

INTERNATIONAL STANDARD

NORME INTERNATIONALE

AMENDMENT 2
AMENDEMENT 2

**Household and similar electrical appliances – Safety –
Part 2-27: Particular requirements for appliances for skin exposure to optical
radiation**
(<https://standards.iteh.ai>)

**Appareils électrodomestiques et analogues – Sécurité –
Partie 2-27: Règles particulières pour les appareils d'exposition de la peau
aux rayonnements optiques**
(<https://standards.iteh.ai/catalog/standards/iec/8c936f58-16d8-4f81-a1be-97138fc89c72/iec-60335-2-27-2009/amd2-2015>)





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FOREWORD

This amendment has been prepared by IEC technical committee 61: Safety of household and similar electrical appliances.

This bilingual version (2018-04) corresponds to the monolingual English version, published in 2015-04.

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

FDIS	Report on voting
61/4876/FDIS	61/4912/RVD

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

The French version of this amendment has not been voted upon.

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

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- withdrawn,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

NOTE 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 contents of the corrigenda of May 2015 and December 2016 have been included in this copy.

Title

In the title of the standard replace "ultraviolet and infrared" by "optical".

1 Scope

Replace the second paragraph 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.

Replace the fourth paragraph by the following:

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

Replace first dashed item in Note 102 by the following:

- 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)¹;
- appliances for medical purposes (IEC 60601);

2 Normative references

Replace the existing text by the following:

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

Add the following new definitions:

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**

5 General conditions for the tests

5.1 *Delete the addition.*

Add the following new subclause:

¹ In preparation.

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

7 Marking and instructions

7.1 Add the following new text after Note 103:

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.

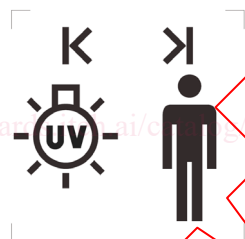
Add the following new text after Note 104:

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, trade mark or identification mark of the manufacturer and the following alpha-numeric characters IEC 60335-2-27.

7.6 Add the following new symbol:



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

ultra-violet light source,
exposure distance

7.12 Replace the last two paragraphs by the following:

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 radiation 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.
- a statement that if unexpected side effects, such as itching, occur within 48 h of the first session of using an appliance, medical advice should be sought prior to further exposure;
- information concerning the intended exposure distance (unless this is controlled by the construction of the appliance);

- recommended schedule of exposure specifying duration and intervals (based on the **emitter** characteristics, distances);
- a statement that the appliance must not be used if the timer is faulty or the filter is broken or removed;
- identification of alternative components that may influence the radiation, such as filters and reflectors;
- identification of replaceable **emitters** and a statement that they are only to be replaced by types marked on the appliance;
- instruction to use goggles and an information about the maximum exposure time (not necessary if the appliance complies with the limits for the exempt group as defined in 6.1.1 of IEC 62471:2006 when tested as required by 32.103).

If either of the following symbols are used, their meaning shall be explained:

- “Not for household use” symbol;
- symbol IEC 60417-6301 (2015-03).

7.14 Add the following to the addition:

The diameter of the UV lamp circle in symbol IEC 60417-6301 (2015-03) shall be at least 20 mm.

11 Heating

11.2 Replace the text of the addition by the following:

Appliances having fluorescent lamps shall be fitted with a fluorescent lamp having either a short mount electrode or long mount electrode, whichever provides the more unfavourable results.

19 Abnormal operation

19.2 Replace the last paragraph of the replacement by the following:

*The test is carried out under the conditions specified in Clause 11. Appliances with **IR emitters** only are operated at 0,85 times **rated power input**. All other appliances are supplied at 0,94 times **rated voltage**.*

19.3 Replace the text of the replacement by the following:

*The test of 19.2 is repeated but appliances with **IR emitters** only are operated at 1,24 times **rated power input**. All other appliances are supplied at 1,1 times **rated voltage**.*

21 Mechanical strength

21.1 In the last paragraph of the addition, replace “**UV filters**” by “**filters**”.

22 Construction

22.103 In the requirement, replace “**UV emitters**” by “**Emitters**”.

22.106 In the second paragraph of the requirement, replace “a dose” by “an exposure dose”.

In the first paragraph of the test specification, replace “dose” by “exposure dose”.

22.111 *In the Y component of the range, replace “0,85” by “0,75” and “1,15” by “1,25”.*

In the Note, replace

“lower value of Y range: 0,85 × 3,2 = 2,72” by “lower value of Y range: 0,75 × 3,2 = 2,40”

“upper value of Y range: 1,15 × 3,2 = 3,68” by “upper value of Y range: 1,25 × 3,2 = 4,00”.

In the paragraph of the Note referring to the fluorescent UV lamp equivalency code range replace “(2,7-3,7)” by “(2,4-4,0)”.

32 Radiation, toxicity and similar hazards

32.101 *Replace the 2nd sentence of the 3rd paragraph of the test specification by:*

The irradiance is then measured according to 32.101.1.

Delete the six dot items of the 3rd paragraph and the 4th paragraph of the test specification.

Delete Note 4.

Replace existing note 5 by the following:

NOTE 4 The exposure dose referred to in 22.106 and Annex DD (except for the maximum yearly dose) is calculated from the total **effective irradiance** weighted according to the erythema action spectrum of Figure 103.

The exposure dose is given by:

$$H_{er} = E_{er}t$$

where

t is the exposure time in seconds, during which the effective **erythema irradiance** is applied;

H_{er} is the effective exposure dose applied in J/m²;

E_{er} is the effective **erythema irradiance** in W/m².

Renumber existing Notes 6 and 7 as Notes 5 and 6.

Replace Subclause 32.102 by the following new subclauses:

32.101.1 *The irradiance is measured with the measuring instrument being placed so that the highest effective irradiance is recorded at positions which model the human body as follows:*

- *for appliances which expose persons from below, the measuring instrument is placed on the surface the person lies on;*
- *for appliances that are arranged over a person, the measuring instrument is placed on the surface of a half-cylinder with a radius of 300 mm in case of full body exposure (position 2 in Figure 101) or of 150 mm in case of facial exposure (position 1 in Figure 101). The half-cylinder is placed directly on the surface the person lays on and is aligned along the centre line of this surface. The half-cylinder for the facial measurement is placed on a 50 mm base that is itself placed directly on the surface the person lays on and is aligned along the centre line of this surface. In the transition area between head and body, measurements are conducted in position 1 and position 2 and the higher effective irradiance is recorded;*
- *for appliances having upper and lower radiating surfaces, each part is measured separately while the other part is covered. If the distance between two radiating surfaces*

is less than 300 mm or 200 mm for a facial measurement, the measurement is made at the surface of the upper panel;

- *for appliances exposing an upright standing person from all sides, the measuring instrument is placed on the surface of a cylinder with a radius of 300 mm. The cylinder is positioned in the centre of the appliance. During the measurement, the opposite side of the cylinder shall be covered;*
- *for appliances where the exposure position is not defined by the construction, such as those placed on a table or some shoulder tanners, the measuring instrument is placed parallel to the emitting surface at the shortest recommended exposure distance or directly on the emitting surface;*
- *for appliances exposing a sitting person, the measuring instrument is placed on the surface of a half-cylinder with a radius of 300 mm in case of full body exposure (positions 2, 3 and 4 of Figure 102) or of 150 mm in case of facial exposure (position 1 of Figure 102). The half-cylinder is located in the position of the body part to be exposed. The half-cylinder for the facial measurement is placed on a 50 mm base. In the transition area between head and body, measurements are conducted in position 1 and position 2 and the higher effective irradiance is recorded.*

Details of the instrument used for the measurements are given in IEC 61228. The measuring instrument shall measure the mean irradiance over a circular area having a diameter not exceeding 20 mm. The response of the instrument shall be proportional to the cosine of the angle between incident radiation and the normal to the circular area. The spectral irradiance shall be measured at intervals of 1 nm in an appropriate double monochromator system. The double monochromator shall have a bandwidth not exceeding 2,5 nm.

32.102 The radiation from appliances incorporating **VIS emitters** or **IR emitters** shall be limited.

Compliance is checked by the following test.

*The appliance is fitted with **VIS emitters** or **IR emitters**, as appropriate, that have been conditioned by supplying them at **rated voltage** for a period of approximately 5 h.*

*The appliance is supplied at **rated voltage** and the radiation from the appliance is measured as detailed in 5.1 of IEC 62471:2006 at the exposure distance in Clause 6 of IEC 62471:2006 or at the recommended exposure distance, whatever is more unfavourable.*

*Irradiances from **VIS appliances** and **IR appliances** shall not exceed the limits of risk group 1 as specified in 6.1 of IEC 62471:2006.*

32.103 Appliances that are not in the exempt group of IEC 62471 shall be supplied with at least two pairs of protective goggles that ensure adequate front and side protection for the eyes and that provide enough luminous transmittance to make it possible to see through them.

Compliance is checked by inspection and by the following test that is carried out on each pair of goggles.

The transmission is measured at the centre of each ocular by means of a spectrophotometer having a bandwidth not exceeding 2,5 nm. A beam of light having a diameter of approximately 5 mm is used. The transmission is measured at intervals of not more than 5 nm.

The transmission shall not exceed the values specified in Table 101 and the luminous transmission shall not be less than 1 %.

Table 101 – Maximum transmission of goggles

Wavelength λ	Maximum transmission %
200 nm < λ ≤ 320 nm	0,1
320 nm < λ ≤ 400 nm	1
400 nm < λ ≤ 550 nm	5
550 nm < λ ≤ 3 000 nm	10

Annexes

Annex DD – Guidelines for the development of an exposure time schedule

Replace the existing title by:

Guidelines for the development of an exposure time schedule for UV exposure

Replace the first sentence by the following:

Annex DD provides detailed information about the requirements for an exposure time schedule for UV exposure.

In the second dotted item first sentence, replace “a dose” by “an exposure dose”.

In the Note of the third dotted item, replace “dose” by “exposure dose”.

In the fourth dotted item, replace “a dose” by “an exposure dose”.

In the fifth dotted item, replace “dose” by “exposure dose”.

In the 7th dotted item, add “used to develop a tan” after “exposures” and replace “dose” by “exposure dose”.

In the eighth dotted item, replace “dose” by “exposure dose”.

Bibliography

Delete the reference to IEC 61228.

Add the following new references:

IEC 60335-2-23, *Household and similar electrical appliances – Safety – Part 2-23: Particular requirements for appliances for skin or hair care*

IEC 60335-2-53, *Household and similar electrical appliances – Safety – Part 2-53: Particular requirements for sauna heating appliances and infrared cabins*