



**SLOVENSKI STANDARD**  
**SIST EN 50483-2:2009**

**01-julij-2009**

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**Zahteve za preskušanje pribora za nizkonapetostne izolirane nadzemne kable - 2. del: Zatezne in nosilne sponke za samonosilne sisteme**

Test requirements for low voltage aerial bundled cable accessories -- Part 2: Tension and suspension clamps for self supporting system

Prüfanforderungen für Bauteile für isolierte Niederspannungsfreileitungen – Teil 2: Abspann- und Tragklammern für selbsttragende isolierte Freileitungsseile

Prescriptions relatives aux essais des accessoires pour réseaux aériens basse tension torsadés -- Partie 2: Matériels d'ancrage et de suspension pour réseaux aériens en conducteurs isolés torsadés auto-portés

**Ta slovenski standard je istoveten z: EN 50483-2:2009**

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**ICS:**

29.240.20      Daljnovodi      Power transmission and distribution lines

**SIST EN 50483-2:2009**      en

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EUROPEAN STANDARD  
NORME EUROPÉENNE  
EUROPÄISCHE NORM

**EN 50483-2**

January 2009

ICS 29.240.20

English version

## **Test requirements for low voltage aerial bundled cable accessories - Part 2: Tension and suspension clamps for self supporting system**

Prescriptions relatives aux essais  
des accessoires pour réseaux aériens  
basse tension torsadés -  
Partie 2: Matériels d'ancrage  
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en conducteurs isolés torsadés auto-portés

Prüfanforderungen für Bauteile für isolierte  
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Teil 2: Abspann- und Tragklemmen  
für selbsttragende isolierte Freileitungsseile

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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.

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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**

## 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 50483-2 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 2 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; [SIST EN 50483-2:2009](https://standards.iteh.ai/catalog/standards/sist/89d1a811-399c-4b24-ba68-0d7ed36d8fb3/sist-en-50483-2-2009)
  - Part 5: Electrical ageing test;
  - Part 6: Environmental testing.
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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.

This Part 2 applies to tensioning devices consisting of tension and suspension clamps designed to be used for installation of self supporting ABC defined in HD 626.

Tests described in this document are type tests.

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.

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

HD 626, *Overhead distribution cables of rated voltage  $U_0/U (U_m)$ : 0,6/1 (1,2) kV*  
<https://standards.iteh.ai/catalog/standards/sist/89d1a811-399c-4b24-ba68-0d7ed36d8f3/sist-en-50483-2-2009>

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

#### **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).

### 3.2

#### **aerial-insulated-cable**

insulated cable designed to be suspended overhead and outdoors

[IEV 461-08-01]

### 3.3

#### **angle of deviation**

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

**3.4****clamp bolt**

bolt which tightens two parts of a clamp together

**3.5****conductor insulation**

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

**3.6****conductor (of a cable)**

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

**3.7****core**

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

**3.8****fixture (or fitting)**

device for attaching ABC tension or/and suspension clamps to a pole or to a wall

**3.9****insulation (of a cable)**

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

**3.10****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

**3.11****self supporting system**

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

**3.12****sheath**

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

**3.13****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]

**3.14****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]

### 3.15

#### 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

$g_{15}$  slippage after 15 cycles

$g_{250}$  slippage after 250 cycles

$D$  circumscribed diameter of conductor bundle (mm)

$\rho$  resistivity ( $\Omega\text{m}$ )

$\alpha$  maximum angle ( $^\circ$ ) of deviation of a suspension clamp as recommended by the manufacturer or specified by the customer

$T$  tension (N)

$F$  sliding force (N)

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## 5 Characteristics

These fittings shall be capable of supporting the tensile loads applied to the ABC for which they are designed in accordance with the following tests.

Tension and suspension equipment shall be designed to avoid any direct or accidental contact between conductors and between any phase and metallic parts of the clamp.

## 6 Marking

See Clause 6 of EN 50483-1.

## 7 General test conditions

### 7.1 Mechanical tests

See Clause 9 of EN 50483-1.

### 7.2 Temperature

See Clause 9 of EN 50483-1.

## 8 Type tests

### 8.1 Type tests for tension clamps

The performance characteristics of all tension clamps shall be proven by satisfactorily undergoing the range of tests listed below. Each clamp shall be tested for the smallest and largest bundled conductor size for which it is marked.

The following type tests shall be carried out.

Test	Subclause
Tensile test at ambient temperature	8.1.1
Breaking load test	8.1.2
Tensile test at high temperature	8.1.3
Tensile test at low temperature	8.1.4
Dielectrical voltage test (clamp)	8.3.1
Dielectrical voltage test (ABC)	8.3.2
Clamp bolt tightening test	8.4
Environmental tests	8.5

NOTE The test procedures for 3 core and 4 core ABC are similar.  
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#### 8.1.1 Tensile test at ambient temperature

##### 8.1.1.1 Principle

The tension clamps shall be subjected to high mechanical loads at ambient temperature in order to ensure that they are capable of sustaining loads likely to be encountered in service without being damaged or damaging the conductor.

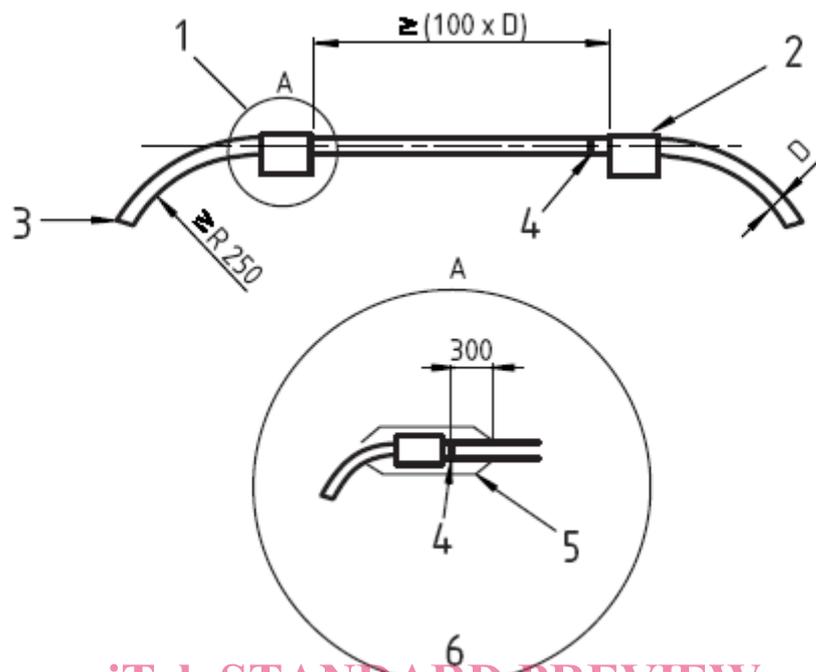
NOTE Test may be carried out on samples which have been subjected to the climatic ageing test or on the cores (see 8.5.2.1)

##### 8.1.1.2 Test arrangement

Two tension clamps shall be assembled on to the ABC, in accordance with the manufacturer's instructions, and fitted into a tensile testing machine as shown in Figure 1. The length of tails on the unloaded side of the clamps shall be a minimum of 350 mm and with a minimum radius of 250 mm.

The span between the two clamps shall be a minimum of  $100 \times D$ , where  $D$  is the circumscribed diameter of the ABC.

The test shall be carried out at ambient temperature.



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#### Key

1	tension clamp	4	marking
2	second tension clamp undergoing test	5	low temperature zone
3	length of tail $\geq 350$ mm	6	arrangement for low temperature testing

Figure 1 – Tension clamps – Tensile tests

#### 8.1.1.3 Procedure

The tensile load shall be applied within 15 min of the clamp being assembled on to the ABC.

The load shall be increased to 20 % of MBL of the cable, and the cores shall be marked where they exit the clamps. The load shall be maintained at that value  $\pm 10$  % for 6 h.

NOTE 1 A reduced time period may be agreed between customer and manufacturer.

The load shall then be increased to a limit of 80 % of the MBL of the cable for ABC sizes up to, and including, 95 mm<sup>2</sup>. For conductor cross sections above 95 mm<sup>2</sup> the load shall be reduced to a limit of 60 % of the MBL of the cable. This load shall be held for 60 s before the load is removed.

NOTE 2 When a clamp of a different rating is needed the clamp may be tested according to the value agreed by the manufacturer and the customer.

#### 8.1.1.4 Requirements

No damage shall occur, which would affect the correct function of the tension clamp.

Slippage of the cores of the cable with respect to the clamp parts when in contact shall not exceed 10 mm.

The clamp shall pass the dielectrical voltage test detailed in 8.3.1.

The cable shall pass the dielectrical voltage test detailed in 8.3.2.

### 8.1.2 Breaking load test (optional)

NOTE This test may be carried out on samples which have previously been subjected to the corrosion ageing test (8.5.1). In this case it is not necessary to carry out the test before the corrosion test.

#### 8.1.2.1 Principle

The tension clamps shall be subjected to increasing mechanical loads, at ambient temperature, in order to ensure that they do not break before loads equal to or greater than the MBL of the maximum ABC size, for which the clamp is designed, are reached.

#### 8.1.2.2 Test arrangement

Two tension clamps shall be assembled in accordance with the manufacturer's instructions on a simulated ABC made of metallic round bars or a suitable conductor of the same diameter as the ABC core and fitted into a tensile testing machine as shown in Figure 1.

To avoid any slippage between bars and the clamps, fixed stops may be used on the bars.

The test shall be carried out at ambient temperature.

#### 8.1.2.3 Procedure

The tensile load shall be applied within 15 min of the clamp being assembled.

The load shall be increased to the MBL of the largest size of ABC core for which the clamp is designed. It shall be maintained at this load for 60 s.

The load shall then be increased until the breaking of the tension clamp occurs.

NOTE 1 When requested by the customer a different load may be increased to the MBL of the clamp given by the manufacturer to check the breaking load of the clamp.

The clamps shall not be tightened or adjusted during the test.

NOTE 2 The failure value may be noted for information.

#### 8.1.2.4 Requirements

Neither tension clamp shall break until the test load has been held for 60 s and the MBL of the cable is reached.

### 8.1.3 Tensile test at high temperature

#### 8.1.3.1 Principle

The tension clamps shall be subjected to steady load, whilst the cable temperature is varied. The test shall be carried out in order to ensure that the cable does not slip through the clamp and that the clamp and the cable remain undamaged.

NOTE When a clamp of lower rating is required, for example a service clamp, this test may be omitted when agreed between the customer and manufacturer.