



BSI Standards Publication

## Household and similar electrical appliances - Safety

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Part 2-59: Particular requirements for insect killers

## National foreword

This British Standard is the UK implementation of EN 60335-2-59:2003+A11:2018. It is derived from IEC 60335-2-59:2002, incorporating amendment 1:2006 and amendment 2:2009. It supersedes BS EN 60335-2-59:2003+A2:2009, which will be withdrawn on 5 October 2021.

The start and finish of text introduced or altered by amendment is indicated in the text by tags. Tags indicating changes to IEC text carry the number of the IEC amendment. For example, text altered by IEC amendment A1 is indicated by  $\boxed{A1}$   $\langle A1 \rangle$ .

Text altered by CENELEC amendment A11 is indicated by  $\boxed{A11}$   $\langle A11 \rangle$ .

The UK participation in its preparation was entrusted to Technical Committee CPL/61/1, Motorised appliance group.

A list of organizations represented on this committee can be obtained on request to its secretary.

This publication does not purport to include all the necessary provisions of a contract. Users are responsible for its correct application.

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**Compliance with a British Standard cannot confer immunity from legal obligations.**

This British Standard was published under the authority of the Standards Policy and Strategy Committee on 26 September 2003.

### Amendments/corrigenda issued since publication

| Date             | Text affected   |
|------------------|---|
| 30 June 2006     | Implementation of IEC amendment 1:2006 with CENELEC endorsement A1:2006 |
| 30 April 2010    | Implementation of IEC amendment 2:2009 with CENELEC endorsement A2:2009 |
| 30 November 2018 | Implementation of CENELEC amendment A11:2018                            |

English Version

**Household and similar electrical appliances – Safety –  
Part 2-59: Particular requirements for insect killers  
(IEC 60335-2-59:2002, modified)**

Appareils électrodomestiques et analogues –  
Sécurité – Partie 2-59: Règles particulières  
pour les destructeurs d'insectes (CEI  
60335-2-59:2002, modifiée)

Sicherheit elektrischer Geräte für den  
Hausgebrauch und ähnliche Zwecke – Teil 2-59:  
Besondere Anforderungen für Insektenvernichter  
(IEC 60335-2-59:2002, modifiziert)

This European Standard was approved by CENELEC on 2003-05-01. 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, 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.



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## European foreword

The text of the International Standard IEC 60335-2-59:2002 (61/2172/FDIS), prepared by the IEC Technical Committee 61, together with the common modifications prepared by CENELEC TC 61, was submitted to the Unique Acceptance Procedure and was approved by CENELEC as [EN 60335-2-59](#) on 2003-05-01.

This European Standard replaces EN 60335-2-59:1997 + A11:2000 + A1:2001.

The following dates are applicable:

- latest date by which the EN has to be implemented at national level by publication of an identical national standard or by endorsement (dop) 2004-05-01
- date on which national standards conflicting with the EN have to be withdrawn (dow) 2006-05-01

This part 2 has to be used in conjunction with EN 60335-1, Household and similar electrical appliances - Safety - Part 1: General requirements. It was established on the basis of the 2002 edition of that standard. Amendments and revisions of Part 1 have also to be taken into account and the dates when such changes become applicable will be stated in the relevant amendment or revision of Part 1.

This part 2 supplements or modifies the corresponding clauses of [EN 60335-1](#), so as to convert it into the European Standard: Safety requirements for electric insect killers.

When a particular subclause of Part 1 is not mentioned in this part 2, that subclause applies as far as is reasonable. When this standard states "addition", "modification" or "replacement", the relevant text of Part 1 is to be adapted accordingly.

NOTE 1 The following numbering system is used:

- subclauses, tables and figures that are numbered starting from 101 are additional to those in Part 1;
- unless notes are in a new subclause or involve notes in Part 1, they are numbered starting from 101, including those in a replaced clause or subclause;
- additional annexes are lettered AA, BB, etc.;
- subclauses, notes and annexes that are additional to those in the IEC standard are prefixed with the letter Z.

NOTE 2 The following print types are used:

- requirements: in roman type;
- *test specifications: in italic type;*
- notes: in small roman type.

Words in **bold** in the text are defined in Clause 3. When a definition concerns an adjective, the adjective and the associated noun are also in bold.

There are no special national conditions causing a deviation from this European Standard, other than those listed in Annex ZA to [EN 60335-1](#).

## Introduction

An investigation by CENELEC TC 61 has shown that all risks from products within the scope of this standard are fully covered by the Low Voltage Directive, 73/23/EEC. For products having mechanical moving parts, a risk assessment in accordance with the Machinery Directive, 98/37/EC, has shown that the risks are mainly of electrical origin and consequently this directive is not applicable. However, the relevant essential safety requirements of the Machinery Directive are covered by this standard together with the principal objectives of the Low Voltage Directive.

### Endorsement notice

The text of the International Standard IEC 60335-2-59:2002 was approved by CENELEC as a European Standard with agreed common modifications.

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## Foreword to amendment A1

The text of document 61/2958/FDIS, future amendment 1 to IEC 60335-2-59:2002, prepared by the IEC Technical Committee 61, Safety of household and similar electrical appliances, was submitted to the IEC-CENELEC parallel vote and was approved by CENELEC as amendment A1 to [EN 60335-2-59:2003](#) on 2006-03-01.

The following dates are applicable:

- latest date by which the amendment has to be implemented at national level by publication of an identical national standard or by endorsement (dop) 2006-12-01
- date on which national standards conflicting with the amendment have to be withdrawn (dow) 2009-03-01

This amendment supplements or modifies the corresponding clauses of [EN 60335-2-59:2003](#).

As a consequence of endorsing amendment 1:2006 to IEC 60335-2-59:2002, the common modifications in [EN 60335-2-59:2003](#) are replaced by IEC text and therefore withdrawn.

There are no special national conditions causing a deviation from this amendment.

There are no national deviations from this amendment.

### Endorsement notice

The text of amendment 1:2006 to the International Standard IEC 60335-2-59:2002 was approved by CENELEC as an amendment without any modification.

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## Foreword to amendment A2

The text of document 61/3868/FDIS, future amendment 2 to IEC 60335-2-59:2002, prepared by the IEC Technical Committee 61, Safety of household and similar electrical appliances, was submitted to the IEC-CENELEC parallel vote and was approved by CENELEC as amendment A2 to [EN 60335-2-59:2003](#) on 2009-10-01.

The following dates are applicable:

- latest date by which the amendment has to be implemented at national level by publication of an identical national standard or by endorsement (dop) 2010-07-01

- date on which national standards conflicting with the amendment have to (dow) 2014-10-01  
be withdrawn

This amendment supplements or modifies the corresponding clauses of [EN 60335-2-59:2003](#).

There are no special national conditions causing a deviation from this amendment.

There are no national deviations from this amendment.

### Endorsement notice

The text of the amendment 2:2009 to the International Standard IEC 60335-2-59:2002 was approved by CENELEC as an amendment to the European Standard without any modification.

In the Bibliography, add the following note to the standard mentioned:

[ISO 13732-1](#) NOTE Harmonized as EN ISO 13732-1:2008 (not modified).

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## Foreword to amendment A11

This document (EN 60335-2-59:2003/A11:2018) has been prepared by CLC/TC 61 "Safety of household and similar electrical appliances".

The following dates are fixed:

- latest date by which the document has to be implemented at national level (dop) 2019-04-05  
by publication of an identical national standard or by endorsement
- latest date by which the national standards conflicting with the document (dow) 2021-10-05  
have to be withdrawn

This amendment supplements or modifies the corresponding clauses of [EN 60335-1:2012](#) including its amendments and [EN 60335-2-59:2003](#) and its amendments A1:2006 and A2:2009.

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

This document has been prepared under a mandate given to CENELEC by the European Commission and the European Free Trade Association.

For relationship with EU Directive(s), see informative [Annex ZZ](#), which is an integral part of this document.

## Annex ZC (normative)

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

| <u>Publication</u>             | <u>Year</u> | <u>Title</u>  | <u>EN/HD</u>  | <u>Year</u> |
|--------------------------------|-------------|---|---------------|-------------|
| <a href="#">IEC 60068-2-52</a> | 1996        | Environmental testing – Part 2: Tests – Test<br>Kb: Salt mist, cyclic (sodium chloride solution | EN 60068-2-52 | 1996        |

## Annex ZZ (informative)

### Relationship between this European Standard and the safety objectives of Directive 2014/35/EU [2014 OJ L96] aimed to be covered

This European Standard has been prepared under a Commission’s standardization request relating to harmonized standards in the field of the Low Voltage Directive, M/511, to provide one voluntary means of conforming to safety objectives of Directive 2014/35/EU of the European Parliament and of the Council of 26 February 2014 on the harmonization of the laws of the Member States relating to the making available on the market of electrical equipment designed for use within certain voltage limits [2014 OJ L96].

Once this standard is cited in the Official Journal of the European Union under that Directive, compliance with the normative clauses of this standard given in [Table ZZA.1](#) confers, within the limits of the scope of this standard, a presumption of conformity with the corresponding safety objectives of that Directive, and associated EFTA regulations.

Compliance with this Part 1 when used together with the relevant Part 2 provides one means of conformity with the safety objectives.

**Table ZZA.1 — Correspondence between this European Standard and Annex I of Directive 2014/35/EU [2014 OJ L96]**

| Safety objectives of Directive 2014/35/EU2014/35/EU | Clause(s)/sub-clause(s) of this EN   | Remarks/Notes |
|---|--|---------------|
| 1 a)  | <a href="#">Clauses 4, 7</a>   | None          |
| 1 b)  | <a href="#">Clauses 4, 7</a>   | None          |
| 1 c)  | <a href="#">Clauses 4, 7</a>   | None          |
| 2 a)  | <a href="#">Clauses 6, 7, 8, 9, 10, 11, 13, 14, 15, 16, 17, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31</a> | None          |
| 2 b)  | <a href="#">Clauses 6, 7, 8, 9, 10, 11, 13, 14, 15, 16, 17, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31</a> | None          |
| 2 c)  | <a href="#">Clauses 6, 7, 11, 15, 17, 18, 19, 20, 21, 22, 24, 25, 30, 32</a>                                       | None          |
| 2 d)  | <a href="#">Clauses 6, 7, 8, 9, 10, 11, 13, 14, 15, 16, 17, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31</a> | None          |
| 3 a)  | <a href="#">Clauses 6, 7, 11, 17, 18, 19, 20, 21, 22</a>   | None          |
| 3 b)  | <a href="#">Clauses 7, 11, 15, 19, 22, 25, 32</a>  | None          |
| 3 c)  | <a href="#">Clauses 6, 7, 9, 10, 11, 14, 17, 18, 19, 21, 22</a>  | None          |

**WARNING 1 — Presumption of conformity stays valid only as long as a reference to this European Standard is maintained in the list published in the Official Journal of the European Union. Users of this standard should consult frequently the latest list published in the Official Journal of the European Union.**

**WARNING 2 — Other Union legislation may be applicable to the product(s) falling within the scope of this standard.**



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## 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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This part of International Standard IEC 60335 has been prepared by IEC technical committee 61: Safety of household and similar electrical appliances.

This third edition cancels and replaces the second edition published in 1997 and its amendment 1 (2000). It constitutes a technical revision.

This bilingual version (2005-10) replaces the English version.

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

| FDIS         | Report on voting |
|--------------|------------------|
| 61/2172/FDIS | 61/2253/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.

## INTRODUCTION

It has been assumed in the drafting of this International Standard that the execution of its provisions is entrusted to appropriately qualified and experienced persons.

This standard recognizes the internationally accepted level of protection against hazards such as electrical, mechanical, thermal, fire and radiation of appliances when operated as in normal use taking into account the manufacturer's instructions. <sup>A1</sup> It also covers abnormal situations that can be expected in practice and takes into account the way in which electromagnetic phenomena can affect the safe operation of appliances. <sup>A1</sup>

This standard takes into account the requirements of IEC 60364 as far as possible so that there is compatibility with the wiring rules when the appliance is connected to the supply mains. However, national wiring rules may differ.

If an appliance with in the scope of this standard also incorporates functions that are covered by an other part 2 of IEC 60335, the relevant part 2 is applied to each function separately, as far as is reasonable. If applicable, the influence of one function on the other is taken into account.

<sup>A2</sup> When a part 2 standard does not include additional requirements to cover hazards dealt with in Part 1, Part 1 applies.

NOTE 1 This means that the technical committees responsible for the part 2 standards have determined that it is not necessary to specify particular requirements for the appliance in question over and above the general requirements.

This standard is a product family standard dealing with the safety of appliances and takes precedence over horizontal and generic standards covering the same subject.

NOTE 2 Horizontal and generic standards covering a hazard are not applicable since they have been taken into consideration when developing the general and particular requirements for the IEC 60335 series of standards. For example, in the case of temperature requirements for surfaces on many appliances, generic standards, such as [ISO 13732-1](#) for hot surfaces, are not applicable in addition to Part 1 or part 2 standards. <sup>A2</sup>

An appliance that complies with the text of this standard will not necessarily be considered to comply with the safety principles of the standard if, when examined and tested, it is found to have other features that impair the level of safety covered by these requirements.

An appliance employing materials or having forms of construction differing from those detailed in the requirements of this standard may be examined and tested according to the intent of the requirements and, if found to be substantially equivalent, may be considered to comply with the standard.



# Household and similar electrical appliances - Safety

## Part 2-59:

### Particular requirements for insect killers

#### 1 Scope

This clause of Part 1 is replaced by the following.

This International Standard deals with the safety of electric **insect killers** for household and similar purposes, their **rated voltage** being not more than 250 V.

Appliances not intended for normal household use but that nevertheless may be a source of danger to the public, such as appliances intended to be used by laymen in shops, in light industry and on farms, are within the scope of this standard.

**A11** This standard deals with the reasonably foreseeable hazards presented by appliances and machines that are encountered by all persons.

However, in general, it does not take into account:

- **children** playing with the appliance;
- the use of the appliance by **very young children**;
- the use of the appliance by **young children** without supervision.

It is recognized that **very vulnerable people** may have needs beyond the level addressed in this standard. **A11**

NOTE 101 Attention is drawn to the fact that

- for appliances intended to be used in vehicles or on board ships or aircraft, additional requirements may be necessary;
- in many countries additional requirements are specified by the national health authorities, the national authorities responsible for the protection of labour and similar authorities.

NOTE 102 This standard does not apply to

- appliances that function by emitting vaporized chemicals;
- appliances emitting ultrasonic waves;
- appliances intended to be used in locations where special conditions prevail, such as the presence of a corrosive or explosive atmosphere (dust, vapour or gas).

NOTE 103 For appliances provided with discharge lamps or tungsten filament lamps, IEC 60598-1 also applies as far as is reasonable.

#### 2 Normative references

*Addition:*

[IEC 60068-2-52:1996](#), *Environmental testing — Part 2: Tests — Test Kb: Salt mist, cyclic (sodium chloride solution)*

### 3 Definitions

This clause of Part 1 is applicable except as follows.

#### 3.1.9 *Replacement:*

##### **normal operation**

operation of the appliance under the following conditions:

- the output circuit is short-circuited;
- the grids are separated by the maximum distance for maintaining an arc, the appliance being operated in cycles consisting of 1 s of operation followed by a rest period of 2 s;
- a resistive load is connected between the grids and adjusted to obtain the maximum current.

#### 3.101

##### **insect killer**

appliance that electrocutes insects by applying a voltage between two or more grids

#### 3.102

##### **effective irradiance**

irradiance of electromagnetic radiation weighted according to a specific action curve

### 4 General requirement

This clause of Part 1 is applicable.

### 5 General conditions for the tests

This clause of Part 1 is applicable except as follows.

**5.101** *For each test, the most unfavourable condition specified in [3.1.9](#) is used.*

**5.102** *Insect killers are tested as **motor-operated appliances**.*

### 6 Classification

This clause of Part 1 is applicable except as follows.

#### 6.1 *Modification:*

**Insect killers** shall be **class I** or **class II**.

#### 6.2 *Addition:*

**Insect killers** intended for outdoor use shall be at least IPX4.

### 7 Marking and instructions

This clause of Part 1 is applicable except as follows.

#### 7.1 *Addition:*

Appliances shall be marked with symbol 5036 of [IEC 60417-1](#) or with the substance of the following:

DANGER: High voltage

Appliances provided with replaceable lamps shall be marked with the type reference of the lamp.

**A<sub>2</sub>** Appliances containing lamps that cannot be replaced without breaking or destroying the appliance shall be marked with the substance of the following:

**WARNING — The lamps in this appliance cannot be replaced. Scrap the appliance when the lamps cease to operate.** **A<sub>2</sub>**

7.6 *Addition:*



[symbol 5036 of IEC 60417-1]

dangerous voltage

7.12 *Addition:*

The instructions shall state whether the appliance is for indoor use only or suitable for outdoor use.

The instructions for appliances for indoor use only shall state that they are not suitable for use in barns, stables and similar locations.

The instructions for appliances intended for outdoor use shall include the substance of the following:

**WARNING — An electric shock hazard may exist if water from a garden hose is directed at the insect killer.**

**When using extension cords, keep the socket-outlet away from moisture and avoid damage to the cord.**

The instructions shall state the substance of the following:

- the appliance is to be kept out of reach of children;
- the appliance is not to be used in locations where flammable vapour or explosive dust is likely to exist.

The instructions shall give details concerning

- the method and frequency of cleaning, together with the precautions to be taken;
- precautions to be taken when replacing lamps and starters, if applicable.

If symbol 5036 of [IEC 60417-1](#) is used, its meaning shall be explained.

7.14 *Addition:*

The height of symbol 5036 of [IEC 60417-1](#) shall be at least 10 mm.

The height of the lettering of the warning relating to high voltage shall be at least 3 mm.

*Compliance is checked by measurement.*

## 8 Protection against access to live parts

This clause of Part 1 is applicable except as follows.

**8.1.1 Addition:**

*When the grid voltage is obtained from an isolating transformer, the test probe may touch earthed parts of the secondary circuit.*

## **9 Starting of motor-operated appliances**

This clause of Part 1 is not applicable.

## **10 Power input and current**

This clause of Part 1 is applicable.

## **11 Heating**

This clause of Part 1 is applicable except as follows.

**11.7 Replacement:**

*Appliances are operated until steady conditions are established.*

**11.8 Addition:**

*The temperature rise of surfaces likely to collect dust or insects shall not exceed 60 K.*

NOTE 101 Surfaces having an inclination of at least 60° to the horizontal and parts having a diameter less than 10 mm are not considered likely to collect dust or insects.

## **12 Void**

## **13 Leakage current and electric strength at operating temperature**

This clause of Part 1 is applicable.

## **14 Transient overvoltages**

This clause of Part 1 is applicable.

## **15 Moisture resistance**

This clause of Part 1 is applicable except as follows.

**15.1 Addition:**

*Water on the grids is ignored.*

## **16 Leakage current and electric strength**

This clause of Part 1 is applicable except as follows.

**16.101** The transformer shall have adequate internal insulation.

*Compliance is checked by the following test.*



Twice the **working voltage** is induced in the secondary winding of the transformer by applying a sinusoidal voltage having a frequency higher than **rated frequency** to the primary terminals.

The duration of the test is

- 60 s, for frequencies up to twice the **rated frequency**, or
- $120 \times \frac{\text{rated frequency}}{\text{test frequency}} \text{ s}$ , with a minimum of 15 s, for higher frequencies.

NOTE The frequency of the test voltage is higher than the **rated frequency** to avoid excessive excitation current.

A maximum of one-third of the test voltage is applied and is then rapidly increased without creating transients. At the end of the test, the voltage is decreased in a similar manner to approximately one-third of its full value before switching off.

There shall be no breakdown between windings or between adjacent turns of the same winding.

## 17 Overload protection of transformers and associated circuits

This clause of Part 1 is applicable.

## 18 Endurance

This clause of Part 1 is not applicable.

## 19 Abnormal operation

This clause of Part 1 is applicable.

## 20 Stability and mechanical hazards

This clause of Part 1 is applicable.

## 21 Mechanical strength

This clause of Part 1 is applicable.

## 22 Construction

This clause of Part 1 is applicable except as follows.

### 22.6 Addition:

Drain holes shall be at least 5 mm in diameter or 20 mm<sup>2</sup> in area with a width of at least 3 mm.

**22.101** Interlock switches that prevent access to **live parts** during **user maintenance** shall be connected in the input circuit and located to prevent unintentional operation.

Compliance is checked by inspection and by applying test probe B of [IEC 61032](#).

**22.102** Appliances having grids in the form of horizontal bars, and one pole of the output of the transformer connected to **accessible parts**, shall have the lowest bar connected to earth.

Compliance is checked by inspection.

**22.103** Appliances shall be constructed so that there is no risk of electric shock when touching the grids during **user maintenance**.

*Compliance is checked by the following test.*

*The appliance is supplied at **rated voltage**. It is then disconnected from the supply mains. One second after disconnection, the voltage between the grids is measured with an instrument that does not appreciably affect the value to be measured.*

*The voltage shall not exceed 34 V.*

**22.104** The short-circuit current of the output circuit shall not be excessive.

*Compliance is checked by the following test.*

*The appliance is supplied at **rated voltage**. The short-circuit current is measured between both grids and between each grid and earth.*

*The current shall not exceed 10 mA.*

## 23 Internal wiring

This clause of Part 1 is applicable except as follows.

### 23.5 Addition:

*For circuits having a voltage over 1 000 V, the test voltage is ( $\sqrt{2} U + 750$ ) V and is applied for 1 min.*

NOTE 101 *U* is the peak value of the **working voltage**.

NOTE 102 The test is only carried out in case of doubt.

## 24 Components

This clause of Part 1 is applicable except as follows.

### 24.1.3 Addition:

*Interlock switches are operated 1 000 times.*

### 24.2 Addition:

Appliances for indoor use only may be fitted with switches in flexible cords.

**24.101** Interlock switches that prevent access to **live parts** during **user maintenance** shall

- disconnect all poles, unless the secondary circuit is supplied through an isolating transformer;
- have a contact separation that provides full disconnection in accordance with [IEC 61058-1](#).

*Compliance is checked by inspection.*

## 25 Supply connection and external flexible cords

This clause of Part 1 is applicable except as follows.

### 25.7 Addition:

**Supply cords** of appliances intended for outdoor use, and of appliances having a lamp emitting ultra-violet radiation, shall be polychloroprene sheathed and not be lighter than ordinary polychloroprene sheathed cord (code designation 60245 IEC 57).

## 26 Terminals for external conductors

This clause of Part 1 is applicable.

## 27 Provision for earthing

This clause of Part 1 is applicable.

## 28 Screws and connections

This clause of Part 1 is applicable.

## 29 Clearances, creepage distances and solid insulation

This clause of Part 1 is applicable except as follows.

### 29.2 Addition:

The microenvironment is pollution degree 3 unless the insulation is enclosed or located so that it is unlikely to be exposed to pollution during normal use of the appliance.

## 30 Resistance to heat, fire and tracking

This clause of Part 1 is applicable except as follows.

### 30.2.2 Not applicable.

**30.101** Parts of non-metallic material enclosing or supporting the grids, and non-metallic trays intended to collect insects, shall be resistant to fire. This also applies to parts within 50 mm above the tray.

Printed boards in the output circuit having a surface area exceeding 25 cm<sup>2</sup> shall be resistant to fire, unless they are contained in a metal enclosure.

*Compliance is checked by the needle-flame test of Annex E.*

*The needle-flame test is not carried out on parts of material classified as V-0 or V-1 according to [IEC 60695-11-10](#), provided that the sample tested was not thicker than the relevant part.*

## 31 Resistance to rusting

This clause of Part 1 is applicable except as follows.

### Addition:

*For appliances intended for outdoor use, compliance is checked by the salt mist test of [IEC 60068-2-52](#), severity 2 being applicable.*

*Before the test, coatings are scratched by means of a hardened steel pin, the end of which has the form of a cone with an angle of 40°. Its tip is rounded with a radius of 0,25 mm ± 0,02 mm. The pin is loaded so that*

the force exerted along its axis is  $10\text{ N} \pm 0,5\text{ N}$ . The scratches are made by drawing the pin along the surface of the coating at a speed of approximately 20 mm/s. Five scratches are made at least 5 mm apart and at least 5 mm from the edges.

After the test, the appliance shall not have deteriorated to such an extent that compliance with this standard, in particular with [Clauses 8](#) and [27](#), is impaired. The coating shall not be broken and shall not have loosened from the metal surface.

## 32 Radiation, toxicity and similar hazards

This clause of Part 1 is applicable except as follows.

*Addition:*

For appliances incorporating lamps emitting UV radiation, compliance is checked by the following test.

The appliance is supplied at **rated voltage** and operated under **normal operation**. The irradiance is measured at a distance of 1 m, the measuring instrument being positioned so that the highest radiation is recorded.

NOTE 101 The measuring instrument used measures the mean irradiance over a circular area having a diameter not exceeding 20 mm. The response of the instrument is proportional to the cosine of the angle between incident radiation and the normal to the circular area. The spectral distribution is measured at intervals of 1 nm by means of a spectrophotometer having a bandwidth not exceeding 2,5 nm.

$\text{A}_2$  NOTE 102 The total **effective irradiance** is given by

$$E = \sum_{250\text{ nm}}^{400\text{ nm}} S_{\lambda} E_{\lambda} \Delta \lambda$$

where

- $E$  is the **effective irradiance**;
- $S_{\lambda}$  is the weighting factor specified in [Table 101](#);
- $E_{\lambda}$  is the spectral irradiance in  $\text{W}/(\text{m}^2\text{nm})$ ;
- $\Delta \lambda$  is the bandwidth in nm.  $\text{A}_2$

$\text{A}_1$  The irradiance is measured when the radiation from the lamp has stabilized. The **effective irradiance** for each wavelength is calculated taking into account the weighting factors specified in [Table 101](#).  $\text{A}_1$

The total **effective irradiance** is determined and shall not exceed  $1\text{ mW}/\text{m}^2$ .

$\text{A}_1$

**Table 101 — Weighting factors for different wavelengths**

| Wavelength<br>nm | Weighting factor ( $S_{\lambda}$ ) | Wavelength<br>nm | Weighting factor ( $S_{\lambda}$ ) | Wavelength<br>nm | Weighting factor ( $S_{\lambda}$ ) |
|------------------|------------------------------------|------------------|------------------------------------|------------------|------------------------------------|
| 250              | 0,430                              | 308              | 0,026                              | 335              | 0,00034                            |
| 254              | 0,500                              | 310              | 0,015                              | 340              | 0,00028                            |
| 255              | 0,520                              | 313              | 0,006                              | 345              | 0,00024                            |
| 260              | 0,650                              | 315              | 0,003                              | 350              | 0,00020                            |
| 265              | 0,810                              | 316              | 0,0024                             | 355              | 0,00016                            |
| 270              | 1,000                              | 317              | 0,0020                             | 360              | 0,00013                            |
| 275              | 0,960                              | 318              | 0,0016                             | 365              | 0,00011                            |
| 280              | 0,880                              | 319              | 0,0012                             | 370              | 0,000093                           |

| Wavelength<br>nm | Weighting<br>factor ( $S_\lambda$ ) | Wavelength<br>nm | Weighting fac-<br>tor ( $S_\lambda$ ) | Wavelength<br>nm | Weighting factor ( $S_\lambda$ ) |
|------------------|-------------------------------------|------------------|---------------------------------------|------------------|----------------------------------|
| 285              | 0,770                               | 320              | 0,0010                                | 375              | 0,000077                         |
| 290              | 0,640                               | 322              | 0,00067                               | 380              | 0,000064                         |
| 295              | 0,540                               | 323              | 0,00054                               | 385              | 0,000053                         |
| 297              | 0,460                               | 325              | 0,00050                               | 390              | 0,000044                         |
| 300              | 0,300                               | 328              | 0,00044                               | 395              | 0,000036                         |
| 303              | 0,120                               | 330              | 0,00041                               | 400              | 0,000030                         |
| 305              | 0,060                               | 333              | 0,00037                               |                  |                                  |

NOTE The weighting factors for intermediate wavelengths are determined by interpolation.

Ⓐ

Ⓐ Figure 101 deleted. Ⓐ

## **A2 Bibliography**

The bibliography of Part 1 is applicable except as follows.

*Addition:*

[ISO 13732-1](#), *Ergonomics of the thermal environment — Methods for the assessment of human responses to contact with surfaces — Part 1: Hot surfaces* A2



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