



**NSAI**  
Standards

Irish Standard  
I.S. EN 60068-2-5:2011

Environmental testing -- Part 2-5: Tests  
- Test Sa: Simulated solar radiation at  
ground level and guidance for solar  
radiation testing (IEC 60068-2-5:2010  
(EQV) + corrigendum Dec. 2010 (EQV))

## I.S. EN 60068-2-5:2011

*Incorporating amendments/corrigenda issued since publication:*

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S.R. xxx: Standard Recommendation - recommendation based on the consensus of an expert panel and subject to public consultation.

SWiFT xxx: A rapidly developed recommendatory document based on the consensus of the participants of an NSAI workshop.

|  |   |   |
|--|---|---|
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English version

**Environmental testing -  
Part 2-5: Tests -  
Test Sa: Simulated solar radiation at ground level and guidance for solar  
radiation testing**  
(IEC 60068-2-5:2010 + corrigendum Dec. 2010)

Essais d'environnement -  
Partie 2-5: Essais -  
Essai Sa: Rayonnement solaire simulé au  
niveau du sol et guide pour les essais de  
rayonnement solaire  
(CEI 60068-2-5:2010 + corrigendum Dec.  
2010)

Umgebungseinflüsse -  
Teil 2-5: Prüfverfahren -  
Prüfung Sa: Nachgebildete  
Sonnenbestrahlung in Bodennähe und  
Leitfaden zur Sonnenstrahlung  
(IEC 60068-2-5:2010 + corrigendum Dec.  
2010)

This European Standard was approved by CENELEC on 2011-01-02. 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, 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, Romania, Slovakia, Slovenia, Spain, Sweden, Switzerland and the United Kingdom.

**CENELEC**

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

**Management Centre: Avenue Marnix 17, B - 1000 Brussels**

## Foreword

The text of document 104/500/FDIS, future edition 2 of IEC 60068-2-5, prepared by IEC TC 104, Environmental conditions, classification and methods of test, was submitted to the IEC-CENELEC parallel vote and was approved by CENELEC as EN 60068-2-5 on 2011-01-02.

This European Standard supersedes EN 60068-2-5:1999 and EN 60068-2-9:1999.

The main changes with respect to EN 60068-2-5:1999 are listed below:

This EN 60068-2-5:2011 will make the reading much easier, partly because it includes guidance for solar radiation testing, previously published in a separate publication, EN 60068-2-9, and partly because it now allows the use of all lamps specified in CIE 85 and published in 1985 by the International commission on Illumination.

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

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) 2011-10-02
- latest date by which the national standards conflicting  
with the EN have to be withdrawn (dow) 2014-01-02

Annex ZA has been added by CENELEC.

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## Endorsement notice

The text of the International Standard IEC 60068-2-5:2010 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:

|            |      |                              |
|------------|------|------------------------------|
| ISO 4892-1 | NOTE | Harmonized as EN ISO 4892-1. |
| ISO 4892-2 | NOTE | Harmonized as EN ISO 4892-2. |
| ISO 4892-3 | NOTE | Harmonized as EN ISO 4892-3. |

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## Annex ZA (normative)

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

The following referenced documents are indispensable for the application 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 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 60068-1        | -           | Environmental testing -<br>Part 1: General and guidance  | EN 60068-1    | -           |
| IEC 60068-2-1      | -           | Environmental testing -<br>Part 2-1: Tests - Test A: Cold  | EN 60068-2-1  | -           |
| IEC 60068-2-2      | -           | Environmental testing -<br>Part 2-2: Tests - Test B: Dry heat  | EN 60068-2-2  | -           |
| IEC 60068-2-78     | -           | Environmental testing -<br>Part 2-78: Tests - Test Cab: Damp heat,<br>steady state   | EN 60068-2-78 | -           |
| CIE 20             | 1972        | Recommendation for the integrated irradiance -<br>and the spectral distribution of simulated solar<br>radiation for testing purposes |               | -           |
| CIE 85             | 1985        | Solar spectral irradiance  | -             | -           |

*This page is intentionally left BLANK.*

IEC 60068-2-5  
(2nd edition – 2010)

Environmental testing – Part 2-5: Tests –  
Test Sa: Simulated solar radiation at ground  
level and guidance for solar radiation  
testing

CEI 60068-2-5  
(2<sup>ème</sup> édition – 2010)

Essais d'environnement – Partie 2-5 : Essais –  
Essai Sa : Rayonnement solaire simulé au  
niveau du sol et guide pour les essais de  
rayonnement solaire

## CORRIGENDUM 1

### 2 Normative references

Insert the following new reference, to  
appear after IEC 60068-2-78:

CIE 20:1972, *Recommendation for the  
integrated irradiance and the spectral  
distribution of simulated solar radiation for  
testing purposes*

### 3 Terms and definitions

Delete, in 3.1, the words: “at the zenith”

#### 4.2 Irradiance

Replace, in the second paragraph:  
“1 120 W/m<sup>2</sup>” by “1 090 W/m<sup>2</sup>”

#### Table 1 – Spectral energy distribution and permitted tolerances

Delete from the title: “and permitted  
tolerances”.

Replace, in the fifth column, under “Infra-red”,  
irradiance value “186 W/m<sup>2</sup>” by “411,2 W/m<sup>2</sup>”

Replace, in the first column, the third entry  
by the following new text:

“Approximate proportion of total radiation”.

#### 5.2 Temperature

Replace the existing NOTE by the following  
new NOTE:

NOTE Additionally, a black standard thermometer  
or a black panel thermometer can be used to  
measure the maximum surface temperature. By  
ventilation, this temperature can be influenced.

### 2 Références normatives

Insérer, après la CEI 60068-2-78, la  
nouvelle référence suivante:

CIE 20:1972, *Recommendation for the  
integrated irradiance and the spectral  
distribution of simulated solar radiation for  
testing purposes* (disponible en anglais  
seulement)

### 3 Termes et définitions

Supprimer, en 3.1, les mots: « au zénith »

#### 4.2 Eclairage énergétique

Remplacer, au deuxième alinéa :  
« 1 120 W/m<sup>2</sup> » par « 1 090 W/m<sup>2</sup> »

#### Tableau 1 – Distribution spectrale de l'énergie et tolérances autorisées

Supprimer dans le titre « et tolérances  
autorisées ».

Remplacer, à la cinquième colonne  
« Infrarouge » la valeur de l'éclairage  
énergétique « 186 W/m<sup>2</sup> » par « 411,2 W/m<sup>2</sup> »

Remplacer, à la première colonne, la  
troisième entrée par ce qui suit :

« Proportion approximative du rayonnement  
total ».

#### 5.2 Température

Remplacer la NOTE existante par la nouvelle  
NOTE suivante :

NOTE De plus, un thermomètre de mesure de corps  
noir normalisé ou un thermomètre à panneau de  
mesure de corps noir peut être utilisé pour mesurer  
la température de surface maximale. Cette  
température peut être influencée par l'aération.

**5.8 Test apparatus**

Replace the two references to irradiance value “1 120 W/m<sup>2</sup>” by “1 090 W/m<sup>2</sup>”.

**5.8 Appareillage d’essai**

Remplacer, à deux reprises, la valeur d’irradiation « 1 120 W/m<sup>2</sup> » par « 1 090 W/m<sup>2</sup> ».

**7.1 General**

Replace, in the fourth paragraph, “± 2 °C” by “± 2 °K”.

Replace, in the fifth paragraph “1 120 W/m<sup>2</sup>” by “1 090 W/m<sup>2</sup>”.

**7.1 Généralités**

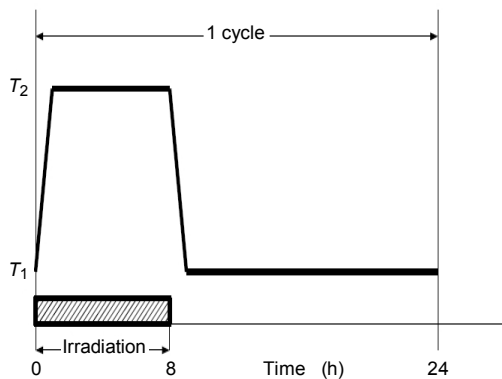
Remplacer, au quatrième alinéa, « ± 2 °C » par « ± 2° K ».

Remplacer, au cinquième alinéa, « 1 120 W/m<sup>2</sup> » par « 1 090 W/m<sup>2</sup> ».

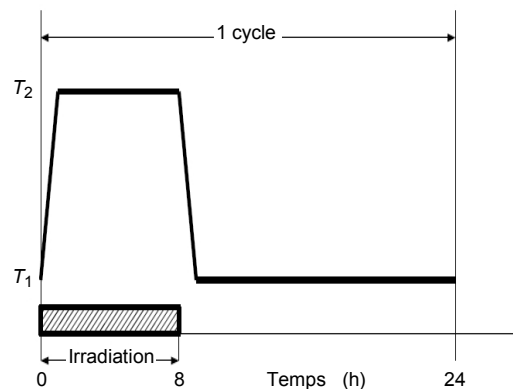
**7.4 Procedure C – Continuous irradiation as required**

Replace the existing Figure 2 by the following new Figure 2:

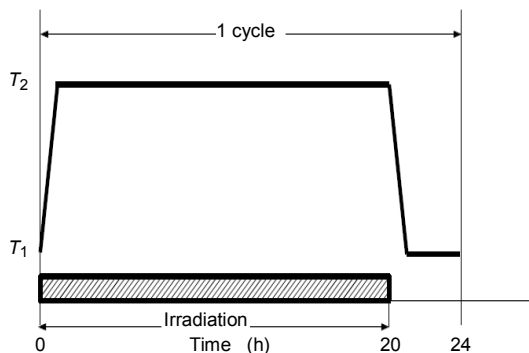
Procedure A



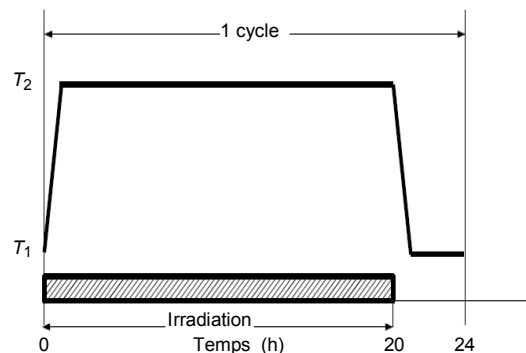
Procédure A



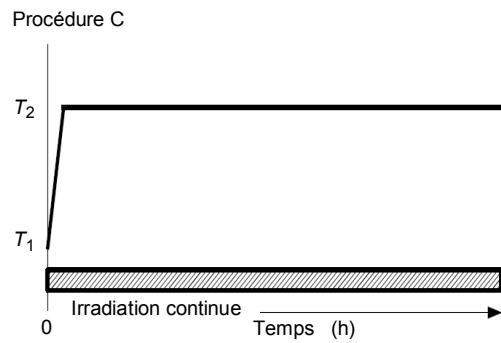
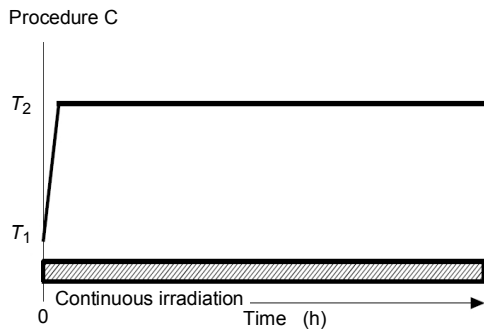
Procedure B



Procédure B







**Key**

$T_1$  lower temperature (25 °C if not otherwise specified)

$T_2$  upper temperature (40 °C if not otherwise specified)

**Légende**

$T_1$  température inférieure (25 °C sauf spécification contraire)

$T_2$  température supérieure (40 °C sauf spécification contraire)

**Figure 2 – Test procedures A, B and C**

**Figure 2 – Procédures d’essai A, B et C**

**9 Information to be given in the relevant specification**

*Replace the text of item b) by the following:*

“b) black standard temperature or black panel temperature”

*Delete item q) and renumber item r) as q).*

**9 Renseignements que doit fournir la spécification applicable**

*Remplacer le texte du point b) par ce qui suit :*

« b) température normale noire ou température de panneau noir ».

*Supprimer le point q) et renuméroter le point r) comme q).*

**B.3 Uniformity of radiance**

*Replace, in the first paragraph: “1 120 W/m<sup>2</sup>” by “1 090 W/m<sup>2</sup>”*

**B.3 Uniformité de l’éclairement énergétique**

*Remplace, au premier alinéa : « 1 120 W/m<sup>2</sup> » par « 1 090 W/m<sup>2</sup> »*

**C.4 Measurement of temperature**

*Insert, in the third paragraph, after “determined by a black standard” and before “thermometer” the words “or black panel”.*

**C.4 Mesure de température**

*Insérer, au troisième alinéa, après « déterminée par un thermomètre » et avant « noir normalisé » les mots « de mesure de corps ».*

**Table C.1 – Detailed spectral distribution of global radiation for calculation purposes**

*Replace the title of Table C.1 to read:*

**“Calculated spectral distribution values”**

*Insert a row above the footnote to Table C.1 which starts “\*Radiation shorter than .. etc.” and write:*

NOTE Irradiation values stated in Table C.1 are based on CIE 20. These values differ from CIE 85.

**Tableau C.1 – Distribution spectrale détaillée du rayonnement global pour les calculs**

*Remplacer le titre du Tableau C.1 par ce qui suit :*

**« Valeurs calculées pour la distribution spectrale »**

*Insérer une ligne au-dessus de la note de bas de tableau du Tableau C.1 qui commence par «Les rayonnements inférieurs » et écrire :*

NOTE Les valeurs de rayonnement indiquées dans le Tableau C.1 sont issues de la CIE 20; Ces valeurs sont différentes de celles indiquées dans la CIE 85.

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INTERNATIONAL ELECTROTECHNICAL COMMISSION

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**ENVIRONMENTAL TESTING –**

**Part 2-5: Tests – Test Sa: Simulated solar radiation at ground level and guidance for solar radiation testing**

FOREWORD

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International Standard IEC 60068-2-5 has been prepared by IEC technical committee 104: Environmental conditions, classification and methods of test.

This second edition cancels and replaces the first edition of IEC 60068-2-5, published in 1975, and IEC 60068-2-9, published in 1975, and constitutes a technical revision.

The main changes with respect to the previous edition are listed below:

This second edition of IEC 60068-2-5 will make the reading much easier, partly because it includes guidance for solar radiation testing, previously published in a separate publication, IEC 60068-2-9, and partly because it now allows the use of all lamps specified in CIE 85 and published in 1985 by the International commission on Illumination.

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

| FDIS         | Report on voting |
|--------------|------------------|
| 104/500/FDIS | 104/515/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.

This publication has been drafted in accordance with the ISO/IEC Directives, Part 2.

A list of all the parts in the IEC 60068 series, under the general title *Environmental testing*, can be found on the IEC website.

The committee has decided that the contents of this publication will remain unchanged until the stability date indicated on the IEC web site under "<http://webstore.iec.ch>" in the data related to the specific publication. At this date, the publication will be

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

The contents of the corrigendum of December 2010 have been included in this copy.

## INTRODUCTION

This part of IEC 60068 describes methods of simulation designed to examine the effect of solar radiation on equipment and components at the surface of the earth. The main characteristics of the environment to be simulated are the spectral energy distribution of the sun, as observed at the earth's surface, and the intensity of received energy, in combination with controlled temperature conditions. However, it may be necessary to consider a combination of solar radiation with other environments, e.g. temperature, humidity, air velocity, etc.

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