SLOVENSKI STANDARD
SIST EN 50164-2:2002/oprA2:2007

01-september-2007

Elementi za zaġļ ito pred strelo (LPC) - 2. del: Zahteve za vodnike in ozemljitvene elektrode

Lightning protection components (LPC) -- Part 2: Requirements for conductors and earth electrodes

Blitzschutzbauteile -- Teil 2: Anforderungen an Leitungen und Erder

Composants de protection contre la foudre (CPF) -- Partie 2: Caractristiques des conducteurs et des lectrodes de terre

Ta slovenski standard je istoveten z: **EN 50164-2:2002/prA2:2007**

ICS:

91.120.40	Zaġļ ita pred strelo	Lightning protection

SIST EN 50164-2:2002/oprA2:2007 **en**

EUROPEAN STANDARD

NORME EUROPÉENNE

EUROPÄISCHE NORM

FINAL DRAFT
EN 50164-2
prA2

May 2007

ICS 91.120.40

English version

Lightning protection components (LPC) -
Part 2: Requirements for conductors and earth electrodes

Composants de protection
contre la foudre (CPF) -
Partie 2: Caractéristiques
des conducteurs et des électrodes
de terre

Blitzschutzbauteile -
Teil 2: Anforderungen an Leitungen
und Erder

This draft amendment prA2, if approved, will modify the European Standard EN 50164-2:2002; it is submitted to CENELEC members for Unique Acceptance Procedure.
Deadline for CENELEC: 2007-10-26.

It has been drawn up by CLC/TC 81X.

If this draft becomes an amendment, CENELEC members are bound to comply with the CEN/CENELEC Internal Regulations which stipulate the conditions for giving this amendment the status of a national standard without any alteration.

This draft amendment was established by CENELEC 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: rue de Stassart 35, B - 1050 Brussels

Foreword

This draft amendment to the European Standard EN 50164-2:2002 was prepared by the Technical Committee CENELEC TC 81X, Lightning protection. It is submitted to the Unique Acceptance Procedure.

The following dates are proposed:

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– latest date by which the national standards conflicting with the amendment have to be withdrawn	(dow)	dor + 36 months (to be confirmed or modified when voting)

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Text of prA2 to EN 50164-2:2002

Foreword

Add the following after the 3rd paragraph:

EN 50164 is a family standard and consists of the following parts under the generic title *"Lightning Protection Components (LPC)"*

Part 1	Requirements for connection components
Part 2	Requirements for conductors and earth electrodes
Part 3	Requirements for isolating spark gaps
Part 4 [1)]	Requirements for conductor fasteners
Part 5 [2)]	Requirements for earth electrode inspection housings
Part 6 [2)]	Requirements for lightning strike counters
Part 7 [1)]	Requirements for earthing enhancing compounds

2 Normative references

Delete the following references:

IEC 61024-1-2:1998	Protection of structures against lightning – Part 1-2: General Principles – Guide B – Design, installation, maintenance and inspection of lightning protection systems
EN ISO 1460:1994 [3)]	Metallic coatings – Hot dip galvanized coatings on ferrous materials – Gravimetric determination on the mass per unit area (ISO 1460:1992)

Add the following references:

EN 62305-1	Protection against lightning – Part 1: General principles (IEC 62305-1)
EN 62305-3	Protection against lightning – Part 3: Physical damage to structures and life hazard (IEC 62305-3, mod.)
EN 62305-4	Protection against lightning – Part 4: Electrical and electronic systems within structures (IEC 62305-4)
EN 10002-1	Metallic materials – Tensile testing – Part 1: Method of test at ambient temperature
EN ISO 1461:1999	Hot deep galvanized coatings on fabricated iron and steel articles – Specifications and test methods (ISO 1461:1999)
EN ISO 2178:1995	Non-magnetic coatings on magnetic substrates – Measurement of coating thickness – Magnetic method (ISO 2178:1982)
IEC 60468:1979	Method of measurement of resistivity of metallic materials

[1)] At draft stage.
[2)] In preparation.
[3)] Appears in EN 50164-2:2002/A1:2006.

4 Requirements

Table 1 - Material, configuration and minimum cross sectional area of air termination conductors, air termination rods, earth lead-in rods and down conductors

Add at the end of footnote “c” The coating can be measured also in accordance with EN ISO 1461:1999 with a sample length of approximately 200 mm.

Add a new footnote “i”

i It is not necessary to detail any specific measuring techniques, as the dimensions of all conductors, plates, rods etc shown in the table are not critical.

Table 2 - Mechanical and electrical characteristics of air termination conductors, air termination rods, earth lead-in rods and down conductors

Delete the NOTE of the Table

Table 3 - Material, configuration and minimum dimensions of earth electrodes

Add a new footnote “h”

h It is not necessary to detail any specific measuring techniques, as the dimensions of all conductors, plates, rods etc shown in the table are not critical.

Table 4 - Mechanical and electrical characteristics of earth electrodes

Replace the footnote “b” by

b Chromium ≥ 16 %, Nickel ≥ 5 %, Molybdenum ≥ 2 %, Carbon ≥ 0,08 %

Add a new footnote “c”

c It is not necessary to detail any specific measuring techniques, as the dimensions of all conductors, plates, rods etc shown in the table are not critical.

5 Tests

5.2 Air termination conductors, air termination rods, earth lead-in rods, down conductors and earth conductors

Replace the whole subclause by the following:

5.2 Air termination conductors, air termination rods, earth lead-in rods, down conductors and earth conductors

5.2.1 Tests for thickness coating on conductors

5.2.1.1 General conditions for tests

Specimens each approximately 200 mm long shall be subjected to a test for galvanized coating thickness. The zinc coating on a steel conductor should be measured in accordance with EN ISO 1461:1999.

NOTE There is no requirement to measure the tin plated copper due to the very small coating thickness. Only a visual inspection is required.

5.2.1.2 Acceptance criteria

The specimens are deemed to have passed the tests if they comply with the requirements of Table 1.

5.2.2 Bend and adhesion test for coated conductors

5.2.2.1 General conditions for tests

Coated conductors each approximately 500 mm long shall be bent to an angle of 90^{o} (+/- 5^{o}).

- For round conductors the bending radius shall be equal to 5 times (+/- 1 mm) of its diameter,
- For tape conductors the bending radius shall be equal to 5 times (+/- 1 mm) of its thickness.

5.2.2.2 Acceptance criteria

After the test, the specimens shall show no sharp edges, cracks or peeling.

5.2.3 Environmental test

5.2.3.1 General conditions for tests

The specimens used in and complying with 5.2.2, air termination rods, earth lead-in rods, down conductors and earth conductors, shall be subjected to the test specified in Annex A.

5.2.3.2 Acceptance criteria

After the test, the specimens shall satisfy the following criteria:

- the electrical resistance over a 100 mm length measured after the tests shall not exceed the resistance value measured before the tests by more than 50 %;

- the base metal shall not exhibit any visual corrosive deterioration.

5.2.4 Tensile and elongation tests

5.2.4.1 General conditions for tests

For the methodology of carrying out tensile strength (R_m) and elongation tests see EN 10002-1.
For the testing of earth rods the test specimen should be tested un-machined as per C.1.

5.2.4.2 Acceptance criteria

The specimens are deemed to have passed the tests if they comply with the requirements of Table 2.

5.2.5 Electrical resistivity test

5.2.5.1 General conditions for tests

A sample length of conductor, approximately 1,2 m long should be used for the test. The resistance measurement should be taken over a 1 m (+/- 1 mm) distance, using a proprietary microhmeter, and the reading corrected to 20 °C using appropriate correction factors.

The sample should then be weighted.

The resistivity of the sample length of conductor can then be found by the formula

$$(\rho) = \frac{R \times a}{\ell}$$

Where: R = resistance in microhms (μΩ) over 1 m length
a = cross sectional area (m^2)
ℓ = unit length (m)

See Annex E for a typical example calculation

NOTE The dimensions of the conductor should be measured at three equally distributed points along one meter length and its cross sectional area should be within a (+/- 5 %) tolerance.

5.2.5.2 Acceptance criteria

The specimens are deemed to have passed the tests if they comply with the requirements of Table 2 and Table 4.

5.3 Earth rods

Replace the whole subclause by the following:

5.3 Earth rods

Copper coated steel earth rods shall be subjected to the tests according to 5.3. Other earth rods shall be subjected to the test according to 5.3 except the test of 5.3.2 and 5.3.3.

5.3.1 Tests for thickness coating on earth rods

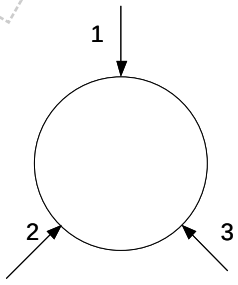
5.3.1.1 General conditions for tests

Specimens each approximately 500 mm long shall be subjected to a test for copper or galvanized coating thickness.

The copper or the zinc coating on a steel cored earth rod should be measured using a magnetic method instrument complying with EN ISO 2178.

Measurements should be taken at three positions along the length of the rod. One 50 mm in from the top of the rod, one 50 mm in from the bottom of the rod and one at the mid point of the rod.

At each position detailed above, two additional measurements should be taken around the circumference of the rod at approximately 120 degrees separation (see sketch below).



1,2,3 = measurements

5.3.1.2 Acceptance criteria

The specimens are deemed to have passed the tests if they comply with the requirements of Table 3.

5.3.2 Adhesion test

5.3.2.1 General conditions for tests

The copper coated steel earth rods specimens used in and complying with 5.3.1 with one end cut to an angle of approximately 45° chamfer shall be subjected to the following test.

The specimens are driven through two steel clamping plates or the jaws of a vice set $1^{+0,00}_{-0,25}$ mm less than the diameter of the specimens, so as to shear off sufficient metal to expose the bond between the coating and the parent metal. A typical test arrangement for the adhesion test is shown in Figure 3.

5.3.2.2 Acceptance criteria

After the test, the coating of the specimens shall show adherence to the parent metal. Separation of the copper from the steel is not acceptable.

NOTE Adhesion test for galvanized steel is under consideration.

5.3.3 Bend test

5.3.3.1 General conditions for tests

The copper coated steel earth rods specimens used in and complying with 5.3.2 shall be bent through a radius equal to 5 times (+/- 1 mm) of its diameter to an angle of 90^{o} (+/- 5^{o}).

5.3.3.2 Acceptance criteria

After the test, the specimens shall show no sharp edges, cracks or peeling around the bending area.

5.3.4 Environmental test

5.3.4.1 General conditions for tests

The copper coated steel earth rods specimens used in and complying with 5.3.3 and the zinc coated earth rods specimens used and complying with 5.3.1 shall be subjected to an environmental test as specified in Annex A.

5.3.4.2 Acceptance criteria

After the test the specimens shall satisfy the following criteria:

- the specimens shall be of good visual appearance and have no rough edges or burrs throughout their length;
- the base metal of the specimens shall not exhibit any visual corrosive deterioration.

NOTE 1 White rust is not considered as corrosive deterioration.

NOTE 2 100 mm from both ends of the specimens are excluded from inspection.