SLOVENSKI STANDARD
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Zahteve za preskuġanje pribora za nizkonapetostne izolirane nadzemne kable - 1. del: Glavne toļ ke

Test requirements for low voltage aerial bundled cable accessories -- Part 1: Generalities

Prüfanforderungen für Bauteile für isolierte Niederspannungsfreileitungen – Teil 1: Allgemeines

Prescriptions relatives aux essais des accessoires pour réseaux aériens basse tension torsadés -- Partie 1: Généralités

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English version

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Up-to-date lists and bibliographical references concerning such national standards may be obtained on application to the Central Secretariat or to any CENELEC 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 CENELEC member into its own language and notified to the Central Secretariat has the same status as the official versions.

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CENELEC

European Committee for Electrotechnical Standardization
Comité Européen de Normalisation Electrotechnique
Europäisches Komitee für Elektrotechnische Normung

Central Secretariat: avenue Marnix 17, B - 1000 Brussels

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Foreword

This European Standard was prepared by a sub-group of WG 11 of the Technical Committee CENELEC TC 20, Electric cables.

The text of the draft was submitted to the formal vote and was approved by CENELEC as EN 50483-1 on 2008-12-01.

The following dates were fixed:

– latest date by which the EN has to be implemented at national level by publication of an identical national standard or by endorsement	(dop)	2009-12-01
– latest date by which the national standards conflicting with the EN have to be withdrawn	(dow)	2011-12-01

This is Part 1 of CENELEC standard EN 50483 "*Test requirements for low voltage aerial bundled cable accessories*", which has six parts:

– Part 1: Generalities;

– Part 2: Tension and suspension clamps for self supporting system;

– Part 3: Tension and suspension clamps for neutral messenger system;

– Part 4: Connectors;

– Part 5: Electrical ageing test;

– Part 6: Environmental testing.

Contents

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1 Scope

EN 50483 series applies to overhead line fittings for tensioning, supporting and connecting aerial bundled cables (ABC) of rated voltage U_0/U (U_m): 0,6/1 (1,2) kV.

The objective is to provide a method of testing the suitability of accessories when used under normal operating conditions with low voltage aerial bundled cables (ABC) complying with HD 626.

There is variation between the different ABC specifications provided by HD 626, and tests carried out on one of the ABC types may not be completely applicable to ABC of a different specification. Therefore, the purchasers of accessories tested to this European Standard, must ensure that all their requirements are met.

NOTE This European Standard does not invalidate existing approvals of products achieved on the basis of national standards and specifications and/or the demonstration of satisfactory service performance. However, products approved according to such national standards or specifications cannot directly claim approval to this European Standard. It may be possible, subject to agreement between supplier and purchaser, and/or the relevant conformity assessment body, to demonstrate that conformity to the earlier standard can be used to claim conformity to this standard, provided an assessment is made of any additional type testing that may need to be carried out. Any such additional testing that is part of a sequence of testing cannot be done separately.

Climate differs across Europe and in order to meet the differing geographic climatic conditions it is necessary to provide a range of tests to meet these variations. A range of optional, additional tests is provided to meet the varying climatic needs and these should be agreed between the customer and the supplier (see Annex C in EN 50483-6).

The purpose of this Part 1 is to define the common aspects of the products included in the above scope.

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 50182:2001, *Conductors for overhead lines – Round wire concentric lay stranded conductors*

EN 50483 series, *Test requirements for low voltage aerial bundled cable accessories*

EN 60068-1:1994, *Environmental testing – Part 1: General and guidance* (IEC 60068-1:1988 + corrigendum Oct. 1988 + A1:1992)

EN 61238-1:2003, *Compression and mechanical connectors for power cables for rated voltages up to 36 kV (U_m = 42 kV) – Part 1: Test methods and requirements* (IEC 61238-1:2003, mod.)

EN ISO 9001:2008, *Quality management systems – Requirements* (ISO 9001:2008)

HD 626, *Overhead distribution cables of rated voltage $U_o/U(U_m)$: 0,6/1 (1,2) kV*

IEC 60050-461, *International Electrotechnical Vocabulary (IEV) – Part 461: Electric cables*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in IEC 60050-461 and the following apply.

3.1
adiabatic
occurring with no addition or loss of heat from the system under consideration

3.2
aerial bundled cable (ABC)
aerial cable consisting of a group of insulated conductors which are twisted together including, or not, a non insulated conductor
[IEV 461-08-02, modified]

NOTE The terms bundled conductors, bundled cables, bundled cores, conductor bundles and bundle could be used as equivalent to the term aerial bundled cable (ABC).

3.3
aerial-insulated-cable
insulated cable designed to be suspended overhead and outdoors
[IEV 461-08-01]

3.4
angle of deviation
complementary angle to the angle defined by the two parts of the cable on both sides of the suspension clamp

3.5
branch connector
metallic device for connecting a branch conductor to a main conductor at an intermediate point on the latter
[IEV 461-17-05]

3.6
branch conductor
conductor connected to the main conductor by a connector

3.7
clamp bolt
bolt which tightens two parts of a clamp together

3.8
conductor insulation
insulation applied on a conductor
[IEV 461-02-02, modified]

3.9
conductor (of a cable)
part of a cable which has the specific function of carrying current
[IEV 461-01-01]

3.10
connector
metallic device to connect cable conductors together
[IEV 461-17-03]

3.11
core
assembly comprising conductor and its own insulation
[IEV 461-04-04, modified]

3.12
equalizer
arrangement used in the test loop to ensure a point of equipotential in a stranded conductor
[EN 61238-1:2003, 3.8]

3.13
fixture (or fitting)
device for attaching ABC tension or/and suspension clamps to a pole or to a wall

3.14
insulation (of a cable)
insulating materials incorporated in a cable with the specific function of withstanding voltage
[IEV 461-02-01]

3.15
insulation piercing connector (IPC)
connector in which electrical contact with the conductor is made by metallic protrusions which pierce the insulation of the ABC core
[IEV 461-11-08, modified]

3.16
median connector
connector which during the first heat cycle records the third highest temperature of the six connectors in the test loop
[EN 61238-1:2003, 3.11]

3.17
messenger
wire or rope, the primary function of which is to support the cable in aerial installations, which may be separate from or integral with the cable it supports
[IEV 461-08-03]

3.18
minimum breaking load (MBL)
minimum breaking load of the conductor given by HD 626 or the cable manufacturer if not defined in the standard, or minimum breaking load of the clamp given by the clamp manufacturer

3.19
mobile link
device linking the suspension clamp to the fixture

3.20
neutral messenger system
aerial insulated system where only the neutral messenger supports the ABC

3.21
pre-insulated (terminal) lug
insulated metallic device for connecting an insulated cable conductor to other electrical equipment

3.22
pre-insulated through connector (sleeve)
insulated metallic device for connecting two consecutive lengths of insulated conductors

3.23
rated tensile strength (RTS)
estimate of the conductor breaking load calculated using the specified tensile properties of the component wires
[EN 50182:2001, 3.7]

3.24
recycling code
mark(s), on a product, which identifies(y) the constituent material(s) of the product

3.25
reference conductor
length of conductor(s) without any joints, which is included in the test loop and which enables the reference temperature and reference resistance(s) to be determined
[EN 61238-1:2003, 3.7, modified]

3.26
reusable connector
connector for connecting ABC to stripped cable or bare conductor where only the branch connection can be reused

3.27
routine test
test made on all accessories to demonstrate their integrity

3.28
sample test
test made on samples of a product or components taken from a product adequate to verify that the finished product meets the design specifications

3.29
self supporting system
aerial insulated system where all the cores of the ABC contribute to its support

3.30
sheath
uniform and continuous tubular covering of metallic or non metallic material, generally extruded
[IEV 461-05-03]

3.31
shear head
head of a bolt, or a device fitted over the head of a bolt or a nut, which is designed to break at a specified torque

3.32
suspension clamp
device which attaches an aerial insulated cable to a fixture in order to carry its weight and any specified loading
[IEV 461-18-02, modified]

3.33
suspension or tension assembly
clamp with mobile link, or not, and associated fixture

3.34
tension clamp
device which firmly attaches an aerial insulated cable to a fixture and is designed to transmit the specified mechanical tension in the cable or messenger to the supporting structure
[IEV 461-18-01, modified]

3.35
traceability code
mark(s), on a product, which gives information about its manufacture and year of production

3.36
type test
test required to be made before supplying a type of material covered by this standard on a general commercial basis, in order to demonstrate satisfactory performance characteristics to meet the intended application

NOTE These tests are of such a nature that, after they have been made, they need not be repeated unless changes are made to the accessory materials, design or type of manufacturing process which might change the performance characteristics.

4 Symbols

A list of symbols is available with each part of the standard where applicable.

5 Products concerned

This European Standard applies to the following products:

– tension and suspension clamps for low voltage ABC self supporting system. The type tests are defined in EN 50483-2;

– tension and suspension clamps for low voltage ABC supporting system with neutral messenger. The type tests are defined in the EN 50483-3;

– connectors including insulation piercing connectors (IPC), pre-insulated lugs and through connectors (sleeves) for low voltage ABC systems. The type tests are defined in EN 50483-4.

NOTE Diagrams show a representation of fittings only and do not indicate any preference of design.

Some type tests are common to several products and have been published under specific standards:

– heat cycling test under EN 50483-5;

– environmental tests under EN 50483-6.

6 Marking

All products mentioned above shall permanently bear:

– manufacturer's trade mark or logo;

– product code or reference;

– traceability code / batch number;

– the minimum and maximum cross section for which the unit is suitable;

– tightening torque or die reference, if applicable;

– recycling code, if any.

NOTE Other specific markings should be agreed between customer and manufacturer.

A test for marking is provided in 9.2.

7 Quality procedure

In order to claim compliance with this European Standard, products covered within the series EN 50483 shall be submitted to all the relevant tests defined in Annexes A and B, and meet the relevant requirements. The manufacturer shall provide the results of the tests in writing.

8 Routine and sample tests

Compliance of the supplied products shall be established by presenting the results of the tests listed in Annex A.

8.1 Checking compliance of the supplied products

8.1.1 With a quality assurance system

Within this system, the quality plan specific to the product shall specify the procedure of the tests to be carried out and their frequency.

This plan shall be made by the manufacturer and given to the customer as a part of the contractual relationship involving the Quality Assurance. The standard model of Quality Management Systems to be adopted by the manufacturer is described in EN ISO 9001:2008 standard.

8.1.2 Without quality assurance system

These tests shall be carried out on randomly sampled items from each supplied batch according to a standard or procedure jointly determined by the manufacturer and the purchaser.

It is assumed that these tests are representative of the whole batch.

8.1.2.1 Tests and inspection

The manufacturer or supplier shall, as a minimum, establish and maintain documented procedures for inspection and testing activities in order to verify that the specified requirements are met. The required inspection and testing procedures shall be provided in writing.

8.1.2.1.1 Receiving inspection and testing

The manufacturer shall ensure that incoming products are not used or processed until they have been inspected or otherwise verified as conforming to specified requirements. Verification of conformance to the specified requirements shall be in accordance with the quality plan and/or documented procedures.

In determining the amount and nature of receiving inspection, consideration shall be given to the amount of control at the subcontractor's premises and the recorded evidence of conformance provided.

8.1.2.1.2 In-process inspection and testing

The manufacturer shall

a) inspect and test the product as required by the quality plan and/or documented procedure,

b) hold product until the required inspection and tests have been completed or necessary reports have been received and verified.

8.2 Final inspection and testing

The supplier shall carry out all final inspection and testing in accordance with the quality plan and/or documented procedures to complete the evidence of conformance of the finished product to the specified requirements.

The quality plan and/or documented procedures for final inspection and testing shall require that all specified inspection and tests, including those specified either on receipt of product or in process, have been carried out and that the results meet the specified requirements.

No product shall be dispatched until all activities specified in the quality plan and/or documented procedures have been satisfactorily completed and the associated data and documentation are available and authorized.

8.3 Inspection and test records

The supplier shall establish and maintain records which provide that the products have been inspected and/or tested. The results shall show clearly whether the product has passed or failed the inspection and/or test, documented procedures for control of non conforming product shall apply.

Records shall identify the inspection authority responsible for the release of product.