

# INTERNATIONAL STANDARD

# NORME INTERNATIONALE

AMENDMENT 1  
AMENDEMENT 1

Household and similar electrical appliances – Safety –  
Part 2-17: Particular requirements for blankets, pads, clothing and similar  
flexible heating appliances

Appareils électrodomestiques et analogues – Sécurité –  
Partie 2-17: Exigences particulières pour les couvertures, coussins, vêtements  
et appareils chauffants souples analogues



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## FOREWORD

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

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

CDV	Report on voting
61/4834/CDV	61/4910/RVC

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 website 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- withdrawn,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.

iTeh STANDARD PREVIEW

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.

[IEC 60335-2-17:2012/AMD1:2015](https://standards.iTech.ai/catalog/standards/sist/ded32a9f-821-4816-af56-1e671e303030/iec-60335-2-17-2012-amd1-2015)

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.

## 2 Normative references

*Replace the reference to ISO 3758 by the following:*

ISO 7000:2014, *Graphical symbols for use on equipment – Registered symbols*

## 3 Terms and definitions

**3.101** Add "electro-conductive textile," after "heating element,".

**3.104** Replace the existing text by the following:

**3.104** Void

**3.106** Add "electro-conductive textile," after "heating element,".

**3.108** Replace the term definition by the following:

appliance for supporting the human body and which incorporates an upholstered **flexible part** for heating the bed

*Add the following Note 1 to entry:*

Note 1 to entry: The appliance may be placed on the floor and referred to as a mat.

**3.110** *Replace the term definition by the following*

heating conductor, including any core and insulation, together with any other integrated conductor

**3.116** *Replace the term definition by the following:*

material incorporating carbon or other conductive substance, together with any associated insulation, which is connected to a pair of electrodes for the purpose of providing a heated surface

## 5 General conditions for the tests

**5.2** *Add the following to the addition:*

*For appliances having a **flexible part** incorporating **electro-conductive textile** and a **working voltage** above 24 V, an additional sample may be required for the test of 21.113.2 and a 1 m length of sheet insulation will be required for the test of 21.113.1.*

**5.3** *Add the following to the replacement as a new second sentence to the paragraph starting with “Appliance A.....”:*

*The tests of Clauses 13, 15 and 16 are not carried out on **class III appliances** having a **rated voltage** not exceeding 24 V or on **class III constructions** having a **working voltage** not exceeding 24 V.*

**5.5** *Add the following after the first paragraph of the addition.*

*If the construction of a **mattress** incorporates a separate **flexible part** that is detachable, the **detachable flexible part** is tested as an **underblanket**.*

## 6 Classification






**6.1** *Delete the second sentence of the modification.*

## 7 Marking and instructions

**7.1** *Add the following as a new fourth dashed item to the fifth paragraph of the addition:*

– symbol ISO 7000-3114 (2012-04) and symbol ISO 7000-3124 (2012-04);

7.6 Replace the symbols in the addition by the following:

	[symbol ISO 7000-3114 (2012-04)]	Do not dry clean
	[symbol ISO 7000-3123 (2012-04)]	Do not wash
	[symbol ISO 7000-3124 (2012-04)]	Do not bleach
	[symbol ISO 7000-3125 (2012-04)]	Wash by hand
	Not to be used by very young children (0-3 years)	

7.12 Replace the first sentence and the second sentence of the third paragraph of the addition starting "The instructions shall contain ..." by "When the symbols of Figure 101, Figure 102 or those in the addition to 7.6 are used, they shall be explained".

Delete the fifth paragraph of the addition starting with "The instructions for underblankets.....".

In the third to last paragraph of the addition replace "guardian, or unless the child" by "guardian, and unless the child".

## 11 Heating

11.2 In the second paragraph of the addition, replace "**Wraps**" by "**Wraps, other than those having heating elements with PTC characteristics,**".

11.3 Replace the second paragraph by the following:

*Thermocouples used for determining the temperature of the surface of **electro-conductive textiles** are fixed by means of thin adhesive tape.*

11.8 Replace the second sentence by the following:

*If the **flexible part** is comprised of **electro-conductive textile**, the values specified for **heating elements** are applicable to the surface of **supplementary insulation** or **reinforced insulation**, or to the conductive surface if there is no insulation.*

### 13 Leakage current and electric strength at operating temperature

13.1 Delete the modification.

### 15 Moisture resistance

15.1 Delete the second paragraph of the addition.

### 16 Leakage current and electric strength

16.1 Delete the addition.

### 19 Abnormal operation

19.1 Replace the second, third, fourth and fifth paragraphs of the modification by the following:

**Blankets** are subjected to the tests of 19.102 and 19.108.

**Pads** are subjected to the tests of 19.108, and 19.110. **Controlled pads** are also subjected to the tests of 19.109.

**Mattresses** are subjected to the tests of 19.108 and 19.113

19.13 In the fourth paragraph, add "or **electro-conductive textiles**" after "heating elements".

19.101 Replace this subclause by the following:

19.101 Void

19.102 Replace the existing text by the following:

**Blankets** are operated under **normal operation** except that the **flexible part** is uncovered and folded at the most unfavourable place with a five-thickness fold having the most unfavourable dimensions. A sheet of thermal insulation as specified in Annex AA, having dimensions of 300 mm × 450 mm × 72 mm, is placed on the folded blanket at the most unfavourable location. An evenly distributed mass of 5 kg is placed on the sheet of thermal insulation.

The widths of each fold may be different and a sandbag may be used as the mass.

If the **blanket** cannot be folded with five thicknesses, it is tested as a **mattress**.

The appliance is supplied with a voltage at the upper limit of the range specified in 19.1.

**19.103** Replace this subclause by the following:

**19.103** Void

**19.104** Replace this subclause by the following:

**19.104** Void

**19.105** Replace this subclause by the following:

**19.105** Void

**19.106** Replace this subclause by the following:

**19.106** Void

**19.107** In the first sentence replace "19.101 to 19.106" by "19.102, 19.110 and 19.113".

Delete "of the fold" at the end of the first sentence.

**19.109** In the first line replace "**Pads**" by "**Controlled pads**".

**19.110** Replace this subclause by the following:

**19.110** **Pads** are operated under **normal operation** except that the **flexible part** is uncovered and folded at the most unfavourable place with a three-thickness fold having the most unfavourable dimensions. A sheet of thermal insulation as specified in Annex AA, having dimensions of 300 mm × 450 mm × 72 mm, is placed on the folded **pad** at the most unfavourable location. An evenly distributed mass of 5 kg is placed on the sheet of thermal insulation.

The widths of each fold may be different and a sandbag may be used as the mass.

Add the following new subclause:

**19.113** **Mattresses** are operated under **normal operation** except that the **flexible part** is uncovered and five runs of the **heating element** are bunched together in the most unfavourable way. Sufficient material of the permanent enclosure of the **flexible part** is removed at the most unfavourable location to get access to the **heating element** runs. The **heating element** runs are bunched over a length of 150 mm and secured by thin high-temperature tape which is not to be overlapped more than once. A sheet of thermal insulation as specified in Annex AA, having dimensions of 300 mm × 450 mm × 72 mm, is placed on the bunched **heating element** at the most unfavourable location. An evenly distributed mass of 5 kg is placed on the sheet of thermal insulation. A sandbag may be used as the mass.

If the construction does not allow the **heating element** runs to be bunched together, the **heating element** assembly is removed from the **mattress** and subjected to the test of 19.102.

## 21 Mechanical strength

**21.1** In the first dashed item of the third paragraph of the addition, replace "busbars" by "electrodes" (in 2 places) and replace "**material**" by "**textile**".



In the third paragraph of the addition, add the following after the first dashed item:

- *breakage of any conductive thread of **electro-conductive textiles**;*

In the existing first dashed item of the third paragraph of the addition replace the 2 dot items by dashed items and print in italics.

**21.2** Add the following to the addition:

except those incorporating **electro-conductive textile** having a **working voltage** above 24 V.

**21.105** Replace the subclause by the following:

**21.105** *Appliances are operated continuously under the conditions specified in Clause 11. Non-controlled appliances and **controlled appliances** having a metallic temperature sensor are tested for 500 h. Other appliances are operated for 1 000 h. The surface temperature of the **flexible part** of **controlled appliances** is measured under steady conditions at the beginning and at the end of this period. It shall not have increased by more than 5 K.*

*For appliances with **heating elements with PTC characteristics**, the test is carried out with the **flexible part** fully covered with a sheet of thermal insulation, as specified in Annex AA, having a thickness of 90 mm. However, the temperature of the **heating element with PTC characteristic** is measured after 100 h and at the end of the test under the conditions specified in Clause 11. It shall not have increased by more than 5 K.*

**21.111** Add the following to the requirement:

The requirement does not apply to **Class III appliances** having a **rated voltage** not exceeding 24 V or to **Class III constructions** having a **working voltage** not exceeding 24 V.

**21.111.1** Add the following as a new third paragraph:

*The diameter of the pulley is increased to 60 mm and the initial load to 0,5 kg for **heating elements with PTC characteristics** used in **mattresses**. The width and form of the groove of the pulley are to be appropriate for the sample under test.*

**21.111.2** *At the end of the first paragraph, replace "only the outer layer is removed." by "only the outer layer is pulled off and tested."*

Add the following subclauses:

**21.113** The insulation of **flexible parts** incorporating **electro-conductive textile** shall retain adequate flexibility and insulating characteristics throughout the life of the appliance. The requirement does not apply to **Class III appliances** having a **rated voltage** not exceeding 24 V or to **Class III constructions** having a **working voltage** not exceeding 24 V.

Compliance is checked by the tests of 21.113.1 and 21.113.2 when the insulation exceeds

- a temperature of 75 °C for **controlled appliances** or a temperature rise of 50 K for other appliances during the test of Clause 11; or
- a temperature of 135 °C for **controlled appliances** or a temperature rise of 110 K for other appliances during the tests of Clause 19.

The tests are carried out on new samples of the **flexible part**.

**21.113.1** Twelve samples having the shape as shown in Figure 114 are stamped from the **supplementary insulation** or **reinforced insulation**, six from the longitudinal direction and six from the lateral direction. If the insulation is integrated with the fabric supporting the conductive threads, the test is not carried out.

Three samples from each direction are conditioned by suspending them vertically so that they hang freely in a heating cabinet, having forced air circulation, at a temperature of  $125\text{ °C} \pm 2\text{ °C}$  for 336 h. The samples are removed from the cabinet and allowed to cool down to room temperature. When the material has stabilized, the length of the samples is measured and shall not be less than 90 % of the original length.

The 12 samples are placed in a tensile machine in turn. The machine is operated at a uniform speed of  $500\text{ mm/min} \pm 50\text{ mm/min}$ . The force and elongation at the instant of rupture are determined.

The elongation of each of the unconditioned samples shall not be less than 100 % and their tensile strength shall not be less than 8,75 MPa.

The average value of both the elongation and the tensile strength of the conditioned samples shall not be less than 75 % of the average value determined for the unconditioned samples.

**21.113.2** Twelve samples having dimensions  $200\text{ mm} \times 100\text{ mm}$  are cut from the **electro-conductive textile**, any other covering being removed. At least one sample is to include a portion of electrode. The samples are then tightly rolled on a metal mandrel having a diameter of 25 mm along the line of the conductive threads, if any. The roll may be held together by suitable tape.

They are then placed in a heating cabinet having forced air circulation at a temperature of  $125\text{ °C} \pm 2\text{ °C}$  for 336 h. The samples are removed from the cabinet and allowed to cool down to room temperature. They are then unwound and removed from the mandrel.

A sample is then placed centrally on a metal plate having dimensions of  $180\text{ mm} \times 80\text{ mm}$  and a similar plate placed on top and weighted so that the applied mass is 5 kg. The sample is then subjected to the electric strength test of 16.3. The other 11 samples are then tested in the same way in turn.

Inspection shall show that there are no visible cracks in the insulation.

## 22 Construction

**22.26** Delete the addition.

**22.101** Replace this subclause by the following:

**22.101** Void

**22.102** Replace this subclause by the following:

**22.102** Void

**22.103** Replace the second sentence of the first paragraph of the requirement by the following:

The **heating element** shall be located so that there are no crossover points.

**22.104** *In the requirement, replace "busbars" by "electrodes".*

**22.106** *Replace this subclause by the following:*

**22.106** Void

**22.107** *Replace this subclause by the following:*

**22.107** Void

**22.113** *Replace this subclause by the following:*

**22.113** Void

*Add the following new subclause:*

**22.116** **Blankets** having a **detachable cord** for the connection of the **flexible part** shall be washable.

*Compliance is checked by inspection.*

## **25 Supply connection and external flexible cords**

**25.2** *Add "and mattresses" after "blankets".*

**25.23** *Delete the first paragraph of the addition.*

## **30 Resistance to heat and fire**

**30.101.1** *In the first sentence of the first paragraph, add "or conductive threads of **electro-conductive textile**" after "heating element".*

*In the fourth sentence of the first paragraph, add "or **electro-conductive textile**" after "heating element".*

*In the seventh paragraph, add "or **electro-conductive textile**" after "heating element".*

**30.102** *In the requirement, add "or **electro-conductive textiles**" after "heating elements".*

*In the second paragraph of the test specification add the following new second sentence.*

*If **electro-conductive textile** is used, the sample has dimensions of 150 mm × 150 mm.*

### **Figures**

**Figure 104** *Replace this figure by the following:*

**Figure 104** – Void

**Figure 105** *Replace this figure by the following:*

**Figure 105** – Void