SLOVENSKI STANDARD
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Klasifikacija okoljskih pogojev - 3-4. del: Klasifikacija skupin okoljskih parametrov in njihove resnosti - Stacionarna uporaba na lokacijah, ki niso zaščitene pred vremenskimi vplivi (IEC 60721-3-4:2019)

Classification of environmental conditions - Part 3-4: Classification of groups of environmental parameters and their severities - Stationary use at non-weatherprotected locations (IEC 60721-3-4:2019)

Klassifizierung von Umweltbedingungen - Teil 3-4: Klassen von Umwelteinflußgrößen und deren Grenzwerte - Ortsfester Einsatz, nicht wettergeschützt (IEC 60721-3-4:2019)

Classification des conditions d'environnement - Partie 3-4: Classification des groupements des agents d'environnement et de leurs sévérités - Utilisation à poste fixe, non protégé contre les intempéries (IEC 60721-3-4:2019)

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English Version

Classification of environmental conditions - Part 3-4: Classification of groups of environmental parameters and their severities - Stationary use at non-weatherprotected locations (IEC 60721-3-4:2019)

Classification des conditions d'environnement - Partie 3-4: Classification des groupements des agents d'environnement et de leurs sévérités - Utilisation à poste fixe, non protégé contre les intempéries (IEC 60721-3-4:2019)

Klassifizierung von Umgebungsbedingungen - Teil 3-4: Klassen von Einflussgrößen und deren Grenzwerte – Ortsfester Einsatz, nicht wettergeschützt (IEC 60721-3-4:2019)

This European Standard was approved by CENELEC on 2019-06-26. CENELEC members are bound to comply with the CEN/CENELEC Internal Regulations which stipulate the conditions for giving this European Standard the status of a national standard without any alteration.

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European Committee for Electrotechnical Standardization
Comité Européen de Normalisation Electrotechnique
Europäisches Komitee für Elektrotechnische Normung

CEN-CENELEC Management Centre: Rue de la Science 23, B-1040 Brussels

European foreword

The text of document 104/828/FDIS, future edition 3 of IEC 60721-3-4, prepared by IEC/TC 104 "Environmental conditions, classification and methods of test" was submitted to the IEC-CENELEC parallel vote and approved by CENELEC as EN IEC 60721-3-4:2019.

The following dates are fixed:

- latest date by which the document has to be implemented at national level by publication of an identical national standard or by endorsement (dop) 2020-03-26
- latest date by which the national standards conflicting with the document have to be withdrawn (dow) 2022-06-26

This document supersedes EN 60721-3-4:1995 and all of its amendments and corrigenda (if any).

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The text of the International Standard IEC 60721-3-4:2019 was approved by CENELEC as a European Standard without any modification.

In the official version, for Bibliography, the following notes have to be added for the standards indicated:

IEC 60068-2-27	NOTE	Harmonized as EN 60068-2-27
IEC 60068-3-3	NOTE	Harmonized as EN 60068-3-3
IEC 60721-2 (series)	NOTE	Harmonized as EN 60721-2 (series)
IEC 60721-1	NOTE	Harmonized as EN 60721-1
IEC 60721-2-1	NOTE	Harmonized as EN 60721-2-1
IEC 60721-2-2	NOTE	Harmonized as EN 60721-2-2
IEC 60721-2-3	NOTE	Harmonized as EN 60721-2-3
IEC 60721-2-4	NOTE	Harmonized as EN IEC 60721-2-4
IEC 60721-2-5	NOTE	Harmonized as HD 478.2.5 S1
IEC 60721-2-6:1990	NOTE	Harmonized as HD 478.2.6 S1:1993 (not modified)
IEC 60721-2-9	NOTE	Harmonized as EN 60721-2-9
IEC 60721-3 (series)	NOTE	Harmonized as EN 60721-3-9 (series)
IEC 60721-3-0	NOTE	Harmonized as EN 60721-3-0
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Classification of environmental conditions – Part 3-4: Classification of groups of environmental parameters and their severities – Stationary use at non-weatherprotected locations

Classification des conditions d'environnement – Partie 3-4: Classification des groupements des agents d'environnement et de leurs sévérités – Utilisation à poste fixe, non protégé contre les intempéries

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CLASSIFICATION OF ENVIRONMENTAL CONDITIONS –

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FOREWORD

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International Standard IEC 60721-3-4 has been prepared by IEC technical committee 104: Environmental conditions, classification, and methods of test.

This third edition cancels and replaces the second edition published in 1995 and Amendment 1:1996. This edition constitutes a technical revision.

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

a) Clause 1: reworded.
b) Clause 2: normative references have been updated.
c) Clause 3: definitions have been updated.
d) Clause 4: reworded and simplified.

e) Clause 5: revised and updated. Several classes have been replaced by completely new classes based on the use of new information obtained from referenced technical reports.

f) Defined values of chemically active substances are now by reference to ISO 9223.

g) Tables 1 through 5: updated.

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

FDIS	Report on voting
104/828/FDIS	104/836/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 60721 series, published under the general title *Classification of environmental conditions*, 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

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

CLASSIFICATION OF ENVIRONMENTAL CONDITIONS –

Part 3-4: Classification of groups of environmental parameters and their severities – Stationary use at non-weatherprotected locations

1 Scope

This part of IEC 60721 classifies groups of environmental parameters and their severities to which products are subjected when installed for stationary use at non-weatherprotected locations. Weatherprotected locations where products can be mounted for stationary use permanently or temporarily are addressed in IEC 60721-3-3.

The environmental conditions specified in this document are limited to those which can directly affect the performance of products. Only environmental conditions as such are considered. No special description of the effects of these conditions on the products is provided.

Environmental conditions directly related to fire or explosion hazards, microclimate within a product, and conditions related to effects from ionizing radiation are excluded. Any other unforeseen incidents are also excluded.

A limited number of classes of environmental conditions is given, covering a broad field of application.

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 terminological databases for use in standardization 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
stationary use
use of a product mounted firmly on a structure, or permanently placed at a certain site

3.2
non-weatherprotected location
location at which a product is not protected from meteorological conditions

3.3
sheltered location
location at which a product is covered by a structure to protect it from direct meteorological conditions, i.e. direct sunlight, heavy rain

4 General

A product may be subjected to a range of environmental conditions during its lifetime. These conditions have been separated into classes described in IEC 60721-3 (all parts). The classes given may be used for defining the maximum short-term environmental stresses on a product. However, they do not provide information regarding the long-term or total lifetime environmental stresses a product may experience. This means that no reliability or lifetime assessment is possible based on these classes alone. Refer to IEC 60721-2 (all parts) and applicable technical reports (IEC TR 62130, IEC TR 62131-2, IEC TR 62131-3, IEC TR 62131-4 and IEC TR 62131-5) for further information on actual environmental conditions.

A product may be simultaneously exposed to several environmental parameters, for example, solar radiation and temperature, temperature and humidity, as well as vibration and temperature change. Combinations of the environmental parameters given may increase the stress effect on a product. Therefore, combined conditions should be considered in the design and evaluation of a product.

Products should be designed to survive and operate in different environments. Basically, they will be affected by environmental influences in two ways:

– by the effects of short-term extreme environmental conditions which may directly cause malfunction or destroy the product;
– by the effect of long-term subjection to non-extreme environmental stresses which may slowly degrade the product and finally cause malfunction or destruction of the product.

Short-term extreme environmental conditions may occur at any time in a product's life. A product may be unaffected by an extreme condition when it is new but fail when it is subjected to the same condition after being used for a long period of time due to the effect of ageing. The order in which the environmental conditions are applied may affect the results of an evaluation.

It is important for the product specification, when referring to a certain class in IEC 60721-3 (all parts), to define whether the product is required to be capable of operating when being exposed to the conditions described by the class.

The environmental classes may be used as a basis for the selection of design and test severities with respect to the consequence of failure. Information contained in IEC 60721-3 (all parts) may be used to help establish expected requirements for use, storage, transportation, etc., and in the development of relevant specifications. The selected severities used for testing should attempt to produce the effects of the actual environment.

EXAMPLE 1 A high temperature test on a heat dissipating product is designed to simulate the thermal effect of subjecting a product to conditions of high air temperature, solar radiation and other possible heat sources dependent on the application.

EXAMPLE 2 In a mechanical shock test, the product can be subjected to mechanical shocks of simple pulse shapes (e.g., half-sine), while the actual conditions cannot be described by such simple pulses.

It is recognized that extreme or special environmental conditions may exist which require consideration of severities that are not addressed in this document. The user of this document should select the lowest classification necessary for covering the conditions of the intended use.

5 Classification of groups of environmental parameters and their severities

5.1 General

Several classes for climatic conditions (K), special climatic conditions (Z), biological conditions (B), chemically active substances (C), mechanically active substances (S), and mechanical conditions (M) are specified.

This classification allows for several possible combinations of environmental conditions which bear upon products when installed in non-weatherprotected locations. It represents the real situation concerning world-wide conditions of use due to local influences of open-air climate, etc.

For certain environmental parameters, it has not yet been possible to specify quantitative severities.

For a given location or product, reference should be made to the total set of classes as defined in 5.2 through 5.7, for example:

4K26/4Z3/4B3/4C2/4S12/4M10

5.2 Climatic conditions (K)

The classes defined in previous versions of this document have been replaced with new classes as a result of recent efforts at collecting information regarding climatic conditions. Those results are contained in technical reports referenced in this document.

At non-weatherprotected locations, the influence of special climatic conditions constitutes a more significant share of the effects bearing upon a product and its functional parts than at weatherprotected locations. Particularly the effects of temperature change, solar radiation, precipitation, air velocity and wind-chill should be considered in this respect.

The severity of these effects may be influenced for instance by constructional details (sort and thickness of material, colour of surface, sealing or breathing of casings or enclosures, product heating, etc.) and by mounting details (selection of mounting site, consideration of degree of exposure to prevailing wind and weather, etc.).

The climatic conditions specified for classes 4K23 to 4K27 refer to the non-weatherprotected conditions where products may be used. These conditions have been experienced world-wide over a long time period. The conditions should cover all normal cases, but not exceptional events. These conditions are specified in Table 1. The interdependence of temperature to relative humidity is shown in Annex A.

Sheltered non-weatherprotected locations

4K23 applies to sheltered non-weatherprotected locations in tropical, arid, temperate, and cold climatic classification with the thermal effects from solar radiation encompassed in the temperature.

4K24 applies to sheltered non-weatherprotected locations in the polar climate type with the thermal effects from solar radiation encompassed in the temperature.

Open-air non-weatherprotected locations

4K25 applies to open-air locations in the tropical climatic classification.

4K26 applies to open-air storage in the arid and temperate climatic classifications.

4K27 applies to open-air storage in the cold and polar climatic classifications.