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**Classification of environmental conditions - Part 3: Classification of groups of environmental parameters and their severities - Section 5: Ground vehicle installations**

Classification of environmental conditions -- Part 3: Classification of groups of environmental parameters and their severities -- Section 5: Ground vehicle installations

Klassifizierung von Umweltbedingungen -- Teil 3: Klassen von Umwelteinflußgrößen und deren Grenzwerte -- Hauptabschnitt 5: Einsatz an und in Landfahrzeugen

Classification des conditions d'environnement -- Partie 3: Classification des groupements des agents d'environnement et de leurs severités -- Section 5: Installations des véhicules terrestres

**Ta slovenski standard je istoveten z: EN 60721-3-5:1997**

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**ICS:**

19.040	Preskušanje v zvezi z okoljem	Environmental testing
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**SIST EN 60721-3-5:2001****en**

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EUROPEAN STANDARD

EN 60721-3-5

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April 1997

ICS 19.040

Supersedes EN 60721-3-5:1993 and its amendment

Descriptors: Electronic components, electrical equipment, electronical equipment, electrotechnical components, climatic conditions, environment, choice, ground vehicles

English version

**Classification of environmental conditions**  
**Part 3: Classification of groups of environmental**  
**parameters and their severities**  
**Section 5: Ground vehicle installations**  
**(IEC 60721-3-5:1997)**

Classification des conditions  
d'environnement

Partie 3: Classification des groupements  
des agents d'environnement et de leurs  
sévérités

Section 5: Installations des véhicules  
terrestres  
(CEI 60721-3-5:1997)

Klassifizierung von Umweltbedingungen

Teil 3: Klassen von  
Umwelteinflußgrößen und deren  
Grenzwerte

Hauptabschnitt 5: Einsatz an und in  
Landfahrzeugen  
(IEC 60721-3-5:1997)

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This European Standard was approved by CENELEC on 1996-12-09. 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 Central Secretariat 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 Central Secretariat has the same status as the official versions.

CENELEC members are the national electrotechnical committees of Austria, Belgium, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Luxembourg, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland and United Kingdom.

# CENELEC

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

Central Secretariat: rue de Stassart 35, B - 1050 Brussels

### Foreword

The text of document 75/281/FDIS, future edition 2 of IEC 60721-3-5, prepared by IEC TC 76 "Optical radiation safety and laser equipment", was submitted to the IEC-CENELEC parallel vote and was approved by CENELEC as EN 60721-3-5 on 1996-12-09.

This European Standard supersedes EN 60721-3-5:1993 and its amendment A2:1994.

The following dates were fixed:

- latest date by which the EN has to be implemented  
at national level by publication of an identical  
national standard or by endorsement (dop) 1997-12-01
- latest date by which the national standards conflicting  
with the EN have to be withdrawn (dow) 1997-12-01

Annexes designated "normative" are part of the body of the standard.

Annexes designated "informative" are given for information only.

In this standard, annex ZA is normative and annexes A and B are informative.

Annex ZA has been added by CENELEC.

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## iTeh STANDARD PREVIEW

Endorsement notice

The text of the International Standard IEC 60721-3-5:1997 was approved by CENELEC as a European Standard without any modification.

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## Annex ZA (normative)

Normative references to international publications  
with their corresponding European publications

This European Standard incorporates by dated or undated reference, provisions from other publications. These normative references are cited at the appropriate places in the text and the publications are listed hereafter. For dated references, subsequent amendments to or revisions of any of these publications apply to this European Standard only when incorporated in it by amendment or revision. For undated references the latest edition of the publication referred to applies (including amendments).

NOTE: When an international publication has been modified by common modifications, indicated by (mod), the relevant EN/HD applies.

<u>Publication</u>	<u>Year</u>	<u>Title</u>	<u>EN/HD</u>	<u>Year</u>
IEC 721-1	1990	Classification of environmental conditions Part 1: Environmental parameters and their severities		
+ A1	1992		EN 60721-1	1995
A2	1995		A2	1995
IEC 721-2-1	1982	Part 2: Environmental conditions appearing in nature - Temperature and humidity		
+ A1	1987		HD 478.2.1 S1	1989
IEC 721-3-0	1984	Part 3: Classification of groups of environmental parameters and their severities - Introduction		
+ A1	1987		EN 60721-3-0	1993
IEC 60721-3-1	1997	Section 1: Storage	EN 60721-3-1	1997
IEC 60721-3-2	1997	Section 2: Transportation	EN 60721-3-2	1997

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**NORME  
INTERNATIONALE  
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**60721-3-5**

Deuxième édition  
Second edition  
1997-03

**Classification des conditions d'environnement –**

**Partie 3:**

**Classification des groupements des agents  
d'environnement et de leurs sévérités –**

**Section 5: Installations des véhicules terrestres**

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**Classification of environmental conditions –**

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**Part 3:**

**Classification of groups of environmental parameters  
and their severities –**

**Section 5: Ground vehicle installations**

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Commission Electrotechnique Internationale  
International Electrotechnical Commission  
Международная Электротехническая Комиссия

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For price, see current catalogue

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## INTERNATIONAL ELECTROTECHNICAL COMMISSION

## CLASSIFICATION OF ENVIRONMENTAL CONDITIONS –

Part 3: Classification of groups of environmental parameters  
and their severities –

## Section 5: Ground vehicle installations

## FOREWORD

- 1) The IEC (International Electrotechnical Commission) is a worldwide organization for standardization comprising all national electrotechnical committees (IEC National Committees). The object of the 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, the IEC publishes International Standards. 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. The 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 the 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 National Committees.
- 3) The documents produced have the form of recommendations for international use and are published in the form of standards, technical reports or guides and they are accepted by the National Committees in that sense.
- 4) In order to promote international unification, IEC National Committees undertake to apply IEC International Standards transparently to the maximum extent possible in their national and regional standards. Any divergence between the IEC Standard and the corresponding national or regional standard shall be clearly indicated in the latter.
- 5) The IEC provides no marking procedure to indicate its approval and cannot be rendered responsible for any equipment declared to be in conformity with one of its standards.
- 6) Attention is drawn to the possibility that some of the elements of this International Standard may be the subject of patent rights. The IEC shall not be held responsible for identifying any or all such patent rights.

International Standard IEC 60721-3-5 has been prepared by IEC technical committee 75: Classification of environmental conditions.

This second edition cancels and replaces the first edition published in 1985, amendment 1 (1991) and amendment 2 (1994). The third amendment led to the publication of this consolidated edition.

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

FDIS	Report on voting
75/281/FDIS	75/294/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.

IEC 721 consists of the following parts, under the general title *Classification of environmental conditions*:

- Part 1: 1990, Environmental parameters and their severities
- Part 2: Environmental conditions appearing in nature
- Part 3: Classification of groups of environmental parameters and their severities.

Annexes A and B are for information only.

**CLASSIFICATION OF ENVIRONMENTAL CONDITIONS –**  
**Part 3: Classification of groups of environmental parameters**  
**and their severities –**  
**Section 5: Ground vehicle installations**

## 1 Scope and object

This standard classifies the environmental conditions to which a product not forming part of the vehicle is subjected when installed in a ground vehicle. Such products are for example radios, communication systems, fare meters, flow meters for liquids transported by the vehicle, for example milk, petroleum products, etc. Vehicles where products may be permanently or temporarily installed include

- *road vehicles*: passenger cars, commercial vehicles, special vehicles, towing vehicles, trailers, mopeds, motor cycles, etc.;
- *rail vehicles*: trains, trams, cranes, etc.;
- *overland vehicles*: four wheel drive cars, tractors, snow scooters, etc.;
- *handling and storage vehicles*: fork-lift trucks (manual and robot), luggage transporters, etc.;
- *self-propelled machinery*: diggers, harvesters, etc.

Although this standard is not designed for products forming part of the vehicles, the environmental condition classification may also be used for some exchangeable parts, installed in a similar way and in the same locations of the vehicle as products which do not form part of the vehicle. Only severe conditions which may be harmful to products are included.

Conditions of storage and transportation are given in IEC 721-3-1 and IEC 721-3-2.

The object of this standard is to classify the environmental parameters and their severities to which a product will be exposed under its conditions of use when installed in ground vehicles.

A limited number of classes of environmental conditions are given, covering a broad field of application. The user of this standard should select the lowest class necessary covering each of the conditions of the intended use. Some guidance for this is given in annex A.

## 2 Normative references

The following normative documents contain provisions which, through reference in this text, constitute provisions of this section of IEC 721-3. At the time of publication, the editions indicated were valid. All normative documents are subject to revision, and parties to agreements based on this section of IEC 721-3 are encouraged to investigate the possibility of applying the most recent editions of the normative documents indicated below. Members of IEC and ISO maintain registers of currently valid International Standards.

IEC 721-1: 1990, *Classification of environmental conditions – Part 1: Environmental parameters and their severities*  
Amendment 1 (1992)  
Amendment 2 (1995)

IEC 721-2-1: 1982, *Classification of environmental conditions – Part 2: Environmental conditions appearing in nature – Temperature and humidity*  
Amendment 1 (1987)

IEC 721-3-0: 1984, *Classification of environmental conditions – Part 3: Classification of groups of environmental parameters and their severities – Introduction*  
Amendment 1 (1987)

IEC 721-3-1: 1997, *Classification of environmental conditions – Part 3: Classification of groups of environmental parameters and their severities – Section 1: Storage*

IEC 721-3-2: 1997, *Classification of environmental conditions – Part 3: Classification of groups of environmental parameters and their severities – Section 2: Transportation*

### 3 Definitions

For the purpose of the present section of IEC 721-3, the following definitions apply, in addition to the definitions in clause 3 of IEC 721-1.

**3.1 internally mounted:** The product is mounted internally in the vehicle, in a compartment which affords some protection from the environment, ranging from complete isolation from external influences to protection only from precipitation when the vehicle is not moving.

**3.2 externally mounted:** The product is mounted on the outside of the vehicle. It is not protected from any external influences.

**3.3 weatherprotected location:** A location in which the vehicle is protected from direct weather influences. The locality is assumed to be reasonably ventilated (at least natural air flow).

### 4 General

Reference to IEC 721-3-0 is strongly recommended in order to avoid misuse of the classes defined in the other sections of IEC 721-3.

The severities specified are those which will have a low probability of being exceeded. All specified values are maximum or limit values. These values may be reached, but do not occur permanently. Depending on the situation there may be different frequencies of occurrence related to a certain period of time. Such frequencies of occurrence have not yet been included in this standard, but should be considered for any environmental parameter. They should additionally be specified, if applicable.

Information on the duration and frequency of occurrence is given, as clause 6, in amendment 1 to IEC 721-3-0.

Attention is drawn to the fact that combinations of the environmental parameters given may increase the effect on a product. This applies especially to the presence of high relative humidity in addition to biological conditions, or to conditions of chemically or mechanically active substances.

## 5 Classification of groups of environmental parameters and their severities

A limited number of classes for climatic conditions (K), special climatic conditions (Z), biological conditions (B), chemically active substances (C), mechanically active substances (S), contaminating fluids (F) and mechanical conditions (M) are given in tables 1, 1A, 2, 3, 4, 5 and 6. For a given product reference should be made to the total set of classes, for example 5K2/5B1/5C3/5S2/5F1/5M2.

The basis of these classes is explained in clause A.2 of annex A.

Climatic conditions in tropical areas as specified in classes 5K5 and 5K6 are explained in annex B.

The combination of the lowest classes 5K1/5B1/5C1/5S1/5F1/5M1 forms the condition to which a product will be subjected when being installed in, for example, smooth running vehicles used only in very restricted conditions (indoors).

The combination of the highest classes 5K4/5B3/5C3/5S3/5F3/5M3 covers installations in a wide number of types of vehicles; including locations with very severe conditions. For a number of environmental parameters and classes special severities are given for products installed in engine compartments.

A class with higher digit conditions normally includes all classes with lower digits. For certain parameters it has not yet been possible to give quantitative severities.

A summary of the conditions covered by the classes is given in clause A.3 of annex A.

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