

# INTERNATIONAL STANDARD

# NORME INTERNATIONALE



Household and similar electrical appliances – Safety –  
Part 2-106: Particular requirements for heated carpets and for heating units for  
room heating installed under removable floor coverings

Appareils électrodomestiques et analogues – Sécurité –  
Partie 2-106: Exigences particulières pour les tapis chauffants et  
les unités chauffantes installées sous des revêtements de sol amovibles, pour  
le chauffage des locaux



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IEC 60335-2-106

Edition 2.0 2021-11

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**HOUSEHOLD AND SIMILAR ELECTRICAL APPLIANCES –  
SAFETY –****Part 2-106: Particular requirements for heated carpets and for heating  
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IEC 60335-2-106 has been prepared by IEC technical committee 61: Safety of household and similar electrical appliances. It is an International Standard.

This second edition cancels and replaces the first edition published in 2007. This edition constitutes a technical revision.

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

- a) the text has been aligned with IEC 60335-1:2020;
- b) some notes have been converted to normative text (Clause 1, 5.2, 5.3, 5.6, 7.12.1, 7.101, 10.1, 18.101.1, 18.101.2, 18.102.5, 19.1, 19.103, 21.1, 21.104, 21.105, 30.102);
- c) requirements for portable heated carpets have been added (Clause 1, 5.2, 5.5, 6.1, 6.2, 7.1, 7.6, 7.12, 7.14, 7.101, 11.8, 15.1, 15.101, 16.1, 16.2, 16.3, 19.101, 19.102, 19.103, 21.105, 21.106, 24.1.5, 24.2, 29.3);

- d) requirements for washable portable heated carpets have been added (5.3, 7.1, 7.6, 7.12, 7.14);
- e) the test of 30.102 has been updated.

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

Draft	Report on voting
61/6369/FDIS	61/6419/RVD

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

The language used for the development of this International Standard is English.

This document was drafted in accordance with ISO/IEC Directives, Part 2, and developed in accordance with ISO/IEC Directives, Part 1 and ISO/IEC Directives, IEC Supplement, available at [www.iec.ch/members\\_experts/refdocs](http://www.iec.ch/members_experts/refdocs). The main document types developed by IEC are described in greater detail at [www.iec.ch/standardsdev/publications](http://www.iec.ch/standardsdev/publications).

A list of all parts in the IEC 60335 series, published 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 unless that edition precludes it; in that case, the latest edition that does not preclude it is used. It was established on the basis of the sixth edition (2020) 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. Particular requirements for heated carpets and for heating units for room heating installed under removable floor coverings.

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 [webstore.iec.ch](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.

- 6.1: Class III heating units only are allowed (Finland).

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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.

Guidance documents concerning the application of the safety requirements for appliances can be accessed via TC 61 supporting documents on the IEC website

<https://www.iec.ch/tc61/supportingdocuments>

This information is given for the convenience of users of this International Standard and does not constitute a replacement for the normative text in this standard.

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.

NOTE 2 Horizontal publications, basic safety publications and group safety publications 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.

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.

NOTE 3 Standards dealing with non-safety aspects of household appliances are:

- IEC standards published by TC 59 concerning methods of measuring performance;
- CISPR 11, CISPR 14-1 and relevant IEC 61000-3 series standards concerning electromagnetic emissions;
- CISPR 14-2 concerning electromagnetic immunity;
- IEC standards published by TC 111 concerning environmental matters.

## HOUSEHOLD AND SIMILAR ELECTRICAL APPLIANCES – SAFETY –

### Part 2-106: Particular requirements for heated carpets and for heating units for room heating installed under removable floor coverings

#### 1 Scope

This clause of Part 1 is replaced by the following.

This part of IEC 60335 deals with the safety of

- **portable heated carpets;**
- **heated carpets** and similar appliances;
- **heating units** to heat the room in which they are located and that are intended to be installed directly under materials used as a removable floor covering such as carpet, cushion vinyl, or loose laid laminate,

their **rated voltage** being not more than 250 V for single-phase installations and 480 V for other installations, including direct current (DC) supplied appliances.

Attention is drawn to the fact that

- in many countries different wiring rules apply;
- 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 authorities for fire protection, the national authorities for building regulations, the national health authorities, the national authorities responsible for the protection of labour and similar authorities.

This standard does not apply to

- appliances intended exclusively for industrial purposes;
- 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);
- blankets, pads and similar flexible heating appliances (IEC 60335-2-17);
- heated mats and foot warmers with an area not exceeding 0,5 m<sup>2</sup> (IEC 60335-2-81);
- flexible sheet heating systems permanently incorporated in the floor of the building structure (IEC 60335-2-96);
- flexible heating elements incorporated in other appliances;
- **battery-operated appliances.**

## 2 Normative references

This clause of Part 1 is applicable except as follows.

*Addition:*

IEC 60884-1:2002, *Plugs and socket-outlets for household and similar purposes – Part 1: General requirements*

IEC 60884-1:2002/AMD1:2006

IEC 60884-1:2002/AMD2:2013<sup>1</sup>

## 3 Terms and definitions

This clause of Part 1 is applicable except as follows.

### 3.1 Definitions relating to physical characteristics

#### 3.1.9 *Replacement:*

operation of the appliance under the following conditions:

**heating units** are installed under a layer of material having a thermal resistance of approximately  $0,1 \text{ m}^2 \cdot \text{K/W}$ . **Heating units**, the current of which can vary depending on the length of the heating element, and those that can supply other **heating units** are loaded so that the current marked on the heating element flows through the **heating unit**.

### 3.5 Definitions relating to types of appliances

#### 3.5.101

##### **heating unit**

heating element equipped with means for connection to the supply

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#### 3.5.102

##### **modular heating unit**

prefabricated assembly consisting of a **heating unit** and other materials

#### 3.5.103

##### **controlled appliance**

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

#### 3.5.104

##### **heated carpet**

appliance having an area exceeding  $0,5 \text{ m}^2$  on which the user's feet or body are placed in order to warm them

### 3.6 Definitions relating to parts of an appliance

#### 3.6.101

##### **electrode**

conductive part incorporated in a flexible sheet heating element for supplying the heating material

<sup>1</sup> There exists a consolidated edition 3.2:2013 that includes edition 3 and its Amendment 1 and Amendment 2.

### 3.6.102

#### **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, which are intended to be under or part of the floor covering

Note 1 to entry: The **flexible part** may be provided with a **detachable cover**.

## 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 Addition:

*For laminated **heated carpets**, an additional appliance is required for the tests of 22.103.*

*For **heating units**, two additional appliances are required for the test of 18.102. For **heating units** with deposited film or printed circuit heating elements, two additional appliances are required for the test of 21.102.*

*For **heated carpets** that incorporate a wear indicator such as a colour change, special samples with the textile layer worn or removed to expose the indicator are required for the tests of Clauses 11, 13, 18 and Subclauses 19.2, 19.101, 21.101, 21.102, 21.103 and 21.104.*

*The tests of 21.101 and 21.104 may be carried out on separate appliances.*

*A 15 m length of heating element or internal wiring is required for the tests of 21.105.*

### 5.3 Addition:

*The test of 21.101 may be carried out in conjunction with the conditioning in 18.102.2.*

*Washable **portable heated carpets** are laundered twice in accordance with the instructions before testing is started.*

### 5.5 Addition:

*If **portable heated carpets** are provided with a **detachable cover**, tests are carried out with or without this cover, whichever is the most unfavourable.*

### 5.6 Addition:

***Thermostats** sensitive to room air temperature or outdoor air temperature are short circuited. However, the **thermostat** is not short circuited if it can be set so that it does not cycle.*

*For electronic controls, it may be necessary to render the sensing elements inoperative instead of short circuiting the **thermostat**.*

### 5.10 Addition:

For **heating units** that are cut to measure, the tests are carried out after connecting the **supply leads** and protecting the edges in accordance with the instructions.

## 6 Classification

This clause of Part 1 is applicable except as follows.

### 6.1 Addition:

If a **heating unit** is classified, the relevant requirements apply.

**Portable heated carpets** shall be class II or III.

### 6.2 Addition:

**Heating units** and other floor mounted parts shall be at least IPX7.

**Heated carpets**, other than **portable heated carpets**, and similar appliances shall be IPX7.

This requirement does not apply to the plug for appliances connected via a **supply cord** fitted with a plug or to wall-mounted controls.

## 7 Marking and instructions

This clause of Part 1 is applicable except as follows.

### 7.1 Modification:

Instead of the marking of **rated power input** or **rated current**, the following applies:

**Heating units** shall be marked with their **rated power input** and the maximum **rated current** at 20 °C. **Heating units** that can be cut to measure shall be marked with their **rated power input** per metre length.

**Heating units** shall be marked with their maximum current if

- the current can vary depending on the length of the **heating unit**; or
- other **heating units** can be supplied through them.

Appliances with **detachable controls** shall be marked with the reference number or by other means of identification of the control.

### Addition:

**Heating units** shall be marked with the indication of orientation, unless they are symmetrical.

The marking shall be repeated at least once every 0,5 m of the heating element or on each section that can be cut to form a **heating unit**.

**Heating units** that can be cut to measure and have to be cut at specified places shall be marked appropriately.

**Heating units** intended to be installed only above a floor of concrete or similar material shall be permanently marked with the substance of the following:

In order to avoid a fire hazard, this heating unit is to be installed only above a floor of concrete or similar material.

**Flexible parts** of the **portable heated carpets** shall be marked with the symbol ISO 7000-3114 (2011-10) and the symbol ISO 7000-3124 (2011-10) or the substance of the following:

Do not dry clean. Do not bleach.

In addition, **portable heated carpets** not intended to be washed shall be marked with the symbol ISO 7000-3123 (2011-10) or the substance of the following:

Do not wash.

#### 7.6 Addition:



[symbol ISO 7000-3114 (2011-10)]

Do not dry clean



[symbol ISO 7000-3123 (2011-10)]

Do not wash



[symbol ISO 7000-3124 (2011-10)]

Do not bleach

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#### 7.12 Addition:

The instructions shall contain the substance of the following:

This appliance is for indoor use only.

For **heated carpets** that incorporate a wear indicator such as a colour change, the instructions shall clearly explain the purpose of the indicator and the action to be taken when it becomes visible.

The instructions for **portable heated carpets** shall contain the substance of the following:

Portable heated carpets should not be used if there are signs of damage.

Portable heated carpets should not be used for warming animals.

The instructions for **portable heated carpets** shall give details regarding laundering or cleaning. If symbol ISO 7000-3114 (2011-10), symbol ISO 7000-3123 (2011-10) or symbol ISO 7000-3124 (2011-10) are used, their meaning shall be explained.

The instructions for **portable heated carpets** shall state that the appliance shall be repaired or replaced if the cover is worn. They shall explain how such wear can be observed.

*Modification:*

The instructions concerning persons (including children) with reduced physical, sensory or mental capabilities or lack of experience and knowledge and children playing with the appliance are not required.

**7.12.1 Addition:**

Instructions shall include the following:

- explanation of the markings, if necessary;
- a statement that **heating units** have to be separated from other heat sources;
- a statement that the **heating unit** is not to be installed on irregular surfaces;
- a statement that the **heating unit** is to be installed with the correct orientation if applicable;
- a statement that the installation is to be in accordance with the national wiring rules; and
- a recommendation that the **heating units** are to be supplied through a residual current device (RCD) having a rated residual operating current not exceeding 30 mA.

Instructions shall include the following information for installing the **heating units**:

- precautions to be taken to avoid damage during installation;
- dimensions and distances to be taken into account;
- description of the fixing areas of the **heating unit**;
- guidance on how to avoid damage to a **heating unit** and its terminations due to relative movement after installation;
- the lowest ambient temperature at which **heating units** may be installed;
- the minimum radius for bending the heating element, if applicable;
- precautions to be taken to avoid creasing the heating element;
- how to interconnect **heating units**, giving the cross-sectional area of the leads and type of leads, if applicable;
- the maximum current allowed to flow through one **heating unit** when other **heating units** are supplied through it or when the current can vary depending on its length;
- list of controls that are necessary to ensure compliance with the standard including the statement that the appliance must only be used in conjunction with these controls as they form part of the overheating protection system, unless they are incorporated into the **heating unit**; and
- specification of any adhesive to be used.

**7.12.101** The instructions for **heating units** that can be cut to measure shall state that the installation work is only to be carried out by the manufacturer or its service agent in order to avoid a hazard.

**7.14 Addition:**

The height of the lettering on the **flexible part** of the **portable heated carpets** shall be at least 2,5 mm.

The height of the symbols shown in the Addition to 7.6 shall be at least 5 mm.

The height of the lettering of the marking for **heating units** intended to be installed only above a floor of concrete or similar material shall be at least 20 mm.