



# SLOVENSKI STANDARD

SIST EN 12927-3:2005

01-januar-2005

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Safety requirements for cableway installations designed to carry persons - Ropes - Part 3: Long splicing of 6 strand hauling, carrying hauling and towing ropes

Sicherheitsanforderungen für Seilbahnen für den Personenverkehr - Seile - Teil 3: Langspleiß von 6-litzigen Zug- und Förderseilen für Seilbahnen

**ITeH STANDARD PREVIEW**

Prescriptions de sécurité des installations de transport a câbles destinées aux personnes - Câbles - Partie 3 : Épissurage des câbles tracteurs, porteurs-tracteurs et de remorquage a 6 torons

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**Ta slovenski standard je istoveten z: EN 12927-3:2004**

**ICS:**

45.100 U] |^{ aÁ aÁ } & Cableway equipment

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ICS 45.100

English version

Safety requirements for cableway installations designed to carry  
persons - Ropes - Part 3: Long splicing of 6 strand hauling,  
carrying hauling and towing ropes

Prescriptions de sécurité des installations de transport à  
câbles destinées aux personnes - Câbles - Partie 3 :  
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Sicherheitsanforderungen für Seilbahnen für den  
Personenverkehr - Seile - Teil 3: Langspleiß von 6-litzigen  
Zug- und Fördeseilen für Seilbahnen

This European Standard was approved by CEN on 23 August 2004.

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 Central Secretariat 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 Central Secretariat has the same status as the official versions.

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



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## Foreword

This document (EN 12927-3:2004) has been prepared by Technical Committee CEN/TC 242 "Safety requirements for passenger transportation by rope", 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 2005, and conflicting national standards shall be withdrawn at the latest by April 2005.

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, which is an integral part of this document.

This EN 12927 includes the following parts under the general title "Safety requirements for cableway installations designed to carry persons – Ropes":

— *Part 1: Selection criteria for ropes and their end fixings*

— *Part 2: Safety factors*

— *Part 3: Long splicing of 6 strand hauling, carrying-hauling and towing ropes*

— *Part 4: End fixings*

— *Part 5: Storage, transportation, handling and tensioning*

— *Part 6: Discard criteria*

— *Part 7: Inspection, repair and maintenance*

— *Part 8: Magnetic rope testing (MRT)*

This European Standard forms part of the standards programme adopted by the CEN Technical Board in relation of safety requirements for passenger transportation by rope. This programme includes the following standards:

- 1) *Safety requirements for cableway installations designed to carry persons - Terminology*
- 2) *Safety requirements for cableway installations designed to carry persons - General requirements*
- 3) *Safety requirements for cableway installations designed to carry persons - Calculations*
- 4) *Safety requirements for cableway installations designed to carry persons - Ropes*
- 5) *Safety requirements for cableway installations designed to carry persons - Tensioning devices*
- 6) *Safety requirements for cableway installations designed to carry persons - Drive systems and other mechanical equipment*
- 7) *Safety requirements for cableway installations designed to carry persons - Carriers*
- 8) *Safety requirements for cableway installations designed to carry persons - Electrical equipment other than for drive systems*
- 9) *Safety requirements for cableway installations designed to carry persons - Civil engineering works*

- 10) *Safety requirements for cableway installations designed to carry persons – Pre-commissioning inspection, maintenance and operational inspection and checks*
- 11) *Safety requirements for cableway installations designed to carry persons – Recovery and evacuation*
- 12) *Safety requirements for cableway installations designed to carry persons - Operation*
- 13) *Safety requirements for cableway installations designed to carry persons - Quality assurance*

Together these form a series of standards regarding design, manufacture, production, maintenance and operation of all installations for passenger transportation by rope. In respect of ski-tows, the drafting of this European Standard has been guided by the works of the International Organisation for Transportation by rope (OITAF).

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

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## 1 Scope

This part of EN 12927 specifies the safety requirements applicable to long splicing of steel wires 6 strand hauling, carrying-hauling and towing ropes for installations for passenger transportation by rope. This standard is applicable to the various types installations systems and their environment.

This part of EN 12927 applies to the requirements for the long splicing, repair and shortening of hauling and carrying hauling ropes that meet the requirements of EN 12385-8.

This part of EN 12927 does not apply to installations for the transportation of goods, nor to inclined lifts.

## 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 1709, *Safety requirements for cableway installations designed to carry persons - Pre-commissioning inspection, maintenance, operational inspection and checks.*

prEN 1907:2004, *Safety requirements for cableway installations designed to carry persons - Terminology.*

EN 1908, *Safety requirements for cableway installations designed to carry persons - Tensioning devices.*

EN 1909, *Safety requirements for cableway installations designed to carry persons - Recovery and evacuation.*

EN 12385-2:2002, *Steel wire ropes - Safety - Part 2: Definitions, designation and classification.*

EN 12385-8, *Steel wire ropes - Safety - Part 8: Stranded hauling and carrying-hauling rope for cableway installations designed to carry persons.*

EN 12397, *Safety requirements for cableway installations designed to carry persons - Operation.*

EN 12408, *Safety requirements for cableway installations designed to carry persons - Quality assurance.*

EN 12927-1, *Safety requirements for cableway installations designed to carry persons - Ropes - Part 1: Selection criteria for ropes and their end fixings.*

EN 12927-2, *Safety requirements for cableway installations designed to carry persons - Ropes - Part 2: Safety factors.*

EN 12927-4, *Safety requirements for cableway installations designed to carry persons - Ropes - Part 4: End fixings.*

EN 12927-5, *Safety requirements for cableway installations designed to carry persons - Ropes - Part 5: Storage, transportation, installation and tensioning.*

EN 12927-6, *Safety requirements for cableway installations designed to carry persons - Ropes - Part 6: Discard criteria.*

EN 12927-7, *Safety requirements for cableway installations designed to carry persons - Ropes - Part 7: Inspection, repair and maintenance.*

EN 12927-8, *Safety requirements for cableway installations designed to carry persons - Ropes - Part 8: Magnetic rope testing (MRT).*

EN 12929-1, *Safety requirements for passenger transportation by rope - General requirements - Part 1: Requirements applicable to all installations.*

## EN 12927-3:2004 (E)

EN 12929-2, *Safety requirements for cableway installations designed to carry persons – General requirements – Part 2: Additional requirements for reversible bicable aerial ropeways without carrier truck brakes.*

EN 12930, *Safety requirements for cableway installations designed to carry persons – Calculations.*

EN 13107, *Safety requirements for cableway installations designed to carry persons – Civil engineering works.*

EN 13223, *Safety requirements for cableway installations designed to carry persons – Drive systems and other mechanical equipment.*

EN 13243, *Safety requirements for cableway installations designed to carry persons - Electrical equipment other than for drive systems.*

prEN 13796-1, *Safety requirements for cableway installations designed to carry persons – Carriers – Part 1: Grips, carrier trucks, on-board brakes, cabins, chairs, carriages, maintenance carriers, tow-hangers.*

prEN 13796-2, *Safety requirements for cableway installations designed to carry persons – Carriers – Part 2: Slipping resistance tests for grips.*

prEN 13796-3, *Safety requirements for cableway installations designed to carry persons – Carriers – Part 3: Fatigue testing.*

### 3 Terms and definitions

For the purposes of this document, the terms and definitions given in prEN 1907:2004 and in EN 12385-2:2002 apply.

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### 4 General requirements

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#### 4.1 Application of this standard

The requirements of this document apply to all installations along with those of EN 1709, EN 1908, EN 1909, EN 12397, EN 12408, EN 12927-1, EN 12927-2, EN 12927-4, EN 12927-5, EN 12927-6, EN 12927-7, EN 12927-8, EN 12929-1, EN 12929-2, EN 12930, EN 13107, EN 13223, EN 13243, prEN 13796-1, prEN 13796-2 and prEN 13796-3.

#### 4.2 Safety principle

##### 4.2.1 General

If ropes of different productions are required to be spliced together, they shall have the same basic design characteristics in terms of nominal rope diameter, strand construction, minimum breaking force, direction and type of lay, wire grades, measured rope diameter and measured lay length.



#### 4.2.2 Hazard scenarios

Especially the following events may lead to hazardous situations, which may be avoided or limited by the requirements of this document:

- a) slipping apart of the two rope ends connected by a long splice may lead to a failure of the long splice;
- b) slipping or malfunction of the grip in the splice area can lead to insufficient attachment of the grip.

#### 4.2.3 Safety measures

- a) The risk of slipping apart of the spliced rope ends may be reduced by a correct correlation of geometrical characteristics of the two ropes connected by the splice, by selecting the splice geometry in accordance with this standard and by selecting the correct auxiliary (wrapping) material.
- b) The risk of an insufficient grip attachment may be reduced by applying the diameters overall to the splice in accordance with this standard.

## 5 Long splicing requirements

### 5.1 General

A spliced connection is admissible only if during operation the rope safety factor does not exceed 20 at any section of the cableway and is not less than the values set-up in EN 12930.

Splicing shall be performed by a competent person, the splicer, following a written technical procedure. The splicer shall be qualified by knowledge and practical experience and shall be capable of assessing the quality of the splice in relation to the strength and function of the rope.

To avoid affecting the results from any subsequent magnetic rope testing (MRT), the rope splice shall not contain any magnetic material other than the rope itself.

If there are two or more splices they shall be durably marked according to their age.

### 5.2 Splice geometry

The overall splice length and the length of the tails shall be at least:

	Length	Tails
Safety factor $\leq 15$	1200	> 60
Safety factor $15 \leq SF \leq 20$	1500	> 100

The distance between ends of two splices or between a splice and the rope end shall be at least 3 000 times the nominal rope diameter.

### 5.3 Splice diameter

#### 5.3.1 Between tucks

Under tension in the cableway, the measured rope diameter on a new splice shall be within 1,05/1,00 times of the measured rope diameter in the main body of the rope away from the splice area.

Permissible waviness, based on the maximum recorded value and measured as defined in EN 12385-8, shall be no greater than 6 % of the nominal rope diameter.