

<b>STN</b>	<b>Klasifikácia podmienok prostredia Časť 3-9: Klasifikácia skupín parametrov prostredia a ich stupňov prísnosti Mikroklímy vo vnútri výrobkov</b>	<b>STN EN IEC 60721-3-9</b>
03 8900		

Classification of environmental conditions - Part 3-9: Classification of groups of environmental parameters and their severities - Microclimates inside products

Táto norma obsahuje anglickú verziu európskej normy.  
This standard includes the English version of the European Standard.

Táto norma bola oznámená vo Vestníku ÚNMS SR č. 08/24

Obsahuje: EN IEC 60721-3-9:2024, IEC 60721-3-9:2024

Oznámením tejto normy sa od 16.05.2027 ruší  
STN EN 60721-3-9+A1 (03 8900) z októbra 1999

**139009**



EUROPEAN STANDARD  
NORME EUROPÉENNE  
EUROPÄISCHE NORM

**EN IEC 60721-3-9**

May 2024

ICS 19.040

Supersedes EN 60721-3-9:1993;  
EN 60721-3-9:1993/A1:1995

English Version

**Classification of environmental conditions - Part 3-9:  
Classification of groups of environmental parameters and their  
severities - Microclimates inside products  
(IEC 60721-3-9:2024)**

Classification des conditions d'environnement - Partie 3-9:  
Classification des groupements des agents  
d'environnement et de leurs sévérités - Microclimat à  
l'intérieur des produits  
(IEC 60721-3-9:2024)

Klassifizierung von Umgebungsbedingungen - Teil 3-9:  
Klassen von Einflussgrößen und deren Grenzwerte -  
Mikroklima innerhalb von Erzeugnissen  
(IEC 60721-3-9:2024)

This European Standard was approved by CENELEC on 2024-05-16. 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.

Up-to-date lists and bibliographical references concerning such national standards may be obtained on application to the CEN-CENELEC Management Centre or to any CENELEC member.

This European Standard exists in three official versions (English, French, German). A version in any other language made by translation under the responsibility of a CENELEC member into its own language and notified to the CEN-CENELEC Management Centre has the same status as the official versions.

CENELEC members are the national electrotechnical committees of Austria, Belgium, Bulgaria, Croatia, Cyprus, the Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, the Netherlands, Norway, Poland, Portugal, Republic of North Macedonia, Romania, Serbia, Slovakia, Slovenia, Spain, Sweden, Switzerland, Türkiye and the United Kingdom.



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

**EN IEC 60721-3-9:2024 (E)****European foreword**

The text of document 104/1041/FDIS, future edition 2 of IEC 60721-3-9, 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 60721-3-9:2024.

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) 2025-02-16
- latest date by which the national standards conflicting with the document have to be withdrawn (dow) 2027-05-16

This document supersedes EN 60721-3-9:1993 and all of its amendments and corrigenda (if any).

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. CENELEC shall not be held responsible for identifying any or all such patent rights.

Any feedback and questions on this document should be directed to the users' national committee. A complete listing of these bodies can be found on the CENELEC website.

**Endorsement notice**

The text of the International Standard IEC 60721-3-9:2024 was approved by CENELEC as a European Standard without any modification.

In the official version, for Bibliography, the following note has to be added for the standard indicated:

IEC 60721-2-1:2013 NOTE Approved as EN 60721-2-1:2014 (not modified)

## Annex ZA (normative)

### Normative references to international publications with their corresponding European publications

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.

NOTE 1 Where an International Publication has been modified by common modifications, indicated by (mod), the relevant EN/HD applies.

NOTE 2 Up-to-date information on the latest versions of the European Standards listed in this annex is available here: [www.cencenelec.eu](http://www.cencenelec.eu).

<u>Publication</u>	<u>Year</u>	<u>Title</u>	<u>EN/HD</u>	<u>Year</u>
IEC 60721-1	-	Classification of environmental conditions - EN 60721-1 Part 1: Environmental parameters and their severities		-
IEC 60721-3-0	2020	Classification of environmental conditions - EN IEC 60721-3-0 Part 3-0: Classification of groups of environmental parameters and their severities - Introduction	2020	
IEC 60721-3-3	2019	Classification of environmental conditions - EN IEC 60721-3-3 Part 3-3: Classification of groups of environmental parameters and their severities - Stationary use at weatherprotected locations	2019	
IEC 60721-3-4	2019	Classification of environmental conditions - EN IEC 60721-3-4 Part 3-4: Classification of groups of environmental parameters and their severities - Stationary use at non-weatherprotected locations	2019	



IEC 60721-3-9

Edition 2.0 2024-04

# INTERNATIONAL STANDARD

## NORME INTERNATIONALE



**Classification of environmental conditions –  
Part 3-9: Classification of groups of environmental parameters and their  
severities – Microclimates inside products**

**Classification des conditions d'environnement –  
Partie 3-9: Classification des groupements des agents d'environnement et de  
leurs sévérités – Microclimats à l'intérieur des produits**





## THIS PUBLICATION IS COPYRIGHT PROTECTED

Copyright © 2024 IEC, Geneva, Switzerland

All rights reserved. Unless otherwise specified, no part of this publication may be reproduced or utilized in any form or by any means, electronic or mechanical, including photocopying and microfilm, without permission in writing from either IEC or IEC's member National Committee in the country of the requester. If you have any questions about IEC copyright or have an enquiry about obtaining additional rights to this publication, please contact the address below or your local IEC member National Committee for further information.

Droits de reproduction réservés. Sauf indication contraire, aucune partie de cette publication ne peut être reproduite ni utilisée sous quelque forme que ce soit et par aucun procédé, électronique ou mécanique, y compris la photocopie et les microfilms, sans l'accord écrit de l'IEC ou du Comité national de l'IEC du pays du demandeur. Si vous avez des questions sur le copyright de l'IEC ou si vous désirez obtenir des droits supplémentaires sur cette publication, utilisez les coordonnées ci-après ou contactez le Comité national de l'IEC de votre pays de résidence.

IEC Secretariat  
3, rue de Varembé  
CH-1211 Geneva 20  
Switzerland

Tel.: +41 22 919 02 11  
[info@iec.ch](mailto:info@iec.ch)  
[www.iec.ch](http://www.iec.ch)

### About the IEC

The International Electrotechnical Commission (IEC) is the leading global organization that prepares and publishes International Standards for all electrical, electronic and related technologies.

### About IEC publications

The technical content of IEC publications is kept under constant review by the IEC. Please make sure that you have the latest edition, a corrigendum or an amendment might have been published.

#### IEC publications search - [webstore.iec.ch/advsearchform](http://webstore.iec.ch/advsearchform)

The advanced search enables to find IEC publications by a variety of criteria (reference number, text, technical committee, ...). It also gives information on projects, replaced and withdrawn publications.

#### IEC Just Published - [webstore.iec.ch/justpublished](http://webstore.iec.ch/justpublished)

Stay up to date on all new IEC publications. Just Published details all new publications released. Available online and once a month by email.

#### IEC Customer Service Centre - [webstore.iec.ch/csc](http://webstore.iec.ch/csc)

If you wish to give us your feedback on this publication or need further assistance, please contact the Customer Service Centre: [sales@iec.ch](mailto:sales@iec.ch).

#### IEC Products & Services Portal - [products.iec.ch](http://products.iec.ch)

Discover our powerful search engine and read freely all the publications previews, graphical symbols and the glossary. With a subscription you will always have access to up to date content tailored to your needs.

#### Electropedia - [www.electropedia.org](http://www.electropedia.org)

The world's leading online dictionary on electrotechnology, containing more than 22 500 terminological entries in English and French, with equivalent terms in 25 additional languages. Also known as the International Electrotechnical Vocabulary (IEV) online.

### A propos de l'IEC

La Commission Electrotechnique Internationale (IEC) est la première organisation mondiale qui élabore et publie des Normes internationales pour tout ce qui a trait à l'électricité, à l'électronique et aux technologies apparentées.

### A propos des publications IEC

Le contenu technique des publications IEC est constamment revu. Veuillez vous assurer que vous possédez l'édition la plus récente, un corrigendum ou amendement peut avoir été publié.

#### Recherche de publications IEC - [webstore.iec.ch/advsearchform](http://webstore.iec.ch/advsearchform)

La recherche avancée permet de trouver des publications IEC en utilisant différents critères (numéro de référence, texte, comité d'études, ...). Elle donne aussi des informations sur les projets et les publications remplacées ou retirées.

#### IEC Just Published - [webstore.iec.ch/justpublished](http://webstore.iec.ch/justpublished)

Restez informé sur les nouvelles publications IEC. Just Published détaille les nouvelles publications parues. Disponible en ligne et une fois par mois par email.

#### Service Clients - [webstore.iec.ch/csc](http://webstore.iec.ch/csc)

Si vous désirez nous donner des commentaires sur cette publication ou si vous avez des questions contactez-nous: [sales@iec.ch](mailto:sales@iec.ch).

#### IEC Products & Services Portal - [products.iec.ch](http://products.iec.ch)

Découvrez notre puissant moteur de recherche et consultez gratuitement tous les aperçus des publications, symboles graphiques et le glossaire. Avec un abonnement, vous aurez toujours accès à un contenu à jour adapté à vos besoins.

#### Electropedia - [www.electropedia.org](http://www.electropedia.org)

Le premier dictionnaire d'électrotechnologie en ligne au monde, avec plus de 22 500 articles terminologiques en anglais et en français, ainsi que les termes équivalents dans 25 langues additionnelles. Egalement appelé Vocabulaire Electrotechnique International (IEV) en ligne.



IEC 60721-3-9

Edition 2.0 2024-04

# INTERNATIONAL STANDARD

# NORME INTERNATIONALE



**Classification of environmental conditions –  
Part 3-9: Classification of groups of environmental parameters and their  
severities – Microclimates inside products**

**Classification des conditions d'environnement –  
Partie 3-9: Classification des groupements des agents d'environnement et de  
leurs sévérités – Microclimat à l'intérieur des produits**

INTERNATIONAL  
ELECTROTECHNICAL  
COMMISSION

COMMISSION  
ELECTROTECHNIQUE  
INTERNATIONALE

ICS 19.040

ISBN 978-2-8322-8626-5

**Warning! Make sure that you obtained this publication from an authorized distributor.  
Attention! Veuillez vous assurer que vous avez obtenu cette publication via un distributeur agréé.**

## CONTENTS

FOREWORD .....	3
1 Scope .....	5
2 Normative references .....	5
3 Terms and definitions .....	5
4 General .....	6
5 Classification of microclimatic conditions .....	6
6 Types and marking of microclimatic classes .....	7
Annex A (informative) Graphical representation and preferred microclimatic classes .....	8
A.1 Graphical representation of the microclimatic classes .....	8
A.2 Tables of preferred microclimatic classes.....	9
Annex B (informative) Constitutional diagram for humid air .....	14
B.1 General.....	14
B.2 Application.....	14
B.3 Description .....	14
Bibliography.....	17
Figure A.1 – Example of a climatogram for a microclimate: Microclimatic class 3K22/X2/Y1 .....	9
Figure B.1 – Constitutional diagram for humid air.....	16
Table 1 – Classification of microclimatic conditions.....	7
Table A.1 – Characteristic parameters and severities of microclimatic classes – Weatherprotected locations: Corner points A', B', C', D', E' and F' .....	10
Table A.2 – Characteristic parameters and severities of microclimatic classes – Weatherprotected locations: Corner points BY <sub>1</sub> to BY <sub>4</sub> and CY <sub>1</sub> to CY <sub>4</sub> .....	11
Table A.3 – Characteristic parameters and severities of microclimatic classes – Non-weatherprotected locations: Corner points A', B', C', D', E' and F' .....	12
Table A.4 – Characteristic parameters and severities of microclimatic classes – Non-weatherprotected locations: Corner points BY <sub>1</sub> to BY <sub>4</sub> and CY <sub>1</sub> to CY <sub>4</sub> .....	13

**INTERNATIONAL ELECTROTECHNICAL COMMISSION****CLASSIFICATION OF ENVIRONMENTAL CONDITIONS –****Part 3-9: Classification of groups of environmental parameters  
and their severities – Microclimates inside products****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.
- 2) The formal decisions or agreements of IEC on technical matters express, as nearly as possible, an international consensus of opinion on the relevant subjects since each technical committee has representation from all interested IEC National Committees.
- 3) IEC Publications have the form of recommendations for international use and are accepted by IEC National Committees in that sense. While all reasonable efforts are made to ensure that the technical content of IEC Publications is accurate, IEC cannot be held responsible for the way in which they are used or for any misinterpretation by any end user.
- 4) In order to promote international uniformity, IEC National Committees undertake to apply IEC Publications transparently to the maximum extent possible in their national and regional publications. Any divergence between any IEC Publication and the corresponding national or regional publication shall be clearly indicated in the latter.
- 5) IEC itself does not provide any attestation of conformity. Independent certification bodies provide conformity assessment services and, in some areas, access to IEC marks of conformity. IEC is not responsible for any services carried out by independent certification bodies.
- 6) All users should ensure that they have the latest edition of this publication.
- 7) No liability shall attach to IEC or its directors, employees, servants or agents including individual experts and members of its technical committees and IEC National Committees for any personal injury, property damage or other damage of any nature whatsoever, whether direct or indirect, or for costs (including legal fees) and expenses arising out of the publication, use of, or reliance upon, this IEC Publication or any other IEC Publications.
- 8) Attention is drawn to the Normative references cited in this publication. Use of the referenced publications is indispensable for the correct application of this publication.
- 9) IEC draws attention to the possibility that the implementation of this document may involve the use of (a) patent(s). IEC takes no position concerning the evidence, validity or applicability of any claimed patent rights in respect thereof. As of the date of publication of this document, IEC had not received notice of (a) patent(s), which may be required to implement this document. However, implementers are cautioned that this may not represent the latest information, which may be obtained from the patent database available at <https://patents.iec.ch>. IEC shall not be held responsible for identifying any or all such patent rights.

IEC 60721-3-9 has been prepared by IEC technical committee 104: Environmental conditions, classification and methods of test. It is an International Standard.

This second edition cancels and replaces the first edition published in 1993, Amendment 1:1994 and Corrigendum 1:1995. This edition constitutes a technical revision.

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

- a) Clause 2 has been updated;
- b) Clause 4 has been re-edited and simplified;
- c) Annex A has been revised and updated;

- d) a new Annex B has been added and gives the origin of the constitutional diagram for humid air, which is the basis of drawing the climatogram for a microclimate.

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

Draft	Report on voting
104/1041/FDIS	104/1050/RVD

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

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

This document was drafted in accordance with ISO/IEC Directives, Part 2, and developed in accordance with ISO/IEC Directives, Part 1 and ISO/IEC Directives, IEC Supplement, available at [www.iec.ch/members\\_experts/refdocs](http://www.iec.ch/members_experts/refdocs). The main document types developed by IEC are described in greater detail at [www.iec.ch/publications](http://www.iec.ch/publications).

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 [webstore.iec.ch](http://webstore.iec.ch) in the data related to the specific document. At this date, the document will be

- reconfirmed,
- withdrawn, or
- revised.

**IMPORTANT – The "colour inside" logo on the cover page of this document indicates that it contains colours which are considered to be useful for the correct understanding of its contents. Users should therefore print this document using a colour printer.**

## CLASSIFICATION OF ENVIRONMENTAL CONDITIONS –

### Part 3-9: Classification of groups of environmental parameters and their severities – Microclimates inside products

#### 1 Scope

This part of IEC 60721 classifies groups of microclimatic conditions, to which components (basic parts, assemblies, built-in units) can be subjected inside products, which are used under the climatic conditions as classified in IEC 60721-3-3 and IEC 60721-3-4.

Characteristic parameters for the microclimates are high air temperature and high relative air humidity. Further parameters of the climatic classes, for example low temperature, can affect the components additionally, but have not been considered here.

A limited number of microclimatic classes is specified taking into consideration typical limiting high air temperatures of components.

NOTE The term "microclimate" can, for example in meteorology or buildings, have a different meaning than those discussed in this document.

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

IEC 60721-3-0:2020, *Classification of environmental conditions – Part 3-0: Classification of groups of environmental parameters and their severities – Introduction*

IEC 60721-3-3:2019, *Classification of environmental conditions – Part 3-3: Classification of groups of environmental parameters and their severities – Stationary use at weatherprotected locations*

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*

**koniec náhľadu – text d'alej pokračuje v platenej verzii STN**