

# 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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## INTERNATIONAL ELECTROTECHNICAL COMMISSION

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### HOUSEHOLD AND SIMILAR ELECTRICAL APPLIANCES – SAFETY –

#### Part 2-27: Particular requirements for appliances for skin exposure to 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 redline version of the official IEC Standard allows the user to identify the changes made to the previous edition IEC 60335-2-27:2019. A vertical bar appears in the margin wherever a change has been made. Additions are in green text, deletions are in strikethrough red text.**

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

This seventh edition cancels and replaces the sixth edition published in 2019. This edition constitutes a technical revision.

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

- a) alignment with IEC 60335-1:2020;
- b) modification or conversion of some notes to normative text (Clause 1, 7.1);
- c) clarification of product risk and liability (7.1);
- d) modification of Annex DD as a normative annex, and modification of relevant text (7.12, Annex DD);
- e) clarification of requirement for product use links provided (7.12.9);
- f) clarification of the application of test probe 18 for appliances for use in tanning salons, beauty parlours and similar premises (8.1.1, 20.2);
- g) introduction of accessible surface temperature limits (Clause 11);
- h) removal of redundancy between 22.113 and 22.114;
- i) clarification that 32.2 is not applicable for UV emitted for the tanning function of the appliance.

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

Draft	Report on voting
61/7071/FDIS	61/7094/RVD

Full information on the voting for its approval can be found in the report on voting indicated in the above table.

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The language used for the development of this International Standard is English.

This document was drafted in accordance with ISO/IEC Directives, Part 2, and developed in accordance with ISO/IEC Directives, Part 1 and ISO/IEC Directives, IEC Supplement, available at [www.iec.ch/members\\_experts/refdocs](http://www.iec.ch/members_experts/refdocs). The main document types developed by IEC are described in greater detail at [www.iec.ch/standardsdev/publications](http://www.iec.ch/standardsdev/publications).

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.

This part 2 is to be used in conjunction with the latest edition of IEC 60335-1 and its amendments unless that edition precludes it; in that case, the latest edition that does not preclude it is used. It was established on the basis of the sixth edition (2020) 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: Particular requirements for appliances for skin exposure to optical 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 this document will remain unchanged until the stability date indicated on the IEC website under [webstore.iec.ch](http://webstore.iec.ch) in the data related to the specific document. At this date, the document will be

- reconfirmed,
- withdrawn, or
- revised.

NOTE 4 The attention of National Committees is drawn to the fact that equipment manufacturers and testing organizations can 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.

- 6.101: Commercial tanning sunbed services are illegal (Australia).
- Annex DD: Exposure doses are based on the Fitzpatrick Skin Phototype classification system (New Zealand).

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## 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.

Guidance documents concerning the application of the safety requirements for appliances can be accessed via TC 61 supporting documents on the IEC website

<https://www.iec.ch/tc61/supportingdocuments>

This information is given for the convenience of users of this International Standard and does not constitute a replacement for the normative text in this standard.

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~~ can 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~~ Horizontal publications, basic safety publications and group safety publications 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.

NOTE 3 Standards dealing with non-safety aspects of household appliances are:

- IEC standards published by TC 59 concerning methods of measuring performance;
- CISPR 11, CISPR 14-1 and relevant IEC 61000-3 series standards concerning electromagnetic emissions;
- CISPR 14-2 concerning electromagnetic immunity;
- IEC standards published by TC 111 concerning environmental matters.

## HOUSEHOLD AND SIMILAR ELECTRICAL APPLIANCES – SAFETY –

### Part 2-27: Particular requirements for appliances for skin exposure to optical radiation

#### 1 Scope

This clause of Part 1 is replaced by the following.

This part of IEC 60335 deals with the safety of electrical appliances incorporating emitters for exposing the skin to 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 including direct current (DC) supplied appliances and **battery-operated appliances**.

~~NOTE 101—Battery-operated appliances and other DC-supplied appliances are within the scope of this standard. Dual-supply appliances, either mains-supplied or battery-operated, are regarded as **battery-operated appliances** when operated in the battery mode.~~

As far as practicable, this standard deals with the common hazards presented by appliances that are encountered by all persons using the 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 102—Attention is drawn to the fact that~~

- for appliances intended to be used in vehicles or on board ships or aircraft, additional requirements can 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 103—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);
- 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).

## 2 Normative references

This clause of Part 1 is applicable except as follows.

*Addition:*

IEC 60584-1, *Thermocouples – Part 1: EMF specifications and tolerances*

IEC 60598-1:2020, *Luminaires – Part 1: General requirements and tests*

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

## 3 Terms and definitions

This clause of Part 1 is applicable except as follows.

### 3.1 Definitions relating to physical characteristics

#### 3.1.101

##### **effective irradiance**

irradiance of electromagnetic radiation weighted according to a specified action spectrum

#### 3.1.102

##### **luminous transmission**

percentage of incident light passing through a material weighted by the spectral sensitivity of the human eye and integrated over the wavelength range 380 nm and 780 nm

### 3.5 Definitions relating to types of appliances

#### 3.5.101

##### **UV appliance**

appliance incorporating **UV emitters** for tanning purposes

#### 3.5.102

##### **IR appliance**

appliance not for tanning purposes incorporating one or more **IR emitters**

#### 3.5.103

##### **VIS appliance**

appliance not for tanning purposes incorporating one or more **VIS emitters**

#### 3.5.104

##### **UV type 1 appliance**

**UV appliance** such that the biological effect is caused by radiation having wavelengths longer than 320 nm and characterized by a relatively high irradiance in the range 320 nm to 400 nm

#### 3.5.105

##### **UV type 2 appliance**

**UV appliance** such that the biological effect is caused by radiation having wavelengths both shorter and longer than 320 nm and characterized by a relatively high irradiance in the range 320 nm to 400 nm

### 3.5.106

#### UV type 3 appliance

**UV appliance** such that the biological effect is caused by radiation having wavelengths both shorter and longer than 320 nm and characterized by a limited irradiance over the whole UV radiation band

### 3.5.107

#### UV type 4 appliance

**UV appliance** such that the biological effect is mainly caused by radiation having wavelengths shorter than 320 nm

### 3.5.108

#### UV type 5 appliance

**UV appliance** such that the biological effect is caused by radiation having wavelengths both shorter and longer than 320 nm and characterized by a relatively high irradiance over the whole UV radiation band

## 3.6 Definitions relating to parts of an appliance

### 3.6.101

#### **ultraviolet UV emitter**

radiating source constructed to emit electromagnetic energy at wavelengths between 200 nm and 400 nm

Note 1 to entry: A fluorescent UV lamp for tanning is an example of a **UV emitter**.

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

Note 3 to entry: **Ultraviolet UV emitters** are also referred to as **UV ultraviolet emitters**.

### 3.6.102

#### **infrared IR emitter**

radiating source constructed to emit electromagnetic energy at wavelengths between 780 nm and 1 mm

Note 1 to entry: **Infrared IR emitters** are also referred to as **IR infrared emitters**.

### 3.6.103

#### **visual VIS emitter**

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

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

### 3.6.104

#### **UV filter**

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

optical element for attenuation of UV radiation

## 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** 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 can 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 informative 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 prohibition sign "~~not for household use~~" pictogram of Figure 101 or with the substance of the following:

Not for household use

Appliances having fluorescent UV lamps for tanning shall be marked with the fluorescent UV lamp equivalency code range. This equivalency code range identifies the fluorescent UV lamps for tanning that shall be used in the appliance.

NOTE 101 Details of the fluorescent UV lamp code that is marked on the lamp are given in IEC 61228 and are reproduced in informative Annex CC for information. An example of the fluorescent UV lamp equivalency code range to be marked on the appliance is given in 22.111.

For **UV emitters** other than fluorescent UV lamps for tanning, the appliance shall be marked with the type reference of the emitters that are recommended for use.

**UV appliances** shall be marked with the substance of the following:

~~WARNING: Ultraviolet radiation can cause injury to eyes, internal tissues of the mouth and skin, such as skin aging and eventually skin cancer. Read instructions carefully. Wear the protective goggles provided. Certain medicines and cosmetics may increase sensitivity.~~

DANGEROUS ULTRAVIOLET (UV) RADIATION! FOLLOW ALL INSTRUCTIONS! WEAR PROTECTIVE GOGGLES PROVIDED! Ultraviolet can cause injury to eyes and skin and can result in skin aging and skin cancers. Certain medicines can increase sensitivity. Do not use any sunscreens or cosmetics and follow the recommended exposure schedule.

~~NOTE 102~~ For **UV appliances** intended only for use in tanning salons, beauty parlours and similar premises, this warning may be given on a permanent label intended to be fixed on the wall adjacent to the UV appliance. ~~The wording "Read instructions carefully" may be replaced by "Consult the attendant for further information".~~

**UV appliances** with a luminance exceeding 100 000 cd/m<sup>2</sup> shall be marked with the substance of the following:

WARNING: Intense light. Do not stare at the emitter.

NOTE 403102 The method for measuring luminance is given in normative Annex AA.

Appliances shall be marked with the substance of the following unless they are in the exempt group (see IEC 62471:2006):

WARNING: Do not stare at the emitter. It is required to wear the provided eyewear due to intense optical radiation. Read instructions carefully.

Appliances incorporating **VIS emitters** or **IR emitters** shall be marked with the manufacturer, model name and technical specification of appropriate replacement lamps.

Unless the intended exposure distance is controlled by their construction, **UV appliances** shall be marked with symbol IEC 60417-6301 (2015-03) with the recommended exposure distance and its unit in centimetres (cm) included between the dimensional arrow heads. Goggles shall be marked with name, trademark or identification mark of the manufacturer and the following alpha-numeric characters IEC 60335-2-27.

NOTE 404103 If these warnings are combined, the word "warning" need not be repeated.

7.6 Addition:



Prohibition sign

not for household use



[symbol IEC 60417-6301 (2015-03)]

ultra-violet light source, exposure distance

7.12 Addition:

~~The instructions shall give clear information with regard to the proper use of the appliance.~~

~~UV appliances shall include a statement that non-users, especially children, must not be present when the appliance is being operated.~~

~~The instructions for UV appliances shall include the substance of the following:~~

~~— a statement that UV appliances are not to be used by~~

- ~~• persons under the age of 18 years;~~
- ~~• persons who tend to freckle;~~
- ~~• persons with a natural red hair colour;~~
- ~~• persons having abnormal discoloured patches on the skin;~~
- ~~• persons having a large number of moles;~~