

INTERNATIONAL STANDARD

IEC
60335-2-7

Fifth edition
2000-01

**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 general terminology, readers are referred to IEC 60050: *International Electrotechnical Vocabulary* (IEV).

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.

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/m² and 175 g/m² 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.

Other appliances are operated according to the following sequence of operation in which

W stands for washing,

R stands for rest,

E stands for water extraction,

Wr stands for wringing,

D stands for drying:

- for appliances without means for water extraction:

| W | R | W | R | W |

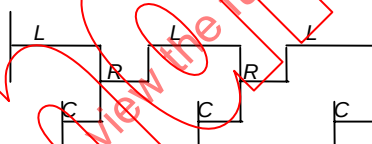
- for appliances having a single drum for washing and water extraction:

| W | E | R | W | E | R | W | E |

- for appliances having separate drums for washing and water extraction, which cannot be used simultaneously:

| W | R | E | R | W | R | E | R | W | R | E |

- for appliances having separate drums for washing and water extraction, which can be used simultaneously:



- for appliances incorporating a power-driven wringer:

| W | Wr | R | W | Wr | R | W | Wr |

- for appliances having a single drum for washing, water extraction and drying:

- for appliances which allow the same quantity of cloth to be washed and dried in the drum:

| W | E | D | R | W | E | D | R | W | E | D |

- for appliances which according to the instructions for use only allow a part of the washed cloth to be dried in the drum.

| W | E | R | D | R | D | R | W | E | R | D | R | D |

For appliances incorporating a timer, the washing period, the water extraction period and the drying period are equal to the maximum period allowed by the timer.

For appliances without a timer,

- the washing period has a duration of:
 - 6 min for washing machines of the continuously rotating impeller type,
 - 18 min for washing machines of the agitator type,
 - 25 min for washing machines of the drum type,
 unless a longer period is specified in the instructions for use;
- the water extraction period has a duration of 5 min, the drum being filled with saturated cloth having the same mass, in the dry condition, as the load used for washing.

For power-driven wringers, the duration of each wringing period is 8 min. The wringer is loaded by passing a board through the rollers once a minute, the roller pressure being adjusted to the maximum value. The board is approximately 20 mm thick and 80 cm long, its width being at least equal to 3/4 of the effective length of the rollers. The board is uniformly tapered at each end down to a thickness of approximately 3 mm, over a distance of 20 cm.

The rest period, including any braking time, has a duration of 4 min.

After the specified sequence of operation, discharge pumps which are driven by a separate motor and switched on and off manually, are subjected to three operating periods separated by rest periods of 4 min. Each operating period is equal to 1.5 times the period necessary to empty the appliance when filled to the maximum normal water level. The outlet of the water discharge pipe is 90 cm above the floor.

NOTE Washing machines with a hand-operated wringer are tested as appliances without means for water extraction.

12 Void

13 Leakage current and electric strength at operating temperature

This clause of part 1 is applicable except as follows:

13.2 Modification:

Instead of the leakage current values specified for **stationary class I appliances**, the following applies:

For **stationary class I appliances**, the leakage current shall not exceed 3,5 mA or 1 mA per kW **rated power input**, whichever is the greater, with a maximum of 5 mA.

14 Void

15 Moisture resistance

This clause of part 1 is applicable except as follows:

15.1 Addition:

Magnetic valves and similar components incorporated in external hoses for connection to the water mains are subjected to the test specified for IPX7 appliances.

15.2 Replacement:

Appliances shall be constructed so that spillage of liquid in normal use does not affect their electrical insulation even if an inlet valve fails to close.

Compliance is checked by the following test:

*Appliances 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 11.*

Appliances intended to be filled with water by the user are completely filled with water containing approximately 1 % NaCl and a further quantity of this solution equal to 15 % of the capacity of the appliance or 0,25 l, whichever is greater, is poured in steadily over a period of 1 min.

Other appliances are operated until the maximum water level is reached and 5 g of the detergent specified in annex AA is added for each litre of water in the appliance. The inlet valve is held open and the filling continued for 15 min after first evidence of overflow or until the inflow is automatically stopped by other means.

For appliances which are loaded from the front, the door is then opened if this can be achieved manually and without damage to the door interlock system.

For appliances having a working surface, 0,5 l of water containing approximately 1 % NaCl and 0,6 % of acid rinsing agent, as specified in annex AA of IEC 60335-2-5, is poured over the top of the appliance, the controls being placed in the on position. The control knobs are then operated through their working range, this operation being repeated after a period of 5 min.

*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 which could result in a reduction of **creepage distances** and **clearances** below the values specified in 29.1.*

15.101 Appliances shall be constructed so that foaming does not affect electrical insulation.

Compliance is checked by the following test which is carried out immediately after that of 15.2.

The appliance is operated under the conditions specified in clause 11 but for one complete cycle with that programme which results in the longest period of operation. Twice the quantity of detergent necessary for normal washing is added, the composition of which is specified in annex AA.

For appliances incorporating an automatic detergent dispenser, the solution is added manually at the point in the cycle when it would normally be dispensed automatically. For other appliances the solution is added before starting the cycle.

The appliance shall then withstand the electric strength test of 16.3.

The appliance is kept in a test room having a normal atmosphere for 24 h before being subjected to the test of 15.3.

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 appliances incorporating a programmer or a timer, the tests of 19.2 and 19.3 are replaced by the test of 19.101.

The test of 19.7 is not carried out on motors driving moving parts of an oscillating agitator.

19.2 Addition:

Restricted heat dissipation is obtained without water in the appliance or with just sufficient water to cover the heating elements, whichever is the more unfavourable.

19.7 Addition:

Appliances without a programmer or timer are operated for 5 min.

Moving parts of a wringer are locked even if a trip bar prevents rotation of the rollers.

19.9 Not applicable.

19.13 Addition.

The cloth shall not ignite and shall not show any charring or glowing.

NOTE Light brown colouring of the cloth or slight emission of smoke is ignored.

During the tests of 19.101, the temperature of windings shall not exceed the values shown in table 6.

19.101 *The appliance is operated under **normal operation** and supplied at **rated voltage**. Any operation or any defect which may be expected in normal use is applied.*

NOTE 1 Examples of fault conditions are:

- the programmer stopping in any position;
- disconnection and reconnection of one or more phases of the supply during any part of the programme;
- open-circuiting or short-circuiting of components;
- failure of a magnetic valve;
- failure or blocking of the mechanical part of a water level switch;
- puncture of the capillary tube of a **thermostat**.

NOTE 2 Locking in the "on" position of the main contacts of a contactor which switches heating elements on and off in normal use is considered to be a fault condition, unless the appliance is provided with at least two sets of contacts connected in series. This may be achieved by providing two contactors operating independently of each other or by providing one contactor having two independent armatures operating two independent sets of main contacts.

NOTE 3 In general, tests are limited to the fault conditions which may be expected to give the most unfavourable results.

The simulation of component faults is limited to those which could expose the user to a hazard.

NOTE 4 If operation without water in the appliance is considered to be a more severe condition for starting any programme, the tests with that programme are made with the water supply tap closed; however, this tap is not closed after the programme has been started.

NOTE 5 If the appliance stops at any particular point in the programme, the test with that fault condition is considered to be ended.

NOTE 6 Thermal controls are not short-circuited.

NOTE 7 The fault condition with the automatic filling device held open is covered by the test of 15.2.

NOTE 8 The fault condition with motor capacitors short-circuited or open-circuited is covered by the test of 19.7.

20 Stability and mechanical hazards

This clause of part 1 is applicable except as follows:

20.1 Replacement:

Appliances other than **fixed appliances** shall have adequate stability.

Compliance is checked by the following test, appliances incorporating an appliance inlet being fitted with an appropriate connector and flexible cord.

*The appliance is empty or filled as specified for **normal operation**, whichever imposes the more unfavourable condition. Doors and lids are closed and any castors turned to the most unfavourable position.*

*The appliance is placed in any normal position of use on a plane inclined at an angle of 10° to the horizontal, the **supply cord** resting on the inclined plane in the most unfavourable position. If, however, the appliance is such that, were it to be tilted through an angle of 10° when standing on a horizontal plane, a part of it not normally in contact with the supporting surface would touch the horizontal plane, the appliance is placed on a horizontal support and tilted in the most unfavourable direction through an angle of 10°.*

The appliance shall not overturn.

NOTE 1 The appliance is not connected to the supply.

NOTE 2 The test on the horizontal plane may be necessary for appliances provided with castors.

NOTE 3 Castors are blocked to prevent the appliance from rolling.

20.101 Washing machines of the drum type which are loaded from the top through an opening with a hinged lid, shall incorporate an interlock which de-energizes the motor before the lid opening exceeds 50 mm.

If a removable or sliding lid is provided, the motor shall be de-energized as soon as the lid is removed or displaced and it shall not be possible to start the motor unless the lid is in the closed position.

The interlock shall be constructed so that unexpected operation of the appliance is unlikely unless the lid is in the closed position.

Compliance is checked by inspection, by measurement and by manual test.

NOTE Interlocks which can be released by means of the test finger of figure 1 do not meet this requirement.

20.102 Washing machines of the drum type which are loaded from the front, shall incorporate an interlock which de-energizes the motor before the door opening exceeds 50 mm.

The interlock shall be constructed so that unexpected operation of the appliance is unlikely unless the lid is in the closed position.

NOTE 1 Interlocks which can be released by means of the test finger of figure 1 do not meet this requirement.

When the water level in the appliance is above the lower edge of the door opening, it shall not be possible to open the door by a simple action while the appliance is operating.

NOTE 2 Interlocked doors and doors which are opened by means of a key or by two separate actions such as pushing and turning, meet this requirement.

Compliance is checked by inspection, by measurement and by manual test

20.103 Power-driven wringers shall be constructed so that the pressure between the rollers has to be maintained by the user, unless a readily accessible safety release or other means of protection is provided.

The release mechanism shall operate easily without violent ejection of any part and shall release pressure on the rollers immediately. The rollers shall separate either by at least 45 mm at both ends or by at least 25 mm at one end and 75 mm at the other.

The safety release shall be operable by a person standing in any normal working position relative to the wringer, even if the fingers of both hands are trapped between the rollers.

Power-driven wringers shall be constructed to prevent fingers being squeezed between a roller and the frame.

Power-driven wringers shall be controlled by an easily accessible switch.

NOTE The switch controlling the washing machine may also control the wringer.

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

The pressure between the rollers is adjusted to its maximum value. The board described in 11.7 is passed between the rollers and the wringer is stopped when the board is approximately halfway through. A force is gradually applied to the operating means of the safety release. The release shall operate before the force exceeds 70 N.

21 Mechanical strength

This clause of part 1 is applicable.

22 Construction

This clause of part 1 is applicable except as follows:

22.6 Modification:

Instead of coloured water, a solution composed of 5 g of the detergent specified in annex AA per litre of distilled water is used.

Addition:

NOTE Parts which withstand the ageing test specified in annex BB are not considered to be parts where leakage could occur.

22.101 Appliances shall withstand the water pressure expected in normal use.

Compliance is checked by connecting the appliance to a water supply having a static pressure equal to twice the maximum permissible inlet water pressure or 1,2 MPa (12 bar) whichever is the higher, for a period of 5 min.

There shall be no leakage from any part, including the inlet water hose.

22.102 Appliances shall be constructed so that cloth cannot come into contact with heating elements.

Compliance is checked by inspection.

22.103 Appliances shall be constructed so that during normal use filter compartments cannot be opened by a simple action if this results in an outflow of water having a temperature exceeding 50 °C.

NOTE 1 Interlocked covers and covers which are opened by means of a key or by two separate actions such as pushing and turning are considered to comply with this requirement.

NOTE 2 Rotation by more than 180° is not considered to be a simple action.

Compliance is checked by inspection and by manual test. If the filter compartment can be opened, any flow of water shall not exceed 0,5 l/min.

23 Internal wiring

This clause of part 1 is applicable except as follows:

23.101 Internal wiring for the supply of magnetic valves and similar components incorporated in external hoses for connection to the water mains, shall be insulated so that the insulation and the sheath are at least equivalent to light polyvinyl chloride sheathed flexible cord (code designation 60227 IEC 52).

Compliance is checked by inspection.

NOTE The mechanical characteristics specified in IEC 60227 are not checked.

24 Components

This clause of part 1 is applicable except as follows:

24.1.2 *Addition:*

The number of cycles of operation for programmers is 3 000.

24.101 Thermal cut-outs which are relied upon for compliance with 19.4 shall be non-self-resetting.

Compliance is checked by inspection during the test of 19.4.

NOTE It may be necessary to short-circuit **self-resetting thermal cut-outs** and other controls simultaneously to check that the **non-self-resetting thermal cut-out** is operated.

25 Supply connection and external flexible cords

This clause of part 1 is applicable.

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 Creepage distances, clearances and distances through insulation

This clause of part 1 is applicable.

30 Resistance to heat, fire and tracking

This clause of part 1 is applicable except as follows:

30.2 Addition:

For appliances incorporating a programmer or a timer, 30.2.3 applies. For other appliances, 30.2.2 applies.

30.3 Addition:

NOTE Switching devices with moving contacts, other than those manually operated and those intended to operate only during abnormal operation, are considered to be subjected to extra-severe duty conditions.

Switching devices with moving contacts intended to operate only during abnormal operation and other parts of insulating materials are also considered to be subjected to extra-severe duty conditions, unless they are enclosed or located so that pollution by detergent is unlikely to occur, in which case they are considered to be subjected to severe duty conditions.

31 Resistance to rusting

This clause of part 1 is applicable.

32 Radiation, toxicity and similar hazards

This clause of part 1 is applicable.

Annexes

The annexes of part 1 are applicable except as follows:

Annex A

Normative references

Addition:

IEC 60335-2-4:1993, *Safety of household and similar electrical appliances – Part 2: Particular requirements for spin extractors.*

IEC 60335-2-11:1993, *Safety of household and similar electrical appliances – Part 2: Particular requirements for tumble dryers.*

IEC 60417:1998, *Graphical symbols for use on equipment. Index, survey and compilation of the single sheets.*

IEC 60456:1998, *Clothes washing machines for household use – Methods for measuring the performance.*

ISO 1817:1985, *Rubber, vulcanized – Determination of the effect of liquids.*

Annex AA (normative)

Detergent (extract from IEC 60456)

The detergent consists of the following:

	Parts by mass
– linear sodium alkyl benzene sulphonate (mean length of alkane chain $C_{11,5}$).....	6,4
– ethoxylated tallow alcohol (14 EO).....	2,3
– sodium soap (chain length C_{12} to C_{16} : 13 % to 26 % and C_{18} to C_{22} : 74 % to 87 %).....	2,8
– sodium tripolyphosphate	35,0
– sodium silicate (SiO_2 : 76,75 % and Na_2O : 23,25 %)	6,0
– magnesium silicate	1,5
– carboxy methyl cellulose	1,0
– ethylenediamine tetra-acetic-sodium-salt.....	0,2
– optical whitener for cotton (dimorpholinostilbene type)	0,2
– sodium sulphate (as accompanying substance or added).....	16,8
– water	7,8
– sodium perborate tetrahydrate (supplied separately).....	20,0

NOTE The detergent specified in the instructions for use may be used but if there is any doubt with regard to the test results, this composition is to be used.