

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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INTERNATIONAL ELECTROTECHNICAL COMMISSION

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.

The text of this standard is based on the following documents:

FDIS	Report on voting
81/391/FDIS	81/399/RVD

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

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

A list of all the 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 publication will remain unchanged until the stability date indicated on the IEC web site under "<http://webstore.iec.ch>" in the data related to the specific publication. At this date, the publication will be

- reconfirmed,
- withdrawn,
- replaced by a revised edition, or
- amended.

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INTRODUCTION

This Part 5 of IEC 62561 deals with the requirements and tests for lightning protection system components (LPSC) used for the installation of a lightning protection system (LPS) designed and implemented according to IEC 62305 series of standards.

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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 5 of IEC 62561 specifies the requirements and tests for

- earth electrode inspection housings (earth pit),
- earth electrode seals.

Lightning protection system components (LPSC) may also be suitable for use in hazardous atmospheres. Regard should then be taken of the extra requirements necessary for the components to be installed in such conditions.

NOTE Different requirements and test procedures are given in EN 124 and EN-1253-1.

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.

IEC 62305 (all parts), *Protection against lightning*

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

3 Terms and definitions

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

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 rod electrode that passes through the foundation of the building, so preventing ground water from entering the building

4 Requirements

4.1 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 surrounding.

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

4.2 Documentation

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 inspection.

4.3 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 5.2.

4.4 Earth electrode seal

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

The material of the earth electrode seal shall be compatible with its surrounding environment and comply with the tests given in 5.3.

4.5 Marking

All products complying with this standard shall be marked at least with the following:

- a) manufacturer's or responsible vendor's name or trade mark;
- b) identifying symbol.

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

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

Compliance is checked in accordance with 5.4.

5 Tests

5.1 General test conditions

The tests in accordance with this standard are type tests.

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

All tests are carried out on new specimens.

Unless otherwise specified, three 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.

NOTE The applicant may also submit an additional set of specimens which may be used should one specimen fail. The testing station will then, without further request, test the additional set of specimens and will reject only if a further failure occurs. If the additional set of specimens is not submitted at the same time, the failure of one specimen will entail rejection.

5.2 Earth electrode inspection housing

5.2.1 General

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

5.2.2 Load test

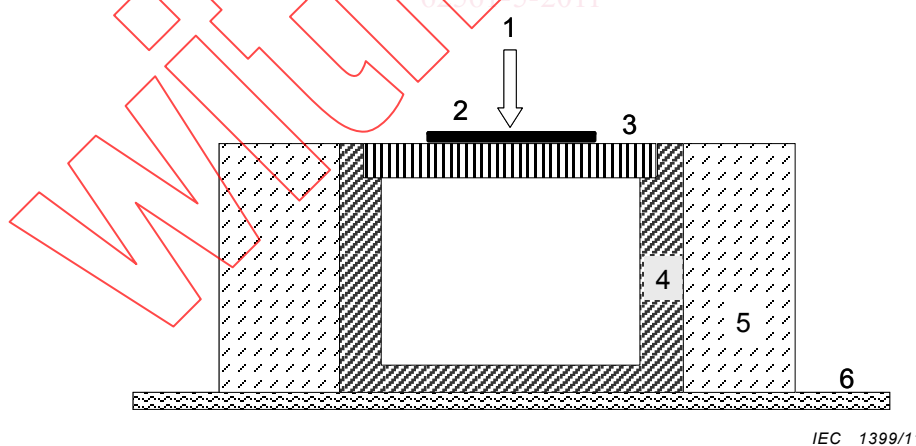
Concrete lid specimens shall be tested after a 28 day curing period. Lid specimens of all other materials shall be tested after a 7 days curing period.

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

The housing of the specimen shall be cast in a concrete base following the manufacturer instructions.

The arrangement should be placed on a rigid support.

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



IEC 1399/11

Key

1 force	4 housing
2 circular steel plate	5 concrete base
3 removable lid	6 rigid support

Figure 1 – Test arrangement for load test

The product applicable for heavy duty usage (transport vehicle 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 an edge radius of approximately 2 mm.

The product applicable for medium duty usage (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 $120 \text{ s} \pm 5 \text{ s}$.

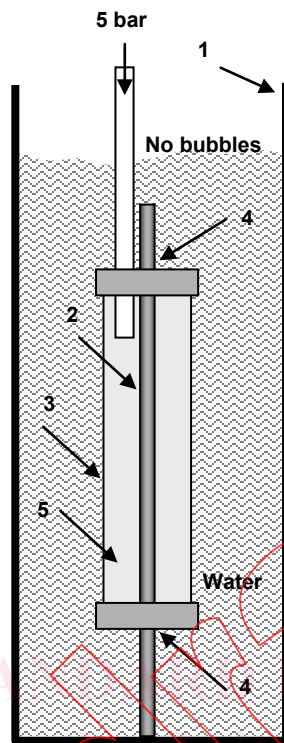
NOTE The tested load of the product should be declared by the manufacturer.

After the test, the specimens shall show no signs of disintegration, nor shall there be any cracks 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 specimens are deemed to have passed the tests if all specimens meet the above requirements.

5.3 Earth electrode seal test

The earth electrode seal shall be assembled in accordance with the manufacturer's instructions in a typical test bed that proves its intended application (as shown in Figure 2).



Key

- 1 tank filled with water
- 2 earth electrode
- 3 earth electrode seal arrangement
- 4 seals
- 5 air

Figure 2 – Test arrangement for sealing test

A minimum air pressure of 5 bar shall be applied for 24 h continuous to the seal arrangement.

The specimens are deemed to have passed the test if no leakage shall be detected at the sealing points at the completion of the test.

5.4 Marking

Marking made by moulding, pressing or engraving is not subjected to this test.

The marking is checked by inspection and 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 by white spirit.

After the test the marking shall be legible.

6 Electromagnetic compatibility (EMC)

Products covered by this standard are, in normal use, passive in respect of electromagnetic influences (emission and immunity).