

INTERNATIONAL STANDARD

NORME INTERNATIONALE

AMENDMENT 1
AMENDEMENT 1

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

**Appareils électrodomestiques et analogues – Sécurité –
Partie 2-27: Règles particulières pour les appareils d'exposition de la peau aux
rayonnements ultraviolets et infrarouges**



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FOREWORD

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

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

FDIS	Report on voting
61/4444/FDIS	61/4497/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 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- withdrawn,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.

Contents

Replace the title of Clause 3 by the following:

Terms and definitions

Replace the title of Figure 103 by the following:

Erythema action spectrum

3 Definitions

Replace the title of Clause 3 but not the clause number, by the following:

Terms and definitions

3.101

ultraviolet emitter

In the term, delete "UV emitter"

Replace the existing term definition by the following:

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

Number the existing note as Note 1 to entry.

Add the following new notes to entry:

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**.

3.102 infrared emitter

In the term, delete “IR emitter”

Replace the existing term definition by the following:

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

Add the following note to entry:

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

3.104 UV filter

Replace the existing term definition by the following:

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

Add the following new definition:

3.105 UV appliance

appliance incorporating **UV emitters** for tanning purposes

5 General conditions for the tests

5.1 *Replace, in the first sentence, “Appliances with **UV emitters**” by “**UV appliances**”.*

6 Classification

6.101 *Replace “UV appliances” by “**UV appliances**”*

7 Marking and instructions

7.1 *In the first paragraph of the addition, replace “UV appliances” by “**UV appliances**”.*

*Replace “Appliances having **UV emitters**” by “**UV appliances**” in three places.*

7.12 *Replace, in the addition, “UV appliances” by “**UV appliances**” in two places.*

Replace “Appliances having **UV emitters**” by “**UV appliances**” in two places.

In the third paragraph, ninth dashed item, delete “alternative”.

In the fourth paragraph, sixth dash, second bulleted item, add “, fragrances, and skin care products” after “cosmetics”.

19 Abnormal operation

19.2 Replace “Appliances having **UV emitters**” by “**UV appliances**”.

19.3 Replace “Appliances having **UV emitters**” by “**UV appliances**”.

22 Construction

22.105 Replace the existing text by the following:

UV appliances that are inclined at an angle of more than 35° to the vertical shall be constructed so that the emission of ultraviolet radiation is automatically stopped if the timer fails.

Compliance is checked by the following tests.

The appliance is supplied at **rated voltage** and operated under **normal operation**. A fault in the timer is simulated. The emission of ultraviolet radiation shall cease before the exposure time has exceeded 110 % of the set value.

If compliance relies on the operation of an **electronic circuit**, the appliance is further tested as follows.

The appliance is supplied at **rated voltage** and operated under **normal operation**. A fault in the timer is simulated. The fault conditions in a) to g) of 19.11.2 are applied one at a time to the **electronic circuit**. The emission of ultraviolet radiation shall cease before the exposure time has exceeded 110 % of the set value and the appliance shall not be capable of further use without repair.

If the **electronic circuit** is programmable, the software shall contain measures to control the fault/error conditions specified in Table R.1 and is evaluated in accordance with the relevant requirements of Annex R.

22.106 In the requirement, replace “UV appliances” by “**UV appliances**”.

22.110 In the requirement, replace “UV appliances” by “**UV appliances**”.

22.112 Replace the existing text by the following:

Appliances fitted with **UV filters** shall be constructed so that the emission of UV radiation is not increased if the filter is removed.

Compliance is checked by the test of 32.101 with the **UV filters** removed.

If compliance relies on the operation of an **electronic circuit**, the appliance is further tested as follows.

The appliance is supplied at **rated voltage** and the filter is removed. The fault conditions in a) to g) of 19.11.2 are then applied one at a time to the **electronic circuit**. The appliance shall comply with 32.101.

If the **electronic circuit** is programmable, the software shall contain measures to control the fault/error conditions specified in Table R.1 and is evaluated in accordance with the relevant requirements of Annex R.

22.113 Add the following new paragraph to the requirement:

Appliances that the user may lock from the inside shall include provision to gain access from outside of the appliance when the appliance is locked.

Replace the first paragraph of the test specification by the following:

Compliance is checked by inspection and by the following test.

Add the following new subclauses:

22.114 Appliances for commercial use only that completely surround a person and that can be locked from the inside shall include provision for the operator to gain access to the appliance from the outside.

Compliance is checked by inspection and by manual test.

22.115 Glass parts of broken high-pressure metal halide lamps shall not be ejected from the appliance or contact a user or cause a fire hazard if they contact non-metallic parts of the appliance.

Compliance is checked by inspection and, if necessary, by the following test.

Non-metallic material that may be contacted by parts of broken high-pressure metal halide lamps shall comply with IEC 60695-2-11 without ignition at a test severity of 750 °C. The glow-wire test need not be carried out on parts that have a glow-wire ignition temperature according to IEC 60695-2-13 of at least 775 °C.

32 Radiation, toxicity and similar hazards

32.101 In the requirement, delete the first sentence and replace “appliances incorporating UV emitters” by “UV appliances”.

Add the following note after the requirement:

NOTE 1 See Annex EE for limits set by some regional or national authorities.

Renumber existing Notes 1, 2, 3 and the first Note 4 as Notes 2, 3, 4 and 5 respectively. Renumber the existing second Note 4 as Note 6 and existing Note 5 as Note 7.

Replace the fifth and sixth paragraphs of the test specification by the following:

Appliances suitable for household use shall have a total **effective irradiance** not exceeding

- 0,15 W/m², for wavelengths up to 320 nm;
- 0,15 W/m², for wavelengths between 320 nm and 400 nm,

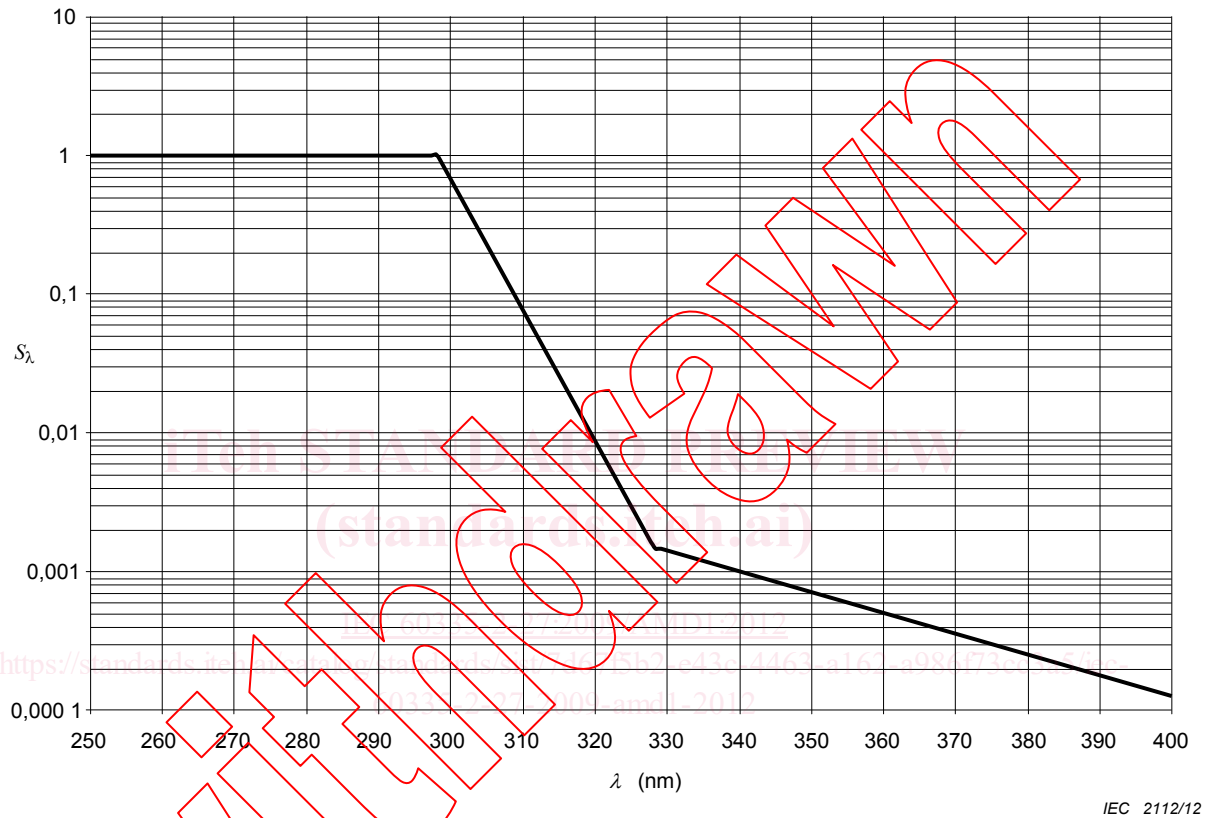
weighted according to the erythema action spectrum of Figure 103.

Appliances for commercial use only shall have a total **effective irradiance** not exceeding $0,7 \text{ W/m}^2$, weighted according to the erythema action spectrum of Figure 103.

In existing first Note 4 (now Note 5), delete "(except for the total yearly dose)".

32.102 In the requirement, replace "UV appliances" by "**UV appliances**".

Replace the existing Figure 103 by the following:



IEC 2112/12

Key

— Erythema action spectrum

NOTE The erythema action spectrum is defined from the following parameters:

Wavelength nm (λ)	Weighting factor (S_λ)
$\lambda \leq 298$	1
$298 < \lambda \leq 328$	$10^{0,094(298-\lambda)}$
$328 < \lambda \leq 400$	$10^{0,015(140-\lambda)}$

Figure 103 – Erythema action spectrum

Annexes

Add, before Annex AA, the following new Annex R:

Annex R (normative)

Software evaluation

R.2.2.5 Modification:

For programmable **electronic circuits** with functions requiring software incorporating measures to control the fault/error conditions specified in Table R.1 or Table R.2, detection of a fault/error shall occur before compliance with Clause 19, 22.105 and 22.112 is impaired.

R.2.2.9 Modification:

The software and safety-related hardware under its control shall be initialized and shall terminate before compliance with Clause 19, 22.105 and 22.112 is impaired.

Annex BB – Detailed classification of UV appliances

Replace “UV appliances” by “**UV appliances**” in two places. Replace “appliance having a UV emitter” by “**UV appliance**” in five places.

BB.3 Effective irradiance

Replace the existing text by the following:

The **effective irradiance** for each type of **UV appliance**, weighted according to the erythema action spectrum of Figure 103, is given in Table BB.1.

Table BB.1 – Limits of effective irradiance

UV type appliance	Effective irradiance W/m ²	
	250 nm < λ ≤ 320 nm	320 nm < λ ≤ 400 nm
1	< 0,001	≥ 0,15
2	0,001 to 0,15	≥ 0,15
3	< 0,15	< 0,15
4	≥ 0,15	< 0,15
5	≥ 0,15	≥ 0,15

λ is the wavelength of the radiation.

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

In the last bulleted item replace “25 kJ/m², weighted according to the non-melanoma skin cancer” by “15 kJ/m², weighted according to the erythema”.

Add, after Annex DD, the following new Annex EE:

Annex EE
(informative)

Irradiance limits set by regional or national authorities

Many national or regional authorities have published regulations on the irradiance limits of **UV appliances** that are in some cases different to those listed in this standard. The limits as advised by National Committees that differ from the IEC limits are given in the following Tables EE.1 to EE.3. These limits should also be taken into account during the type testing and classification of the appliance for these countries. Where no differing limit is given, the IEC limit is assumed to apply.

Table EE.1 – Europe: EN 60335-2-27 limits

Appliance	Total effective irradiance W/m ²	(280 – 320) nm effective irradiance W/m ²	(320 – 400) nm effective irradiance W/m ²	(200 – 280) nm short wavelength irradiance W/m ²	Maximum dose per exposure J/m ²	Maximum dose per year ^a kJ/m ² (NMSC) ^b
UV type 1	0,3	< 0,001	≥ 0,15	0,003	600	25
UV type 2	0,3	< 0,15	≥ 0,15	0,003	600	25
UV type 3	0,3	< 0,15	< 0,15	0,003	600	25
UV type 4	0,3	≥ 0,15	< 0,15	0,003	600	25
UV type 5	Not allowed					
^a The maximum dose per year applicable in Finland is 5 kJ/m ² weighted according to the erythema action spectrum.						
^b (NMSC) means that the maximum dose per year is weighted according to the non-melanoma skin cancer spectrum						

Table EE.2 – Australia and New Zealand: AS/NZS 60335.2.27 limits

Appliance	Total effective irradiance W/m ²	(280 – 320) nm effective irradiance W/m ²	(320 – 400) nm effective irradiance W/m ²	(200 – 280) nm short wavelength irradiance W/m ²
UV type 1	Not allowed			
UV type 2	0,7	0,001 to 0,15 in addition 0,007 < UVB*/UVT** < 0,03	≥ 0,15	0,003 in addition the spectral irradiance limit is 1,0 × 10 ⁻⁵ W/m ² /nm
UV type 3		< 0,15 in addition 0,007 < UVB*/UVT** < 0,03	< 0,15	0,003 in addition the spectral irradiance limit is 1,0 × 10 ⁻⁵ W/m ² /nm
UV type 4	Not allowed			
UV type 5	Not allowed			
UVB* = Irradiance in the range 280 nm ≤ λ ≤ 320 nm				
UVT** = Total irradiance				

Table EE.3 – USA: 21 CFR 1040.20 limits

Appliance	Total effective irradiance W/m ²	(280 – 320) nm effective irradiance W/m ²	(320 – 400) nm effective irradiance W/m ²	(200 – 260)/(260 – 320) short wavelength irradiance ratio
All types				0,003

Bibliography

Delete the reference to ISO 13732-1.

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