SLOVENSKI STANDARD
oSIST prEN 12929-2:2013

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Varnostne zahteve za žičniške naprave za prevoz oseb - Splošne zahteve - 2. del: Dodatne zahteve za dvovrvne nihalne žičnice brez vrvnih zavor

Safety requirements for cableway installations designed to carry persons - General requirements - Part 2: Additional requirements for reversible bicable aerial ropeways without carrier truck brakes

Sicherheitsanforderungen an Seilbahnen für den Personenverkehr - Allgemeine Bestimmungen - Teil 2: Ergänzende Anforderungen an Zweiseil - Pendelbahnen ohne Tragseilbremse

Prescriptions de sécurité pour les installations à câbles destinées au transport de personne - Dispositions générales - Partie 2: Prescriptions complémentaires pour les téléphériques bicâbles à va et vient sans frein de chariot

Ta slovenski standard je istoveten z: **prEN 12929-2**

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45.100	Oprema za žičnice	Cableway equipment

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EUROPEAN STANDARD

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English Version

Safety requirements for cableway installations designed to carry persons - General requirements - Part 2: Additional requirements for reversible bicable aerial ropeways without carrier truck brakes

Prescriptions de sécurité pour les installations à câbles destinées au transport de personne - Dispositions générales - Partie 2: Prescriptions complémentaires pour les téléphériques bicâbles à va et vient sans frein de chariot

Sicherheitsanforderungen an Seilbahnen für den Personenverkehr - Allgemeine Bestimmungen - Teil 2: Ergänzende Anforderungen an Zweiseil - Pendelbahnen ohne Tragseilbremse

This draft European Standard is submitted to CEN members for enquiry. It has been drawn up by the Technical Committee CEN/TC 242.

If this draft becomes a European Standard, 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.

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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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Foreword

This document (prEN 12929-2:2013) has been prepared by the Technical Committee CEN/TC 242 “Safety requirements for passenger transportation by rope”, the secretariat of which is held by AFNOR.

This document is currently submitted for CEN enquiry.

This document is intended to replace EN 12929-2:2004.

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 Directives.

For the relationship with EU Directives, see informative Annex ZA, which is an integral part of this document.

— In 5.2.2 the reference to the requested safety analysis in EN 12929-1 has been removed, as this requirement is no longer included in EN 12929-1.

— In 6.3 the requirement has been removed that stipulates that for the tension safety factor the haul rope loop shall comply with 1,2 times the value of the tension safety factor for haul ropes of bicable reversible aerial ropeways with carrier track brakes in accordance with EN 12930, as the value established from this was only slightly above 4,5. The requirement for the maximum tension safety factor was clarified on the area of the long splicing.

— In 6.4 b) 1), the value for the smallest permissible tension safety factor has been adapted to comply with the state of the art.

— In 6.6 the requirement has been removed that stipulates that the device shall be available for the magneto-inductive inspection of the installation, as this is not safety-related.

— The previous Clauses 6.13, 6.14, 6.20, 6.22, 7.7, 7.8 and 7.9 have been deleted without replacement, as there was no safety-relevant justifications for supplementary requirements with regard to bicable aerial ropeway with carrier track brakes.

— In 6.13, the alternative has been removed regarding taking into consideration the actually executed transverse sway options.

— In 6.15, the regulations for the device for detecting lightning strikes have been clarified.

— In 7.4 the value for the assumed longitudinal sway has been slightly reduced to the value that is assumed in accordance with EN 12929-1 and the formula adapted.

— In 8.2 the value for the safety has been reduced, as in 8.1 a redundant execution is required and therefore in the event of a system failure a safety of 1,5 is still ensured. The terms and definitions have been adapted to EN 13796-1.

— In 8.4, the terms and definitions have been adapted to EN 13796-1.

— In 8.7 the requirements on the gripping force for reducing the diameter of the haul rope has been modified by 20 %, as the former regulation contained disproportionately high requirements for the execution of the grip.

— In Annex A the A-deviation for Germany has been removed.

— In Annex ZA, the relationships with the basic requirements of the Directive 2000/9/EC have been adapted to the new numbering.

EN 12929 with the generic title “Safety requirements for cable way installations designed to carry persons – General requirements” consists of the following parts:

— Part 1: Requirements for all installations

— Part 2: Additional requirements for reversible bicable aerial ropeways without carrier truck brakes

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 – Precommissioning 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, erection, maintenance and operation of all cableway installations designed to carry persons.

In respect of ski-tows, the drafting of this document has been guided by the works of the International Organisation for Transportation by Rope (OITAF).

1 Scope

This document specifies additional safety requirements for bicable reversible aerial ropeways without carrier truck brakes. This document is applicable to the various types of cableway installations and takes into account their environment.

It contains:

— additional requirements relating to the integrity of the haul rope loop;

— additional requirements intended to prevent specific operational incidents;

— requirements concerning the attachment of the carriers to the haul rope.

It does not apply to cableway installations for transportation of goods nor to lifts.

2 Normative references

The following documents, in whole or in part, are normatively referenced in this document and are indispensable for its application. 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 — Precommissioning inspection, maintenance, operational inspection and checks*

EN 1907:2005, *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 12397, *Safety requirements for cableway installations designed to carry persons — Operation*

EN 12408, *Safety requirements for cableway installations designed to carry persons — Quality control*

EN 12927, *Safety requirements for cableway installations designed to carry persons — Ropes*

EN 12929-1, *Safety requirements for cableway installations designed to carry persons — General requirements — Part 1: Requirements for all installations*

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*

EN 13796-1, *Safety requirements for cableway installations designed to carry persons — Carriers — Part 1: Grips, carrier trucks, onboard brakes, cabins, chairs, carriages, maintenance carriers, tow-hangers*

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

EN 13796-3, *Safety requirements for cableway installations designed to carry persons — Carriers — Part 3: Fatigue tests*

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

EN 12385-9, *Steel wire ropes — Safety — Part 9: Locked coil carrying ropes for cableway installations designed to carry persons*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in EN 1907:2005 and the following apply.

4 Symbols and abbreviations

Symbols and abbreviations are explained with the formula to which they apply throughout this document.

5 General requirements

5.1 Application of this Standard

The requirements of this document, together with those of EN 1709, EN 1908, EN 1909, EN 12397, EN 12408, EN 12927 (Parts 1 to 8), EN 12929-1, EN 12930, EN 13107, EN 13223, EN 13243 and EN 13796 (Part 1 to 3) apply to bi-cable reversible aerial ropeways without carrier truck brakes.

5.2 Safety principles

5.2.1 General

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

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

5.2.2 Hazard scenarios

The events listed in Tables 1 and 2 in particular may result in a hazardous situation which may be avoided or limited by means of the safety requirements in this document.

Table 1 — Events which compromise the integrity of the haul rope loop

Hazard scenario	Other relevant Standards
rupture of haul rope	EN 12930, EN 12927
deropement of haul rope	EN 12929-1
unacceptable reduction in rope tension	EN 1908
unacceptable increase in rope tension	EN 1908
overlapping of haul rope	EN 12929-1
contact with ropes other than the track rope	
failure of support system for the haul rope loop	EN 13223
effect of aircraft	EN 12929-1
twist of haul rope	
damage to haul rope due to atmospheric influences (e.g. lightning, corrosion)	EN 13243

Table 2 — Events during operation which may represent a hazard when there is no carrier truck brake, even though the haul rope loop remains intact

Hazard scenario	Other relevant Standards
failure of attachment of carrier to haul rope	EN 13796-1
failure of entry monitoring	EN 13243
loss of traction to drive sheave	EN 12929-1, EN 12930, EN 13223
derailment of carrier when stationary in extreme operating conditions	EN 13796-1
obstacle on line	
obstacle in station area	EN 13223
movement of carrier during an evacuation procedure	
twist of haul rope	
problems during correction of haul rope overlap	

5.2.3 Safety measures

This document contains the measures required to avoid or limit the hazard scenarios listed in 5.2.2.

6 Measures to ensure the integrity of the haul rope loop

6.1 The integrity of the haul rope and the support system for the haul rope loop shall be ensured in all operating situations.

6.2 The haul rope system shall be arranged as a continuous loop.

6.3 When verifying the haul rope loop in accordance with EN 12930, the tension safety factor shall be at least 4,5; the tension safety factor may not exceed the 20,0 in the long splicing.

6.4 Without prejudice to the requirements of 6.3, the tension safety factor shall correspond to the values below, with the calculation being carried out by one of the methods listed below according to whether or not

the system and dimensioning of the attachment to the carrier requires that slipping of the haul rope on the grip has to be taken into account if the carrier becomes caught on a fixed obstacle on the line or in a station:

a) if slipping does not have to be taken into account, the tension safety factor shall be at least 2,0 throughout the whole time of coming to a stop;

b) if slipping has to be taken into account:

   1) the tension safety factor shall be at least 2,5 with respect to the greatest calculated slipping resistance of the grip, and;

   2) the tension safety factor shall be at least 2,0 with respect to the greatest measured slipping resistance of the grip.

6.5 The movements and loadings caused, on the basis of the investigations in 6.4, in the haul rope loop and in the associated components are to be investigated by calculation; it shall be proven that no dangerous conditions arise (see safety principles in EN 12929-1).

6.6 As an exception to the requirements of EN 12927, the haul rope shall be inspected by magnetic methods at the following intervals (see also Table 3 below):

— in the first year of use of the haul rope: at intervals of 200 operating hours, but at least once every 4 weeks in operation;

— in the second to the tenth years of use: at intervals of 1 000 operating hours, but at least once each year;

— after the tenth year of use: at intervals of 200 operating hours, but at least once every 3 months in operation;

— before resumption of operation after any period of shut-down of 3 months or longer.

The device shall meet the requirements of EN 12927 and the inspector shall be qualified to “Class 1” in accordance with EN 12927.

In addition, the whole length of the haul rope is to be inspected magnetically once each year by an inspector qualified to “Class 2” in accordance with EN 12927.

6.7 The carriers shall be displaced along the haul rope at intervals not greater than 200 operating hours and at least every 3 consecutive months in operation. When this takes place, the previous grip attachment zones and the splice shall be inspected visually. Without prejudice to the intervals mentioned above, the carriers shall be displaced before resumption of operation after any stoppage of 3 months or longer (see also Table 3 below).

If using particular attachment systems, other time intervals for displacing the carriers may be specified.

6.8 The intervals listed in 6.6 and 6.7 shall be reduced if, during inspection, the damage to the rope is found to reach or exceed half of the permissible damage in accordance with EN 12927.