IEC 60299

Edition 3.0 2014-07

INTERNATIONAL STANDARD

NORME INTERNATIONALE

Household electric blankets – methods for measuring performance

Couvertures chauffantes électriques à usage domestique – méthodes de mesure des performances

IEC 60299:2014-07(en-fr)

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INTERNATIONAL ELECTROTECHNICAL COMMISSION

COMMISSION ELECTROTECHNIQUE INTERNATIONALE

PRICE CODE
CODE PRIX N

ICS 97.100.10

ISBN 978-2-8322-1694-1

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INTERNATIONAL ELECTROTECHNICAL COMMISSION

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FOREWORD

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International Standard IEC 60299 has been prepared by sub-committee 59C: Heating appliances, of IEC technical committee 59: Performance of household electrical appliances.

This third edition cancels and replaces the second edition published in 1994. This edition constitutes a technical revision.

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

a) extended classification;

b) extended list of measurements;

c) temperature measurement means changed to thermocouples.

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

FDIS	Report on voting
59C/181/FDIS	59C/184/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 publication has been drafted in accordance with the ISO/IEC Directives, Part 2.

In this standard, the following print types are used:

– *test specifications: in italic type*
– notes: in small roman type
– other text: in roman type
– terms defined in Clause 3: in **bold** type.

The committee has decided that the contents of this 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- withdrawn,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.

HOUSEHOLD ELECTRIC BLANKETS – METHODS FOR MEASURING PERFORMANCE

1 Scope

This International Standard applies to electric **blankets**, **wraps** and **duvets** for household use.

This International Standard defines the main performance characteristics of electric **blankets**, **wraps** and **duvets** and specifies methods for measuring these characteristics, for the information of users.

This International Standard does not specify values for performance characteristics.

NOTE This standard does not deal with safety requirements that are covered by IEC 60335-2-17.

2 Normative references

The following documents, in whole or in part, are normatively referenced in this document and are indispensable for its application. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

IEC 60335-2-17:2012 *Household and similar electrical appliances – Safety – Part 2-17: Particular requirements for blankets, pads, clothing and similar flexible heating appliances*

IEC 62301:2011, *Household electrical appliances – Measurement of standby power*

ISO 2439, *Polymeric materials, cellular flexible – Determination of linear dimensions*

3 Terms and definitions

For the purposes of this document, the following terms and definitions apply.

3.1
blanket
appliance comprising a substantially flat **flexible part** that is intended to form part of the bedding, for heating the bed

3.2
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 1 to entry: The **flexible part** may be inside a detachable cover.

3.3
underblanket
blanket to be used under the occupant of the bed

3.4
overblanket
blanket to be used over the occupant of the bed

3.5
wrap
blanket comprising a **flexible part** intended to be draped over the human body in order to keep it warm

3.6
duvet
quilted **overblanket** intended to be used without additional bedding over the occupant of the bed, the heated element providing supplementary heat

3.7
blanket with uniform temperature
blanket having an even temperature over the **heated area**

3.8
blanket with non-uniform temperature
blanket in which the temperature gradually increases from the head end to the foot end of the **heated area**

3.9
blanket with a high temperature zone
blanket having an even temperature over the major part and having a higher temperature zone generally at the foot end of the **heated area**

3.10
blanket with ambient temperature compensation
blanket having a power input which significantly varies inversely with changes in ambient temperature

3.11
heated area
area of the **flexible part** enclosed within the outer perimeter of the heating element or electro-conductive textile

Note 1: The **heated area** 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 2: 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 3: If a **blanket** has two separate 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

3.12
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

Note 1 to entry: 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 parallel runs of the heating element.

Note 2 to entry: If a double **blanket** has two heating elements which are separately controlled, it has two **heated areas**.

4 Classification

4.1 General

The classifications of the appliance are stated.

4.2 Type

Electric **blankets**, **wraps** and **duvets** for household use are classified according to their type:

– **underblanket;**
– **overblanket;**
– **wrap;**
– **duvet.**

4.3 Heated areas

Electric **blankets**, **wraps** and **duvets** for household use are classified according to the size and the number of **heated areas**:

– single **blanket**;
– double **blanket** with one **heated area**;
– double **blanket** with two **heated areas**.

4.4 Temperature distribution

Electric **blankets**, **wraps** and **duvets** for household use are classified according to temperature distribution.

4.5 Means of control

Electric **blankets**, **wraps** and **duvets** for household use are classified according to the means of control:

– **non-controlled appliance**
– **controlled appliance**
– **blanket** with uniform **temperature**;
– **blanket with non-uniform temperature**;
– **blanket with a high temperature zone**.

4.6 Regulation

Electric **blankets**, **wraps** and **duvets** for household use are classified according to means of regulation:

– **blanket** without any control;
– **blanket** with a control having variable settings;
– **blanket** with a control having step settings;
– **blanket with ambient temperature compensation**;

4.7 Type of supply

Electric **blankets**, **wraps** and **duvets** for household use are classified according to the type of supply:

– **blanket** for direct connection to the supply mains;

– extra low voltage **blanket**.

NOTE An extra low voltage **blanket** has a rated voltage not exceeding 24 V.

4.8 Method of cleaning

Electric **blankets**, **wraps** and **duvets** for household use are classified according to the method of cleaning:

– washable by hand;

– machine washable;

– not washable.

4.9 Fixing of the underblanket to the mattress

Electric **blankets**, **wraps** and **duvets** for household use are classified according to the means of fixing of the **underblanket** to the mattress:

– **underblanket** without means of fixing;

– **underblanket** with tie tapes;

– fitted **underblanket**.

5 List of measurements

Performance is determined by means of the following measurements:

– dimensions, mass and textile composition (Clause 7);

– evenness of temperature (Clause 8);

– heating-up time and energy consumption (Clause 9);

– stability of temperature (Clause 10);

– effect of laundering (Clause 11);

– control settings (Clause 12).

6 General conditions for measurements

Unless otherwise specified, measurements are made under the following conditions:

a) Test room:

The tests are carried out in a draught-free room in which the ambient temperature is maintained at 20 °C ± 5 °C.

b) Supply voltage:

The supply voltage is maintained at the rated voltage ± 1 %. When the appliance is marked with a rated voltage range, the report shall state the voltage used for the test.

NOTE 1 If the results obtained by testing the appliance at rated voltage are considered to be misleading due to the national supply voltage, the appliance can also be tested at a voltage corresponding to the nominal voltage of the national supply system.

c) Arrangement of the appliance:

Any detachable cover is fitted and the **flexible part** is placed between sheets of thermal insulation , the size of which is such that the edges extend at least 100 mm beyond the outline of the **heated area**.

d) The thermal insulation is made of open-cell polyether having:

- cell count 18 + 2 per cm;
- specific mass 30 kg/m^3 +10 %;
- hardness to ISO 2439. between 120 N and 170 N at 40 % impression measured according

The thermal insulation is supported over its entire area by a piece of plywood 20 mm thick, situated not less than 300 mm above the floor.

The thickness of the thermal insulation under the appliance is approximately 72 mm and over the appliance approximately

- no material for **duvets,**
- 7,2 mm for **overblanket**s and **wraps,**
- 36 mm for **underblankets**

NOTE 2 The specification of the thermal insulation is taken from IEC 60335-2-17:2012, Annex AA.

The above specified thickness of the thermal insulation is for reference; the exact thickness shall be calibrated as specified in IEC 60335-2-17:2012, Annex AA.

7 Dimensions, mass and textile composition

7.1 Dimensions

7.1.1 The dimensions of the **flexible part** of the appliance and the **heated area** are determined.

7.1.2 The dimensions of a washable detachable cover are also determined in order to assess the effect of laundering.

The appliance is spread out without tension on a flat surface and the length and width are measured.

The average values for each dimension are calculated.

The dimensions are stated in millimetres (mm), rounded to the nearest 10 mm.

7.1.3 The lengths of flexible cords are determined.

The measurements are made, as applicable, between

- *the cord-entry of the **flexible part** and the control or the transformer;*
- *the control or the transformer and the plug;*
- *two controls.*

The lengths are stated in metres (m), rounded down to the nearest 0,05 m.

7.2 Mass

*The mass of the **flexible part** is measured after the test of Clause 10.*

The appliance is conditioned by operating it for 3 h at rated voltage and then the mass is measured. The specific mass is calculated by dividing the mass by the area of the **flexible part**.

The specific mass is stated in g/m^2 rounded up to the nearest 10 g/m^2.

NOTE The mass of flexible cords and other external components is not included.

7.3 Textile composition

The textile composition of the external surface of the **flexible part** and detachable cover, if any, is stated.

8 Evenness of temperature

*The temperature of the surface of the **flexible part** is measured by means of thermocouples attached to the centre of copper plates having dimensions of 100 mm × 100 mm × 0,5 mm.*

*For **overblankets**, **wraps** and **duvets** the plates are placed under the **flexible part**.*

*For **underblankets** the plates are placed over the **flexible part**.*

*A plate is placed at the centre of the **heated area** and oriented so that its axes are at 45° to the axes of the appliance. Other plates are placed on the **heated area**, as shown in Figure 1.*