

# INTERNATIONAL STANDARD

## NORME INTERNATIONALE

**Classification of environmental conditions –  
Part 2-4: Environmental conditions appearing in nature – Solar radiation and  
temperature**

**Classification des conditions d'environnement –  
Partie 2-4: Conditions d'environnement présentes dans la nature – Rayonnement  
solaire et température**



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COMMISSION

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## INTERNATIONAL ELECTROTECHNICAL COMMISSION

**CLASSIFICATION OF ENVIRONMENTAL CONDITIONS –****Part 2-4: Environmental conditions appearing in nature –  
Solar radiation and temperature**

## FOREWORD

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International Standard IEC 60721-2-4 has been prepared by IEC technical committee 104: Environmental conditions, classification and methods of test.

This second edition cancels and replaces the first edition published in 1987 and Amendment 1:1988. This edition constitutes a technical revision.

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

- a) Figures updated including the addition of global irradiation information,
- b) Format updated.

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

| FDIS         | Report on voting |
|--------------|------------------|
| 104/800/FDIS | 104/803/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- withdrawn,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 2-4: Environmental conditions appearing in nature – Solar radiation and temperature**

#### **1 Scope**

This part of IEC 60721 presents a broad division into types of solar radiation areas. It is intended to be used as part of the background material when selecting appropriate severities of solar radiation for product applications.

All types of geographical areas are covered, except areas with altitudes above 5 000 m.

This document also serves to define limiting severities of solar radiation to which products are liable to be exposed during transportation, storage and use.

#### **2 Normative references**

There are no normative references in this document.

#### **3 Terms and definitions**

No terms and definitions are listed in this document.

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>

#### **4 General**

Solar radiation can affect products primarily by the heating of material and their environment or by photochemical degradation of material.

Solar radiation, especially its ultraviolet content, causes photochemical degradation of most organic materials. Elasticity and plasticity of certain rubber compounds and plastic materials are affected. Optical glass may become opaque.

Solar radiation bleaches out colours in paints, textiles, paper, etc. This can be of importance, for example for the colour-coding of components.

The heating of material is a consequence of exposure to solar radiation. The presentation of severities of solar radiation is therefore related to the power density radiated towards a surface, or irradiance, expressed in W/m<sup>2</sup>.

An object subjected to solar radiation will attain a temperature that depends primarily on the surrounding air temperature, the energy radiated from the Sun, and the incidence angle of the radiation on the object. Other factors, for example wind and heat conduction to mountings, can be of importance. In addition, the absorptance  $\alpha_s$  of the surface for the solar spectrum is of importance.