

INTERNATIONAL STANDARD

NORME INTERNATIONALE

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

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





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INTERNATIONAL ELECTROTECHNICAL COMMISSION

CLASSIFICATION OF ENVIRONMENTAL CONDITIONS –

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

FOREWORD

- 1) The International Electrotechnical Commission (IEC) is a worldwide organization for standardization comprising all national electrotechnical committees (IEC National Committees). The object of IEC is to promote international co-operation on all questions concerning standardization in the electrical and electronic fields. To this end and in addition to other activities, IEC publishes International Standards, Technical Specifications, Technical Reports, Publicly Available Specifications (PAS) and Guides (hereafter referred to as "IEC Publication(s)"). Their preparation is entrusted to technical committees; any IEC National Committee interested in the subject dealt with may participate in this preparatory work. International, governmental and non-governmental organizations liaising with the IEC also participate in this preparation. IEC collaborates closely with the International Organization for Standardization (ISO) in accordance with conditions determined by agreement between the two organizations.
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International Standard IEC 60721-3-3 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 1994, Amendment 1: 1995 and Amendment 2:1996. This edition constitutes a technical revision.

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

- a) Clause 3: definitions aligned with IEC 60721-3-1.
- b) Clause 4: aligned with IEC 60721-3-1.
- c) Clause 5: Clause A.3 has been incorporated into Clause 5.

- d) Subclause 5.2: all existing climate classes have been replaced by completely new classes. The new classes are divided into two groups. The reason for the new classes is the latest revision of IEC 60721-2-1 which incorporates new climate types.
- e) Subclause 5.3: addition of a new class for low air pressure.
- f) Defined values of chemically active substances are now by reference to ISO 9223.
- g) Subclause 5.6: all existing classes for mechanically active substances have been replaced by completely new classes, in alignment with IEC 60721-3-1.
- h) Subclause 5.7: all existing classes for mechanical conditions have been replaced by completely new classes, in alignment with IEC 60721-3-1.
- i) Table 1: new climatic classes with new severities.
- j) Table 2: new class for low air pressure.
- k) Table 4: new mechanically active substances classes.
- l) Table 5: new mechanical conditions classes.
- m) Annex A: revised and includes a clean climatogram.
- n) Annex B: revised and includes the definition of seismic environment.
- o) All classes regarding fire, all combined classes, all chemically active substances classes, Clause A.2, Annexes C, D and E have been removed.

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

FDIS	Report on voting
104/829/FDIS	104/837/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 3-3: Classification of groups of environmental parameters and their severities – Stationary use at 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 weatherprotected locations.

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 explosion hazards, microclimate within a product, fire extinction and ionizing radiation are excluded. Any other unforeseen incidents are also excluded. The possibility of their occurrence can be considered as special cases. This document does not cover equipment covered by building standards, codes or regulations.

Conditions of stationary use at non-weatherprotected locations, portable and non-stationary use, use in vehicles and ships, conditions of storage and transportation, and microclimates inside products are given in other parts of the IEC 60721-3 series.

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

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 60721-3-0, *Classification of environmental conditions – Part 3: Classification of groups of environmental parameters and their severities – Introduction*

IEC 60721-1, *Classification of environmental conditions – Part 1: Environmental parameters and their severities*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in IEC 60721-1 and the following 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

weatherprotected location

location at which a product is protected from direct exposure to meteorological conditions

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 60721-3-0. The classes given may be used for defining the maximum short-term environmental stresses of 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 and IEC TR 62131-5) for further information on actual environmental conditions.

A product will be simultaneously exposed to a number of environmental parameters, for example, low air pressure and temperature, temperature and humidity, as well as vibration and temperature change. Combinations of the environmental parameters given may increase the 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 the 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 the 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 or only to survive without permanent damage 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.