

J U f b c g l b Y n U h j Y n U j j b j y \_ Y b U d f U j Y n U d f Y j c n ' c g Y V ' E ' J f j j ' E ' + " X Y . ' D f Y [ ' Y X ] ž  
d c d f U j j U j b j n X f y Y j U b Y

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

Sicherheitsanforderungen für Seilbahnen für den Personenverkehr - Seile - Teil 7:  
Inspektion, Reparatur und Wartung

Prescriptions de sécurité pour les installations à câbles transportant des personnes -  
Câbles - Partie 7 : Contrôle, réparation et entretien

**iTeh STANDARD PREVIEW**

(standards.iteh.ai)

[SIST EN 12927-7:2005](https://standards.iteh.ai/catalog/standards/sist/6ce95afd-ac0a-4e6c-90e8-126795cc9ef/sist-en-12927-7-2005)

<https://standards.iteh.ai/catalog/standards/sist/6ce95afd-ac0a-4e6c-90e8-126795cc9ef/sist-en-12927-7-2005>

**Ta slovenski standard je istoveten z: EN 12927-7:2004**

**ICS:**

45.100

U] | ^ { æ Á æ Œ } æ ^

Cableway equipment

**SIST EN 12927-7:2005**

**en**

## **iTeh STANDARD PREVIEW** **(standards.iteh.ai)**

SIST EN 12927-7:2005

<https://standards.iteh.ai/catalog/standards/sist/6ce95afd-ac0a-4e6c-90e8-f28795cbc9ef/sist-en-12927-7-2005>

English version

## Safety requirements for cableway installations designed to carry persons - Ropes - Part 7: Inspection, repair and maintenance

Prescriptions de sécurité pour les installations à câbles transportant des personnes - Câbles - Partie 7 : Contrôle, réparation et entretien

Sicherheitsanforderungen für Seilbahnen und Schleppaufzüge des Personenverkehrs - Seile; Teil 7: Inspektion, Reparatur, Wartung

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.

[SIST EN 12927-7:2005](https://standards.iteh.ai/catalog/standards/sist/6ce95afd-ac0a-4e6c-90e8-f28795cbc9ef/sist-en-12927-7-2005)

<https://standards.iteh.ai/catalog/standards/sist/6ce95afd-ac0a-4e6c-90e8-f28795cbc9ef/sist-en-12927-7-2005>



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

Management Centre: rue de Stassart, 36 B-1050 Brussels

## Contents

	Page
Foreword .....	3
1 Scope .....	5
2 Normative references .....	5
3 Terms and definitions .....	6
4 General requirements .....	7
4.1 Application of this standard .....	7
4.2 Safety principles .....	7
5 Maintenance .....	8
5.1 General .....	8
5.2 Rope cleaning or dressing .....	8
5.3 Relocation of track ropes and fixed grips .....	8
5.4 End fixing .....	9
5.5 Shortening of rope loops .....	9
5.6 End fixing of towing cords .....	9
6 Inspection .....	10
6.1 General .....	10
6.2 Periodical inspection .....	10
6.3 Extraordinary inspections .....	10
6.4 Visual annual inspection .....	10
6.5 Measurement .....	11
6.6 Magnetic MRT inspection .....	11
6.7 Ray inspection .....	11
6.8 Interpretation .....	11
6.9 Personnel requirements .....	11
6.10 Inspection report .....	12
7 Repair .....	13
7.1 General provisions .....	13
7.2 Stranded rope .....	13
7.3 Locked coil rope .....	13
8 Rope re-use .....	14
Table 1 — Carrying rope .....	15
Table 2 — Carrying hauling rope & hauling rope .....	16
Table 3 — Other ropes .....	17
Annex A (informative) A—deviations .....	18
Annex ZA (informative) Relationship between this European Standard and the Essential Requirements of EU Directive 2000/9/EC relating to cableway installations designed to carry persons .....	19
Table ZA — Correspondence between this European Standard and Directive 2000/9/EC relating to cableway installations designed to carry persons .....	19

## Foreword

This document (EN 12927-7:2004) 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 consists of 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, installation 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 (CEN/BT) in relation to safety requirements for passenger transportation by rope.

This programme comprises 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.

## iTeh STANDARD PREVIEW (standards.iteh.ai)

SIST EN 12927-7:2005

<https://standards.iteh.ai/catalog/standards/sist/6ce95afd-ac0a-4e6c-90e8-f28795cbc9ef/sist-en-12927-7-2005>

## 1 Scope

This part of EN 12927 specifies the safety requirements applicable to maintaining, inspecting and repairing steel wire ropes and their related installations for passenger transportation by rope. It is essential to meet its requirements taking into account the various types of installation systems and their environment.

Some requirements concern synthetic ropes.

Requirements relating to the protection of workers are not included in this part of EN 12927.

This part does not apply to installations for 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 444, *Non-destructive testing - General principles for radiographic examination of metallic materials by X- and gamma rays.*

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

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

EN 12385-3, *Steel wire ropes - Safety - Part 3: Information for use and maintenance.*

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 12927-3, *Safety requirements for cableway installations designed to carry persons – Ropes – Part 3: Long splicing of 6 strand hauling, carrying hauling and towing ropes.*

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 12927-8, *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 for all installations.*

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.*

**ITeH STANDARD PREVIEW**  
**(standards.iteh.ai)**

[SIST EN 12927-7:2005](https://standards.iteh.ai/catalog/standards/sist/6ce95afd-ac0a-4e6c-90e8-f28795cbc9ef/sist-en-12927-7-2005)

<https://standards.iteh.ai/catalog/standards/sist/6ce95afd-ac0a-4e6c-90e8-f28795cbc9ef/sist-en-12927-7-2005>

### **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 and the following apply.

#### **3.1**

##### **rope dressing**

any product applied to the rope in service in order to protect it against internal wear, corrosion or both



## 4 General requirements

### 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 12927-3, EN 12927-4, EN 12927-5, EN 12927-6, 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 principles

#### 4.2.1 General

The safety principles set out in EN 12929-1 apply.

In addition the following hazard scenarios and safety requirements relative to the scope of this document are to be taken into consideration.

#### 4.2.2 Hazard scenarios

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

- a) deposits on the rope surface may lead to a malfunction of components (track rope brakes, detachable grips etc.) interacting to the rope;
- b) corrosion and wear by excessive internal friction may lead to a failure of rope and end fixing;
- c) stress concentration effecting an essential reduction of the rope fatigue properties may lead to premature fatigue breaks and rope failure within the inspection intervals given in this standard;
- d) excessive fatigue breaks by the working stress in the steel wires of rope and end fixing may lead to a failure of rope and end fixing.

#### 4.2.3 Safety measures

The safety measures to be taken to eliminate the danger factors listed under 4.2.2 are the following:

- a) the risk of malfunction of components may be reduced by cleaning the rope surface;
- b) the risk of corrosion and excessive internal friction may be reduced by dressing the rope in accordance with this standard;
- c) the risk of stress concentration shall be limited by discarding the rope in accordance with EN 12927-6 or by relocation in accordance with this standard;
- d) the effect of the working stress on the steel wires shall be controlled by assessing the current condition of rope and end fixing by inspections at intervals in accordance with this standard.

## 5 Maintenance

### 5.1 General

Particular attention shall be given to singular parts such as end fixings, splices and repaired areas.

### 5.2 Rope cleaning or dressing

#### 5.2.1 Use of rope cleaning or dressing

Ropes may be cleaned or dressed in accordance with the operating and maintenance instructions (see EN 12929-1).

If a rope cleaning or dressing is used in servicing the following requirements shall apply.

#### 5.2.2 Selection of rope dressing or cleaning agent

The rope dressing or cleaning agent used in servicing shall be compatible with the rope manufacturing lubricant and with any material used for sheave and roller lining, for splices, and for parts of grips and end fixings with which the rope makes contact and shall not alter the working conditions of these components.

#### 5.2.3 Frequency and method of application

The frequency and method of application of the rope cleaning or dressing agent shall be determined in accordance with recommendations provided by supplier and according to operating and maintenance inspection.

Track ropes of cableways equipped with track rope brakes shall be scoured at least once a year.

If the rope is required to be dressed, the area of the splice and any repaired strands, shall be dressed at the beginning of each season of operation.

After dressing the installation should not be used until the solvent disappears.

### 5.3 Relocation of track ropes and fixed grips

#### 5.3.1 Relocation of track rope

Track rope shall be relocated every 12 years at least.

This requirement may not be applied to track ropes which can be in conformity with Table 1, and whose end connections are fitted with a doubling device.

If the rope is relocated the length of displacement shall be at least equal to that of the contact area plus 3 m. In case of 2 shoes the length of displacement shall be different from the length and shall allow the NDT inspection of the displaced part of the rope.

### 5.3.2 Relocation of fixed grips of monocable aerial ropeways

Unless otherwise specified by the installation designer, fixed grips of monocable aerial ropeways with evenly spaced vehicles shall be relocated at intervals  $t$  not exceeding, in hours of operation, the value given by the following formula :

$$t = K \frac{L}{V}$$

with

$L$  length of the installation in meters;

$V$  speed of the installation in meters per second;

$K$  coefficient equal to 0,8 for Lang lay rope, and to 0,5 for regular lay rope.

Each grip shall be displaced in the direction opposite of that of the movement of the rope over a distance equal to its overall length (including the needles) plus 2 rope diameters.

The interval between two grip displacements shall not be more than six months.

### 5.3.3 Relocation of other fixed grips (including "chapeau de gendarme") of bicable aerial ropeways and funicular railways

These fixed grips shall be relocated:

— every 200 operating hours in the case of a single haulage rope;

— yearly if there are several haulage ropes.

The length of displacement shall be at least equal to the contact area plus 3 lay lengths.

## 5.4 End fixing

Grip socket shall be dismantled every 3 years.

The discard criteria for filled sockets are in EN 12927-6.

End fixings, if any, shall be remade in accordance with EN 12927-4.

## 5.5 Shortening of rope loops

To ensure the free movements of tensioning device see EN 1908.

Rope loops shall be shortened in accordance with EN 12927-3.

## 5.6 End fixing of towing cords

The knots of synthetic fibre towing cords shall be replaced every 1 000 operating hours and at least annually.