

INTERNATIONAL STANDARD

NORME INTERNATIONALE

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

**Composants de système de protection contre la foudre (CSPF) –
Partie 5: Exigences pour les regards de visite et les joints d'étanchéité
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****FOREWORD**

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

This second edition cancels and replaces the first edition, published in 2011. This edition constitutes a technical revision.

This edition includes the following major technical changes with respect to the previous edition.

- Testing requirements have been added for the sealing of earth electrode installed in or through watertight concrete.

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

FDIS	Report on voting
81/565/FDIS	81/568/RVD

Full information on the voting for the approval of this International Standard can be found in the report on voting indicated in the above table.

This document has been drafted in accordance with the ISO/IEC Directives, Part 2.

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 "<http://webstore.iec.ch>" in the data related to the specific document. At this date, the document will be

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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 IEC 62305 (all parts).

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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 housing) installed in the earth and for earth electrode seals.

Lightning protection system components (LPSC) can also be suitable for use in hazardous atmospheres. There are therefore additional requirements when installing the components under such conditions.

NOTE Different requirements and test procedures are given in EN 124 (all parts) and EN 1253 (all parts).

2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements 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.

IEC 62305-3, *Protection against lightning – Part 3: Physical damage to structures and life hazard*

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3 Terms and definitions

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

ISO and IEC maintain terminological databases for use in standardization, which can be consulted at the following addresses:

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

3.1

earth electrode inspection housing

metallic or non-metallic enclosure that houses the down conductor/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, so 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

EXAMPLES Earth rods, earth conductors and earth plates.

4 Classification

4.1 Earth electrode inspection housings

- a) heavy duty usage for slow moving vehicular traffic, multi-axle, etc;
- b) medium duty usage for slow moving automobiles, etc;
- c) light duty usage for walkways, etc.

4.2 Earth electrode seals

No classifications.

5 Requirements

5.1 General

All earth electrode inspection housings and earth electrode seals shall be so designed and constructed that in normal use their performance is reliable and without danger to persons and the surroundings.

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

5.2 Installation instructions

The manufacturer or supplier of the earth electrode inspection housing and earth electrode seals shall provide adequate information in his literature to ensure that the installer can select and install the materials in a suitable and safe manner, in accordance with IEC 62305-3.

Compliance is checked by review as per 6.4.

5.3 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/earth rod termination in an acceptable and safe manner, and has sufficient internal dimensions to permit the assembly/disassembly of the earth rod clamp. The housing body shall be deep enough to permit the lid to sit flush on the body without fouling on the rod/conductor/clamp assembly.

The material of the earth electrode inspection housing shall be compatible with its surrounding environment and shall comply with the tests given in 6.2.

5.4 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 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 6.3.

5.5 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 or identifying symbol;
- b) part number;
- c) classification as per Clause 4;

d) load withstand force in kN.

Where this proves to be impractical, the marking in accordance with the identifying symbol may be given on the smallest packing unit.

NOTE Marking can be applied for example by moulding, pressing, engraving, printing adhesive labels or water slide transfers.

Compliance is checked in accordance with 6.5.

6 Tests

6.1 General test conditions

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

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

All tests are carried out on new specimens.

Unless otherwise specified, 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 may 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.

The applicant, when submitting the first set of samples, can also submit an additional set of samples that may 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.

6.2 Earth electrode inspection housing

6.2.1 General

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

6.2.2 Load test

Concrete lid 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.

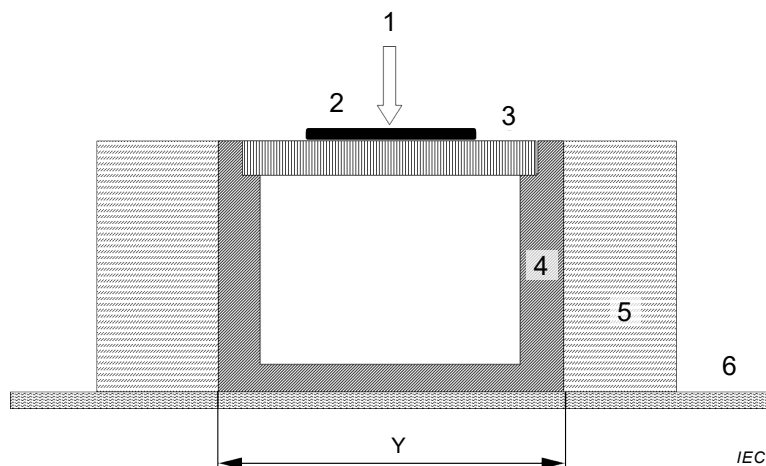
The test is carried out on a complete assembly and prepared according to the manufacturer's instructions.

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 size of the housing and not greater than the nominal size of the housing.

The arrangement should be placed on a rigid support.

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



Key

- 1 force
- 2 circular steel plate
- 3 removable lid
- 4 housing
- 5 surrounding material
- 6 rigid support

Thickness of surrounding material (5) is equal to $0,5 \times Y$ up to $1 \times Y$.

Figure 1 – Test arrangement for load test

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The product applicable for heavy duty usage (slow moving vehicular traffic, multi-axle, etc.) shall be subjected to a force of 30 kN vertically applied through a circular steel plate with a $170 \text{ mm} \pm 0,5 \text{ mm}$ diameter and a thickness of $20 \text{ mm} \pm 1 \text{ mm}$ with a radius of both edges (top and bottom) of minimum 2 mm.

The product applicable for medium duty usage (slow moving automobiles, etc.) shall be subjected to a force of 15 kN vertically applied through a circular steel plate with a $130 \text{ mm} \pm 0,5 \text{ mm}$ diameter and a thickness of $20 \text{ mm} \pm 1 \text{ mm}$ with an edge radius of approximately 2 mm.

The product applicable for light duty usage (walkways, etc.) shall be subjected to a force of 4 kN vertically applied through a circular steel plate with a $62 \text{ mm} \pm 0,5 \text{ mm}$ diameter and a thickness of $20 \text{ mm} \pm 1 \text{ mm}$ with an edge radius of approximately 2 mm.

The centre of the circular plate should be positioned over the centre of the lid.

The force shall be gradually applied over $60 \text{ s} \pm 10 \text{ s}$ and maintained for $120 \text{ s} \pm 5 \text{ s}$.

The tested load of the product should be declared by the manufacturer.

After the test, the specimens shall show no signs of disintegration, nor crack be visible to normal or corrected vision without additional magnification. One minute after the load has been removed, there shall be no permanent deformation exceeding 3 mm.

The specimen is deemed to have passed the tests if it meets the above requirements.