

# INTERNATIONAL STANDARD

# IEC 60335-2-7

Fifth edition  
2000-01

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## Safety of household and similar electrical appliances –

### Part 2-7: Particular requirements for washing machines

*Sécurité des appareils électrodomestiques et analogues –*

*Partie 2-7:  
Règles particulières pour les machines à laver le linge*

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For graphical symbols, and letter symbols and signs approved by the IEC for general use, readers are referred to publications IEC 60027: *Letter symbols to be used in electrical technology*, IEC 60417: *Graphical symbols for use on equipment. Index, survey and compilation of the single sheets* and IEC 60617: *Graphical symbols for diagrams*.

\* See web site address on title page.

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## INTERNATIONAL ELECTROTECHNICAL COMMISSION

**SAFETY OF HOUSEHOLD AND SIMILAR ELECTRICAL APPLIANCES –****Part 2-7: Particular requirements for washing machines**

## FOREWORD

- 1) The IEC (International Electrotechnical Commission) is a worldwide organization for standardization comprising all national electrotechnical committees (IEC National Committees). The object of the IEC is to promote international co-operation on all questions concerning standardization in the electrical and electronic fields. To this end and in addition to other activities, the IEC publishes International Standards. Their preparation is entrusted to technical committees; any IEC National Committee interested in the subject dealt with may participate in this preparatory work. International, governmental and non-governmental organizations liaising with the IEC also participate in this preparation. The IEC collaborates closely with the International Organization for Standardization (ISO) in accordance with conditions determined by agreement between the two organizations.
- 2) The formal decisions or agreements of the IEC on technical matters express, as nearly as possible, an international consensus of opinion on the relevant subjects since each technical committee has representation from all interested National Committees.
- 3) The documents produced have the form of recommendations for international use and are published in the form of standards, technical specifications, technical reports or guides and they are accepted by the National Committees in that sense.
- 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.

International Standard IEC 60335-2-7 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
61/1644/FDIS	61/1740/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 of IEC 60335-1 so as to convert it into the IEC standard: Safety requirements for electric washing machines.

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 is to 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 which are additional to those in part 1 are numbered starting from 101. Annexes which are additional to those in part 1 are lettered AA, BB, etc.

The following additional differences exist in some countries:

- 2.2.9: Different size cloths are used. The initial water temperature for machines without heating elements and without a wringer is 71 °C (USA).
- 6.1: Class 01 appliances are permitted (China and Japan).
- 6.2: IPX0 appliances are permitted (Canada and USA).
- 11.7: The test durations are different (USA).
- 15.101: The test is carried out differently (USA).
- 19.7: Appliances without a programmer are operated until steady conditions are established (USA).
- 19.101: A redundant set of contacts is not required as shown in note 2. Operation without water as specified in note 4 is not considered an abnormal condition (USA).
- 22.6: A different test is made (USA).

The test is carried out at twice the permissible inlet pressure or 2,0 MPa, whichever is greater (Norway).

The test is not conducted (USA).

- Annex AA: A different detergent is used (USA).
- Annex BB: Other tests are made on elastomeric parts (USA).

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



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## SAFETY OF HOUSEHOLD AND SIMILAR ELECTRICAL APPLIANCES –

### Part 2-7: Particular requirements for washing machines

#### 1 Scope

This clause of part 1 is replaced by:

This standard deals with the safety of electric washing machines for household and similar purposes, intended for washing clothes and textiles, their **rated voltage** being not more than 250 V for single-phase appliances and 480 V for other appliances.

NOTE 1 Washing machines may incorporate means for heating water, water extraction and drying.

NOTE 2 Washing machines having a spin extraction function also have to comply with the relevant requirements of IEC 60335-2-4.

Washing machines having a drying function also have to comply with the relevant requirements of IEC 60335-2-11.

NOTE 3 Washing machines supplied with electricity together with other forms of energy are also within the scope of this standard.

Appliances not intended for normal household use but which nevertheless may 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.

NOTE 4 Examples of such appliances are washing machines for communal use in blocks of flats or in launderettes.

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.

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 5 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 6 This standard does not apply to:

- appliances designed 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 Definitions

This clause of part 1 is applicable except as follows:

### 2.2.9 Replacement:

**normal operation:** Appliances are operated filled with a quantity of cloth, having a mass in the dry condition equal to the maximum mass specified in the instructions for use, and with the maximum quantity of water for which they are designed. However, if the power input or current is higher when only 50 % of the cloth is used, the appliance is operated with this load instead.

The temperature of the water is:

- 65 °C ± 5 °C for appliances without heating elements;
- 15 °C ± 5 °C for other appliances.

If the appliance does not incorporate a programmer, the water is heated to 90 °C ± 5 °C or lower if steady conditions are established, before starting the first washing period.

The cloth is pre-washed double-hemmed cotton sheets having dimensions of approximately 70 cm × 70 cm and a mass between 140 g/m<sup>2</sup> and 175 g/m<sup>2</sup> in the dry condition.

NOTE If the cloth in washing machines of the continuously rotating impeller type does not move properly during operation, its quantity is reduced until the maximum motor power input is attained.

## 3 General requirement

This clause of part 1 is applicable.

## 4 General conditions for the tests

This clause of part 1 is applicable except as follows:

### 4.3 Addition:

*The test of 15.101 is made before that of 15.3.*

### 4.7 Replacement:

*The tests are made in a draught-free location and in general at an ambient temperature of 20 °C ± 5 °C.*

*If the temperature attained by any part is limited by a temperature sensitive device or is influenced by the temperature of the water, the ambient temperature is maintained at 23 °C ± 2 °C if all three of the following conditions are met:*

- *the temperature of the water is within 6 K of the boiling point or the temperature of the water or any part of the washing machine is limited by a thermal control;*
- *the room temperature during the test is less than 21 °C;*
- *the difference between the temperature rise of the relevant part and the limit specified does not exceed 25 K minus the room temperature.*



## 5 Void

## 6 Classification

This clause of part 1 is applicable except as follows:

### 6.1 Replacement:

Appliances shall be of **class I**, **class II** or **class III** with respect to protection against electric shock.

*Compliance is checked by inspection and by the relevant tests.*

### 6.2 Addition:

Appliances shall be at least IPX4.

## 7 Marking and instructions

This clause of part 1 is applicable except as follows:

### 7.1 Addition:

Appliances without automatic water level control shall also be marked with the maximum water level.

The safety release mechanism of power-driven wringers shall be marked to indicate its method of operation, unless its operating means has to be continuously actuated by the user.

NOTE This marking may be near the mechanism.

### 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 specify the maximum mass of dry cloth in kilogrammes, for which the appliance is designed.

The instructions for use for washing machines incorporating a power-driven wringer shall draw attention to the potential hazards involved when operating the wringer and shall state that

- the wringer must be disengaged or switched off when not in use;
- the appliance must not be operated by children.

### 7.12.1 Addition:

The instructions shall state:

- the maximum permissible inlet water pressure, in pascals or bars, for appliances intended to be connected to the water mains;
- the minimum permissible inlet water pressure, in pascals or bars, if this is necessary for the correct operation of the appliance;
- for washing machines with ventilation openings in the base, that a carpet must not obstruct the openings.

The instructions shall state that the appliance is to be connected to the water mains using new hose-sets and that old hose-sets should not be reused.

NOTE This instruction is not required if the hoses are permanently attached to the appliance.

**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 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 except as follows:

### 10.1 Addition:

NOTE The selected representative period is the period during which the power input is the highest.

### 10.2 Addition:

NOTE The selected representative period is the period during which the current is the highest.

## 11 Heating

This clause of part 1 is applicable except as follows:

### 11.2 Addition:

*Appliances are placed as specified for motor-operated appliances unless they incorporate a heating element for drying.*

### 11.7 Replacement:

*Appliances incorporating a programmer are operated for three cycles with the programme which gives the highest temperature rises, with a rest period of 4 min between cycles.*