

INTERNATIONAL STANDARD

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60335-2-17

Second edition
2002-10

Household and similar electrical appliances – Safety –

Part 2-17: Particular requirements for blankets, pads and similar flexible heating appliances

*Appareils électrodomestiques et analogues –
Sécurité –*

*Partie 2-17:
Règles particulières pour les couvertures, coussins
et appareils chauffants souples analogues*



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INTERNATIONAL ELECTROTECHNICAL COMMISSION

**HOUSEHOLD AND SIMILAR ELECTRICAL APPLIANCES –
SAFETY –**

**Part 2-17: Particular requirements for blankets, pads
and similar flexible heating appliances**

FOREWORD

- 1) The IEC (International Electrotechnical Commission) is a worldwide organization for standardization comprising all national electrotechnical committees (IEC National Committees). The object of the 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, the IEC publishes International Standards. 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. The IEC collaborates closely with the International Organization for Standardization (ISO) in accordance with conditions determined by agreement between the two organizations.
- 2) The formal decisions or agreements of the IEC on technical matters express, as nearly as possible, an international consensus of opinion on the relevant subjects since each technical committee has representation from all interested National Committees.
- 3) The documents produced have the form of recommendations for international use and are published in the form of standards, technical specifications, technical reports or guides and they are accepted by the National Committees in that sense.
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- 6) Attention is drawn to the possibility that some of the elements of this International Standard may be the subject of patent rights. The IEC shall not be held responsible for identifying any or all such patent rights.

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

This second edition cancels and replaces the first edition published in 1998. It constitutes a technical revision.

The text of this part of IEC 60335 is based on the following documents:

FDIS	Report on voting
61/2168/FDIS	61/2249/RVD

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

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 fourth edition (2001) 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 electric blankets, pads and similar flexible heating appliances.

NOTE 2 Annex AA contains provisions from ISO 2439.

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 3 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 4 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 publication will remain unchanged until 2004. At this date, the publication will be

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

The following differences exist in the countries indicated below.

- 6.1: Class 0 products are allowed (Japan and USA).
- 19.108: The fuse is not required to rupture (Australia).
- 22.102: Thermostats and thermal cut-outs are not allowed in the flexible part of underblankets (Australia and New Zealand).
- Annex AA: Felt is used for the thermal insulation (USA).

A bilingual version of this publication may be issued at a later date.

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.

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.

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.

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.

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HOUSEHOLD AND SIMILAR ELECTRICAL APPLIANCES – SAFETY –

Part 2-17: Particular requirements for blankets, pads and similar flexible heating appliances

1 Scope

This clause of Part 1 is replaced by the following.

This International Standard deals with the safety of electric **blankets, pads** and other flexible appliances that heat the bed or human body, for household and similar purposes, their **rated voltage** being not more than 250 V.

This standard also applies to **control units** supplied with the appliance.

As far as is practicable, this standard deals with the common hazards presented by appliances that are encountered by all persons in and around the home. However, in general, it does not take into account

- the use of appliances by young children or infirm persons without supervision;
- playing with the appliance by young children.

NOTE 101 Children are considered to be old enough to use an appliance without supervision when they have been adequately instructed by a parent or guardian and are deemed competent to use the appliance safely.

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 may 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.

NOTE 103 This standard does not apply to

- 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);
- rigid bed warmers, such as those of metal or ceramic material;
- water bed heaters (IEC 60335-2-66);
- heating appliances for breeding and rearing animals (IEC 60335-2-71);
- foot warmers and heating mats (IEC 60335-2-81);
- appliances specifically intended for use under medical supervision (IEC 60601-2-35).

2 Normative references

This clause of Part 1 is applicable except as follows.

Addition:

ISO 2439, *Flexible cellular polymeric materials – Determination of hardness (indentation technique)*

ISO 3758, *Textiles – Care labelling code using symbols*

3 Definitions

This clause of Part 1 is applicable except as follows.

3.1.9 Replacement:

normal operation

operation of the appliance under the following conditions

Blankets and pads are placed between sheets of thermal insulation.

Duvets are placed on a sheet of thermal insulation but not covered.

Mattresses are covered by a sheet of thermal insulation.

NOTE 101 The specification for the thermal insulation is given in Annex AA.

The **flexible part** is supported on a plywood base 20 mm thick and positioned not less than 300 mm above the floor. The size of the plywood base is such that the thermal insulation can be fully supported over its entire area. The size of the sheets of thermal insulation is such that the edges extend at least 100 mm beyond the outline of the **heated area**.

3.8.4 Replacement

PTC heating element

heating element consisting of two conductors separated by conductive material that has a rapid non-linear increase in resistance when the temperature is raised through a particular range

3.101

flexible part

all layers of material forming the permanent enclosure of the appliance together with the **heating element, thermostats** and all other current-carrying parts contained within it

NOTE The **flexible part** may be inside a **detachable cover**. <https://standards.iteh.ai/> [https://standards.iteh.ai/3a3-4b8d-b77f-a17184b48e2b/iec-60335-2-17-2002](https://standards.iteh.ai/https://standards.iteh.ai/3a3-4b8d-b77f-a17184b48e2b/iec-60335-2-17-2002)

3.102

blanket

appliance comprising a substantially flat **flexible part** that is intended to form part of the bedding, for heating the bed

3.103

underblanket

blanket intended to be used under the occupant of the bed

3.104

ruck-resistant blanket

underblanket that has sufficient rigidity to prevent rucking of the **flexible part**

3.105

overblanket

blanket intended to be used over the occupant of the bed

3.106

duvet

quilted **overblanket** intended to be used without additional bedding over the occupant of the bed, the **heating element** providing supplementary heat

3.107**pad**

appliance comprising a **flexible part** having a **heated area** not exceeding 0,2 m² on each face and which is intended to heat part of the human body

3.108**mattress**

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

3.109**controlled appliance**

appliance incorporating means in the **flexible part** for sensing changes in temperature when the appliance is operated under **normal operation**, thus automatically controlling the average power input

3.110**heating element**

heating conductor, including the core on which it is wound and the insulation, together with any other integrated conductor

3.111**heated area**

area of the **flexible part** enclosed within the outer perimeter of the **heating element**. It includes a margin outside the perimeter that has a width equal to 0,5 times the average distance between adjacent runs of the **heating element**.

NOTE 1 The **heated area** includes the return length of the **heating element** if the average distance between this part and the adjacent **heating element** does not exceed the average distance between adjacent runs of the **heating element**.

NOTE 2 If a **blanket** or **mattress** has two separate **heated areas**, the surface between the two areas is considered to be part of the **heated areas**, if at any place the distance between the two **heating elements** does not exceed 1,5 times the average distance between adjacent runs of the **heating element**.

3.112**moisture-proof appliance**

appliance having a **flexible part** that is suitable for use under moist conditions

3.113**bonded enclosure**

enclosure of the **flexible part** that has the opposite faces joined together by means of an adhesive or by welding

NOTE The bonded enclosure may include several bonded layers of material.

3.114**control unit**

device, external to the **flexible part**, by means of which the average power input of the appliance can be adjusted or regulated

NOTE 1 **Control units** may be incorporated in the **supply cord** or at the end of an **interconnection cord**.

NOTE 2 Multi-position cord switches are not considered to be **control units** unless they incorporate components for regulating the power input.

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.

5.2 Modification:

The tests are carried out on two appliances, identified as appliance A and appliance B.

Addition:

*For appliances having a **bonded enclosure**, an additional appliance is required for the tests of 21.108 and 21.111. For other appliances, a length of 15 m of **heating element** is required for the tests of 21.111.*

*For **moisture-proof pads** subjected to the tests of 21.110, five additional appliances and 1 m² of enclosure material are required.*

*If heat-shrink material is used to insulate connections in the **flexible part**, a sample at least 150 mm in length is required for the test of 30.102.*

NOTE 101 An additional appliance may be required for the test of 19.110.

NOTE 102 If a further appliance is required in order to continue testing after a test of Clause 19, it has to be adequately preconditioned taking into account 21.102 to 21.107.

NOTE 103 Additional samples of **pads** may be required for the test of 30.101.

5.3 Replacement:

The order in which the tests are carried out is as follows:

Appliance A: 7, 22.11, 8, 22.112, 10, 11.101, 21.102 to 21.107, 22.108, 13, 15, 16, 17, 20, 25.15, 25.16, 19, 21.108, 22.18, 30, 31 and 32.

Appliance B: 10, 11 (remainder), 21, 21.101, 22 (remainder), 23, 24, 25 (remainder), 26, 27, 28, 29 and 14.

NOTE 101 **Duvets** are tested as **overblankets**.

*The **flexible part** of washable appliances is laundered twice in accordance with the instructions before testing is started.*

If it is evident from the construction of the appliance that a particular test is not applicable, the test is not carried out.

5.5 Addition:

*If the **flexible part** of the appliance is provided with a **detachable cover**, the tests are carried out with or without this cover, whichever is more unfavourable. However, **duvets** are tested without a **detachable cover**.*

*If the **heating element** can move in the channels, it is manipulated so that the individual runs are placed in the most unfavourable position.*

5.6 Addition:

When testing appliances for d.c. only, the possible influence of polarity on the operation of the appliance is taken into account.

5.7 Modification:

For **flexible parts** incorporating **PTC heating elements**, the tests of Clauses 10, 11 and 19 are carried out at the most unfavourable ambient temperature within the range of 0 °C to 25 °C.

For other **controlled blankets** and **mattresses**, the tests of Clauses 10, 11 and 19 are carried out at the most unfavourable ambient temperature within the range of 0 °C to 15 °C.

5.8.1 Addition:

Appliances for d.c. only are tested with d.c.

5.8.2 Addition:

Controlled appliances are supplied as specified for **motor-operated appliances**.

NOTE Appliances incorporating **PTC heating elements** within the **flexible part** are considered to be **controlled appliances**.

6 Classification

This clause of Part 1 is applicable except as follows.

6.1 Modification:

Appliances shall be **class II** or **class III**. **Class III appliances** shall have a **rated voltage** not exceeding 24 V.

7 Marking and instructions

This clause of Part 1 is applicable except as follows.

7.1 Modification:

Appliances shall be marked with the **rated power input**.

Parts of **class III construction** shall not be marked with the **rated voltage** of the appliance.

Addition:

Flexible parts and **detachable covers** shall be marked with the name, trademark or identification mark of the manufacturer or responsible vendor.

Detachable covers shall be marked with the model or type reference of the appliance with which they are intended to be used.

The **flexible part** of appliances to be used with a **detachable control unit** shall be marked with the reference of the **control unit** to be used.

The **flexible part** of appliances to be used with a **detachable transformer** shall be marked with the reference of the transformer to be used.

Flexible parts and **detachable covers** shall be marked with the substance of the following:

- read the instructions or symbol 1641 of ISO 7000;
- do not use folded or by the symbol shown in Figure 101 (this marking is not required for **duvets, mattresses** and appliances with **PTC heating elements**);
- do not use rucked or by the symbol shown in Figure 101 (this marking is required only for **underblankets**, other than those with **PTC heating elements**);
- do not insert pins or by the symbol shown in Figure 102;
- underblanket or overblanket, as appropriate;
- do not use if wet (this marking is not required for **moisture-proof appliances**);
- do not use with a helpless person, an infant or a person insensitive to heat;
- overlong application at high setting can result in skin burns (this marking is required only for **pads**, other than those having a timer that switches off the supply after a period not exceeding 1 h).

NOTE 101 The words "at high setting" are not required on **pads** without temperature adjustment.

The **flexible part** of **blankets** and **detachable covers** shall be marked with the appropriate laundering symbols specified in ISO 3758.

7.12 Addition:

The instructions shall contain the substance of the following:

Important instructions. Retain for future use.

The instructions shall contain the substance of the instructions required in 7.1. If symbols are used, they shall be explained.

The instructions for **underblankets**, other than **blankets** having a ruck-resistance greater than 1,2 as determined in 22.106, shall state how the **blanket** is to be secured to the bed.

The instructions shall specify the appropriate settings of the control for all-night use of the appliance.

The instructions for **pads** shall contain a warning that the user should not fall asleep when the appliance is in use.

NOTE 101 The requirement does not apply to **pads** fitted with a timer that switches off the supply after a period not exceeding 1 h.

The instructions for appliances provided with **detachable control units** or **detachable transformers** shall state that the appliance is only to be used with the types that are marked on the appliance.

The instructions for **duvets** shall state the length and width of the **detachable cover** to be used.

The instructions for appliances containing a fuse link or **thermal link** shall state that the appliance must be returned to the manufacturer or his agent if the link has ruptured.

The instructions shall state the substance of the following:

- when not in use, store as follows (quote necessary instructions);
- avoid creasing the appliance (for **blankets** and **pads** only);