

# INTERNATIONAL STANDARD



**Household and similar electrical appliances – Safety –  
Part 2-27: Particular requirements for appliances for skin exposure to optical  
radiation**

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IEC 60335-2-27

Edition 5.2 2015-04  
CONSOLIDATED VERSION

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INTERNATIONAL  
ELECTROTECHNICAL  
COMMISSION

ICS 13.120, 97.170

ISBN 978-2-8322-2651-3

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**Household and similar electrical appliances – Safety –  
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## INTERNATIONAL ELECTROTECHNICAL COMMISSION

### HOUSEHOLD AND SIMILAR ELECTRICAL APPLIANCES – SAFETY –

#### Part 2-27: Particular requirements for appliances for skin exposure to ~~ultraviolet and infrared~~ optical radiation

#### 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 consolidated version of the official IEC Standard and its amendments has been prepared for user convenience.**

**IEC 60335-2-27 edition 5.2 contains the fifth edition (2009-12) [documents 61/3911/FDIS and 61/3969/RVD], its amendment 1 (2012-11) [documents 61/4444/FDIS and 61/4497/RVD] and its amendment 2 (2015-04) [documents 61/4876/FDIS and 61/4912/RVD] including its corrigenda 1 (2015-05) and 2 (2016-12).**

**In this Redline version, a vertical line in the margin shows where the technical content is modified by amendments 1 and 2. Additions and deletions are displayed in red, with deletions being struck through. A separate Final version with all changes accepted is available in this publication.**



International Standard IEC 60335-2-27 has been prepared by IEC technical committee 61: Safety of household and similar electrical appliances.

The principal changes in this edition as compared with the fourth edition of IEC 60335-2-27 are as follows (minor changes are not listed):

- clarification of the radiation measurement procedure (32.101);
- guidelines for an exposure time schedule (Annex DD).

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

This part 2 is to be used in conjunction with the latest edition of IEC 60335-1 and its amendments. It was established on the basis of the fourth edition (2001) of that standard.

NOTE 1 When "Part 1" is mentioned in this standard, it refers to IEC 60335-1.

This part 2 supplements or modifies the corresponding clauses in IEC 60335-1, so as to convert that publication into the IEC standard: Safety requirements for appliances for skin exposure to ultraviolet and infrared radiation.

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 in Part 1 is to be adapted accordingly.

NOTE 2 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.

NOTE 3 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.

The committee has decided that the contents of the base publication and its amendments 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.

NOTE 4 The attention of National Committees is drawn to the fact that equipment manufacturers and testing organizations may need a transitional period following publication of a new, amended or revised IEC publication in which to make products in accordance with the new requirements and to equip themselves for conducting new or revised tests.

It is the recommendation of the committee that the content of this publication be adopted for implementation nationally not earlier than 12 months or later than 36 months from the date of publication.

The following differences exist in the countries indicated below.

- 7.1: The markings are different (USA).
- 10.1: The deviations are different (USA).
- 10.2: The deviations are different (USA).
- 19.101: The test is different (USA).
- 20.1: The test is carried out at an angle of 8° (USA).
- Clause 22: Series resistors are to be incorporated in some UV emitters (Australia).
- 22.107: The requirement is not applicable (USA).
- 22.108: The maximum timer setting is shorter (USA).
- 32.101: The irradiance limits and the tests are different (USA).
- 32.101: The total erythema **effective UV irradiance** shall not be greater than 0,3 W/m<sup>2</sup> (Belgium)
- 32.101: The **effective irradiance** limits and wavelength intervals are different (Spain).
- 32.102: The requirements for protective goggles are different (USA).
- Annex DD: The recommended number of exposures for each part of the body is to be based upon a maximum yearly dose of 5 kJ/m<sup>2</sup>, weighted according to the erythema action spectrum shown in Figure 103 and taking into account the recommended schedule of exposure (Finland).

A list of all parts of the IEC 60335 series, under the general title: *Household and similar electrical appliances – Safety*, can be found on the IEC website.

The contents of the corrigendum of the Consolidated version (June 2015) have been included in this copy.

**IMPORTANT – The 'colour inside' logo on the cover page of this publication 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.**

## 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. 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.

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 within the scope of this standard also incorporates functions that are covered by another 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.

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.

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 2-27: Particular requirements for appliances for skin exposure to **ultraviolet and infrared optical** radiation

#### 1 Scope

This clause of Part 1 is replaced by the following.

This International Standard deals with the safety of electrical appliances incorporating emitters for exposing the skin to **ultraviolet or infrared optical** radiation (wavelength **100 nm to 1 mm**), for household and similar use, their **rated voltage** being not more than 250 V for single-phase appliances and 480 V for other appliances.

Appliances not intended for normal household use but which nevertheless may be a source of danger to the public, such as appliances intended to be used in tanning salons, beauty parlours and similar premises, are also within the scope of this standard.

As far as practicable, this standard deals with the common hazards presented by appliances that are encountered by persons using the **UV** appliances in tanning salons, beauty parlours and similar premises or at home. However, in general, it does not take into account

- persons (including children) whose
  - physical, sensory or mental capabilities; or
  - lack of experience and knowledgeprevents them from using the appliance safely without supervision or instruction;
- children playing with the appliance.

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;
- IEC 60598-1 is applicable as far as is reasonable.

NOTE 102 This standard does not apply to

- **appliances for skin or hair care (IEC 60335-2-23);**
- **sauna heating appliances and infrared cabins (IEC 60335-2-53);**
- **cosmetic and beauty care appliances incorporating lasers and intense light sources (IEC 60335-2-113)<sup>1</sup>;**
- appliances for medical purposes (IEC 60601);
- appliances that use UV radiation for purposes other than tanning the skin;
- 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).

<sup>1</sup> In preparation.

## 2 Normative references

This clause of Part 1 is applicable **except as follows**.

*Addition:*

IEC 61228, *Fluorescent ultraviolet lamps used for tanning – Measurement and specification method*

IEC 62471:2006, *Photobiological safety of lamps and lamp systems*

## 3 Terms and definitions

This clause of Part 1 is applicable except as follows.

### 3.101 ultraviolet emitter

**UV emitter**

radiating source constructed to emit ~~non-ionizing~~ electromagnetic energy at wavelengths ~~of~~ between 200 nm and 400 nm ~~or less~~

NOTE 1 A fluorescent UV lamp for tanning is an example of a **UV emitter**.

NOTE 2 UV radiation with wavelengths below 200 nm is not easily transmitted through air and usually exists only in a vacuum.

NOTE 3 **Ultraviolet emitters** are also referred to as **UV emitters**.

### 3.102 infrared emitter

**IR emitter**

radiating source constructed to emit electromagnetic energy at wavelengths ~~of~~ 800 nm or longer between 780 nm and 1 mm

NOTE **Infrared emitters** are also referred to as **IR emitters**.

### 3.103 effective irradiance

irradiance of electromagnetic radiation weighted according to a specified action spectrum

### 3.104 UV filter

device used to ~~reduce or~~ modify the ultra-violet radiation passing through it, **generally** by altering the spectral distribution ~~of the radiation~~

### 3.105 UV appliance

appliance incorporating **UV emitters** for tanning purposes

### 3.106 IR appliance

appliance incorporating one or more **IR emitters**

### 3.107 visual emitter

radiating source constructed to emit electromagnetic energy at wavelengths of 400 nm to 780 nm

Note 1 to entry: **Visual emitters** are also referred to as **VIS emitters**.

### 3.108

#### **VIS appliance**

appliance incorporating one or more **VIS emitters**

## 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.

### ~~5.1 Addition:~~

~~Appliances with **UV emitters** are tested as **motor-operated appliances**.~~

~~Appliances with **IR emitters** only are tested as **heating appliances**.~~

**5.101 Appliances with IR emitters only are tested as heating appliances. All other appliances are tested as motor-operated appliances.**

## 6 Classification

This clause of Part 1 is applicable except as follows.

**6.101 UV appliances** shall be one of the following types with respect to the emission of ultraviolet radiation:

- appliances suitable for household use;
- appliances for commercial use only.

NOTE 1 Appliances for household use may also be for commercial use, such as in tanning salons, beauty parlours and similar premises.

NOTE 2 Detailed classification of the appliances is described in Annex BB.

*Compliance is checked by inspection and by the relevant tests.*

## 7 Marking and instructions

This clause of Part 1 is applicable except as follows.

### 7.1 Addition:

**UV appliances** intended for commercial use, such as in tanning salons, beauty parlours and similar premises shall be marked with the “not for household use” symbol shown in 7.6 or with the substance of the following:

Not for household use