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Safety requirements for cableway installations designed to carry persons - Carriers - Part
3: Fatigue tests

Sicherheitsanforderungen für Seilbahnen für den Personenverkehr - Fahrzeuge - Teil 3:
Ermüdungsversuche

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Prescriptions de sécurité pour les installations à câbles transportant des personnes -
Véhicules - Partie 3 : Essais de fatigue

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Ta slovenski standard je istoveten z: EN 13796-3:2005

ICS:

45.100 U] |^{ æ Á æ Ñ } æ^ Cableway equipment

SIST EN 13796-3:2005

en

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ICS 45.100

English version

Safety requirements for cableway installations designed to carry persons - Carriers - Part 3: Fatigue tests

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This European Standard was approved by CEN on 17 April 2005.

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

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Foreword

This European Standard (EN 13796-3:2005) 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 November 2005, and conflicting national standards shall be withdrawn at the latest by November 2005

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

For relationship with the EU Directive, see informative annex ZA, which is an integral part of this European Standard.

EN 13796 comprises the following parts under the general title *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
- Part 2: Slipping resistance test for grips
- Part 3: Fatigue tests

This European Standard forms part of the standards programme approved by the CEN Technical Board on safety requirements for cableway installations designed to carry persons. 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

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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, construction, maintenance and operation of all cableway installations designed to carry persons.

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 the United Kingdom.

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1 Scope

This European Standard specifies the safety requirements applicable to carriers for cableway installations for passenger transportation. This standard is applicable to the various types of installations and takes into account their environment.

This European Standard sets out the requirements to be met for fatigue tests for carriers of unidirectional monocable aerial ropeways of capacity not greater than 16 persons according to 6.3.3.1 of Part 1 of this standard..

This standard 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 European Standard. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

EN 1907:2005, *Safety requirements for cableway installations designed to carry persons – Terminology*

EN 13796-1:2005, *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*

EN ISO/IEC 17025, *General requirements for the competence of testing and calibration laboratories (ISO/IEC 17025:1999)*

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3 Terms and definitions

For the purposes of this document, the terms and definitions of EN 1907:2005 and EN 13796-1:2005 apply.

4 Symbols and abbreviations

$\Delta\varepsilon$	Range of elongation	($\mu\text{m}/\text{m}$)
ε_m	Mean elongation	($\mu\text{m}/\text{m}$)
ε_u	Lower limit of elongation	($\mu\text{m}/\text{m}$)
$\varepsilon_{\text{stat}}$	Elongation due to static loading ($G + Q$)	($\mu\text{m}/\text{m}$)
ΔF	Range of load	(kN)
F_m	Mean load	(kN)
F_u	Minimum load	(kN)
G	Self-weight of carrier	(kN)
N	Number of cycles	(-)
Q	Useful load	(kN)

5 General

The danger factors and corresponding safety measures to be taken into consideration in this standard appear in EN 13796-1.

The tests shall be carried out by a laboratory certified according to EN ISO/IEC 17025.

Once they have undergone fatigue testing, the test pieces shall not be used again for transport in an installation.

6 Parts to be tested

The test is carried out either on the fully equipped carrier or on its load-bearing structure alone. Elements having an effect on the fatigue behaviour of the load-bearing structure shall remain in place for the test, or be taken into account adequately in the definition of the masses or forces. For ski racks, an equivalent mass of 5 kg per set of equipment shall be allowed for as specified in EN 13796-1.

To simplify the test, the carrier may be subdivided into sub-assemblies. The following are regarded as sub-assemblies:

- grip;
- suspension;
- intermediate structure;
- cabin or chair;
- seat.

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If the test is carried out on sub-assemblies, care shall be taken to ensure that they are loaded in the same way as in the carrier as a complete unit.

The geometry and materials of the test piece shall be identical to the series-manufactured components. Their methods of manufacture shall be equivalent. In particular, the test piece shall be galvanized if it is planned for the component to be so.

7 Information to be supplied by the manufacturer

The manufacturer shall supply the test laboratory with the following information and documents:

- general description of the carrier or sub-assembly;
- diagrams, sketches and manufacturing drawings of the carrier or sub-assembly;
- descriptions and explanations necessary for understanding the above-mentioned sketches and drawings and the method of operation of the carrier or sub-assembly;
- scope of use of the carrier
- declaration of conformity certifying that the carriers and sub-assemblies supplied for the test meet the requirements of the operating manual specified in EN 13796-1;
- inspection procedures specified in 11.1 (cracks, deformations)

The test pieces shall be identified by a mark.

8 Examination prior to test

The test laboratory shall verify by means of a visual examination that the carrier or the sub-assemblies comply with the documentation supplied by the manufacturer.

The procedure and the result of the examination shall be included in the test report.

9 Test requirements

The test consists of subjecting the carrier or sub-assemblies to the number of cycles and the effects of actions defined in clause 10.

The test may be carried out either as a function of the intensity of the action (load) or as a function of the elongation it causes.

The excitation shall be sinusoidal in form.

On the test bench, adequate account shall be taken of the degrees of freedom the test piece has in actual operation. In particular, the grips shall be subjected to $N/2$ cycles in the horizontal position and to $N/2$ cycles inclined at 45° to the horizontal.

If the test so requires, shock-absorbing elements may be replaced with rigid elements as long as:

- safety components are not involved;
- during the test, this does not cause any reduction in the effect of actions on the test piece or parts of it.

The values of the parameters specified in clause 10 shall be recorded at least every 500 000 cycles.

When the test is carried out as a function of elongation, the measuring point selected shall not be located in an area of stress concentration.