IEC 60335-2-43

Edition 5.0 2024-10
COMMENTED VERSION

INTERNATIONAL STANDARD

colour inside

Household and similar electrical appliances – Safety –
Part 2-43: Particular requirements for clothes dryers and towel rails

IEC 60335-2-43:2024-10 CMV(en)

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Household and similar electrical appliances – Safety – Part 2-43: Particular requirements for clothes dryers and towel rails

INTERNATIONAL ELECTROTECHNICAL COMMISSION

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INTERNATIONAL ELECTROTECHNICAL COMMISSION

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HOUSEHOLD AND SIMILAR ELECTRICAL APPLIANCES – SAFETY –

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FOREWORD

1) The International Electrotechnical Commission (IEC) is a worldwide organization for standardization comprising all national electrotechnical committees (IEC National Committees). The object of 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, IEC publishes International Standards, Technical Specifications, Technical Reports, Publicly Available Specifications (PAS) and Guides (hereafter referred to as "IEC Publication(s)"). 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. IEC collaborates closely with the International Organization for Standardization (ISO) in accordance with conditions determined by agreement between the two organizations.
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9) IEC draws attention to the possibility that the implementation of this document may involve the use of (a) patent(s). IEC takes no position concerning the evidence, validity or applicability of any claimed patent rights in respect thereof. As of the date of publication of this document, IEC had not received notice of (a) patent(s), which may be required to implement this document. However, implementers are cautioned that this may not represent the latest information, which may be obtained from the patent database available at https://patents.iec.ch. IEC shall not be held responsible for identifying any or all such patent rights.

This commented version (CMV) of the official standard IEC 60335-2-43:2024 edition 5.0 allows the user to identify the changes made to the previous IEC 60335-2-43:2017 edition 4.0. Furthermore, comments from IEC TC 61 experts are provided to explain the reasons of the most relevant changes, or to clarify any part of the content.

A vertical bar appears in the margin wherever a change has been made. Additions are in green text, deletions are in strikethrough red text. Experts' comments are identified by a blue-background number. Mouse over a number to display a pop-up note with the comment.

This publication contains the CMV and the official standard. The full list of comments is available at the end of the CMV.

IEC 60335-2-43 has been prepared by IEC technical committee 61: Safety of household and similar electrical appliances. It is an International Standard.

This fifth edition cancels and replaces the fourth edition published in 2017. This edition constitutes a technical revision.

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

a) alignment with IEC 60335-1:2020;
b) conversion of some notes to normative text (Clause 1, 11.101, 15.101);
c) addition of test probe 19 for accessibility of live parts and moving (8.1.1, 20.2, B.22.3, B.22.4);
d) addition of accessible surface temperature limits (11.3, 11.8).

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

Draft	Report on voting
61/7281/FDIS	61/7305/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. The main document types developed by IEC are described in greater detail at www.iec.ch/publications.

A list of all parts of the IEC 60335 series, 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 clothes dryers and towel rails.

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 in the data related to the specific document. At this date, the document will be

- reconfirmed,
- withdrawn, or
- revised.

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.

IMPORTANT – The "colour inside" logo on the cover page of this document indicates that it contains colours which are considered to be useful for the correct understanding of its contents. Users should therefore print this document using a colour printer.

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~~ can 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 and generic standards~~ 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. ~~For example, in the case of temperature requirements for surfaces on many appliances, generic standards, such as ISO 13732-1 for hot surfaces, are not applicable in addition to Part 1 or part 2 standards.~~ 1

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. 2

HOUSEHOLD AND SIMILAR ELECTRICAL APPLIANCES – SAFETY –

Part 2-43: Particular requirements for clothes dryers and towel rails

1 Scope

This clause of Part 1 is replaced by the following.

This part of IEC 60335 deals with the safety of electric **clothes dryers** ~~for drying textiles on racks located in a warm airflow,~~ including **clothes dryers** intended for drying footwear or gloves, and ~~to electric~~ **towel rails** for household and similar purposes, their **rated voltage** being not more than 250 V including direct current (DC) powered appliances and **battery-operated appliances**. 3

~~NOTE 101 The clothes racks can be fixed or free-standing in a cabinet. The air circulation can be natural or forced.~~

Appliances not intended for normal household use but that nevertheless ~~may~~ can be a source of danger to the public, such as appliances intended to be used by laymen in shops, in light industry and on farms, are within the scope of this standard.

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:

– persons (including children) whose
  - physical, sensory or mental capabilities; or
  - lack of experience and knowledge

  prevents them from using the appliance safely without supervision or instruction;
– children playing with the appliance.

~~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~~ can 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:

– spin extractors (IEC 60335-2-4);
– tumble dryers (IEC 60335-2-11);
– 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).

2 Normative references

This clause of Part 1 is applicable.

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*~~ *Modification:* **4**
normal operation

Replace the first paragraph with the following:

operation of the appliance under the following conditions:

Textiles positioned over the racks or rails in accordance with the instructions. The textiles are pre-washed, double-hemmed cotton sheets having dimensions approximately 700 mm × 700 mm and a specific mass between 140 g/m^2 and 175 g/m^2 in the dry condition.

Four layers of textiles are used for appliances having a heated surface supporting the textiles. One layer is used for appliances in which the textiles are dried by a warm airflow.

Note 101 to entry: In case of doubt, the cotton sheets are conditioned for at least 24 h at a temperature of 20 °C ± 5 °C and a relative humidity of (60 ± 5) %.

For appliance with a cabinet, the cabinet shall be closed during operation.

For **clothes dryers** intended for drying footwear or gloves, having loads that cover all of the air outlets, if any, the air outlets are blocked with a number of layers of textile material that results in the most unfavourable condition without operation of a **protective device**.

3.5 Definitions relating to types of appliances

~~**3.5** *Additional definitions:*~~

3.5.101
clothes dryer
appliance that does not have a mechanical action such as tumbling or spinning that is intended to dry clothes by air flow

Note 1 to entry: These appliances ~~may~~ can also be suitable to dry footwear, gloves and the like.

Note 2 to entry: The clothes can be located on racks that are fixed or free-standing in a cabinet. The air circulation can be natural or forced.

3.5.102
towel rail
appliance to hold, warm and dry towels

Note 1 to entry: These appliances ~~may~~ can also be suitable to dry swimwear, bath robes or the like.

3.6 Definitions relating to parts of appliances

~~**3.6** *Additional definition:*~~

3.6.101
free space
space with a volume exceeding 60 l where a child can be entrapped and which is accessible after opening any door or lid and removing any **detachable internal part**, including shelves and containers

Note 1 to entry: In calculating the volume, a space with any single dimension not exceeding 150 mm or any two orthogonal dimensions, each of which do not exceed 200 mm, is ignored.

4 General requirement

This clause of Part 1 is applicable.

5 General conditions for the tests

This clause of Part 1 is applicable.

6 Classification

This clause of Part 1 is applicable except as follows.

6.2 *Addition:*

Clothes dryers intended for drying footwear or gloves that when in use have electrical components located below or inserted inside the footwear or gloves shall be at least IPX2. All other appliances shall be at least IPX1.

7 Marking and instructions

This clause of Part 1 is applicable except as follows.

7.12 *Addition:*

The instructions for **clothes dryers** shall include the substance of the following:

WARNING: This appliance is intended only for drying textiles washed in water.

Instructions for appliances intended to be placed above 850 mm in normal use shall include the substance of the following:

Do not place this product lower than 850 mm from the floor during use. **5**

7.12.1 *Addition:*

The installation instructions for **fixed towel rails** shall include the substance of the following:

WARNING: In order to avoid a hazard for very young children, this appliance ~~should~~ shall be installed so that the lowest heated rail is at least ~~600~~ 850 mm above the floor.

Instructions for other **fixed appliances** intended for installation above 850 mm in normal use shall include the substance of the following:

Do not mount this product lower than 850 mm from the floor. **6**

The instructions for **fixed towel rails** likely to be used in a bathroom shall state that the **towel rail** is to be installed so that switches and other controls cannot be touched by a person in the bath or shower. This instruction is not necessary if the **towel rail** is classified as at least IPX4.

8 Protection against access to live parts

This clause of Part 1 is applicable except as follows.

8.1.1 *Addition:*

For parts of appliances situated not more than 850 mm above the floor after installation or in normal use, in addition to the use of test probe 18, test probe 19 of IEC 61032 is also applied wherever test probe 18 is used and with the same test conditions used for test probe 18. **7**

8.1.3 *Addition:*

Test probe 19 is not applied.

9 Starting of motor-operated appliances

This clause of Part 1 is not applicable.

10 Power input and current

This clause of Part 1 is applicable.

11 Heating

This clause of Part 1 is applicable except as follows.

11.1 *Addition:*

***Towel rails** are also subjected to the test of 11.101.*

11.3 *Addition:*

*Where the external **accessible surfaces** are suitably flat and access permits, then the test probe of Figure 101 is used to measure the temperature rises of external **accessible surfaces** specified in Table 101. The probe is applied with a force of 4 N ± 1 N to the surface in such a way that the best possible contact between the probe and the surface is ensured. The measurement is performed after a contact period of 30 s.*

The probe may be held in place using a laboratory stand clamp or similar device. Any measuring instrument giving the same results as the probe may be used. **8**

11.4 *Addition:*

*If the temperature rise limits are exceeded in appliances incorporating motors, transformers or **electronic circuits**, and the power input is lower than the **rated power input**, the test is repeated with the appliance supplied at 1,06 times **rated voltage**.*

11.6 *Addition:*

***Combined appliances** are operated as **heating appliances**.*

11.7 ~~*Replacement*~~ *Modification:* **9**

Replace the first paragraph with the following:

Appliances are operated until steady conditions are established.

If drying action is controlled by a timer, ***clothes dryers*** *are operated for two cycles with the timer set to the maximum time.*

Replace the second dashed item of the second paragraph with the following:

– *the* ***battery*** *that has been* ***fully discharged*** *is charged for 1 h, while the appliance is operated as specified performing its intended function, if allowed by the construction of the appliance.* **10**

11.8 *Modification*:

Replace the first paragraph with the following:

During the test, the temperature rises are monitored continuously and shall not exceed the values shown in Table 3 and Table 101. **11**

Addition:

The temperature rise of the textiles shall not exceed 75 K.

The temperature rise at the air outlet of ***clothes dryers*** *intended for drying footwear or gloves shall not exceed the limits of Table 3 for handles held for short periods only.*

The temperature rise limits of motors, transformers and components of ***electronic circuits****, including parts directly influenced by them, may be exceeded when the appliance is operated at 1,15 times* ***rated power input****.*

The temperature rise of handles or grips of vents and air shutters shall not exceed the value specified in Table 3 for surfaces of handles, knobs, grips and similar parts which are held for short periods only in normal use. **12**

For oil-filled appliances, the temperature rise of parts in contact with oil is not measured.

Table 101 – Maximum temperature rises for specified external accessible surfaces under normal operating conditions

Surface	*Temperature rise of external accessible surfaces* [a] *K*		
	Surfaces and air outlets of clothes dryers intended for drying footwear or gloves	*Surfaces of other appliances situated not more than 850 mm above the floor after installation or in normal use*	*Surfaces of other appliances situated more than 850 mm above the floor after installation or in normal use*
Bare metal	*35*	*38*	*42*
Coated metal [b]	*39*	*42*	*49*
Glass and ceramic	*45*	*51*	*56*
Plastic and plastic coating > 0,4 mm [c], [d]	*60*	*58*	*62*
NOTE The temperature rise limits of handles, knobs, grips, keyboards, keypads and similar parts are specified in Table 3.			

[a] *Temperature rises are not measured on*
- *surfaces that are inaccessible to a 75 mm diameter probe having a hemispherical end;*
- *surfaces of **towel rails** that are measured during the test of 11.101.*

[b] *Metal is considered coated when a coating having a minimum thickness of 90 µm made of enamel, powder or non-substantially plastic coating is used.*

[c] *The temperature rise limit of plastic also applies for plastic material having a metal finish of thickness less than 0,1 mm.*

[d] *When the thickness of the plastic coating does not exceed 0,4 mm, the temperature rise limits of coated metal for underlying metal apply or the temperature rise limits for glass or ceramic material for underlying glass or ceramic material apply.*

11.101 ***Towel rails*** *are operated at* ***rated power input*** *but without textiles.*

The temperature rises of the surface shall not exceed the following values:

- *metal and painted metal* 60 K
- *vitreous enamelled metal* 65 K
- *glass and ceramic surfaces* 70 K
- *plastic having a thickness exceeding 0,3 mm* 85 K

The temperature rise limit of 85 K also applies for plastic material having a metal finish of thickness less than 0,1 mm.

~~NOTE~~ *When the thickness of the plastic coating does not exceed 0,3 mm, the temperature rise limits of the supporting material apply.*

12 ~~Void~~ Charging of metal-ion batteries

This clause of Part 1 is applicable. **13**

13 Leakage current and electric strength at operating temperature

This clause of Part 1 is applicable.

14 Transient overvoltages

This clause of Part 1 is applicable.

15 Moisture resistance

This clause of Part 1 is applicable except as follows.

~~**15.2** *Replacement:*~~ **14**

15.101 **Clothes dryers**, in which electrical components are located below the textiles, shall be constructed so that dripping water does not affect their electrical insulation.

Compliance is checked by the following test.

***Clothes dryers** with **type X attachment**, except those having a specially prepared cord, are fitted with the lightest permissible type of flexible cord of the smallest cross-sectional area specified in Table 13.*

~~*Water containing approximately 1 % NaCl*~~ *The spillage solution of 15.2* **15** *is dripped at a rate of 12 ml/min from a height just above the top rail. It is uniformly distributed over the usable area, 3 l of solution being used for each cubic metre of usable volume.*

~~NOTE 101~~ *The following dimensions are used to calculate the usable volume:*

– *height, maximum distance between the top of the uppermost rail and the top surface of the heating unit;*

– *width, length of the longest rail;*

– *depth, overall horizontal distance between the outer rails.*

*The appliance shall then withstand the electric strength test of 16.3 and inspection shall show that there is no trace of water on insulation that could result in a reduction of **clearances** and **creepage distances** below the values specified in Clause 29.*

16 Leakage current and electric strength

This clause of Part 1 is applicable.

17 Overload protection of transformers and associated circuits

This clause of Part 1 is applicable.

18 Endurance

This clause of Part 1 is not applicable.

19 Abnormal operation

This clause of Part 1 is applicable except as follows.

19.1 *Addition:*

For each of the tests, new textiles are used.

***Clothes dryers** intended for drying footwear or gloves are subjected to the tests of 19.101 and 19.102.*

19.2 *Addition:*

For appliances having a heated surface that supports the textiles, eight layers of textiles are used. For appliances in which the textiles are dried by a warm airflow, two layers of textiles are placed on the heating element guard or over the air inlet if the heating unit is located above the textiles.

The test is carried out with the textiles completely covering the guard or air inlet and then with the textiles covering 80 % of the area of the guard or air inlet, taking into account different positions of the textiles in order to find the most unfavourable condition.

Appliances incorporating a fan are also tested without the motor operating, the guard or air inlet being uncovered.

Appliances in which the heating unit is located above the textiles are also tested with two layers of textiles placed over the rails. The rails are raised by 50 mm above their normal position or through the maximum distance allowed by the construction, whichever is less.

Wall-mounted appliances that are folded when stored are also tested in the folded position without textiles.

19.9 *Addition:*

***Clothes dryers** intended for drying footwear or gloves are considered to be operated continuously.*

19.10 *Addition:*

The test is carried out with the heating elements disconnected or switched off.

19.13 *Addition:*

The temperature rise of the textiles shall not exceed 150 K.

*For **clothes dryers** intended for drying footwear or gloves, the temperature rise of the textiles shall not exceed 75 K.*

The textiles shall not be ~~significantly~~ scorched.

19.101 ***Clothes dryers** intended for drying footwear or gloves are operated as specified in Clause 11 until steady conditions are established. The voltage at the terminals of the motor is then reduced in steps until the ~~running speed of the motor is just sufficient to prevent the~~ **thermal cut-out** ~~from operating~~ operates, the power input to the heating element being maintained at 1,15 times **rated power input**.*

The voltage is decreased at:

– *1 V per minute, for motors having a **working voltage** not exceeding 30 V;*
– *5 V per minute, for motors having a **working voltage** exceeding 30 V.*

*The voltage is then increased one step, the **thermal cut-out** is reset and the appliance is ~~then~~ operated until steady conditions are established.* **16**

*The test is repeated with the heat setting switch, if any, placed in each position. The voltage to the heating element switch being maintained at the value that gives 1,15 times **rated power** input with the switch at the highest heat setting position.*

19.102 ***Portable clothes dryers** intended for drying footwear or gloves are operated under **normal operation** at 1,15 times **rated power input**.*

A rectangular sheet of paper is held against air inlets, without additional pressure. The paper has an area ~~sufficient~~ that is large enough to cover the surface where air inlets are situated and is moved in any direction in order to restrict the airflow so that the most unfavourable conditions are established.

The paper has a specific mass of 80 g/m^2 ± 16 g/m^2.

*The test is carried out with the paper sheet positioned so that the **thermal cut-out** is prevented from operating.*

20 Stability and mechanical hazards

This clause of Part 1 is applicable except as follows.

20.2 *Addition:*

For parts of appliances situated not more than 850 mm above the floor after installation or in normal use, in addition to the use of test probe 18, test probe 19 of IEC 61032 is also applied wherever test probe 18 is used and with the same test conditions used for test probe 18. **17**

20.101 Wall-mounted **clothes dryers** of the folding type shall withstand the forces likely to occur in normal use.

Compliance is checked by the following test.

*The appliance is loaded as specified for **normal operation** or without textiles, whichever is more unfavourable. A force of 50 N is applied to each critical part of the supporting mechanism in turn.*

The appliance shall not collapse.

20.102 The doors of **clothes dryers** that contains a **free space** shall be capable of being opened from the inside.

Compliance is checked by inspection, by measurement and by the following test.

*A force is applied to a point, equivalent to an **accessible inside point**, of each appropriate door of the appliance, at the midpoint of the edge farthest from the hinge axis in the direction perpendicular to the plane of the door.*

The force shall be applied at a rate not exceeding 15 N/s and the door shall open before the force exceeds 70 N.

20.103 Appliances with horizontally hinged doors shall have adequate stability when the open door is subjected to a load.

Compliance is checked by the following test.

The empty appliance is placed on a horizontal surface and a mass of 23 kg applied to the centre of the open door.

The appliance shall not tilt.

NOTE Damage and deformation of doors and hinges are neglected.

21 Mechanical strength

This clause of Part 1 is applicable.

22 Construction

This clause of Part 1 is applicable except as follows.

22.40 *Addition:*

For **clothes dryers** intended for drying footwear or gloves, the switch in the **off-position** shall disconnect **electronic circuits**, unless compliance with Clause 19 does not depend on the operation of a **self-resetting thermal cut-out**.

23 Internal wiring

This clause of Part 1 is applicable except as follows.

23.3 *Addition:*

*The number of flexings for conductors of **portable clothes dryers** intended for drying footwear or gloves that are only flexed when the appliance is stored is 5 000.*

24 Components

This clause of Part 1 is applicable except as follows.

24.101 **Thermal cut-outs** incorporated in appliances for compliance with 19.4 shall not be a **self-resetting thermal cut-out**.

Compliance is checked by inspection.

25 Supply connection and external flexible cords

This clause of Part 1 is applicable except as follows.

25.1 *Modification:*

Appliances shall not incorporate an appliance inlet.

26 Terminals for external conductors

This clause of Part 1 is applicable.

27 Provision for earthing

This clause of Part 1 is applicable.

28 Screws and connections

This clause of Part 1 is applicable.

29 Clearances, creepage distances and solid insulation

This clause of Part 1 is applicable.

30 Resistance to heat and fire

This clause of Part 1 is applicable except as follows.

30.2.2 Not applicable.

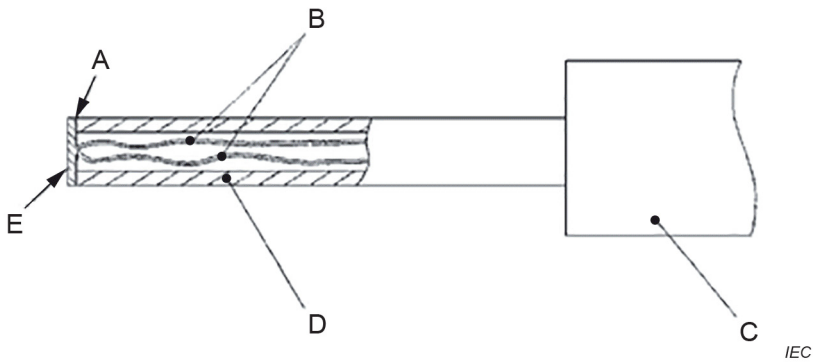
31 Resistance to rusting

This clause of Part 1 is applicable.

32 Radiation, toxicity and similar hazards

This clause of Part 1 is applicable.

Figures



Key

A adhesive

B thermocouple wires 0,3 mm diameter to IEC 60584-1 Type K

C handle arrangement permitting a contact force of 4 N ± 1 N

D polycarbonate tube: inside diameter 3 mm, outside diameter 5 mm

E tinned copper disc: 5 mm diameter, 0,5 mm thick with a flat contact face

Figure 101 – Probe for measuring surface temperatures

Annexes

The annexes of Part 1 are applicable except as follows.

Annex B
(normative)

Battery-operated appliances, separable batteries and detachable batteries for battery-operated appliances

Annex B of Part 1 is applicable except as follows.

11 Heating

B.11.1 Addition:

*If drying action is controlled by a timer, **clothes dryers** are operated for two cycles with the timer set to the maximum time or until the **battery** is depleted or the minimum capacity of the **battery** as specified in Table B.1 has been delivered, whichever is shorter. For appliances operated with **detachable batteries** or **separable batteries** that are disconnected from the appliance for charging purposes, if the **battery** is depleted before the appliance completes the duration of the test, the depleted **battery** is immediately replaced with another **battery** that is **fully charged**, the **battery** being the model or type reference of the **battery** provided or indicated in the instructions and the test is continued until the appliance completes the duration of the test as specified or it no longer operates due to depletion of the **battery**.* **18**

22 Construction

B.22.3 *Addition:*

For parts of appliances situated not more than 850 mm above the floor after installation or in normal use, in addition to the use of test probe 18, test probe 19 of IEC 61032 is applied as specified for test probe 18.

B.22.4 *Addition:*

*For parts of **batteries** situated not more than 850 mm above the floor after installation or in normal use, in addition to the use of test probe 18, test probe 19 of IEC 61032 is applied as specified for test probe 18.* **19**

Bibliography

The bibliography of Part 1 is applicable except as follows.

Addition:

IEC 60335-2-4, *Household and similar electrical appliances – Safety – Part 2-4: Particular requirements for spin extractors*

IEC 60335-2-11, *Household and similar electrical appliances – Safety – Part 2-11: Particular requirements for tumble dryers*

List of comments

1 This revision is for alignment with IEC 60335-1:2020.

2 This revision is for alignment with IEC 60335-1:2020.

3 This revision is for alignment with IEC 60335-1:2020.

4 This revision maintains the normal operation while charging as specified in IEC 60335-1:2020.

5 This instruction is introduced so that manufacturers can state whether the appliance is intended to be placed above 850 mm, in which case test probe 19 is not applied and the accessible surface temperature limits are greater.

6 This instruction is introduced so that manufacturers can state whether the appliance is intended for installation above 850 mm, in which case test probe 19 is not applied and the accessible surface temperature limits are greater.

7 Appliance can be located on the floor where they would be accessible to children up to 3 years in age, so test probe 19 is applicable. However, appliances and parts of appliances located above 850 mm from the floor are not considered to be within reach of these children, so test probe 19 is not applied.

8 Limits on the temperature rise of external accessible surfaces are introduced to address the risk of thermal injury from contact with external accessible surfaces based on IEC Guide 117 for Temperatures of touchable hot surfaces.

9 This revision maintains the requirements for appliance outlets and socket outlets and the test duration for charging of battery-operated appliances as specified in IEC 60335-1:2020.

10 This modification is for alignment with IEC 60335-1:2020 and aligns the test duration for operation of battery-operated appliances with that of mains operated appliances.

11 Limits on the temperature rise of external accessible surfaces are introduced to address the risk of thermal injury from contact with external accessible surfaces based on IEC Guide 117 for Temperatures of touchable hot surfaces.

12 This addition clarifies that these parts are considered to be held for short periods only.

13 This revision is for alignment with IEC 60335-1:2020.

14 The test of Subclause 15.2 of the Part 1 Standard may be applicable for some appliances. Therefore, this replacement is moved to Subclause 15.101 to maintain the test of Subclause 15.2 from the Part 1 Standard.

15 This revision is for alignment with IEC 60335-1:2020.

16 The test method is clarified by removing any subjective wording.

17 Appliance can be located on the floor where they would be accessible to children up to 3 years in age, so test probe 19 is applicable. However, appliances and parts of appliances located above 850 mm from the floor are not considered to be within reach of these children, so test probe 19 is not applied.

18 The test duration of operation for battery-operated appliances is modified to align with that of mains operated appliances.

19 Battery-operated appliance can be located on the floor where they would be accessible to children up to 3 years in age, so test probe 19 is applied to battery-operated appliances, detachable batteries and separable batteries. However, appliances and parts of appliances located above 850 mm from the floor are not considered to be within reach of these children, so test probe 19 is not applied.

IEC 60335-2-43

Edition 5.0 2024-10

INTERNATIONAL STANDARD

NORME INTERNATIONALE

Household and similar electrical appliances – Safety –
Part 2-43: Particular requirements for clothes dryers and towel rails

Appareils électrodomestiques et analogues – Sécurité –
Partie 2-43: Exigences particulières pour les appareils de séchage du linge et les sèche-serviettes

IEC 60335-2-43:2024-10(en-fr)

CONTENTS

INTERNATIONAL ELECTROTECHNICAL COMMISSION

_____

HOUSEHOLD AND SIMILAR ELECTRICAL APPLIANCES – SAFETY –

Part 2-43: Particular requirements for clothes dryers and towel rails

FOREWORD

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IEC 60335-2-43 has been prepared by IEC technical committee 61: Safety of household and similar electrical appliances. It is an International Standard.

This fifth edition cancels and replaces the fourth edition published in 2017. This edition constitutes a technical revision.

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

a) alignment with IEC 60335-1:2020;
b) conversion of some notes to normative text (Clause 1, 11.101, 15.101);

c) addition of test probe 19 for accessibility of live parts and moving (8.1.1, 20.2, B.22.3, B.22.4);

d) addition of accessible surface temperature limits (11.3, 11.8).

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

Draft	Report on voting
61/7281/FDIS	61/7305/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. The main document types developed by IEC are described in greater detail at www.iec.ch/publications.

A list of all parts of the IEC 60335 series, 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 clothes dryers and towel rails.

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 in the data related to the specific document. At this date, the document will be

- reconfirmed,
- withdrawn, or
- revised.

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.

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 can 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 2-43: Particular requirements for clothes dryers and towel rails

1 Scope

This clause of Part 1 is replaced by the following.

This part of IEC 60335 deals with the safety of electric **clothes dryers** including **clothes dryers** intended for drying footwear or gloves, and **towel rails** for household and similar purposes, their **rated voltage** being not more than 250 V including direct current (DC) powered appliances and **battery-operated appliances**.

Appliances not intended for normal household use but that nevertheless can be a source of danger to the public, such as appliances intended to be used by laymen in shops, in light industry and on farms, are within the scope of this standard.

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:

– persons (including children) whose
  - physical, sensory or mental capabilities; or
  - lack of experience and knowledge

  prevents them from using the appliance safely without supervision or instruction;
– children playing with the appliance.

Attention is drawn to the fact that:

– 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 health authorities, the national authorities responsible for the protection of labour and similar authorities.

This standard does not apply to:

– spin extractors (IEC 60335-2-4);
– tumble dryers (IEC 60335-2-11);
– 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).

2 Normative references

This clause of Part 1 is applicable.

3 Terms and definitions

This clause of Part 1 is applicable except as follows.

3.1 Definitions relating to physical characteristics

3.1.9 *Modification:*
normal operation

Replace the first paragraph with the following:

operation of the appliance under the following conditions:

Textiles positioned over the racks or rails in accordance with the instructions. The textiles are pre-washed, double-hemmed cotton sheets having dimensions approximately 700 mm × 700 mm and a specific mass between 140 g/m^2 and 175 g/m^2 in the dry condition.

Four layers of textiles are used for appliances having a heated surface supporting the textiles. One layer is used for appliances in which the textiles are dried by a warm airflow.

Note 101 to entry: In case of doubt, the cotton sheets are conditioned for at least 24 h at a temperature of 20 °C ± 5 °C and a relative humidity of (60 ± 5) %.

For appliance with a cabinet, the cabinet shall be closed during operation.

For **clothes dryers** intended for drying footwear or gloves having loads that cover all of the air outlets, if any, the air outlets are blocked with a number of layers of textile material that results in the most unfavourable condition without operation of a **protective device**.

3.5 Definitions relating to types of appliances

3.5.101
clothes dryer
appliance that does not have a mechanical action such as tumbling or spinning that is intended to dry clothes by air flow

Note 1 to entry: These appliances can also be suitable to dry footwear, gloves and the like.

Note 2 to entry: The clothes can be located on racks that are fixed or free-standing in a cabinet. The air circulation can be natural or forced.

3.5.102
towel rail
appliance to hold, warm and dry towels

Note 1 to entry: These appliances can also be suitable to dry swimwear, bath robes or the like.

3.6 Definitions relating to parts of appliances

3.6.101
free space
space with a volume exceeding 60 l where a child can be entrapped and which is accessible after opening any door or lid and removing any **detachable internal part**, including shelves and containers

Note 1 to entry: In calculating the volume, a space with any single dimension not exceeding 150 mm or any two orthogonal dimensions, each of which do not exceed 200 mm, is ignored.

4 General requirement

This clause of Part 1 is applicable.

5 General conditions for the tests

This clause of Part 1 is applicable.

6 Classification

This clause of Part 1 is applicable except as follows.

6.2 *Addition:*

Clothes dryers intended for drying footwear or gloves that when in use have electrical components located below or inserted inside the footwear or gloves shall be at least IPX2. All other appliances shall be at least IPX1.

7 Marking and instructions

This clause of Part 1 is applicable except as follows.

7.12 *Addition:*

The instructions for **clothes dryers** shall include the substance of the following:

WARNING: This appliance is intended only for drying textiles washed in water.

Instructions for appliances intended to be placed above 850 mm in normal use shall include the substance of the following:

Do not place this product lower than 850 mm from the floor during use.

7.12.1 *Addition:*

The installation instructions for **fixed towel rails** shall include the substance of the following:

WARNING: In order to avoid a hazard for very young children, this appliance shall be installed so that the lowest heated rail is at least 850 mm above the floor.

Instructions for other **fixed appliances** intended for installation above 850 mm in normal use shall include the substance of the following:

Do not mount this product lower than 850 mm from the floor.

The instructions for **fixed towel rails** likely to be used in a bathroom shall state that the **towel rail** is to be installed so that switches and other controls cannot be touched by a person in the bath or shower. This instruction is not necessary if the **towel rail** is classified as at least IPX4.

8 Protection against access to live parts

This clause of Part 1 is applicable except as follows.

8.1.1 *Addition:*

For parts of appliances situated not more than 850 mm above the floor after installation or in normal use, in addition to the use of test probe 18, test probe 19 of IEC 61032 is also applied wherever test probe 18 is used and with the same test conditions used for test probe 18.

8.1.3 *Addition:*

Test probe 19 is not applied.

9 Starting of motor-operated appliances

This clause of Part 1 is not applicable.

10 Power input and current

This clause of Part 1 is applicable.

11 Heating

This clause of Part 1 is applicable except as follows.

11.1 *Addition:*

***Towel rails** are also subjected to the test of 11.101.*

11.3 *Addition:*

*Where the external **accessible surfaces** are suitably flat and access permits, then the test probe of Figure 101 is used to measure the temperature rises of external **accessible surfaces** specified in Table 101. The probe is applied with a force of 4 N ± 1 N to the surface in such a way that the best possible contact between the probe and the surface is ensured. The measurement is performed after a contact period of 30 s.*

The probe may be held in place using a laboratory stand clamp or similar device. Any measuring instrument giving the same results as the probe may be used.

11.4 *Addition:*

*If the temperature rise limits are exceeded in appliances incorporating motors, transformers or **electronic circuits**, and the power input is lower than the **rated power input**, the test is repeated with the appliance supplied at 1,06 times **rated voltage**.*

11.6 *Addition:*

***Combined appliances** are operated as **heating appliances**.*

11.7 *Modification:*

Replace the first paragraph with the following:

Appliances are operated until steady conditions are established.

If drying action is controlled by a timer, ***clothes dryers*** *are operated for two cycles with the timer set to the maximum time.*

Replace the second dashed item of the second paragraph with the following:

– *the* ***battery*** *that has been* ***fully discharged*** *is charged for 1 h, while the appliance is operated as specified performing its intended function, if allowed by the construction of the appliance.*

11.8 *Modification*:

Replace the first paragraph with the following:

During the test, the temperature rises are monitored continuously and shall not exceed the values shown in Table 3 and Table 101.

Addition:

The temperature rise of the textiles shall not exceed 75 K.

The temperature rise at the air outlet of ***clothes dryers*** *intended for drying footwear or gloves shall not exceed the limits of Table 3 for handles held for short periods only.*

The temperature rise limits of motors, transformers and components of ***electronic circuits****, including parts directly influenced by them, may be exceeded when the appliance is operated at 1,15 times* ***rated power input****.*

The temperature rise of handles or grips of vents and air shutters shall not exceed the value specified in Table 3 for surfaces of handles, knobs, grips and similar parts which are held for short periods only in normal use.

For oil-filled appliances, the temperature rise of parts in contact with oil is not measured.

Table 101 – Maximum temperature rises for specified external accessible surfaces under normal operating conditions

Surface	*Temperature rise of external accessible surfaces* [a] *K*		
	Surfaces and air outlets of clothes dryers intended for drying footwear or gloves	***Surfaces of other appliances situated not more than 850 mm above the floor after installation or in normal use***	***Surfaces of other appliances situated more than 850 mm above the floor after installation or in normal use***
Bare metal	*35*	*38*	*42*
Coated metal [b]	*39*	*42*	*49*
Glass and ceramic	*45*	*51*	*56*
Plastic and plastic coating > 0,4 mm [c, d]	*60*	*58*	*62*
NOTE The temperature rise limits of handles, knobs, grips, keyboards, keypads and similar parts are specified in Table 3.			

[a] *Temperature rises are not measured on*
- *surfaces that are inaccessible to a 75 mm diameter probe having a hemispherical end;*
- *surfaces of **towel rails** that are measured during the test of 11.101.*

[b] *Metal is considered coated when a coating having a minimum thickness of 90 µm made of enamel, powder or non-substantially plastic coating is used.*

[c] *The temperature rise limit of plastic also applies for plastic material having a metal finish of thickness less than 0,1 mm.*

[d] *When the thickness of the plastic coating does not exceed 0,4 mm, the temperature rise limits of coated metal for underlying metal apply or the temperature rise limits for glass or ceramic material for underlying glass or ceramic material apply.*

11.101 ***Towel rails*** *are operated at* ***rated power input*** *but without textiles.*

The temperature rises of the surface shall not exceed the following values:

- *metal and painted metal* 60 K
- *vitreous enamelled metal* 65 K
- *glass and ceramic surfaces* 70 K
- *plastic having a thickness exceeding 0,3 mm* 85 K

The temperature rise limit of 85 K also applies for plastic material having a metal finish of thickness less than 0,1 mm.

When the thickness of the plastic coating does not exceed 0,3 mm, the temperature rise limits of the supporting material apply.

12 Charging of metal-ion batteries

This clause of Part 1 is applicable.

13 Leakage current and electric strength at operating temperature

This clause of Part 1 is applicable.

14 Transient overvoltages

This clause of Part 1 is applicable.

15 Moisture resistance

This clause of Part 1 is applicable except as follows.

15.101 **Clothes dryers**, in which electrical components are located below the textiles, shall be constructed so that dripping water does not affect their electrical insulation.

Compliance is checked by the following test.

***Clothes dryers** with **type X attachment**, except those having a specially prepared cord, are fitted with the lightest permissible type of flexible cord of the smallest cross-sectional area specified in Table 13.*

The spillage solution of 15.2 is dripped at a rate of 12 ml/min from a height just above the top rail. It is uniformly distributed over the usable area, 3 l of solution being used for each cubic metre of usable volume.

The following dimensions are used to calculate the usable volume:

- *height, maximum distance between the top of the uppermost rail and the top surface of the heating unit;*
- *width, length of the longest rail;*
- *depth, overall horizontal distance between the outer rails.*

*The appliance shall then withstand the electric strength test of 16.3 and inspection shall show that there is no trace of water on insulation that could result in a reduction of **clearances** and **creepage distances** below the values specified in Clause 29.*

16 Leakage current and electric strength

This clause of Part 1 is applicable.

17 Overload protection of transformers and associated circuits

This clause of Part 1 is applicable.

18 Endurance

This clause of Part 1 is not applicable.

19 Abnormal operation

This clause of Part 1 is applicable except as follows.

19.1 *Addition:*

For each of the tests, new textiles are used.

Clothes dryers *intended for drying footwear or gloves are subjected to the tests of 19.101 and 19.102.*

19.2 *Addition:*

For appliances having a heated surface that supports the textiles, eight layers of textiles are used. For appliances in which the textiles are dried by a warm airflow, two layers of textiles are placed on the heating element guard or over the air inlet if the heating unit is located above the textiles.

The test is carried out with the textiles completely covering the guard or air inlet and then with the textiles covering 80 % of the area of the guard or air inlet, taking into account different positions of the textiles in order to find the most unfavourable condition.

Appliances incorporating a fan are also tested without the motor operating, the guard or air inlet being uncovered.

Appliances in which the heating unit is located above the textiles are also tested with two layers of textiles placed over the rails. The rails are raised by 50 mm above their normal position or through the maximum distance allowed by the construction, whichever is less.

Wall-mounted appliances that are folded when stored are also tested in the folded position without textiles.

19.9 *Addition:*

Clothes dryers *intended for drying footwear or gloves are considered to be operated continuously.*

19.10 *Addition:*

The test is carried out with the heating elements disconnected or switched off.

19.13 *Addition:*

The temperature rise of the textiles shall not exceed 150 K.

For ***clothes dryers*** *intended for drying footwear or gloves, the temperature rise of the textiles shall not exceed 75 K.*

The textiles shall not be scorched.

19.101 ***Clothes dryers*** *intended for drying footwear or gloves are operated as specified in Clause 11 until steady conditions are established. The voltage at the terminals of the motor is then reduced in steps until the* ***thermal cut-out*** *operates, the power input to the heating element being maintained at 1,15 times* ***rated power input****.*

The voltage is decreased at:

– *1 V per minute, for motors having a* ***working voltage*** *not exceeding 30 V;*
– *5 V per minute, for motors having a* ***working voltage*** *exceeding 30 V.*

The voltage is then increased one step, the ***thermal cut-out*** *is reset and the appliance is operated until steady conditions are established.*

*The test is repeated with the heat setting switch, if any, placed in each position. The voltage to the heating element switch being maintained at the value that gives 1,15 times **rated power** input with the switch at the highest heat setting position.*

19.102 ***Portable clothes dryers*** *intended for drying footwear or gloves are operated under **normal operation** at 1,15 times **rated power input**.*

A rectangular sheet of paper is held against air inlets, without additional pressure. The paper has an area that is large enough to cover the surface where air inlets are situated and is moved in any direction in order to restrict the airflow so that the most unfavourable conditions are established.

The paper has a specific mass of 80 g/m^2 ± 16 g/m^2.

*The test is carried out with the paper sheet positioned so that the **thermal cut-out** is prevented from operating.*

20 Stability and mechanical hazards

This clause of Part 1 is applicable except as follows.

20.2 *Addition:*

For parts of appliances situated not more than 850 mm above the floor after installation or in normal use, in addition to the use of test probe 18, test probe 19 of IEC 61032 is also applied wherever test probe 18 is used and with the same test conditions used for test probe 18.

20.101 Wall-mounted **clothes dryers** of the folding type shall withstand the forces likely to occur in normal use.

Compliance is checked by the following test.

*The appliance is loaded as specified for **normal operation** or without textiles, whichever is more unfavourable. A force of 50 N is applied to each critical part of the supporting mechanism in turn.*

The appliance shall not collapse.

20.102 The doors of **clothes dryers** that contains a **free space** shall be capable of being opened from the inside.

Compliance is checked by inspection, by measurement and by the following test.

*A force is applied to a point, equivalent to an **accessible inside point**, of each appropriate door of the appliance, at the midpoint of the edge farthest from the hinge axis in the direction perpendicular to the plane of the door.*

The force shall be applied at a rate not exceeding 15 N/s and the door shall open before the force exceeds 70 N.

20.103 Appliances with horizontally hinged doors shall have adequate stability when the open door is subjected to a load.

Compliance is checked by the following test.

The empty appliance is placed on a horizontal surface and a mass of 23 kg applied to the centre of the open door.

The appliance shall not tilt.

NOTE Damage and deformation of doors and hinges are neglected.

21 Mechanical strength

This clause of Part 1 is applicable.

22 Construction

This clause of Part 1 is applicable except as follows.

22.40 *Addition:*

For **clothes dryers** intended for drying footwear or gloves, the switch in the **off-position** shall disconnect **electronic circuits**, unless compliance with Clause 19 does not depend on the operation of a **self-resetting thermal cut-out**.

23 Internal wiring

This clause of Part 1 is applicable except as follows.

23.3 *Addition:*

*The number of flexings for conductors of **portable clothes dryers** intended for drying footwear or gloves that are only flexed when the appliance is stored is 5 000.*

24 Components

This clause of Part 1 is applicable except as follows.

24.101 **Thermal cut-outs** incorporated in appliances for compliance with 19.4 shall not be a **self-resetting thermal cut-out**.

Compliance is checked by inspection.

25 Supply connection and external flexible cords

This clause of Part 1 is applicable except as follows.

25.1 *Modification:*

Appliances shall not incorporate an appliance inlet.

26 Terminals for external conductors

This clause of Part 1 is applicable.

27 Provision for earthing

This clause of Part 1 is applicable.

28 Screws and connections

This clause of Part 1 is applicable.

29 Clearances, creepage distances and solid insulation

This clause of Part 1 is applicable.

30 Resistance to heat and fire

This clause of Part 1 is applicable except as follows.

30.2.2 Not applicable.

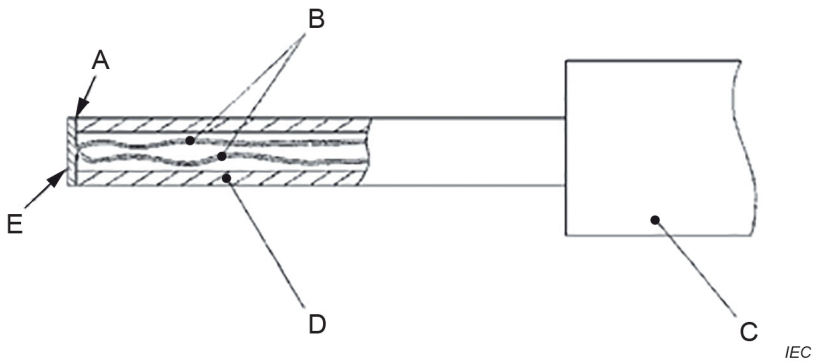
31 Resistance to rusting

This clause of Part 1 is applicable.

32 Radiation, toxicity and similar hazards

This clause of Part 1 is applicable.

Figures



Key

A adhesive

B thermocouple wires 0,3 mm diameter to IEC 60584-1 Type K

C handle arrangement permitting a contact force of 4 N ± 1 N

D polycarbonate tube: inside diameter 3 mm, outside diameter 5 mm

E tinned copper disc: 5 mm diameter, 0,5 mm thick with a flat contact face

Figure 101 – Probe for measuring surface temperatures

Annexes

The annexes of Part 1 are applicable except as follows.

Annex B
(normative)

Battery-operated appliances, separable batteries and detachable batteries for battery-operated appliances

Annex B of Part 1 is applicable except as follows.

11 Heating

B.11.1 Addition:

*If drying action is controlled by a timer, **clothes dryers** are operated for two cycles with the timer set to the maximum time or until the **battery** is depleted or the minimum capacity of the **battery** as specified in Table B.1 has been delivered, whichever is shorter. For appliances operated with **detachable batteries** or **separable batteries** that are disconnected from the appliance for charging purposes, if the **battery** is depleted before the appliance completes the duration of the test, the depleted **battery** is immediately replaced with another **battery** that is **fully charged**, the **battery** being the model or type reference of the **battery** provided or indicated in the instructions and the test is continued until the appliance completes the duration of the test as specified or it no longer operates due to depletion of the **battery**.*

22 Construction

B.22.3 *Addition:*

For parts of appliances situated not more than 850 mm above the floor after installation or in normal use, in addition to the use of test probe 18, test probe 19 of IEC 61032 is applied as specified for test probe 18.

B.22.4 *Addition:*

*For parts of **batteries** situated not more than 850 mm above the floor after installation or in normal use, in addition to the use of test probe 18, test probe 19 of IEC 61032 is applied as specified for test probe 18.*

Bibliography

The bibliography of Part 1 is applicable except as follows.

Addition:

IEC 60335-2-4, *Household and similar electrical appliances – Safety – Part 2-4: Particular requirements for spin extractors*

IEC 60335-2-11, *Household and similar electrical appliances – Safety – Part 2-11: Particular requirements for tumble dryers*

SOMMAIRE

COMMISSION ÉLECTROTECHNIQUE INTERNATIONALE

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APPAREILS ÉLECTRODOMESTIQUES ET ANALOGUES – SÉCURITÉ –

Partie 2-43: Exigences particulières pour les appareils de séchage du linge et les sèche-serviettes

AVANT-PROPOS

1) La Commission Électrotechnique Internationale (IEC) est une organisation mondiale de normalisation composée de l'ensemble des comités électrotechniques nationaux (Comités nationaux de l'IEC). L'IEC a pour objet de favoriser la coopération internationale pour toutes les questions de normalisation dans les domaines de l'électricité et de l'électronique. À cet effet, l'IEC – entre autres activités – publie des Normes internationales, des Spécifications techniques, des Rapports techniques, des Spécifications accessibles au public (PAS) et des Guides (ci-après dénommés "Publication(s) de l'IEC"). Leur élaboration est confiée à des comités d'études, aux travaux desquels tout Comité national intéressé par le sujet traité peut participer. Les organisations internationales, gouvernementales et non gouvernementales, en liaison avec l'IEC, participent également aux travaux. L'IEC collabore étroitement avec l'Organisation Internationale de Normalisation (ISO), selon des conditions fixées par accord entre les deux organisations.
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9) L'IEC attire l'attention sur le fait que la mise en application du présent document peut entraîner l'utilisation d'un ou de plusieurs brevets. L'IEC ne prend pas position quant à la preuve, à la validité et à l'applicabilité de tout droit de brevet revendiqué à cet égard. À la date de publication du présent document, l'IEC n'avait pas reçu notification qu'un ou plusieurs brevets pouvaient être nécessaires à sa mise en application. Toutefois, il y a lieu d'avertir les responsables de la mise en application du présent document que des informations plus récentes sont susceptibles de figurer dans la base de données de brevets, disponible à l'adresse https://patents.iec.ch. L'IEC ne saurait être tenue pour responsable de ne pas avoir identifié de tels droits de brevets.

L'IEC 60335-2-43 a été établie par le comité d'études 61 de l'IEC: Sécurité des appareils électrodomestiques et analogues. Il s'agit d'une Norme internationale.

Cette cinquième édition annule et remplace la quatrième édition parue en 2017. Cette édition constitue une révision technique.

Cette édition inclut les modifications techniques majeures suivantes par rapport à l'édition précédente:

a) le texte a été aligné sur l'IEC 60335-1:2020;

b) certaines notes ont été converties en texte normatif (Article 1,11.101, 15.101);

c) le calibre d'essai 19 a été ajouté pour l'accès aux parties actives et mobiles (8.1.1, 20.2, B.22.3, B.22.4);

d) des limites de température ont été ajoutées pour les surfaces accessibles (11.3, 11.8).

Le texte de cette Norme internationale est issu des documents suivants:

Projet	Rapport de vote
61/7281/FDIS	61/7305/RVD

Le rapport de vote indiqué dans le tableau ci-dessus donne toute information sur le vote ayant abouti à son approbation.

La langue employée pour l'élaboration de cette Norme internationale est l'anglais.

Ce document a été rédigé selon les Directives ISO/IEC, Partie 2, il a été développé selon les Directives ISO/IEC, Partie 1 et les Directives ISO/IEC, Supplément IEC, disponibles sous www.iec.ch/members_experts/refdocs. Les principaux types de documents développés par l'IEC sont décrits plus en détail sous www.iec.ch/publications.

Une liste de toutes les parties de la série IEC 60335, publiées sous le titre général *Appareils électrodomestiques et analogues – Sécurité*, se trouve sur le site web de l'IEC.

La présente partie 2 doit être utilisée conjointement avec la dernière édition de l'IEC 60335-1 et ses amendements sauf si cette édition l'exclut. Dans ce cas, la dernière édition qui n'exclut pas la présente partie 2 est utilisée. Elle a été établie sur la base de la sixième édition (2020) de cette norme.

NOTE 1 L'expression "la Partie 1" utilisée dans la présente norme fait référence à l'IEC 60335-1.

La présente partie 2 complète ou modifie les articles correspondants de l'IEC 60335-1, de façon à transformer cette publication en norme IEC: Exigences particulières pour les appareils de séchage du linge et les sèche-serviettes.

Lorsqu'un paragraphe particulier de la Partie 1 n'est pas mentionné dans cette partie 2, ce paragraphe s'applique pour autant que cela soit raisonnable. Lorsque la présente norme mentionne "addition", "modification" ou "remplacement", le texte correspondant de la Partie 1 doit être adapté en conséquence.

NOTE 2 Le système de numérotation suivant est utilisé:

– les paragraphes, tableaux et figures qui s'ajoutent à ceux de la Partie 1 sont numérotés à partir de 101;

– à l'exception de celles qui sont dans un nouveau paragraphe ou de celles qui concernent des notes de la Partie 1, les notes sont numérotées à partir de 101, y compris celles des articles ou paragraphes qui sont remplacés;

– les annexes qui sont ajoutées sont désignées AA, BB, etc.

NOTE 3 Les caractères d'imprimerie suivants sont utilisés:

– exigences: caractères romains;

– *modalités d'essais: caractères italiques*;

– notes: petits caractères romains.

Les termes en **gras** dans le texte sont définis à l'Article 3. Lorsqu'une définition concerne un adjectif, l'adjectif et le nom associé figurent également en gras.

Le comité a décidé que le contenu de ce document ne sera pas modifié avant la date de stabilité indiquée sur le site web de l'IEC sous webstore.iec.ch dans les données relatives au document recherché. À cette date, le document sera

- reconduit,
- supprimé, ou
- révisé.

NOTE 4 L'attention des Comités nationaux est attirée sur le fait que les fabricants d'appareils et les organismes d'essai peuvent avoir besoin d'une période transitoire après la publication d'une nouvelle publication IEC, ou d'une publication amendée ou révisée, pour fabriquer des produits conformes aux nouvelles exigences et pour adapter leurs équipements aux nouveaux essais ou aux essais révisés.

Le comité recommande que le contenu de cette publication soit adopté pour application nationale (obligatoire) au plus tôt 12 mois et au plus tard 36 mois après la date de publication.

INTRODUCTION

Il a été admis par hypothèse, en établissant la présente Norme internationale, que l'exécution de ses dispositions était confiée à des personnes expérimentées et ayant une qualification appropriée.

Les documents de recommandations concernant l'application des exigences de sécurité pour les appareils peuvent être consultés dans les documents de support du CE 61, accessibles sur le site web de l'IEC à l'adresse:

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

Cette information est donnée à l'intention des utilisateurs de la présente Norme internationale et ne constitue nullement un remplacement du texte normatif de la présente norme.

La présente norme reconnaît le niveau de protection internationalement accepté contre les risques électriques, mécaniques, thermiques, liés au feu et au rayonnement des appareils, lorsqu'ils fonctionnent comme en usage normal en tenant compte des instructions du fabricant. Elle couvre également les situations anormales auxquelles on peut s'attendre dans la pratique et elle tient compte de la façon dont les phénomènes électromagnétiques peuvent affecter le fonctionnement sûr des appareils.

La présente norme tient compte autant que possible des exigences de l'IEC 60364, de façon à rester compatible avec les règles d'installation quand l'appareil est raccordé au réseau d'alimentation. Cependant, des règles d'installation nationales peuvent être différentes.

Si un appareil relevant du domaine d'application de la présente norme comporte également des fonctions couvertes par une autre partie 2 de l'IEC 60335, la partie 2 correspondante est appliquée à chaque fonction séparément, dans la limite du raisonnable. Si cela s'applique, l'influence d'une fonction sur les autres fonctions est prise en compte.

Lorsqu'une partie 2 ne comporte pas d'exigences complémentaires pour couvrir les dangers traités dans la Partie 1, la Partie 1 s'applique.

NOTE 1 Cela signifie que les comités d'études responsables pour les parties 2 ont déterminé qu'il n'était pas nécessaire de spécifier des exigences particulières pour l'appareil en question en plus des exigences générales.

La présente norme est une norme de famille de produits traitant de la sécurité d'appareils et a préséance sur les normes horizontales et génériques couvrant le même sujet.

NOTE 2 Les publications horizontales, les publications fondamentales de sécurité et les publications groupées de sécurité couvrant un danger ne s'appliquent pas, parce qu'elles ont été prises en considération lorsque les exigences générales et particulières ont été étudiées pour la série de normes IEC 60335.

Un appareil conforme au texte de la présente norme ne sera pas nécessairement jugé conforme aux principes de sécurité de la norme si, lorsqu'il est examiné et soumis aux essais, il apparaît qu'il présente d'autres caractéristiques qui compromettent le niveau de sécurité visé par ces exigences.

Un appareil utilisant des matériaux ou présentant des modes de construction différents de ceux décrits dans les exigences de la présente norme peut être examiné et soumis aux essais en fonction de l'objectif poursuivi par ces exigences et, s'il est jugé pratiquement équivalent, il peut être estimé conforme aux principes de sécurité de la présente norme.

NOTE 3 Les normes traitant des aspects non relatifs à la sécurité des appareils électrodomestiques sont:

– les normes IEC publiées par le comité d'études 59 concernant les méthodes de mesure d'aptitude à la fonction;
– les normes CISPR 11 et CISPR 14-1, ainsi que les normes applicables de la série IEC 61000-3 concernant les émissions électromagnétiques;
– la norme CISPR 14-2 concernant l'immunité électromagnétique;
– les normes IEC publiées par le comité d'études 111 concernant l'environnement.

APPAREILS ÉLECTRODOMESTIQUES ET ANALOGUES – SÉCURITÉ –

Partie 2-43: Exigences particulières pour les appareils de séchage du linge et les sèche-serviettes

1 Domaine d'application

L'article de la Partie 1 est remplacé par le texte suivant.

La présente partie de l'IEC 60335 traite de la sécurité des **appareils de séchage du linge** électriques, y compris des **appareils de séchage du linge** destinés au séchage des chaussures ou des gants et des **sèche-serviettes**, pour usages domestiques et analogues, dont la **tension assignée** ne dépasse pas 250 V, y compris les appareils alimentés en courant continu et les **appareils alimentés par batteries**.

Les appareils non destinés à un usage domestique normal, mais qui peuvent néanmoins constituer une source de danger pour le public, tels que les appareils destinés à être utilisés par des utilisateurs non avertis dans des magasins, chez des artisans et dans des fermes, sont compris dans le domaine d'application de la présente norme.

Dans la mesure du possible, la présente norme traite des dangers courants que présentent les appareils et auxquels sont exposés tous les individus situés à l'intérieur et autour de l'habitation. Cependant, cette norme ne tient pas compte en général:

– des personnes (y compris des enfants) dont
  - les capacités physiques, sensorielles ou mentales; ou
  - le manque d'expérience et de connaissance

  les empêchent d'utiliser l'appareil en toute sécurité sans surveillance ou instruction;
– des enfants qui jouent avec l'appareil.

L'attention est attirée sur le fait que:

– pour les appareils destinés à être utilisés dans des véhicules ou à bord de navires ou d'avions, des exigences supplémentaires peuvent être nécessaires;
– dans de nombreux pays, des exigences supplémentaires sont spécifiées par les organismes nationaux de la santé, par les organismes nationaux responsables de la protection des travailleurs et par des organismes similaires.

La présente norme ne s'applique pas:

– aux essoreuses centrifuges (IEC 60335-2-4);
– aux sèche-linge à tambour (IEC 60335-2-11);
– aux appareils prévus exclusivement pour des usages industriels;
– aux appareils destinés à être utilisés dans des locaux qui présentent des conditions particulières, telles que la présence d'une atmosphère corrosive ou explosive (poussière, vapeur ou gaz).

2 Références normatives

L'article de la Partie 1 s'applique.

3 Termes et définitions

L'article de la Partie 1 s'applique, avec les exceptions suivantes.

3.1 Définitions relatives aux caractéristiques physiques

3.1.9 *Modification:*
conditions de fonctionnement normal

Remplacer le premier alinéa par ce qui suit:

fonctionnement de l'appareil dans les conditions suivantes:

Le linge est disposé sur les barres ou supports conformément aux instructions. Le linge est constitué de pièces de coton décati à double ourlet, de dimensions approximatives 700 mm × 700 mm et de masse volumique comprise entre 140 g/m^2 et 175 g/m^2 à sec.

Quatre couches de linge sont utilisées pour les appareils dont la surface chauffée supporte le linge. Une seule couche est utilisée pour les appareils dans lesquels le linge est séché par un courant d'air chaud.

Note 101 à l'article: En cas de doute, les pièces de coton sont conditionnées pendant 24 h au moins, à une température de 20 °C ± 5 °C et à une humidité relative de (60 ± 5) %.

Pour les appareils comportant une enceinte, celle-ci doit être fermée pendant l'opération.

Pour les **appareils de séchage du linge** destinés au séchage des chaussures ou des gants, dont les charges recouvrent toutes les sorties d'air, le cas échéant, ces sorties d'air sont obstruées par le nombre de couches de matériau textile qui donne la condition la plus défavorable sans déclenchement du **dispositif de protection**.

3.5 Définitions relatives aux types d'appareils

3.5.101
appareil de séchage du linge
appareil qui n'exerce pas d'action mécanique telle que la rotation dans un tambour ou la centrifugation, destiné au séchage du linge au moyen d'un débit d'air

Note 1 à l'article: Ces appareils peuvent également être adaptés au séchage des chaussures, des gants et des articles analogues.

Note 2 à l'article: Les supports du linge peuvent être fixés ou être indépendants, à l'intérieur d'une enceinte. La circulation d'air peut être naturelle ou forcée.

3.5.102
sèche-serviette
appareil destiné à porter, chauffer et sécher les serviettes

Note 1 à l'article: Ces appareils peuvent également être adaptés au séchage des maillots de bain, des peignoirs ou des articles analogues

3.6 Définitions relatives aux parties d'un appareil

3.6.101
espace libre
espace dont le volume est supérieur à 60 l où un enfant peut être enfermé et qui est accessible après avoir ouvert une porte ou un couvercle et après avoir retiré toute **partie interne amovible**, y compris les étagères et les paniers

Note 1 à l'article: Lors du calcul du volume, un espace qui présente une dimension inférieure ou égale à 150 mm ou deux dimensions orthogonales, dont aucune ne dépasse 200 mm, est ignoré.