SLOVENSKI STANDARD
oSIST prEN IEC 61969-3:2022

01-julij-2022

Mehanske strukture za električno in elektronsko opremo - Ohišja na prostem - 3. del: Okoljevarstvene zahteve, preskusi in varnostni vidiki

Mechanical structures for electrical and electronic equipment - Outdoor enclosures - Part 3: Environmental requirements, tests and safety aspects

Mechanische Bauweisen für elektrische und elektronische Einrichtungen - Außengehäuse - Teil 3: Umgebungsanforderungen, Prüfungen und Sicherheitsaspekte

Structures mécaniques pour équipement électrique et électronique - Enveloppes de plein air - Partie 3: Exigences et essais d'environnement, et aspects liés à la sécurité

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COMMITTEE DRAFT FOR VOTE (CDV)

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IEC SC 48D : MECHANICAL STRUCTURES FOR ELECTRICAL AND ELECTRONIC EQUIPMENT	
SECRETARIAT: Germany	SECRETARY: Mr Arno Bergmann
OF INTEREST TO THE FOLLOWING COMMITTEES:	PROPOSED HORIZONTAL STANDARD: ☐ Other TC/SCs are requested to indicate their interest, if any, in this CDV to the secretary.

FUNCTIONS CONCERNED:

☐ EMC ☒ ENVIRONMENT ☐ QUALITY ASSURANCE ☒ SAFETY

☒ SUBMITTED FOR CENELEC PARALLEL VOTING	☐ NOT SUBMITTED FOR CENELEC PARALLEL VOTING
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This document is still under study and subject to change. It should not be used for reference purposes.

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TITLE:

Mechanical structures for electrical and electronic equipment - Outdoor enclosures - Part 3: Environmental requirements, tests and safety aspects

PROPOSED STABILITY DATE: 2025

NOTE FROM TC/SC OFFICERS:

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INTERNATIONAL ELECTROTECHNICAL COMMISSION

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MECHANICAL STRUCTURES FOR ELECTRICAL AND ELECTRONIC EQUIPMENT – OUTDOOR ENCLOSURES –

Part 3: Environmental requirements, tests and safety aspects

FOREWORD

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IEC 61969-3 has been prepared by subcommittee 48D: Mechanical structures for electrical and electronic equipment, of IEC technical committee 48: Electrical connectors and mechanical structures for electrical and electronic equipment. It is an International Standard.

This fourth edition cancels and replaces the third edition published in 2020. This edition constitutes a technical revision.

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

a) alignment with the content of ETSI EN 300 019 and IEC 60721 series latest editions, particularly with the actualization of climate conditions;

b) rational for the selected operating conditions from IEC 60721-3-4 are added;

c) tests are grouped according to the classification of conditions in IEC 60721-3-4;

d) test severities for vibration and shock tests are aligned with ETSI EN 300 019-2-4;

e) addition of pass/fail criteria for each test.

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

FDIS	Report on voting
48D/xxx/FDIS	48D/xxx/RVD

93

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

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

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

101 This International Standard is to be used in conjunction with IEC 61969-1:202x.

102 A list of all parts in the IEC 61969 series, published under the general title *Mechanical structures*
103 *for electrical and electronic equipment – Outdoor enclosures*, can be found on the IEC website.

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

107 • reconfirmed,
108 • withdrawn,
109 • replaced by a revised edition, or
110 • amended.

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INTRODUCTION

The products covered by IEC 61969 (all parts) are empty enclosures for outdoor locations, to be equipped with application-specific combinations of electrical and electronic equipment, and to be used at non-weather protected locations above ground.

IEC 61969 (all parts) consists of:

– a design guidelines general part (IEC 61969-1);

– a coordination dimensions standard (IEC 61969-2);

– an environmental requirements and tests, safety aspects standard (IEC 61969-3).

This document provides basic environmental requirements and tests, as well as safety aspects, to be used for outdoor enclosures in absence of local regulatory documents, or of application-specific environmental test requirements.

This document provides manufacturers and users of generic outdoor enclosures with minimum performance compliance criteria. The thermal management solution depends on the specific environment of the outdoor enclosure.

Since forced air heat dissipation and acoustic noise are closely related, noise limitations are typically defined by local regulatory documents.

It is responsibility of the outdoor enclosure vendor to provide a solution for thermal management within the local regulatory noise limitations.

MECHANICAL STRUCTURES FOR ELECTRICAL AND ELECTRONIC EQUIPMENT – OUTDOOR ENCLOSURES –

Part 3: Environmental requirements, tests and safety aspects

1 Scope

This part of IEC 61969 specifies a set of basic environmental requirements and tests, as well as safety aspects for outdoor enclosures for electrical and electronic equipment, under conditions of non-weatherprotected locations above ground.

The purpose of this document is to define a minimum level of environmental performance in order to meet requirements of storage, transport and final installation. The intention is to establish basic environmental performance criteria for outdoor enclosure compliance.

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 60068-2-1, *Environmental testing – Part 2-1: Tests – Test A: Cold*

IEC 60068-2-2, *Environmental testing – Part 2-2: Tests – Test B: Dry heat*

IEC 60068-2-6, *Environmental testing – Part 2-6: Tests – Test Fc: Vibration (sinusoidal)*

IEC 60068-2-10, *Environmental testing – Part 2-10: Tests – Test J and guidance: Mould growth*

IEC 60068-2-11, *Basic environmental testing procedures – Part 2-11: Tests – Test Ka: Salt mist*

IEC 60068-2-14, *Environmental testing – Part 2-14: Tests – Test N: Change of temperature*

IEC 60068-2-27, *Environmental testing – Part 2-27: Tests – Test Ea and guidance: Shock*

IEC 60068-2-30, *Environmental testing – Part 2-30: Tests – Test Db: Damp heat, cyclic (12 h + 12 h cycle)*

IEC 60068-2-31, *Environmental testing – Part 2-31: Tests – Test Ec: Rough handling shocks, primarily for equipment-type specimens*

IEC 60068-2-60, *Environmental testing – Part 2-60: Tests – Test Ke: Flowing mixed gas corrosion test*

IEC 60068-2-64, *Environmental testing - Part 2-64: Tests - Test Fh: Vibration, broadband random and guidance*

IEC 60529, *Degrees of protection provided by enclosures (IP Code)*

IEC 61300-2-10, *Fibre optic interconnecting devices and passive components - Basic test and measurement procedures - Part 2-10: Tests - Crush and load resistance*

IEC 61300-2-56, *Fibre optic interconnecting devices and passive components - Basic test and measurement procedures - Part 2-56: Tests - Wind resistance of mounted housing*

IEC 61587-1, *Mechanical structures for electronic equipment – Tests for IEC 60917 and IEC 60297 series – Part 1: Environmental requirements, test set-up and safety aspects for cabinets, racks, subracks and chassis under indoor condition use and transportation*

IEC 61587-2, *Mechanical structures for electronic equipment – Tests for IEC 60917 and 60297 – Part 2: Seismic tests for cabinets and racks*

IEC 61969-1:2020, *Mechanical structures for electrical and electronic equipment – Outdoor enclosures – Part 1: Design guidelines*

IEC 62262, *Degrees of protection provided by enclosures for electrical equipment against external mechanical impacts (IK code)*

IEC 62368-1, *Audio/video, information and communication technology equipment – Part 1: Safety requirements*

ISO 3744, *Acoustics – Determination of sound power levels and sound energy levels of noise sources using sound pressure – Engineering methods for an essentially free field over a reflecting plane*

ISO 4892-2, *Plastics – Methods of exposure to laboratory light sources – Part 2: Xenon-arc lamps*

ISO 4892-3, *Plastics – Methods of exposure to laboratory light sources – Part 3: Fluorescent UV lamps*

ETSI EN 300 019-2-2, *Environmental Engineering (EE) – Environmental conditions and environmental tests for telecommunications equipment – Part 2-2: Specification of environmental tests – Transportation*

ETSI EN 300 019-2-4, *Environmental Engineering (EE); Environmental conditions and environmental tests for telecommunications equipment; Part 2-4: Specification of environmental tests; Stationary use at non-weatherprotected locations*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in IEC 61969-1 apply.

ISO and IEC maintain terminological 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

4 Classification of environmental conditions

The environmental operating conditions are derived from IEC 60721-3-4, with the focus on empty outdoor enclosures relevant requirements. Two classes of environmental performance are described:

– class 1: Non-weatherprotected locations, standard performance: Covers all regions with a moderate climate;

- class 2: Non-weatherprotected locations, extended performance: Covers regions with extremely cold or extremely warm climate.

The individual outdoor enclosure tested to these basic environmental test requirements may claim compliance to either class 1 or class 2 or a combination of class 1/class 2.

5 Environmental test conditions

5.1 General

The minimum tests and test severities for the non-weatherprotected conditions as defined in IEC 60721-3-4 can be found as:

- climatic conditions (K) given in Table 2;
- biological conditions (B) given in Table 3;
- chemical active substance (C) given in Table 4;
- mechanical active substance (S) given in Table 1;
- mechanical conditions during operation (M) in Table 5;
- mechanical conditions during transport, handling and installation in Table 6.

Two classes of test severities for the operating conditions are defined, each corresponding to the relevant class of environmental performance defined in clause 4:

- class 1 for operating conditions in temperate climatic environments. The refence for this environment in IEC 60721-3-4 is 4K26/4Z4/4B2/4C2/4S12/4M11;
- class 2 for operating conditions with more extreme tropical and polar conditions 4K25/4Z5/4B2/4C2/4S12/4M11 and 4K27/4Z5/4B2/4C2/4S12/4M11 from IEC 60721-3-4.

5.2 Pass/fail criteria tests

Table 1 contains the pass/fail criteria tests that shall be performed after the climatic tests (Table 2), the biological tests (Table 3), the resistance against chemically active substances tests (Table 4), the mechanical tests (Table 5) and the transport tests (Table 6). When the same test sample is used for several tests, it is allowed to perform the relevant pass/fail tests at the end of the test sequence.

Table 1 – Pass/fail criteria tests

Test	Environmental parameters and test methods	Test severity		Acceptance conditions
		Class 1	Class 2	
PF1	Visual examination	Examination of the internal and external parts. Inspection with the naked eye for flaws, deformation, surface changes, rust, cracks or other deteriorations that could impair functionality.		No defects which would adversely affect product performance.
PF2	Protection against ingress of dust (IEC 60529)	IP5X		The protection is satisfactory if talcum powder has not accumulated in a quantity or location such that, as with any other kind of dust, it could interfere with the correct operation of the equipment or impair safety. No dust shall deposit where it could lead to tracking along the creepage distance.