wire

All wires, before ropemaking, shall conform to EN 10264-2.

For rope grades 1180/1770 (dual tensile), 1370/1770 (dual tensile) and 1570/1770 (dual tensile), the tensile strength grades of the outer wires shall be 1180 N/mm^2, 1370 N/mm^2 and 1570 N/mm^2 respectively. The tensile strength grade of the inner wires shall be 1770 N/mm^2.

For rope grades 1570 (single tensile) and 1770 (single tensile), the wire tensile strength grades shall be 1570 N/mm^2 and 1770 N/mm^2 respectively.

The tensile strength grades of centre wires, filler wires and core wires shall be determined by the manufacturer.

5.2.2 Core

The core shall be one of the following types:

a) fibre;

b) steel, as an independent wire rope (IWRC);

c) steel based composite e.g. steel plus fibre, steel plus polymer; or

d) non-metallic other than only of fibre.

5.2.3 Lubricant

Where used, the lubricant shall comply with ISO 4346.

5.3 Rope manufacture

5.3.1 Lubrication

Lubrication shall be limited to the strands.

5.3.2 Construction

The rope construction shall be either:

a) one of those covered by Tables 6, 7, 8, 9 and 10; or

b) another construction as specified by the manufacturer.

5.3.3 Rope grade

5.3.3.1 General

The rope grade shall reflect the tensile strength grades of the outer and inner wires respectively, e.g. rope grade 1370/1770 signifies a dual tensile rope having outer wires of tensile strength grade 1370 N/mm^2 and inner wires of tensile strength grade 1770 N/mm^2 and rope grade 1570 signifies a single tensile rope having outer and inner wires of tensile strength grade 1570 N/mm^2.

For the more common classes of rope, the rope grade, R_r , shall be used in the calculation of minimum breaking force of single tensile ropes and the rope value R_{dt} shall be used in the calculation of minimum breaking force of dual tensile ropes, see Annex A for values of R_{dt}.

The rope grades for the various duties shall be in accordance with 5.3.3.2 to 5.3.3.4.

5.3.3.2 Suspension ropes

The rope grade shall be one of the following:

a) for traction drive lifts, see Tables 6 to 8

Rope with fibre core: 1180/1770; 1370/1770; 1570; 1770

Rope with steel core: 1370/1770; 1570/1770; 1570; 1770

b) for roped hydraulic lifts, see Tables 6 to 8

Rope with fibre core: 1370/1770; 1770

Rope with steel core: 1370/1770; 1570/1770; 1770

5.3.3.3 Governor ropes

The rope grade shall be one of the following: 1370/1770; 1570/1770; 1570 or 1770, see Tables 6 to 8.

5.3.3.4 Compensating ropes

The ropes grade shall be one of the following: 1370/1770; 1570 or 1770, see Tables 6, 7, 9 and 10.

5.4 Diameter

5.4.1 Tolerances

When measured in accordance with 6.3.1 of EN 12385-1:2002+A1:2008, the actual diameter under no load and under a load equivalent to 5 % or 10 % of the minimum breaking force of the rope shall not vary from the nominal diameter by more than the values given in Tables 2, 3 or 4, as appropriate.

Table 2 — Tolerances on diameter for suspension ropes for traction drive lifts and governor ropes with fibre and other non-metallic cores

Nominal rope diameter mm	Tolerances as percentage of nominal diameter		
	Maximum at no load	**Minimum at** **5 % of F_{min}**	**10 % of F_{min}.**
up to 10	+ 6	+ 1	0
greater than 10	+ 5	+ 1	0

Table 3 — Tolerances on diameter for suspension ropes for traction drive lifts and governor ropes with steel and steel-based composite cores

Nominal rope diameter mm	Tolerances as percentage of nominal diameter		
	Maximum at no load	**Minimum at** **5 % of F_{min}**	**10 % of F_{min}**
up to 10	+ 3	0	- 1
greater than 10	+ 2	0	- 1

Table 4 — Tolerances on diameter for suspension ropes of roped hydraulic lifts and compensating ropes

Nominal rope diameter mm	Tolerance as percentage of nominal rope diameter
From 6 to < 8	+6 0
8 and greater	+5 0

5.4.2 Differences between diameter measurements

The difference between any two of the four measurements stated in EN 12385-1:2002+A1:2008, 6.3.1 at a load equivalent to 5 % or 10 % of the minimum breaking force shall not exceed the values given in Table 5 for diameter ovality.

The difference between the average of the two measurements taken at each of the two positions stated in EN 12385-1:2002+A1:2008, 6.3.1 at a load equivalent to 5 % or 10 % of the minimum breaking force shall not exceed the values given in Table 5 for average diameter variation.