



**SLOVENSKI STANDARD**  
**oSIST prEN 50483-4:2024**  
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**Zahteve za preskušanje pribora za nizkonapetostne izolirane nadzemne kable - 4.  
del: Spojke**

Test requirements for low voltage aerial bundled cable accessories - Part 4: Connectors

Prüfanforderungen für Bauteile für isolierte Niederspannungsfreileitungen - Teil 4:  
Verbinder

Prescriptions relatives aux essais des accessoires pour réseaux aériens basse tension  
torsadés - Partie 4: Connecteurs

**Ta slovenski standard je istoveten z: prEN 50483-4**

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**ICS:**

29.240.20      Daljnovodi      Power transmission and  
distribution lines

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**DRAFT**  
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## Test requirements for low voltage aerial bundled cable accessories - Part 4: Connectors

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Niederspannungsfreileitungen - Teil 4: Verbinder

This draft European Standard is submitted to CENELEC members for enquiry.  
Deadline for CENELEC: 2025-01-03.

It has been drawn up by CLC/TC 20.

If this draft becomes a European Standard, CENELEC 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.

This draft European Standard was established by CENELEC in three official versions (English, French, German).  
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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 Electrotechnical Standardization  
Comité Européen de Normalisation Electrotechnique  
Europäisches Komitee für Elektrotechnische Normung

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## 21 European foreword

22 This document [prEN 50483-4:2024] has been prepared by WG 11 of CLC/TC 20 "Electric cables".

23 This document is currently submitted to the Enquiry.

24 The following dates are proposed:

- latest date by which the existence of this document has to be announced at national level (doa) dav + 6 months
- latest date by which this document has to be implemented at national level by publication of an identical national standard or by endorsement (dop) dav + 12 months
- latest date by which the national standards conflicting with this document have to be withdrawn (dow) dav + 36 months (to be confirmed or modified when voting)

25 This document will supersede EN 50483-4:2009 and all of its amendments and corrigenda (if any).

26 prEN 50483-4:2024 includes the following significant technical changes with respect to EN 50483-4:2009:

27 This is Part 4 of CENELEC standard EN 50483 "Test requirements for low voltage aerial bundled cable  
28 accessories", which has six parts:

29 — Part 1: Generalities;

30 — Part 2: Tension and suspension clamps, fittings and brackets for self supporting system;

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

32 — Part 4: Connectors;

33 — Part 5: Electrical ageing test;

34 — Part 6: Environmental testing.

## 35 Introduction

36 The objective of the EN 50483 series is to provide a method of testing the suitability of accessories when used  
37 under normal operating conditions with low voltage aerial bundled cables (ABC) complying with HD 626.

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

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## 46 1 Scope

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

49 This Part 4 applies to connectors used for the electrical connection of ABC.

50 The connectors are designed to be installed where either the main and/or branch cable is ABC as defined by  
51 HD 626.

52 Tests described in this document are type tests.

## 53 2 Normative references

54 The following documents are referred to in the text in such a way that some or all of their content constitutes  
55 requirements of this document. For dated references, only the edition cited applies. For undated references,  
56 the latest edition of the referenced document (including any amendments) applies.

57 EN 50182, *Conductors for overhead lines - Round wire concentric lay stranded conductors*

58 EN 50483-1:2024, *Test requirements for low voltage aerial bundled cable accessories*

59 EN 50483-5:2024, *Test requirements for low voltage aerial bundled cable accessories*

60 EN 50483-6:2024, *Test requirements for low voltage aerial bundled cable accessories*

61 EN 60529:1991, *Degrees of protection provided by enclosures (IP Code)*

62 HD 626, *Overhead distribution cables of rated voltage  $U_0/U(U_m)$ : 0,6/1 (1,2) kV*

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

## 64 3 Terms and definitions

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

66 ISO and IEC maintain terminology databases for use in standardization at the following addresses:

67 — ISO Online browsing platform: available at <https://www.iso.org/obp/>

68 — IEC Electropedia: available at <https://www.electropedia.org/>

### 69 3.1

#### 70 **aerial bundled cable (ABC)**

71 aerial cable consisting of a group of insulated conductors which are twisted together including, or not, a non  
72 insulated conductor

73 [SOURCE: IEC 461-08-02, modified]

74 Note 1 to entry: The terms bundled conductors, bundled cables, bundled cores, conductor bundles and bundle could be  
75 used as equivalent to the term aerial bundled cable (ABC).

### 76 3.2

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

78 insulated cable designed to be suspended overhead and outdoors

79 [SOURCE: IEC 461-08-01]

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80 **3.3**  
 81 **branch connector**  
 82 metallic device for connecting a branch conductor to a main conductor at an intermediate point on the latter

83 [SOURCE: IEC 461-17-05]

84 **3.4**  
 85 **branch conductor**  
 86 conductor connected to the main conductor by a connector

87 **3.5**  
 88 **conductor insulation**  
 89 insulation applied on a conductor

90 [SOURCE: IEC 461-02-02, modified]

91 **3.6**  
 92 **conductor (of a cable)**  
 93 part of a cable which has the specific function of carrying current

94 [SOURCE: IEC 461-01-01]

95 **3.7**  
 96 **connector**  
 97 metallic device to connect cable conductors together

98 [SOURCE: IEC 461-17-03]

99 **3.8**  
 100 **core**  
 101 assembly comprising conductor and its own insulation

102 [SOURCE: IEC 461-04-04, modified]

103 **3.9**  
 104 **insulation (of a cable)**  
 105 insulating materials incorporated in a cable with the specific function of withstanding voltage [IEC 461-02-01]

106 **3.10**  
 107 **insulation piercing connector (IPC)**  
 108 connector in which electrical contact with the conductor is made by metallic protrusions which pierce the  
 109 insulation of the ABC core

110 [SOURCE: IEC 461-11-08, modified]

111 **3.11**  
 112 **messenger**  
 113 wire or rope, the primary function of which is to support the cable in aerial installations, which may be separate  
 114 from or integral with the cable it supports

115 [SOURCE: IEC 461-08-03]

116 **3.12**  
 117 **minimum breaking load (MBL)**  
 118 minimum breaking load of the conductor given by HD 626 or the cable manufacturer if not defined in the  
 119 standard or minimum breaking load of the clamp given by the clamp manufacturer



- 120 **3.13**  
 121 **neutral messenger system**  
 122 aerial insulated system where only the neutral messenger supports the ABC
- 123 **3.14**  
 124 **pre-insulated (terminal) lug**  
 125 insulated metallic device for connecting an insulated cable conductor to other electrical equipment
- 126 **3.15**  
 127 **pre-insulated through connector (sleeve)**  
 128 insulated metallic device for connecting two consecutive lengths of insulated conductors
- 129 **3.16**  
 130 **rated tensile strength (RTS)**  
 131 estimate of the conductor breaking load calculated using the specified tensile properties of the component  
 132 wires

133 [SOURCE: EN 50182:2001, 3.7]

- 134 **3.17**  
 135 **reusable connector**  
 136 connector for connecting ABC to stripped cable or bare conductor where only the branch connection can be  
 137 reused

- 138 **3.18**  
 139 **self supporting system**  
 140 aerial insulated system where all the cores of the ABC contribute to its support
- 141 **3.19**  
 142 **sheath**  
 143 uniform and continuous tubular covering of metallic or non metallic material, generally extruded

144 [SOURCE: IEC 461-05-03]

- 145 **3.20**  
 146 **shear head**  
 147 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  
 148 torque

- 149 **3.21**  
 150 **type test**  
 151 test required to be made before supplying a type of material covered by this standard on a general  
 152 commercial basis, in order to demonstrate satisfactory performance characteristics to meet the intended  
 153 application

154 Note 1 to entry: These tests are of such a nature that, after they have been made, they need not be repeated unless  
 155 changes are made to the accessory materials, design or type of manufacturing process which might change the  
 156 performance characteristics.

## 157 **4 Symbols**

$\rho$  resistivity ( $\Omega \cdot m$ )

## 158 **5 Characteristics**

159 These connectors shall connect cables designed to HD 626 and withstand the following type tests.

**prEN 50483-4:2024 (E)****6 Marking**

See Clause 6 of prEN 50483-1:2024.

**7 General test conditions****7.1 Generalities**

See Clause 9 of prEN 50483-1:2024.

Minimum and maximum cross-sections of the conductors used for the tests shall be the minimum and maximum cross-sections for which the connector is designed.

All conductors used in these tests shall be pre-conditioned in accordance with 7.2.

When tensile test loads are applied to conductors the rate of increase shall be in accordance with prEN 50483-1:2024, 9.1.4.

A torque meter shall be used for all tightening operations and it shall have a resolution and accuracy in accordance with prEN 50483-1:2024, 9.1.8.

All tests shall be carried out at ambient temperature unless otherwise stated in this standard.

The frequency of a.c. tests shall be in accordance with prEN 50483-1:2024, 9.1.1.

The relative humidity shall be in accordance with prEN 50483-1:2024, 9.1.9 unless otherwise altered by this standard.

If a cable breaks beyond any part of a connector, the test result shall be declared void without discrediting the connector. Tests can be repeated using a new connector and a new cable.

**7.2 Preconditioning of ABC**

New cores or cables shall be used.

Cores shall be pre-conditioned according to prEN 50483-1:2024, 9.1 in order to ensure the dimensional stabilization of the insulating sheath.

The extremities of the service cables shall be installed into the connector in accordance with the instructions given by the connector manufacturer.

For the voltage and water tightness tests in 8.1.3, if the connector is tested in horizontal position, the cores shall first be bent and held in a rigid position using an appropriate device in order to prevent damage to the connections during handling, as required in the specific test.

For the climatic ageing test in 8.1.5.2, the cores shall be bent as for the dielectrical voltage and water tightness tests and their ends shall be tightly capped to prevent moisture from penetrating the conductors, as required in the specific test.

When there is a requirement to bend the cables, the bending radius shall be at least 15 times the outer diameter of the core.

The cores should be shaped before installing the connectors.

Cores used should comply with the piercing test of the insulating sheath defined in HD 626 where the customer requires this and it is applicable to the type of cable being tested.

**8 Type tests****8.1 IPC tests****8.1.1 Installation of IPCs**

Connectors shall be installed in accordance with the manufacturer's instructions. A torque meter, in accordance with prEN 50483-1:2024, 9.1.8, shall be used for all tightening and untightening operations.

Tightening shall be at the rate specified in prEN 50483-1:2024, 9.1.10.

The same core (e.g. Phase 1) of a cable with the same cross-section shall be used for each test.

202 Connectors, used on cores with a cross-section lower than, or equal to, 35 mm<sup>2</sup>, can be held in position during  
203 tightening if necessary.

## 204 8.1.2 Mechanical testing

### 205 8.1.2.1 General

206 The following tests are designed to ensure that the IPC is both mechanically suitable and does not damage  
207 the conductors it connects:

Test	Subclause
Test for mechanical damage to the main conductor	8.1.2.2
Branch cable pull-out test	8.1.2.3
Connector bolt tightening test	8.1.2.4
Shear head function test	8.1.2.5
Low temperature impact test	8.1.2.6

### 208 8.1.2.2 Test for mechanical damage to the main conductor

#### 209 8.1.2.2.1 Principle

210 This test ensures that the mechanical performance of the conductor is not impaired as a consequence of the  
211 installation of the IPC.

#### 212 8.1.2.2.2 Test arrangement

213 Two samples shall be tested. Where the IPC is designed to accept more than one size of core, 2 samples  
214 shall be tested in each of the following conductor combinations:

Main	Branch
max.	max.
min.	min.
min.	max.

215 Where max. min. combination is required this may be agreed between the customer and the manufacturer.

216 The core shall be mounted in a tensile test machine in a suitable manner.

217 The core, on which the IPCs will be tested, shall be tensioned to between 10 % and 15 % of its MBL for  
218 aluminium conductors (AAC) and between 15 % and 20 % of its MBL for all other conductors as defined in  
219 HD 626 (for example copper and AAAC).

220 The core length shall be between 0,5 m and 1,5 m.

221 When using bare main conductors according to EN 50182 not included in HD 626, RTS shall be used.

#### 222 8.1.2.2.3 Procedure

223 Connectors shall be installed in accordance with the manufacturer's instructions.

224 When the connector is designed with a shear-head, it shall be tightened to the manufacturer's specified  
225 maximum torque.

226 When the connector is designed without a shear-head, it shall be tightened to 1,1 times the manufacturer's  
227 specified nominal torque.

228 The connectors shall not be removed from the core before the mechanical tensile test.

## prEN 50483-4:2024 (E)

229 A tensile test load shall be applied to the main conductor until it reaches the following values in Table 1:

230

**Table 1**

System type	Conductor	Tensile test load
Self supporting	Copper (4 mm <sup>2</sup> to 16 mm <sup>2</sup> )	20 % MBL of the cable
	Copper (>16 mm <sup>2</sup> )	80 % MBL of the cable
	Aluminium (16 mm <sup>2</sup> to 25 mm <sup>2</sup> )	1 200 N or 40 % MBL of the cable, whichever is the greater
	Aluminium (>25 mm <sup>2</sup> )	80 % MBL of the cable
Neutral messenger	Phase	60 % MBL of the cable
	Neutral	90 % MBL of the cable

NOTE Loads for other designs of ABC shall be agreed between the customer and the manufacturer.

231 Note for Neutral messenger type: when the phase MBL is not specified, the value of 120 N/mm<sup>2</sup> time the  
 232 cross section for pure aluminium conductor and 300 N/mm<sup>2</sup> time the cross section for pure copper conductors  
 233 can be applied. The load shall be maintained for 60 s.

#### 234 8.1.2.2.4 Requirements

235 The conductor shall maintain the test load for 60 s without breaking or any damage that would prevent the  
 236 correct function of the cable.

#### 237 8.1.2.3 Branch cable pull-out test

##### 238 8.1.2.3.1 Principle

239 To ensure that the IPC provides mechanical security of the branch cable.

##### 240 8.1.2.3.2 Test arrangement

241 Two samples shall be tested. Where the IPC is designed to accept more than one size of conductor, two  
 242 samples shall be tested in each of the following conductor combinations:

Main	Branch
min.	min.
max.	min.

243 Where other combinations are required these may be agreed between the customer and the manufacturer.

244 The branch connector shall be positioned and then installed in accordance with the manufacturer's  
 245 instructions.

246 The core lengths shall be between 0,2 m and 0,5 m.