

INTERNATIONAL STANDARD

IEC 60335-2-11

Fifth edition
2000-02

Safety of household and similar electrical appliances –

Part 2-11: Particular requirements for tumble dryers

Sécurité des appareils électrodomestiques et analogues –

*Partie 2-11:
Règles particulières pour les sèche-linge à tambour*

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* See web site address on title page.

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INTERNATIONAL ELECTROTECHNICAL COMMISSION

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**SAFETY OF HOUSEHOLD AND SIMILAR
ELECTRICAL APPLIANCES –**
Part 2-11: Particular requirements for tumble dryers**FOREWORD**

- 1) The IEC (International Electrotechnical Commission) is a worldwide organization for standardization comprising all national electrotechnical committees (IEC National Committees). The object of the IEC is to promote international co-operation on all questions concerning standardization in the electrical and electronic fields. To this end and in addition to other activities, the IEC publishes International Standards. Their preparation is entrusted to technical committees; any IEC National Committee interested in the subject dealt with may participate in this preparatory work. International, governmental and non-governmental organizations liaising with the IEC also participate in this preparation. The IEC collaborates closely with the International Organization for Standardization (ISO) in accordance with conditions determined by agreement between the two organizations.
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- 3) The documents produced have the form of recommendations for international use and are published in the form of standards, technical specifications, technical reports or guides and they are accepted by the National Committees in that sense.
- 4) In order to promote international unification, IEC National Committees undertake to apply IEC International Standards transparently to the maximum extent possible in their national and regional standards. Any divergence between the IEC Standard and the corresponding national or regional standard shall be clearly indicated in the latter.
- 5) The IEC provides no marking procedure to indicate its approval and cannot be rendered responsible for any equipment declared to be in conformity with one of its standards.
- 6) Attention is drawn to the possibility that some of the elements of this International Standard may be the subject of patent rights. The IEC shall not be held responsible for identifying any or all such patent rights.

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

This fifth edition cancels and replaces the fourth edition published in 1993, amendment 1 (1998) and amendment 2 (1999). This fifth edition constitutes a technical revision.

The text of this standard is based on the fourth edition, amendments 1 and 2 and the following documents:

FDIS	Report on voting
61/1646/FDIS	61/1742/RVD

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

This part 2 is intended to be used in conjunction with the latest edition of IEC 60335-1 and its amendments. It was established on the basis of the third edition (1991) of that standard.

This part 2 supplements or modifies the corresponding clauses in IEC 60335-1, so as to convert it into the IEC standard: Safety requirements for electric tumble dryers (fourth edition).

Where a particular subclause of part 1 is not mentioned in this part 2, that subclause applies as far as is reasonable. Where this standard states "addition", "modification" or "replacement", the relevant text in part 1 should be adapted accordingly.

NOTE 1 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 2.

NOTE 2 Subclauses and figures which are additional to those in part 1 are numbered starting from 101.

The following differences exist in some countries:

- 2.2.9: Different size cloths are used (USA).
- 6.2: Tumble dryers are not required to be IPX4 (USA).
- 7.1: An instruction concerning cleaning the lint trap is to be marked on the dryer in letters not less than 8 mm high and is to be conspicuous when the dryer door is open (Australia, New Zealand).
- 7.12: Actual articles of clothing can be specified instead and warnings are required to be marked on the appliance regarding the use of chemicals for cleaning (USA).
- 11.2: Other methods are used for conducting heating tests on tumble dryers (USA).
- 11.7: This test is continued until steady conditions are established and different criteria are used to determine when steady conditions are reached (USA).
- 19.4: The test is conducted differently (USA).
- 19.9: A running overload test is required on automatically controlled tumble dryers (USA).
- 20.101: The requirement is applicable to door openings with a dimension exceeding 20 cm (Norway).
- 20.102: When considering accessibility to rotating drums, the maximum drum volume is 60 dm³ and the maximum door opening is 20 cm (USA).
- 20.103: This test is not conducted (USA).
- 22.103: Different methods are used to evaluate the stability of stacked tumble dryers and washing machines (USA).
- 27.1: Earthing terminals and contacts are permitted to be electrically connected to the neutral conductor of a tumble dryer (USA).

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

SAFETY OF HOUSEHOLD AND SIMILAR ELECTRICAL APPLIANCES –

Part 2-11: Particular requirements for tumble dryers

1 Scope

This clause of part 1 is replaced by:

This standard deals with the safety of electric **tumble dryers** intended for household and similar purposes and having a **rated voltage** not more than 250 V for single-phase appliances and 480 V for other appliances.

NOTE 1 This standard applies to the drying function of appliances having both a washing and drying function.

Appliances not intended for normal household use but which nevertheless may be a source of danger to the public, such as appliances for communal use in blocks of flats or in laundrettes, are also within the scope of this standard.

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

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

NOTE 2 Attention is drawn to the fact that

- For appliances intended to be used in vehicles or on board ships or aircraft, additional requirements may be necessary;
- For appliances intended to be used in tropical countries, special requirements may be necessary;
- In many countries additional requirements are specified by the national health authorities, the national authorities responsible for the protection of labour, the national water supply authorities and similar authorities.

NOTE 3 – This standard does not apply to:

- appliances intended exclusively for industrial or commercial 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 Definitions

This clause of part 1 is applicable except as follows:

2.2.9 Replacement:

normal operation

the **tumble dryer** is operated with the drum filled with textile material having a mass in the dry condition equal to the maximum load stated in the instructions for use.

The textile material consists of pre-washed double-hemmed cotton sheets approximately 70 cm × 70 cm having a mass between 140 g/m² and 175 g/m² in the dry condition. The textile material is soaked with water having a temperature of 25 °C ± 5 °C and a mass equal to that of the textile material.

If the drying function can automatically follow the washing function in a washing machine, the drum is not separately loaded. The **tumble dryer** is operated with the maximum quantity of textile material stated in the instructions for use for the combined washing-drying cycle.

NOTE Cotton having a water content not exceeding 10 % is considered as being in the dry condition. Cotton conditioned for 24 h in still air having a temperature of 20 °C ± 2 °C, a relative humidity between 60 % and 70 % and a pressure between 860 mbar and 1 060 mbar, will contain approximately 7 % of water.

2.101

tumble dryer

an appliance in which textile material is dried by tumbling in a rotating drum through which heated air is blown

2.102

condensation-type tumble dryer

a **tumble dryer** in which the air used for the drying process is dehumidified by cooling.

3 General requirement

This clause of part 1 is applicable.

4 General conditions for the tests

This clause of part 1 is applicable.

5 Void

6 Classification

This clause of part 1 is applicable, except as follows:

6.2 Addition:

Appliances shall be at least IPX4.

7 Marking and instructions

This clause of part 1 is applicable, except as follows:

7.10 Addition:

If the **off position** is only indicated by letters, the word "off" shall be used.

7.12 Addition:

The instructions for use shall state

- the maximum mass in kilogrammes of dry textile material for which the appliance is designed;
- that the **tumble dryer** is not to be used if chemicals have been used for cleaning;
- that there has to be adequate ventilation to avoid the back flow of gases into the room from appliances burning other fuels, including open fires, when operating the tumble dryer.

NOTE This instruction is not required if the tumble dryer discharges the air back into the room.

7.12.1 Addition:

The instructions for use shall state

- that the lint trap is to be cleaned frequently, if applicable;
- that lint is not to be allowed to accumulate around the **tumble dryer** (not applicable for appliances intended to be vented to the exterior of the building);
- for **condensation-type tumble dryers** intended to be connected to the water mains:
 - the maximum permissible inlet water pressure, in pascals or bars;
 - the minimum permissible inlet water pressure, in pascals or bars, if necessary for correct operation;
 - the appliance is to be connected to the water mains using a new hose-set and old hose-sets should not be reused.

NOTE 1 This instruction is not required if the hose is permanently attached to the appliance.

- for appliances with ventilation openings in the base, that a carpet must not obstruct the openings;
- that exhaust air must not be discharged into a flue which is used for exhausting fumes from appliances burning gas or other fuels.

NOTE 2 This instruction is not required if the tumble dryer discharges the air back into the room.

If the instructions for use state that the **tumble dryer** can be placed on top of a washing machine, the instructions shall state which washing machines are suitable. Instructions shall be given for the assembly of the **tumble dryer** and washing machine.

7.101 The enclosure of magnetic valves and similar components incorporated in external hoses for direct connection to the water mains, shall be marked with the symbol No. 5036 of IEC 60417-1 if their **working voltage** exceeds **extra-low voltage**.

Compliance is checked by inspection.

8 Protection against access to live parts

This clause of part 1 is applicable.

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:

11.2 Addition:

Lint traps are cleaned and then 50 % of the area of the filter is blocked.

11.3 Addition:

Temperature rises of the accessible front surface are measured using the probe shown in figure 101. The probe is applied with a force of $4\text{ N} \pm 1\text{ N}$ to the surface in such a way that the best possible contact between the probe and the surface is ensured.

NOTE Any measuring instrument giving the same results may be used.

11.7 Replacement:

Appliances incorporating a timer, a humidity sensing control or other time-limiting control are operated in cycles. Each cycle comprises an operating period having a duration equal to the maximum time that can be provided by the control and a rest period of 4 min during which the appliance is reloaded.

The test may be ended if the temperature rise of any part does not exceed the value determined during the preceding cycle by more than 8 K.

Appliances having a washing and drying function which incorporates a programmer are operated with the drying programme leading to the highest temperature rise.

Other appliances are operated continuously until steady conditions are established.

11.8 Addition:

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

- | | |
|---|------|
| - metal and painted metal parts | 60 K |
| - vitreous-enamelled metal parts | 65 K |
| - glass and ceramic parts | 65 K |
| - plastic parts having a thickness exceeding 0,3 mm | 80 K |