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INTERNATIONAL STANDARD

NORME INTERNATIONALE

Lightning protection system components (LPSC) – Part 5: Requirements for earth electrode inspection housings and earth electrode seals

Composants des systèmes de protection contre la foudre (CSPF) – Partie 5: Exigences pour les regards de visite et les joints des électrodes de terre

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LIGHTNING PROTECTION SYSTEM COMPONENTS (LPSC) –

Part 5: Requirements for earth electrode inspection housings and earth electrode seals

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IEC 62561-5 has been prepared by IEC technical committee 81: Lightning protection. It is an International Standard.

This third edition cancels and replaces the second edition published in 2017. This edition constitutes a technical revision.

This edition includes the following significant technical changes with respect to the previous edition:

a) A classification of earth electrode seals has been added.

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The text of this International Standard is based on the following documents:

Draft	Report on voting
81/738/FDIS	81/753/RVD

Full information on the voting for its approval can be found in the report on voting indicated in the above table.

The language used for the development of this International Standard is English.

This document was drafted in accordance with ISO/IEC Directives, Part 2, and developed in accordance with ISO/IEC Directives, Part 1 and ISO/IEC Directives, IEC Supplement, available at www.iec.ch/members_experts/refdocs. The main document types developed by IEC are described in greater detail at www.iec.ch/publications.

A list of all parts in the IEC 62561 series, published under the general title *Lightning protection system components (LPSC)*, can be found on the IEC website.

The committee has decided that the contents of this document will remain unchanged until the stability date indicated on the IEC website under webstore.iec.ch in the data related to the specific document. At this date, the document will be

- reconfirmed,
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INTRODUCTION

This part of IEC 62561 deals with the requirements and tests for lightning protection system components (LPSC), specifically earth electrode inspection housings and earth electrode seals, used for the installation of a lightning protection system (LPS) designed and implemented according to the IEC 62305 series [1][1].

[1] Numbers in square brackets refer to the Bibliography.

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LIGHTNING PROTECTION SYSTEM COMPONENTS (LPSC) –

Part 5: Requirements for earth electrode inspection housings and earth electrode seals

1 Scope

This part of IEC 62561 specifies the requirements and tests for earth electrode inspection housings (earth housings) installed in the earth and for earth electrode seals.

Lightning protection system components (LPSC) can also be suitable for use in hazardous atmospheres. For this reason, there are additional requirements when installing the components under such conditions.

NOTE Different requirements and test procedures are given in the EN 124 series [2] and the EN 1253 series [3].

2 Normative references

There are no normative references in this document.

3 Terms and definitions

For the purposes of this document, the following terms and definitions apply.

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

- IEC Electropedia: available at https://www.electropedia.org/
- ISO Online browsing platform: available at https://www.iso.org/obp

3.1
earth electrode inspection housing
metallic or non-metallic enclosure that houses the down conductor and earth termination connection for inspection and testing purposes and consists of a housing and a removable lid

3.2
earth electrode seal
water pressure seal used in conjunction with an earth electrode that passes through or enters the foundation or wall of the building, preventing ground water from entering the building

3.3
earth electrode
part or group of parts of the earth termination system which provides direct electrical contact with and disperses the lightning current to the earth

EXAMPLE Earth rods, earth conductors and earth plates.

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4 Classification

4.1 Earth electrode inspection housings

Earth electrode inspection housings are classified according to the ability to withstand load stress as follows:

a) class H, heavy duty usage for slow moving vehicular traffic, multi-axle, etc;

b) class M, medium duty usage for slow moving automobiles, etc;

c) class L, light duty usage for walkways, etc.

4.2 Earth electrode seals

Earth electrode seals are classified according to the medium in contact with the earth electrode, as follows:

a) earth electrode in watertight housing;

b) earth electrode through watertight concrete.

5 Requirements

5.1 General

All earth electrode inspection housings and earth electrode seals shall be designed and constructed so that, in normal use according to the manufacturer's or supplier's instructions, their performance shall be reliable, stable and safe to persons and surrounding equipment.

The choice of a material depends on its ability to match the particular application requirements.

5.2 Documentation and installation instructions

The manufacturer or supplier of the earth electrode inspection housing and earth electrode seals shall provide adequate information in their literature to ensure that the installer can select and install the materials in a suitable and safe manner.

The literature shall contain at least the following information:

a) classification as per Clause 4;

b) load withstand force for earth electrode inspection housings in kN;

c) installation instructions.

Compliance is checked by review in accordance with 6.2.

5.3 Marking

5.3.1 Content of marking

All products complying with this document shall be marked at least with:

a) the manufacturer's or responsible vendor's name or trade mark;

b) part number or identifying symbol;

c) classification as per Clause 4;

d) load withstand force for earth electrode inspection housings in kN.

Where this proves to be impractical, the marking in accordance with b), c) and d) may be given on the smallest packing unit.

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Compliance is checked in accordance with 6.3.

NOTE Marking can be applied for example by moulding, pressing, engraving, and printing.

5.3.2 Durability and legibility

Compliance is checked in accordance with 6.3.

5.4 Earth electrode inspection housing

The design of the earth electrode inspection housing shall be such that it carries out its function of enclosing the down conductor and earth rod termination in an acceptable and safe manner, and has sufficient internal dimensions to permit the assembly or disassembly of the earth rod clamp. The housing body shall be deep enough to permit the lid to sit flush on the body without interfering with the rod or conductor or clamp assembly.

The material of the earth electrode inspection housing shall be compatible with its surrounding environment, i.e. in terms of load rating, and shall comply with the tests given in 6.4.

5.5 Earth electrode seal

The design of the earth electrode seal shall be such that, in an acceptable and safe manner, it carries out its function of preventing ground water bypassing the earth electrode and entering the foundation or the basement or a wall of a building.

The material of the earth electrode seal shall be compatible with its surrounding environment and comply with the tests given in 6.5.

6 Tests

6.1 General

The tests in accordance with this document are type tests. These tests are of such a nature that, after they have been performed, it is not necessary for these tests to be repeated unless changes are made to the materials, design or type of manufacturing process, which can change the performance characteristics of the product.

Tests are carried out with the specimens prepared as in normal use according to the manufacturer's or supplier's instructions, unless otherwise specified.

All tests are carried out on new specimens.

Three new specimens are subjected to the tests and the requirements are satisfied if all the tests are met. If only one of the specimens does not satisfy a test due to an assembly or a manufacturing fault, that test and any preceding one which can have influenced the results of the test shall be repeated. The tests which follow shall be carried out in the required sequence on another full set of specimens, all of which shall comply with the requirements, unless otherwise specified.

The applicant, when submitting the first set of samples, can also submit an additional set of samples that can be necessary should one sample fail. The testing laboratory shall then, without further request, test the additional set of samples, and shall only reject if a further failure occurs. If the additional set of samples is not submitted at the same time, a failure of one sample shall entail rejection.

For products already tested according to IEC 62561-5:2011 and IEC 62561-5:2017, the applicability of previous tests according to Annex A, Table A.1 can be applied.

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For new products, complete type tests and samples according to Clause 6 are required.

6.2 Documentation and installation instructions

6.2.1 General conditions

The content of the installation instructions is checked as per its completeness by review.

6.2.2 Acceptance criteria

Documentation or installation instructions are deemed to be acceptable if they contain at least the information given in 5.2.

6.3 Marking test

6.3.1 General test conditions

The marking is checked:

a) as per its completeness in accordance with 5.3.1 by review;

b) as per its durability and legibility by rubbing it by hand for 15 s with a piece of cloth soaked with water and again for 15 s with a piece of cloth soaked with white spirit or mineral spirit.

NOTE Marking made by moulding, pressing or engraving is not subjected to the test of 6.3.1 b).

6.3.2 Acceptance criteria

The specimen is deemed to have passed the test if:

a) the marking contains all information of 5.3.1;

b) after the test of 6.3.1 b) the marking remains legible.

6.4 Earth electrode inspection housing

6.4.1 General test conditions

All tests shall be performed on three new lid specimens using one housing.

6.4.2 Load test

Concrete lid and concrete housing specimens shall be tested after a 28 day curing period. Lid specimens of all other materials shall be tested after a seven day curing period.

The test is carried out on a complete assembly and prepared according to the manufacturer's instructions.

a) First alternative load test

The housing of the specimen shall be surrounded by a material relevant to a declared load rating in accordance with the manufacturer's instructions.

The thickness of the surrounding material shall be at least 0,5 times the nominal external size of the housing and not greater than the nominal size of the housing or can be reduced as specified by the manufacturer.

The arrangement should be placed on a rigid support.

An example for the test arrangement is shown in Figure 1.

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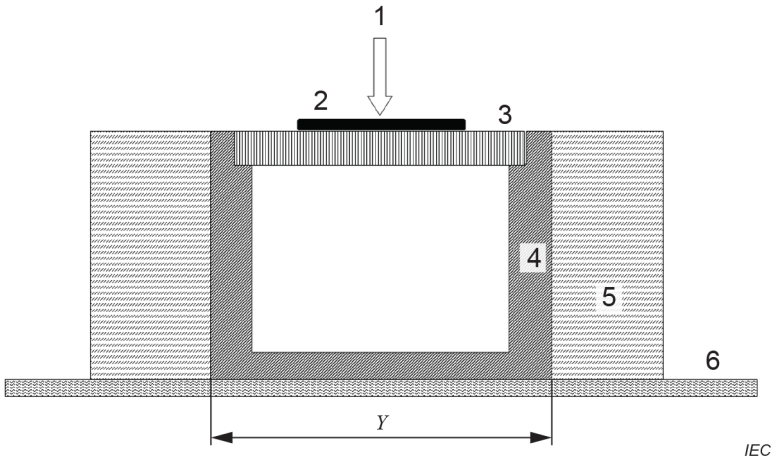

Key

1 force

2 circular steel plate

3 removable lid

4 housing

5 surrounding material

6 rigid support

Y nominal size

The thickness of the surrounding material (5) is usually equal to 0,5 × Y up to 1 × Y . It can be reduced as specified by the manufacturer.

Figure 1 – Test arrangement of the first alternative for load test

b) Second alternative load test

The housing of the specimen shall be confined within steel plates with a minimum thickness of 10 mm, according to the manufacturer's instructions, held together by suitable means for example using threaded rods, fasteners.

The arrangement should be placed on a rigid support.

An example of the second alternative of the load test is shown in Figure 2.

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