

INTERNATIONAL STANDARD

NORME INTERNATIONALE



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

Appareils électrodomestiques et analogues – Sécurité –
Partie 2-27: Exigences particulières pour les appareils d'exposition de la peau
aux rayonnements optiques



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INTERNATIONAL ELECTROTECHNICAL COMMISSION

**HOUSEHOLD AND SIMILAR ELECTRICAL APPLIANCES –
SAFETY –****Part 2-27: Particular requirements for appliances
for skin exposure to optical radiation**

FOREWORD

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

This sixth edition cancels and replaces the fifth edition published in 2009, Amendment 1:2012 and Amendment 2:2015. This edition constitutes a technical revision.

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

- aligns the text with IEC 60335-1, Ed 5, and its Amendments 1 and 2;
- luminous transmission has been defined (3.1.102);
- requirements for testing parts of the appliance that are operated unattended are added (30.2).

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

FDIS	Report on voting
61/5796/FDIS	61/5837/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 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. It was established on the basis of the fifth edition (2010) 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 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 "<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.

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).
- 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).
- 32.102: The requirements for protective goggles are different (USA).

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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.

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.

[IEC 60335-2-27:2019](#)

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 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 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.

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 knowledge
 prevents 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 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 of 380 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 incorporating one or more **IR emitters**

3.5.103

VIS appliance

appliance incorporating one or more **VIS emitters**

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3.6 Definitions relating to parts of an appliance

3.6.101

ultraviolet 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 emitters** are also referred to as **UV emitters**.

3.6.102

infrared emitter

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

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

3.6.103

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**.

3.6.104

UV filter

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

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 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” 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 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.

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/m² shall be marked with the substance of the following:

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

NOTE 103 The method of measuring luminance is given in Annex AA.

Appliances shall be marked with the substance of the following unless they are in the exempt group (see 6.1.1 in 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 centimeters (cm) included between the dimensional arrow heads.

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Goggles shall be marked with name, trade mark or identification mark of the manufacturer and the following alpha-numeric characters IEC 60335-2-27.

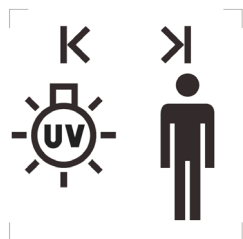
NOTE 104 If these warnings are combined, the word "warning" need not be repeated.

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;
 - persons having asymmetrical irregularly shaped moles larger than 5 mm in diameter with variable pigmentation and irregular borders; in case of doubt, seek medical advice;
 - persons suffering from sunburn;
 - persons not able to tan at all or persons that burn easily when exposed to the sun;
 - persons having a history of frequent severe sunburn during childhood;
 - persons suffering from or previously suffering from skin cancer or predisposed to skin cancer;
 - persons under a doctor's care for diseases that involve photosensitivity;
 - persons receiving photosensitising medications.
- a statement that if unexpected side effects, such as itching, occur within 48 h of the first session of using a UV appliance, medical advice should be sought prior to further UV exposure;
- a statement that exposures should not exceed the minimal amount of UV radiation exposure required to cause perceptible reddening of the skin (a person's minimal erythema dose (MED));
- a statement that if skin reddening (erythema) is visible approximately 16 h to 24 h after any exposure, further exposure should cease. After one week, exposures may be restarted from the beginning of the schedule of exposure;
- a statement that the appliance must not be used if the timer is faulty or the filter is broken or removed;
- identification of components that may influence the ultraviolet radiation, such as filters and reflectors;
- identification of replaceable **UV emitters** and a statement that they are only to be replaced by types marked on the appliance. For fluorescent UV lamps for tanning, it shall be stated that they are only to be replaced by types marked with an equivalency code, the UV component of which falls within the UV component equivalency code range that is marked on the appliance. In this case, an example of the equivalency code shall be given and the UV component aspect of the fluorescent UV lamp for tanning equivalency code shall be explained.

The instructions for **UV appliances** shall contain the substance of the following information and precautions:

- ultraviolet radiation from the sun or from UV appliances can cause skin or eye damage that may be irreversible. Avoid exposure to the internal tissues of the mouth as it may be more susceptible to UV damage than the skin. These biological effects depend upon the quality and quantity of the radiation as well as the skin sensitivity of the individual;
- the skin may develop sunburn after overexposure. Excessively repeated exposures to ultraviolet radiation from the sun or from UV appliances may lead to premature ageing of the skin as well as increased risk of development of skin tumours. These risks increase

with increasing cumulative UV exposure. Exposure at an early age increases the risk of skin damage later in life;

- the unprotected eye may develop surface inflammation and in some cases damage may occur to the retina after excessive exposure. Cataracts may develop after many repeated exposures;
- in cases of pronounced individual sensitivity or allergic reaction to ultraviolet radiation, medical advice is recommended before starting exposure;
- information concerning the intended exposure distance (unless this is controlled by the construction of the UV appliance);
- recommended schedule of exposure specifying duration and intervals (based on the UV emitter characteristics, distances and skin sensitivity), see Annex DD;
- recommended number of exposures that should not be exceeded in one year, see Annex DD;
- the type reference of the protective goggles to be used;
- the following precautions must be taken:
 - always use the protective goggles provided. Contact lenses and sun glasses are not a substitute for goggles;
 - remove cosmetics, fragrances, and skin care products well in advance of exposure and do not use any sunscreens or products that accelerate tanning;
 - certain medical conditions or side effects of certain medicines may be aggravated by ultraviolet exposure. In case of doubt, seek medical advice;
 - allow at least 48 h between the first two exposures;
 - do not sunbathe and use the appliance on the same day;
 - follow the recommendations concerning exposure durations, exposure intervals and distances from the lamp;
 - seek medical advice if persistent lumps or sores appear on the skin or if there are changes in pigmented moles;
 - protect sensitive skin parts such as scars, tattoos and genitals from exposure.

For appliances having a lid that has to be opened in normal use, the instructions shall include a warning that the appliance must not be switched on with the lid in the closed position and that, before closing the lid for storage, the appliance must be disconnected from the supply and allowed to cool down.

NOTE 101 This warning is not required if the appliance complies with the tests of 19.2 and 19.3.

For appliances having parts that are intended to support a person, the instructions shall include the substance of the following:

This appliance shall not be used by persons exceeding the maximum load of xxx kg. (The value of xxx is to be stated by the manufacturer).

The instructions for appliances incorporating **VIS emitters** or **IR emitters** shall include the substance of the following:

- advice for the protection of the eyes against exposure to visible and infrared radiation and advise that adequate precautions must be taken to safeguard the user against the dangers of excessive exposure.
- a statement that VIS appliances and IR appliances are not to be used by
 - persons suffering from sunburn;
 - persons under medical care for diseases that involve photosensitivity;
 - persons receiving photosensitising medications;