# IEC 60335-2-15

Edition 7.0 2024-11
COMMENTED VERSION

# INTERNATIONAL STANDARD



colour inside

## Household and similar electrical appliances – Safety – Part 2-15: Particular requirements for appliances for heating liquids

IEC 60335-2-15:2024-11 CMV(en)

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## Household and similar electrical appliances – Safety – Part 2-15: Particular requirements for appliances for heating liquids

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INTERNATIONAL ELECTROTECHNICAL COMMISSION

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# HOUSEHOLD AND SIMILAR ELECTRICAL APPLIANCES – SAFETY –

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## FOREWORD

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**This commented version (CMV) of the official standard IEC 60335-2-15:2024 edition 7.0 allows the user to identify the changes made to the previous IEC 60335-2-15:2012+AMD1:2016+AMD2:2018 CSV edition 6.2. 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 60335-2-15 has been prepared by IEC technical committee 61: Safety of household and similar electrical appliances. It is an International Standard.

This seventh edition cancels and replaces the sixth edition published in 2012, Amendment 1:2016 and Amendment 2:2018. 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, 8.1.2, 11.7.104, 15.2, 15.101);
c) introduction of surface temperature limits (3.6.102, 7.1, 7.6, 7.12, 7.14, 7.15, 11.1, 11.3, 11.101);
d) addition of instructions for appliances with liquid containers made from polycarbonate material and kettles (7.12);
e) introduction of test probe 18 and clarification of the application force for test probes in 20.103;
f) improvement of spillage test for coffee-makers with a removable coffee pot and addition of test for appliances with a surface that will support a cup of vessel (15.2);
g) specified that kettles are to be tested with NaCl instead of the spillage solution (15.2);
h) addition of spillage tests for built-in appliances (15.104, 15.105);
i) addition of compliance criteria for impact testing on glass containers of kettles, coffee-makers and tea makers (21.1);
j) addition of requirements for the strength of kettle handles (21.101, 21.102);
k) clarification of requirements for drain holes (22.6);
l) added requirements for remote operation (22.49, 22.51);
m) clarification of test method evaluation of appliance couplers for cordless appliances (22.103);
n) clarification of requirements for pressure cookers (22.108, 22.108.1, 22.108.2, 22.109);
o) revision of requirements for the maximum rotation angle of a frothing or hot water nozzle (22.115, R.2.2.5, R.2.2.9);
p) addition of requirements for programmable electronic circuits that limit the number of heating elements and motors able to operate at the same time (22.116, R.2.2.5, R.2.2.9).

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

| Draft | Report on voting |
|---|---|
| 61/7289/FDIS | 61/7332/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 appliances for heating liquids.

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 following differences exist in the countries indicated below.

– 1: In AU and NZ, there are additional construction and abnormal requirements for all-in-one appliances that do not have pressure cooker functions
– 19.101: The test is not applicable (Japan).
– 25.8: A supply cord having a cross-sectional area of 0,75 $mm^2$ is not allowed for appliances having a rated current exceeding 6 A (Japan).
– 25.8: Longer supply cords are allowed (Japan).

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 can 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 2-15: Particular requirements for appliances for heating liquids

## 1 Scope

This clause of Part 1 is replaced by the following.

This part of IEC 60335 deals with the safety of electrical appliances for heating liquids for household and similar purposes, their **rated voltage** being not more than 250 V. Including direct current (DC) supplied appliances and **battery-operated appliances**. 3

~~NOTE 101~~ Some appliances in this standard ~~can be~~ are used for heating food.

~~NOTE 102~~ Examples of appliances that are within the scope of this standard are:

– coffee-makers;
– cooking pans;
– egg boilers;
– **feeding-bottle heaters**;
– kettles and other appliances for boiling water, having a **rated capacity** not exceeding 10 l;
– milk heaters;
– pressure cookers having a **rated cooking pressure** not exceeding 140 kPa and a **rated capacity** not exceeding 10 l;
– **rice cookers**;
– slow cookers;
– **steam cookers**;
– **soy milk makers**;
– tea makers;
– wash boilers;
– yoghurt makers.

Appliances can have more than one function.

Appliances intended for normal household and similar use and that ~~may~~ can also be used by ~~laymen~~ laypersons in shops, in light industry and on farms, are within the scope of this standard.

~~NOTE 103~~ Examples of such appliances are glue pots with a water jacket, livestock feed boilers and sterilizers.

If the appliance is intended to be used professionally to process food for commercial consumption, the appliance is not considered to be for household and similar use only.

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 104~~ 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, the national water supply authorities and similar authorities;
  - additional national requirements for pressure vessels are specified for pressure cookers.

~~NOTE 105~~ This standard does not apply to

– frying pans and deep fat fryers (IEC 60335-2-13);
– storage water heaters (IEC 60335-2-21);
– instantaneous water heaters (IEC 60335-2-35);
– surface-cleaning appliances employing liquids or steam (IEC 60335-2-54);
– portable immersion heaters (IEC 60335-2-74);
– commercial dispensing appliances and vending machines (IEC 60335-2-75);
– appliances for medical purposes (IEC 60601);
– 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);
– appliances for high-frequency heating;
– pressure sterilizers;
– humidifiers for household and similar use (IEC 60335-2-98).

~~NOTE 106 Attention is drawn to the fact that in many countries requirements for pressure vessels are applied to pressure cookers.~~



## 2 Normative references

This clause of Part 1 is applicable except as follows.

*Addition:*

IEC 60584-1, *Thermocouples – Part 1: EMF specifications and tolerances*

## 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 specified in 3.1.9.101 to 3.1.9.107

**3.1.9.101** Kettles, thermal pots, urns and other appliances for boiling water, cooking pans, glue pots, milk heaters, slow cookers, sterilizers, wash boilers and yoghurt makers are operated with their container filled with the **rated capacity** of water, any lid being closed. The quantity of water in slow cookers is maintained above 50 % of their **rated capacity**.

Coffee-makers are operated in accordance with their instructions with the water container filled to its **rated capacity** and bean container, if any, filled with coffee beans. The warming plate and all other energy consuming functions, if any, are switched on.

Appliances with a heated surface intended to keep the liquid warm are operated with or without the container, whichever is the more unfavourable.

**3.1.9.102** Egg boilers and **steam cookers** are operated with their containers filled with the maximum quantity of water specified in the instructions.

**3.1.9.103** **Feeding-bottle heaters** are operated with a bottle of heat-resistant glass, round or hexagonal in shape, having a mass between 190 g and 200 g and a capacity of approximately 225 ml, unless a particular bottle is specified, in which case that bottle is used. The bottle is filled to approximately its **rated capacity** of water or 200 ml, whichever is less, and is placed in the **feeding-bottle heater**. The heater is filled with water to the level specified in the instructions or, in the absence of instructions, to the maximum level.

**3.1.9.104** Livestock feed boilers are operated with the lid closed; the container being filled with half its **rated capacity** of water.

**3.1.9.105** Pressure cookers are operated in accordance with the instructions but with the container filled with water to a depth of 25 mm.

**3.1.9.106** **Rice cookers** are operated with the rice container filled with water to the level of maximum **rated capacity**. Water is added to maintain the level during boiling as necessary.

When operated in the keep-warm mode, the **rice cooker** is operated with the rice container empty.

**3.1.9.107** **Soy milk makers** are operated with the container filled with soy beans in accordance with the instructions and water to the **rated capacity**.

**3.1.101**
**rated capacity**
capacity assigned to the appliance by the manufacturer

**3.1.102**
**rated cooking pressure**
pressure assigned to the appliance by the manufacturer

### 3.5 Definitions relating to types of appliances

**3.~~103~~5.101**
**espresso coffee-maker**
coffee-maker in which water is heated and forced through the ground coffee by steam pressure or by means of a pump

Note 1 to entry: **Espresso coffee-makers** ~~may~~ can have an outlet for supplying steam or hot water.

**3.~~104~~5.102**
**feeding-bottle heater**
appliance for heating prepared baby food in a feeding-bottle, heat being transferred by means of water

Note 1 to entry: **Feeding-bottle heaters** ~~may~~ can have a control to set the temperature or time to a predetermined level.

**3.~~107~~5.103**
**cordless kettle**
kettle incorporating a heating element and which is connected to the supply only when placed on its associated stand

**3.~~108~~5.104**
**steam cooker**
appliance in which food is heated by steam generated at atmospheric pressure

**3.~~109~~5.105**
**rice cooker**
appliance for cooking rice that is placed in a **detachable container**, the container being placed within the appliance when cooking

Note 1 to entry: **Rice cookers** ~~may~~ can have a keep warm function.

Note 2 to entry: **Rice cookers** ~~may~~ can cook food other than rice.

**3.~~110~~5.106**
**induction rice cooker**
**rice cooker** that heats the rice container by means of eddy currents

Note 1 to entry: The eddy currents are induced in the rice container or lid or rice container and lid by the electromagnetic field of a coil.

**3.~~111~~5.107**
**cordless appliance**
appliance incorporating a heating element and which is connected to the supply only when placed on its associated stand

**3.~~112~~5.108**
**dynamic pressure cooker**
pressure cooker which reduces the pressure by a dynamic action of an elastic part

**3.~~113~~5.109**
**soy milk maker**
appliance with heating, pulverising and agitating functions that are intended to make soy milk

### 3.6 Definitions relating to parts of an appliance

**3.~~114~~6.101**
**decorative door**
part of an appliance having the same function as a cabinet door

**3.6.102**
**functional surface**
surface that is intentionally heated by an internal heat source and has to be hot to carry out the function for which the appliance is intended

Note 1 to entry: An example is the heated sheath of a tubular heating element.

### 3.7 Definitions relating to safety components

**3.~~105~~7.101**
**pressure regulator**
control that maintains the pressure at a particular value during normal use

**3.~~106~~7.102**
**pressure-relief device**
control that limits the pressure under abnormal operating conditions

## 4 General requirement

This clause of Part 1 is applicable.

## 5 General conditions for the tests

This clause of Part 1 is applicable except as follows.

**5.2** *Addition:*

*If the test of 15.101 has to be carried out, three additional samples are required.*

*The tests of 21.101 and 21.102 may be carried out on separate appliances.*

**5.3** *Addition:*

*The test of 19.101 is carried out after the other tests.*

*The tests of 22.102, 22.110 and 22.111 are carried out during the test of Clause 11.*

**5.101** ***Induction rice cookers*** *are tested as* ***motor-operated appliances****.*

## 6 Classification

This clause of Part 1 is applicable except as follows.

**6.2** *Addition:*

Wash boilers and livestock feed boilers shall be at least IPX3.

## 7 Marking and instructions

This clause of Part 1 is applicable except as follows.

**7.1** *Addition:*

Appliances intended to be partially immersed in water for cleaning shall be marked with the maximum level of immersion and with the substance of the following:

Do not immerse beyond this level.

Kettles shall have a level mark or other means to indicate when they are filled to **rated capacity**, unless they cannot be filled beyond the **rated capacity**. This indication shall be visible when the kettle is in the filling position. If the level mark is not self-evident, there shall be a reference to this mark on the outside of the kettle which shall be visible when the kettle is in its normal position of use.

If the closed position of the lid of a pressure cooker is not obvious, this position shall be marked on the appliance.

Stands provided with **cordless appliances** shall be marked with:

– the name, trademark or identification mark of the manufacturer or responsible vendor;
– the model or type reference.

**Soy milk makers** shall have a level mark or other means to indicate when they are filled to **rated capacity**, unless they cannot be filled beyond the **rated capacity**.

If appliances have external **accessible surfaces**, for which temperature rise limits are specified in Table 101 and for which the provisions of footnote b to Table 101 apply, then the appliance shall be marked with symbol IEC 60417-5041(2002-10), or with the substance of the following:

CAUTION: Hot surface **5**

**7.6** *Add the following*

[symbol IEC 60417-5041 (2002-10)] caution, hot surface

**7.12** *Addition:*

The instructions for appliances shall include the substance of the following:

This appliance is intended to be used in household and similar applications such as:

- staff kitchen areas in shops, offices and other working environments;
- farm houses;
- by clients in hotels, motels and other residential type environments;
- bed and breakfast type environments.

If the manufacturer wants to limit the use of the appliance to less than the above, this ~~must~~ shall be clearly stated in the instructions.

The instructions for appliances incorporating an appliance inlet, and intended to be partially or fully immersed in water for cleaning, shall state that the connector must be removed before the appliance is cleaned and that the appliance inlet must be dried before the appliance is used again.

The instructions for appliances normally cleaned after use, and not intended to be immersed in water for cleaning, shall state that the appliance must not be immersed. This requirement normally applies to coffee-makers, cooking pans, milk heaters, pressure cookers, **steam cookers**, slow cookers, **soy milk makers** and yoghurt makers.

The instructions for appliances intended to be used with a connector incorporating a **thermostat** shall state that only the appropriate connector must be used.

Unless kettles are constructed so that a hazard cannot arise from boiling water being ejected, the instructions shall state that if the kettle is overfilled, boiling water ~~may~~ can be ejected.

The instructions for kettles filled through a lid aperture situated below the handle shall include the substance of the following:

– WARNING: Do not remove the lid while the water is boiling.

– CAUTION: Position the lid so that steam is directed away from the handle.

The caution statement is not required if the lid can only be closed so that steam is directed away from the handle.

The instructions for **cordless appliances** shall state that the appliance is only to be used with the stand provided.

If the appliance and stand of **cordless appliances** can be lifted together by gripping the handle of the appliance, the instructions shall include the substance of the following:

– CAUTION: ~~Insure~~Ensure that the appliance is switched off before removing it from its stand.

The instructions for **feeding-bottle heaters** shall state:

– that the food should not be heated for too long;

– how to check that the correct food temperature has not been exceeded.

The instructions for **feeding-bottle heaters** that do not switch off automatically shall additionally include an instruction to switch off the **feeding-bottle heater** after use.

The instructions for pressure cooker**s**, other than **dynamic pressure cookers**, shall state that the ducts in the **pressure regulator** allowing the escape of steam should be checked regularly to ensure that they are not blocked.

The instructions for pressure cookers shall also give details of how to open the container safely and state that the container must not be opened until the pressure has decreased sufficiently.

The instructions for egg boilers provided with a pricking device shall contain the substance of the following:

CAUTION: Avoid injuries from the egg pricking device.

For **espresso coffee-makers** incorporating a pressurized reservoir filled by the user, the instructions shall contain information for the safe refilling of the water reservoir and the substance of the following:

WARNING: The filling aperture must not be opened during use.

The instructions for all appliances shall include:

– a warning to avoid spillage on the connector;
– details on how to clean the surfaces in contact with food;
– a warning of potential injury from misuse;
– a statement that the heating element surface is subject to residual heat after use.

The instructions for **soy milk makers** shall also include a statement that care shall be taken when handling the sharp cutting blades, emptying the container and during cleaning.

The instruction for **soy milk makers** incorporating a switch necessary for compliance with 22.40 shall include the substance of the following:

Switch off the appliance and disconnect from supply before changing accessories or approaching parts that move in use.

The instructions for coffee-makers other than **built-in coffee-makers** or those tested in a cabinet, shall state that the coffee-maker shall not be placed in a cabinet when in use.

For coffee-makers having an additional **decorative door**, and for coffee-makers intended to be used in a cabinet, the instructions shall state that the coffee-maker must be operated with the **decorative door** open or the cabinet door open.

The instructions for coffee-makers having surfaces of glass, ceramic or similar material that forms part of the enclosure of **live parts** shall include the substance of the following:

WARNING: Do not use the appliance if the surface is cracked.

The instructions for coffee-makers shall state that cleaning and **user maintenance** shall not be made by children without supervision.

If symbol IEC 60417-5041(2002-10) is marked on the appliance, its meaning shall be explained. **6**

The instructions for appliances with liquid containers made from polycarbonate material that are accessible to the user shall state the substance of the following:

CAUTION: To prevent damage to the appliance, do not use aggressive cleaning agents when cleaning. Use a soft cloth and a mild detergent.

CAUTION: Do not use the appliance if the enclosure is damaged or has visible cracks. **7**

The instructions for kettles shall state the substance of the following:

CAUTION: Do not operate the kettle on an inclined plane. Do not switch on the kettle if there is no water in the kettle. Do not move the kettle while it is switched on. **8**

**7.12.4** *Addition:*

For coffee-makers suitable for operation when placed in a cabinet, the minimum dimensions of the cabinet shall be given.

**7.14** *Addition:*

The height of the triangle in symbol IEC 60417-5041 (2002-10) shall be at least 8 mm.

**7.15** *Addition:*

The marking specified for external **accessible surfaces** shall be visible when the appliance is operated as in normal use, including when actuating any switch, adjusting any control or opening a lid or door. It shall not be placed on a **functional surface**.

## 8 Protection against access to live parts

This clause of Part 1 is applicable except as follows.

**8.1.2** *Addition:*

~~NOTE 101~~ Connecting devices in stands of **cordless appliances** are not considered to be socket-outlets.

## 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:*

*The power input of automatic coffee-makers is measured during one operating cycle that is selectable by the user, such as cleaning, descaling, or selecting a beverage. The measurement starts with the appliance at* ***room*** ~~*ambient*~~ ***temperature****.*

*The operating cycle starts with the activation by the user and ends when the appliance stops the cycle automatically and the next operating cycle can be started by the user.*

**10.2** *Addition:*

*The input current of automatic coffee-makers is measured during one operating cycle that is selectable by the user, such as cleaning, descaling, or selecting a beverage. The measurement starts with the appliance at* ***room*** ~~*ambient*~~ ***temperature****.*

*The operating cycle starts with the activation by the user and ends when the appliance stops the cycle automatically and the next operating cycle can be started by the user.*

## 11 Heating

This clause of Part 1 is applicable except as follows.

**11.1** *Addition:*

*Compliance is also checked by the test of 11.101.* **9**

**11.2** *Addition:*

***Portable appliances*** *are tested away from the walls of the test corner. Coffee-makers with a* ***decorative door*** *or intended to be used in a cabinet shall be tested with the door open.*

**11.3** *Addition:*

*During the test of 11.101, 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.* **10**

NOTE 101 If the magnetic field of an **induction rice cooker** unduly influences the results, the temperature rises can be determined using platinum resistances with twisted connecting wires or any equivalent means.

**11.4** *Addition:*

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

**11.6** *Addition:*

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

**11.7** ~~*Replacement*~~ *Modification:* **11**

Replace the first paragraph with the following:

*Appliances are operated for the duration specified in 11.7.101 to 11.7.~~105~~106.*

*For appliances incorporating **integral batteries** or **separable batteries** not disconnected from the appliance for charging purposes, the **battery** that has been **fully discharged** is charged while the appliance is operated as specified for 1 h or the time specified in 11.7.101 to 11.7.106, whichever comes first, if allowed by the construction of the appliance.*

Replace the first dashed item of the third paragraph with the following:

– *the **battery** that has been **fully discharged** is charged while the appliance is operated as specified for 1 h or the time specified 11.7.101 to 11.7.106, whichever comes first, if allowed by the construction of the appliance;* **12**

**11.7.101** *For kettles incorporating a **temperature limiter**, the **temperature limiter** is reset 1 min after it has operated or as soon as possible afterwards. The test is terminated after the **temperature limiter** has operated for the second time.*

*For kettles incorporating a **thermostat**, the test is terminated 15 min after the water has attained a temperature of 95 °C.*

*For other kettles, the test is terminated 5 min after the water has attained a temperature of 95 °C.*

**11.7.102** *For cooking pans, egg boilers, **feeding-bottle heaters**, glue pots, livestock feed boilers, milk heaters, sterilizers, wash boilers and for appliances that boil water other than kettles, the test is terminated*

– *for appliances without a thermal control, 15 min after the water in the container has attained a temperature of 95 °C or the maximum temperature it can attain if this is lower;*

– *for **portable appliances** provided with a thermal control, 15 min after the thermal control has operated for the first time;*

– *for **fixed appliances** provided with a thermal control, 30 min after the thermal control has operated for the first time;*

– *1 min after a continuous or repetitive acoustic signal having intervals of less than 5 s has sounded;*

– *when steady conditions are established, for egg boilers having provision for keeping eggs warm, and appliances having a heated surface intended to keep liquid warm.*

**11.7.103** *Slow cookers, **rice cookers**, **steam cookers** and yoghurt makers are operated until steady conditions are established. Slow cookers are prewarmed in the dry state if this instruction is given.*

**11.7.104** *For **espresso coffee-makers**, the brewing period is followed by a rest period of 1 min or the period stated in the instructions, if this is longer. The water container is refilled during the rest periods.*

*For automatic **espresso coffee-makers** and **espresso coffee-makers** provided with a coffee pot, the brewing period is the time necessary to produce the maximum quantity of coffee allowed by the timer or by the capacity of the coffee pot.*

*For manual **espresso coffee-makers**, if the maximum quantity of coffee to be produced is not specified in the instructions, the brewing period is the time necessary to produce 100 ml of coffee for each cycle.*

*For **espresso coffee-makers** having an outlet for supplying steam or hot water, the brewing period is immediately followed by a period during which the steam or water is supplied for the time stated in the instructions or for the following periods, whichever is more unfavourable:*

– *for **espresso coffee-makers** having an outlet for supplying steam, 1 min;*

– *for **espresso coffee-makers** having an outlet for supplying hot water, the time necessary to produce 100 ml of water.*

– *for **espresso coffee-makers** having an outlet for supplying steam and an outlet for supplying hot water, 1 min period supplying steam is followed by time necessary to produce 100 ml of water.*

~~NOTE~~ *The steam is blown into a vessel containing cold water.*

***Espresso coffee-makers** are operated until steady conditions are established.*

*Other coffee-makers are operated for the time necessary to make the maximum quantity of coffee stated in the instructions. The container is then refilled as quickly as possible and the coffee-maker operated again.*

*The procedure is repeated until steady conditions are established.*

**11.7.105** *Pressure cookers are operated for 15 min after attaining the maximum cooking pressure.*

**11.7.106** ***Soy milk makers** are operated for a complete operating cycle.*

**11.8** *Addition:*

*When an appliance connector incorporates a **thermostat**, the temperature rise limit for the pins of the inlet does not apply.*

*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**.*

**11.101** *Appliances are placed as specified in 11.2 and are operated at **rated power input** under **normal operation** for the duration specified in 11.7.*

*During the test, the temperature rise of surfaces shall not exceed the values specified in Table 101.* **13**

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

| *Surface* | *Temperature rise of external accessible surfaces*[a, b] *K* | |
|---|---|---|
| | *Surfaces of appliances intended to be placed or installed less than 850 mm from the floor* | *Surfaces of appliances intended to be placed or installed at or above 850 mm from the floor* |
| *Bare metal* | *38* | *42* |
| *Coated metal* [c] | *42* | *49* |
| *Glass and ceramic* | *51* | *56* |
| *Plastic and plastic coating > 0,4 mm* [d, e] | *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:*

- *the underside of appliances intended to be used on a working surface or floor, where these surfaces are inaccessible to a 75 mm diameter probe having a hemispherical end;*
- *the fittings and hoses for hot water, vapour, coffee, tea and similar fluids, including **pressure regulators** and **pressure-relief devices**;*
- ***functional surfaces**;*
- *surfaces within 25 mm of the outline of the **functional surfaces**;*
- *lids and covers;*
- *surfaces within 25 mm from the edge of lids;*
- *surfaces within 25 mm from ventilation openings;*
- *vessels that contain hot liquids and that become hot through conduction by a heated part of the appliance (e.g. coffee pots and coffee filter holders in percolator type coffee-makers and kettles).*

[b] *When the required values are not met, the maximum temperature rise shall not be higher than two times the values indicated.*

[c] *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.*

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

[e] *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.*

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

This clause of Part 1 is applicable. **14**

## 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** *Addition:*

For kettles, replace the first paragraph of the test specification by the following:

*For kettles, compliance is checked by the following test using a solution comprising water containing approximately 1 % NaCl.* **15**

For steam sterilizers, replace the fifth paragraph of the test specification by the following:

*Steam sterilizers are placed on a horizontal surface and 30 ml of the spillage solution is poured onto the top rim in the most unfavourable place. The spillage solution is poured steadily through a tube having an inner diameter of 8 mm over a period of 2 s, the lower end of the tube being 200 mm above the appliance.*

NOTE 101 A schematic representation of the test arrangement is shown in Figure 102.

*The test is only carried out with the appliance connector in position.*

*For **rice cookers**, the test specified in Part 1 shall be conducted with the rice container in place.*

*In case of doubt, the spillage test is carried out with the appliance deviating from the normal position of use by an angle not exceeding 5°.*

*Kettles are ~~then~~ filled to **rated capacity** with water. They are placed on a plane inclined at an angle of 20° to the horizontal with their spout facing up the slope of the inclined plane. Water shall not be discharged from the kettle.*

*Kettles that can be filled through the spout are also tested on a plane inclined at an angle of 20° to the horizontal, with the spout uppermost. The kettle is filled with water containing approximately 1 % NaCl to the maximum level, if this indication is visible from the filling position, otherwise until water spills from the kettle. A further quantity, equal to 15 % of the **rated capacity** of the kettle, is then added as quickly as possible.*

*For **cordless appliances**, the test with the appliance on the horizontal plane is carried out with the appliance both on and off its stand. The additional test for kettles that can be filled through the spout is carried out only with the **cordless kettle** off its stand, the kettle being replaced on its stand in order to carry out the electric strength test of 16.3.*

~~*For coffee makers provided with a removable coffee pot, the liquid container is filled with maximum amount of water containing 1 % NaCl. The funnel is placed in position but without placing the coffee pot in position. The appliance is switched on and operated until the container is empty.*~~

*For coffee-makers provided with a removable coffee pot, the funnel is placed in position but without placing the coffee pot in position. The spillage solution is manually poured steadily into the funnel without the solution overflowing from the funnel. The quantity of the spillage solution is the maximum capacity of the water supply tank. If the top opening of the funnel is enclosed in the coffee- maker, the funnel is moved out, filled with its capacity of the spillage solution, and set back into the coffee-maker, this operation being repeated until the maximum quantity of the solution is poured. If there is an anti-drop mechanism in the funnel, the mechanism is rendered inoperative.* **16**

~~*Modification:*~~

~~*For steam sterilizers, replace the penultimate paragraph of this subclause of Part 1 by the following:*~~

~~*Steam sterilizers are placed on a horizontal surface and 30 ml of water containing approximately 1 % NaCl is poured onto the top rim in the most unfavourable place. the solution is poured steadily through a tube having an inner diameter of 8 mm over a period of 2 s, the lower end of the tube being 200 mm above the appliance.*~~

~~NOTE 101 A schematic representation of the test arrangement *is* shown *in* Figure 101.~~

~~*For* **rice cookers**, *the test specified in Part 1 shall be conducted with the rice container in place.*~~

*Coffee-makers dispensing liquid into a serving container, such as a cup or jug, are tested by steadily pouring 0,5 l of the spillage solution over the surface where the container is filled or the container is transported and removed by the user. If a drop container is placed beneath this surface, the drop container is completely filled before the test is carried out.*

*Coffee-makers having external surfaces on which it is possible to place a vessel, such as a cup or jug, are tested by pouring 0,2 l of the ~~solution over the complete depositing area in approximately 5 s~~ spillage solution rapidly over the top of the appliance in the most unfavourable way so that the spillage solution also flows over the surface of the appliance that incorporates controls and other places where it can penetrate the appliance enclosure, the controls being placed in the most unfavourable position. The controls are then operated through their working range, this operation being repeated after 5 min. If necessary, the test is repeated until all different controls or gaps are covered by the spillage test, the appliance being dried between each test. External surfaces with a minimum linear dimension of a horizontal or near horizontal top surface of 75 mm or less are not considered to be surfaces on which it is possible to place a vessel or cup.* **17**

*For coffee-makers, after each overfilling test or application of liquid, all residues are then removed and the appliance is dried.*

**15.101** Appliances intended to be partially or completely immersed in water for cleaning shall have adequate protection against the effects of immersion.

*Compliance is checked by the following tests, which are carried out on three additional appliances.*

*The appliances are operated under* ***normal operation*** *at 1,15 times* ***rated power input****, until the* ***thermostat*** *operates for the first time. Appliances without a* ***thermostat*** *are operated until steady conditions are established. The appliances are disconnected from the supply, any appliance connector being withdrawn. They are then completely immersed in water containing approximately 1 % NaCl and having a temperature between 10 °C and 25 °C, unless they are marked with the maximum level of immersion, in which case they are immersed 50 mm deeper than this level.*

*After 1 h, the appliances are removed from the saline solution, dried and subjected to the leakage current test of 16.2.*

~~NOTE~~ *Care is taken to ensure that all moisture is removed from the insulation around the pins of appliance inlets.*

*This test is carried out four more times, after which the appliances shall withstand the electric strength test of 16.3, the voltage being as specified in Table 4.*

*The appliance having the highest leakage current after the fifth immersion is dismantled and inspection shall show that there is no trace of liquid on insulation that could result in a reduction of **clearances** and **creepage distances** below the values specified in Clause 29.*

*The remaining two appliances are operated under **normal operation** at 1,15 times **rated power input** for 240 h. After this period, the appliances are disconnected from the supply and immersed again for 1 h. They are then dried and subjected to the electric strength test of 16.3, the voltage being as specified in Table 4.*

*Inspection shall show that there is no trace of liquid on insulation that could result in a reduction of **clearances** and **creepage distances** below the values specified in Clause 29.*

**15.102** The connecting devices of stands for **cordless appliances** shall not be affected by water.

*Compliance is checked by the following test.*

*The stand is placed on a horizontal surface and 30 ml of water containing approximately 1 % NaCl is poured onto the connecting device. The solution is poured steadily through a tube having an inner diameter of 8 mm over a period of 2 s, the lower end of the tube being 200 mm above the connecting device.*

NOTE A schematic representation of the test arrangement is shown in ~~Figure 101~~ Figure 102.

*The stand shall then withstand the electric strength test of 16.3, the test voltage for **reinforced insulation** being 2 500 V.*

**15.103** The interior of **rice cookers** shall not be affected by water.

*Compliance is checked by the following test.*

*The **rice cooker** is placed on a horizontal surface, with the rice container removed and 30 ml of water containing approximately 1 % NaCl is poured on to the centre of the bottom of the interior of the **rice cooker**. The saline solution is poured steadily through a tube having an inner diameter of 8 mm and a length of 30 mm, over a period of 2 s, the lower end of the tube being 200 mm above the bottom of the **rice cooker**.*

NOTE A schematic representation of the test arrangement is shown in ~~Figure 101~~ Figure 102.

*The **rice cooker** shall then withstand the electric strength test of 16.3.*

**15.104 Built-in appliances** intended to be installed in a cabinet and therefore subject to spillage of liquid onto work surfaces located above the appliance after installation shall be constructed so that such spillage does not affect their electrical insulation.

*Compliance is checked by the following test.*

*The appliance is subjected to a spillage test with 0,5 l of the spillage solution specified in 15.2. The appliance shall be installed according to the manufacturer's instructions except that the front surface of the appliances (excluding control knobs, handles) shall align with the front edge of a 30 mm thick wooden work surface with a square front edge, see Figure 103. The spillage solution shall be poured on the work surface at the area which gives the most unfavourable*

*conditions representing the pouring likely to occur, so that the spillage solution flows down the front surface of the appliance over controls, joints, vents and similar openings. If necessary, the test is repeated until all different controls or gaps are covered by the spillage test. The appliance is dried between each test.*

*The test is performed as follows:*

*A bottle with a shape similar to the one in Figure 104 and a cap is filled with 0,5 l of the spillage solution.*

*The cap of the bottle shall have a hole of 8 mm diameter, placed off-centre according to Figure 105. The bottle shall also have a hole of 8 mm diameter near the bottle base (see Figure 104) to equalize the liquid pressure.*

*Other suitable containers may be used provided the spillage solution amount is poured over the appliance under test in the same manner.*

*The hole in the cap of the bottle is put on the horizontal work surface at approximately 80 mm horizontal distance with respect to the front of the appliance. The inclination of the bottle shall be higher than 30° and lower than 45° to allow the spillage solution to flow over the front of the appliance. The lower part of the bottle hole in the cap shall be in contact with the work surface, with the hole in the cap placed down closest to the surface. See Figure 106.*

*When using holes of 8 mm diameter, the specified solution amount is spilled in about 15 s.*

*When the 0,5 l of spillage solution has been poured, the remaining solution on the work surface is pushed towards the front so that the remaining solution spills homogeneously over the front with a suitably flat means.*

*Immediately after the test, the appliance shall 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** or **creepage distances** below the values specified in Clause 29.* **18**

**15.105 Built-in appliances** intended to be installed in cabinets below other **built-in appliances** and therefore subject to spillage of liquid during use of these other appliances shall be constructed so that such spillage does not affect their electrical insulation.

*Compliance is checked by the following test (see Figure 107). The appliance is built-in as specified in the instructions. The test cabinet is tilted to an angle of 2° in the most unfavourable direction. 200 ml of the spillage solution specified in 15.2 is poured steadily over a period of 8 s through a funnel onto the complete width of the separation board above the appliance being tested. The funnel has an outlet diameter of approximately 8 mm and the lower edge of its outlet is positioned 20 mm above the separation board. The centre of the funnel is positioned 15 mm inwards from the leading edge of the separation board.*

*If the manufacturer states in the installation instructions that a separation board above the appliance is not required, the test shall be repeated while pouring the spillage solution directly onto the complete width of the top surface of the appliance. The lower edge of the funnel outlet is positioned 20 mm above the top surface of the appliance and its centre is positioned 15 mm inwards from the leading edge of the appliance.*

*Immediately after the test, the appliance shall 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** or **creepage distances** below the values specified in Clause 29.* **19**

## 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:*

*Kettles are not subjected to the test of 19.2.*

*Kettles are also subjected to the test of 19.101, unless the appliance incorporates a* ***non-self-resetting thermal cut-out*** *that is not resettable by the user, in order to comply with 19.4.*

*Kettles for which compliance with 19.101 relies on the operation of a* ***self-resetting thermal cut-out*** *are also subjected to the test of 19.102.*

*For appliances with an external surface providing a keep warm function, the test of 19.106 applies.*

*For coffee-makers having a* ***decorative door****, the test of 19.107 applies.*

*For automatic coffee-makers of the coffee bean type, the tests of 19.108 applies.*

**19.2** *Addition:*

*Appliances are placed as near as possible to the walls of the test corner. They are tested empty with lids open or closed whichever is more unfavourable.*

***Induction rice cookers*** *are operated under the conditions of Clause 11 with the rice container empty.*

**19.3** *Addition:*

*Kettles are operated empty at 1,15 times* ***rated power input****.*

*The test is also carried out with the kettle filled with sufficient water to cover the heating element, or to a depth of 10 mm if the heating element is not positioned inside the container, the lid being open or closed, whichever is more unfavourable.*

**19.4** *Addition:*

*For pressure cookers,*

– *all **pressure regulating devices** are rendered inoperative; and*
– *in other than **dynamic pressure cookers**, all **protective devices** that vent steam and **intentionally weak parts** that vent steam are rendered inoperative; and*
– *in **dynamic pressure cookers**, all **protective devices**, other than **intentionally weak parts**, that vent steam are rendered inoperative.*

**19.7** *Addition:*

***Espresso coffee-makers** incorporating a pump are operated for a period of 5 min.*

***Soy milk makers** are operated for one cycle of operation.*

**19.13** *Addition:*

*During the test of 19.4, **protective devices** of pressure cookers other than **dynamic pressure cookers** shall operate before the pressure has reached 350 kPa.*

*During the test of 19.4, **protective devices** or **intentionally weak parts** of **dynamic pressure cookers** shall operate before the pressure has reached 250 kPa.*

*The temperature rise of the windings of **induction rice cookers** shall not exceed the values specified in 19.7.*

*The electric strength test of **induction rice cookers** is carried out immediately after switching off the appliance.*

**19.101** *Kettles are placed on a plywood board having a thickness of approximately 20 mm. The **thermal cut-out** that operates during the test of 19.4 and all thermal controls that operate during the test of Clause 11 are short circuited simultaneously and the kettle is operated empty at 0,85 times **rated power input** or 1,15 times **rated power input**, whichever is more unfavourable. If the kettle incorporates more than one **thermal cut-out** that could operate during the test of 19.4, they are short circuited in turn.*

*During the test, any flames shall be kept within the enclosure of the kettle and the supporting surface shall not ignite.*

*After the test, and when the insulation has cooled down to approximately **room temperature**, **live parts** shall not be accessible, and the kettle shall pass the dielectric strength test in 16.3 with the test voltage specified in Table 4.*

*The humidity treatment of 15.3 is not applied before the electric strength test is carried out.*

*The kettle is filled to its **rated capacity** with water for 24 h before the electric strength test is carried out. Other requirements of 19.13 are not applicable.*

**19.102** *Kettles are placed on a plywood board having a thickness of approximately 20 mm.*

*Kettles incorporating two **self-resetting thermal cut-outs** are operated with one of the **thermal cut-outs** short circuited. The kettle is operated empty at 0,85 times **rated power input** or 1,15 times **rated power input**, whichever is more unfavourable.*

*Within 2 s of the other **thermal cut-out** operating, the kettle is filled with water having a temperature of 15 °C ± 5 °C. After 1 min, the kettle is emptied.*

*The test is carried out 100 times.*

**19.103** For appliances with **detachable liquid containers**, the automatic transfer of liquid from one container to another shall not give rise to an electrical hazard if they are incorrectly positioned.

*Compliance is checked by assembling the appliance with its receiving container incorrectly positioned or removed. The water discharge pipe is incorrectly positioned if this is more unfavourable. The appliance is operated as specified in Clause 11 but for one cycle only.*

*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 the reduction of **clearances** and **creepage distances** below the values specified in Clause 29.*

**19.104** The overloading of a **soy milk maker** shall not result in a hazard.

*Compliance is checked by the following test.*

***Soy milk makers** are placed on a plywood board having a thickness of approximately 20 mm and operated under the conditions of Clause 11 with the container filled with 2 times the maximum mass of the soy beans specified in the instructions and water to **rated capacity**.*

*During the test, any flames shall be kept within the enclosure and the supporting surface shall not ignite.*

*After the test, **live parts** shall not be accessible.*

**19.105** When a **soy milk maker** is disconnected from the supply accidently during normal use, it shall not result in a hazard.

*Compliance is checked by the following test.*

***Soy milk makers** are placed on a plywood board having a thickness of approximately 20 mm and operated under the conditions of Clause 11. The appliance shall be disconnected from the supply at the most unfavourable time during the cycle. The **soy milk maker** is then restarted with a new cycle of operation without changing the load.*

*During the test, any flames shall be kept within the enclosure and the supporting surface shall not ignite.*

*After the test, **live parts** shall not be accessible.*

**19.106** *The appliance is operated at **rated power input** with the heated surface completely covered with two layers of textile material of pre-washed double-hemmed cotton sheets until steady conditions are established.*

*The textile material consists of pre-washed double-hemmed cotton sheet having dimensions approximately 700 mm × 700 mm and specific mass between 140 g/m$^2$ and 175 g/m$^2$ in the dry condition.*

*If a **thermostat** operates, the test is repeated with the one-third of the heated surface furthest from the temperature-sensing element covered.*

*The textile material shall not ignite.*

**19.107** *Coffee-makers with a **decorative door** or intended to be used in a cabinet are operated under the conditions specified in Clause 11 but with the **decorative door** or cabinet door closed.*

**19.108** *Automatic coffee-makers of the coffee bean type, other than automatic* ***espresso coffee-makers*** *of the coffee bean type, are supplied at* ***rated voltage*** *and operated under* ***normal operation*** *five times with rest periods.*

*Automatic* ***espresso coffee-makers*** *of the coffee bean type are supplied at* ***rated voltage*** *and are set to maximum quantity of coffee powder, with the smallest amount of coffee in the cup according to the instructions without rest periods.*

*The duration of the operating period is:*

– *for appliances incorporating a timer, the longest period allowed by the timer;*
– *for other appliances, as follows:*
  - *for automatic coffee-makers incorporating coffee mills of the grinding type, 30 s longer than the time needed to fill the collecting container or the time required to empty the hopper, whichever is shorter;*
  - *for automatic coffee-makers incorporating other coffee mills, 1 min.*

*The duration of the rest period is:*

– *10 s, for appliances provided with a collecting container;*
– *60 s, for other appliances.*

*The temperature of the windings shall not exceed the values shown in Table 8.*

## 20 Stability and mechanical hazards

This clause of Part 1 is applicable except as follows.

**20.2** *Addition:*

For **soy milk makers**, test probe 18 is not applied to the cutting blades. **20**

**20.101** The container and cutting blades of **soy milk makers** shall have adequate mechanical strength.

*Compliance is checked by the following test.*

*The* ***soy milk maker*** *is supplied at* ***rated voltage*** *and is operated continuously with the container filled with dry soy beans to the* ***rated capacity****. The test is carried out as follows:*

– *for appliances with accumulated working time of the motor during one cycle not exceeding 4 min, the test is conducted for the accumulated working time of the motor during one complete working cycle plus 1 min;*
– *for appliances with accumulated working time of the motor during one cycle exceeding 4 min, the test is conducted for the accumulated working time of the motor during one complete working cycle.*

*Care needs to be taken to ensure that the cutting blades are not jammed by the soy beans, and that they rotate continuously during the test.*

*After the test, the container and cutting blades shall not be broken; however, distorted and blunt edges are ignored.*

**20.102** The rotating parts of **soy milk makers** shall be secured so that they do not become loose during operation.

*Compliance is checked by inspection and manual test.*

*Fastening of screws and nuts in a direction opposite to the direction of rotation of the rotating parts is considered to be a suitable means of securing the rotating parts.*

**20.103** The lid interlock, if any, of **soy milk makers** shall be constructed so that accidental operation of the appliance is prevented. Lid interlock switches shall be **biased-off switches**.

If there is an interlock between the lid and the main switch, the lid shall be locked when the switch is in the on position. When the lid is not correctly closed, the switch shall be locked in the **off position**.

*Compliance is checked by inspection, by manual test and by applying test probe B of IEC 61032 with a force not exceeding 5 N and test probe 18 of IEC 61032 with a force not exceeding 2,5 N to the lid interlock actuator.* **21**

*If compliance relies on the operation of an **electronic circuit** for the interlock function the moving parts shall not operate with the lid removed under the following conditions applied separately:*

*a) The fault conditions in a) to g) of 19.11.2 are applied one at a time to the **electronic circuit**.*

*a) The electromagnetic phenomena tests of 19.11.4.2 and 19.11.4.5 are applied. The tests are carried out with surge protective devices disconnected, unless they incorporate spark gaps.*

*If the **electronic circuit** is programmable, the software shall contain measures to control the fault/error conditions specified in Table R.1 and is evaluated in accordance with the relevant requirements of normative Annex R.* **22**

## 21 Mechanical strength

This clause of Part 1 is applicable except as follows.

**21.1** *Addition:*

*Breakage of glass parts, other than glass water containers of kettles and glass coffee or tea containers of coffee-makers and tea makers, is neglected provided that compliance with 8.1, 15.1 and 15.101 is not impaired.*

*The glass of the water container of a kettle and the glass of the coffee or tea container of a coffee-maker or tea maker shall not break.* **23**

NOTE In Australia and New Zealand the energy is increased to 1 J for glass kettles.

**21.101** The handle of kettles and its securement means shall be constructed to withstand the stresses occurring during normal use.

*Compliance is checked by inspection and by the following test.*

*Kettles shall be subjected to the following pre-treatment.*

*The empty kettle shall be placed in a heating cabinet. The cabinet is a single chamber type heating oven in accordance with IEC 60216-4-1 with regard to specimen mounting arrangement, temperature, differences, fluctuation and variations appropriate to the test temperature. The temperature of the cabinet is maintained at 80 °C ± 2 °C. The kettle is suspended at the centre of the grip area of the handle, taking care that the kettle is well balanced with the spout pointing radially outwards in a cabinet.*

*The kettle shall be at least 50 mm from all parts of the cabinet.*

*The kettle is kept in the cabinet for 168 h and then at **room temperature** for at least 16 h.*

NOTE 1 A schematic representation of the grip area is shown in Figure 108.

*The kettle is then loaded with sand sealed in a plastic bag to a mass that corresponds to 1,2 times the **rated capacity** of the kettle.*

*The load shall be prevented from falling out during the test.*

NOTE 2 There is no specific requirement for the type of sand and moisture content.

*For movement tests, the kettle is attached to the test apparatus at its handle in the grip area, taking care that the kettle is well balanced with the spout pointing radially outwards.*

*Between the test apparatus and the handle shall be of rubber of a thickness of 5 mm and a hardness of 50 Shore ± 10 Shore.*

*The clamping position shall be in the centre of the grip area of the handle. The distance between the pivot point and the centre of the grip area of the handle shall be 400 mm ± 10 mm.*

NOTE 3 A schematic representation of the clamp position is shown in samples in Figure 108.

*For the horizontal movement test, the kettle is moved, while maintaining the kettle in vertical orientation, to the left and back to the right in an arc of 90°. The movement is repeated 2 500 times at a rate of approximately 10 times per minute with uniform acceleration and deceleration.*

NOTE 4 A schematic representation of the test arrangement is shown in Figure 109.

*For a vertical movement test, the kettle is moved down and up in a pouring motion of 120°. The movement is repeated for 5 000 times at a rate of approximately 10 times per minute with uniform acceleration and deceleration.*

NOTE 5 A schematic representation of the test arrangement is shown in Figure 110.

*The kettle, the handle and its securement means shall not break, crack or loosen.* **24**

**21.102** Kettles shall be constructed so that there are no sudden breaks of the handle or its securement means likely to expose the user to a hazard when the appliance is used as in normal use.

*Compliance checked by the following test.*

*The kettle is filled with the **rated capacity** of water when determining the mass of the filled kettle. A mass that is 2 times the mass of the filled kettle is hung from the centre of the bottom of the empty kettle. The kettle is gently lifted and suspended by the handle for 5 min.*

*The kettle, the handle and its securement mean shall not break, crack or loosen.* **25**

## 22 Construction

This clause of Part 1 is applicable except as follows.

**22.6** *Addition:*

~~Drain holes shall be at least 5 mm in diameter or 20 mm² in area with a width of at least 3 mm.~~

A drain hole that is necessary to comply with the standard shall be at least 5 mm in diameter or 20 $mm^2$ in area with a width of at least 3 mm. Holes that do not meet these dimensions are considered to be blocked when determining compliance. **26**

*Compliance is also checked by measurement.*

**22.7** *Addition:*

***Espresso coffee-makers** are filled with water to their **rated capacity** and operated at **rated power input** with the coffee filter blocked and outlet closed. The maximum pressure attained is measured. The appliance is then subjected to twice the measured pressure for 5 min.*

*The overpressure may be supplied from an external source, care being taken to ensure that the **espresso coffee-maker** is at the normal temperature for brewing.*

*If the valve for steam supply is linked to the switch used for starting the production of steam, this link is not to be disturbed while measuring the maximum pressure.*

*The appliance shall not rupture and there shall be no leakage other than through a self-resetting **pressure-relief device** or **intentionally weak part**. If a self-resetting **pressure-relief device** operates, the appliance shall be suitable for further use.*

*Controls that limit the pressure are rendered inoperative and the appliance is operated again as described for determining the maximum pressure.*

*The appliance shall not explode or emit hazardous jets of steam. If an **intentionally weak part** ruptures, the test is repeated on a second appliance and shall be terminated in the same mode.*

*All pressure regulating devices and all **protective devices** and **intentionally weak parts** are rendered inoperative and the lid is closed.*

*For pressure cookers, other than **dynamic pressure cookers**, the pressure is gradually increased hydraulically to two times the operating pressure of the **protective device** during the test of 19.4.*

*For **dynamic pressure cookers**, the pressure is gradually increased hydraulically to 50 kPa in excess of the operating pressure of the **protective device** or **intentionally weak part** during the test of 19.4.*

*The container shall not rupture.*

**22.40** *Addition:*

For **soy milk makers**, any switch controlling the motor shall also disconnect **electronic circuits**, if their malfunction would impair compliance with this standard.

*Compliance is checked by the tests of Clause 19.*

**22.49** *Replacement:*

For **remote operation**, the duration of operation of the function that is going to be remotely operated shall be set before the function is started, unless:

– the function switches off automatically at the end of a cycle, or

– the function can operate continuously without giving rise to a hazard.

Slow cookers, **rice cookers**, **steam cookers** and yoghurt makers, and appliances that automatically change to a keep warm function after the cooking or brewing cycle is completed are considered to be functions that can operate continuously without giving rise to a hazard. **27**

*Compliance is checked by inspection.*

**22.51** *Replacement:*

A control on the appliance shall be manually adjusted to the setting for **remote operation** before the appliance can be operated in this mode. There shall be a visual indication on the appliance showing that the appliance is adjusted for **remote operation**. **28**

*Compliance is checked by inspection.*

**22.101** Kettles shall be constructed so that the lid does not fall off when water is poured out.

*Compliance is checked by the following test.*

*The kettle is filled to its **rated capacity** and the lid closed in accordance with the instructions. The kettle is supplied at **rated voltage** and operated until the water boils. Approximately 90 % of the water is poured from the kettle in the normal way. The lid shall not fall off and water shall only be emitted from the spout.*

**22.102** Kettles shall be constructed so that there are no sudden jets of steam or hot water likely to expose the user to a hazard when the appliance is used as in normal use.

NOTE Normal use takes into account the instructions concerning the position of the lid and the likely position of the user's hands when gripping the handle.

*Compliance is checked by inspection during the test of Clause 11.*

**22.103** The appliance coupler of **cordless appliances** shall be constructed to withstand the stresses occurring during normal use.

*Compliance is checked by the following test.*

*The two **live pin**s of the appliance are connected together and an external resistive load is connected in series with the supply. The external load is such that the current is 1,1 times **rated current**.*

*The appliance is placed on its stand and withdrawn*

- *for **cordless kettles**, 10 000 times*
- *for **cordless coffee-makers**, 10 000 times*
- *for other **cordless appliances**, 6 000 times*

*at a rate of approximately 10 times per minute. The test is continued without current flowing for a further 10 000 times for **cordless kettles** and **cordless coffee-makers** and 6 000 times for other **cordless appliances**.*

*If a single stand is supplied with more than one **cordless appliance**, the test for each **cordless appliance** shall be carried out using the same stand.*

*The test shall be performed with the **cordless appliance** empty, placed without appreciable force, and withdrawn in a motion perpendicular to the stand. The appliance shall be placed and withdrawn at the same position from the stand, without rotation, throughout the test.* **29**

*After the test, the appliance shall be suitable for further use and compliance with 8.1, 16.3, 27.5 and Clause 29 shall not be impaired.*

*The test is carried out without current flowing if the connection contacts cannot make or break on load.*

**22.104 Portable appliances** for boiling water that have a **rated capacity** exceeding 3 l, and which are liable to overturn, shall be constructed so that the rate of discharge is limited.

*Compliance is checked by the following test, appliances incorporating an appliance inlet being fitted with a cord set.*

*The appliance is filled with water to its **rated capacity** and the lid closed in accordance with the instructions. It is placed on a horizontal plane in any position of normal use but orientated to produce the most unfavourable result.*

*The plane is slowly inclined to an angle of 25°. If the appliance overturns, it is left in this position for 10 s and then returned to its normal position. The quantity of water remaining is measured. The rate of discharge of water is determined from the formula:*

$$D = \frac{60\,(C_1 - C_2)}{t}$$

*where*

*D* *is the rate of discharge of water;*

$C_1$ *is the **rated capacity** in litres;*

$C_2$ *is the remaining quantity of water in litres;*

*t* *is the duration of the discharge in seconds, measured from the time the appliance overturns.*

*The rate of discharge of water shall not exceed 16 l/min.*

NOTE Suitable means can be used to prevent the appliance from slipping on the inclined plane.

**22.105 Fixed appliances** for boiling water shall be constructed so that the container is always open to the atmosphere through an aperture of at least 5 mm in diameter, or 20 $mm^2$ in area with a width of at least 3 mm. The aperture shall be located so that it is unlikely to be obstructed in normal use.

If the appliance has provision for discharging steam or for water overflow, the discharge aperture shall be at the base of the appliance and shall discharge vertically downwards.

*Compliance is checked by inspection and by measurement.*

**22.106 Espresso coffee-makers** shall be constructed so that it is not possible to remove the coffee filter by a simple operation while there is a hazardous pressure within the container.

*Compliance is checked by inspection and by manual test. This requirement is considered to be met if the coffee filter can only be removed after it has been rotated through an angle of at least 30°.*

**22.107** Pressure cookers shall incorporate a non-self-resetting pressure or temperature responsive **pressure-relief device**.

*Compliance is checked by inspection.*

**22.108** Pressure cookers shall be constructed so that:

– the lid cannot be removed while the pressure within the container is excessive;

– there is no build-up of pressure within the container unless the lid is locked.

They shall incorporate a means to release the pressure to a value such that the lid can be removed without risk.

*Compliance is checked by inspection and the ~~following~~ tests of 22.108.1 and 22.108.2.*

**22.108.1** *The pressure cooker is operated as specified in Clause 11 until the **pressure regulator** operates for the first time.*

~~*The pressure cooker is then disconnected from the supply and the pressure allowed to decrease until the pressure is 4 kPa. A force of 100 N is applied to the most unfavourable point where the lid or its handle can be gripped. It shall not be possible to remove the lid.*~~

~~*The internal pressure is then gradually reduced, the force of 100 N being maintained. There shall be no hazardous displacement of the lid when it is released.*~~

*The pressure cooker is then disconnected from the supply and a force of 150 N is immediately applied to the most unfavourable point where the lid or its handle or knob can be gripped or a torque of 15 N m is applied to the handle or knob about the axis of rotation for opening the lid, applying the most unfavourable condition. It shall not be possible to remove the lid.*

*If the lid, handle or knob breaks, there shall be no ejection of the **pressure cooker** contents. The test shall then be continued if the construction permits.* **30**

*The internal pressure is then gradually reduced, the force of 150 N or the torque of 15 N m being applied, taking care to ensure that the force or torque is applied in a manner that does not prevent a lid locking mechanism from operating to release the lid before a safe internal pressure is obtained. The internal pressure is allowed to decrease until the internal pressure does not exceed 4 kPa when the test is stopped. There shall be no hazardous displacement of the lid or of the pressure cooker contents when the lid is released.* **31**

*This test is not carried out on pressure cookers when the lid is secured by screw clamps or other devices that ensure that the pressure is automatically reduced in a controlled manner before the lid can be removed.*

**22.108.2** *Immediately after the test of 22.108.1, the pressure cooker is then tested by placing the lid on the appliance in the most unfavourable position without allowing the lid safety locking mechanism to lock. Attempts are made to gradually pressurise the container hydraulically. The internal pressure of the container shall not exceed 4 kPa.* **32**

**22.109** Pressure cookers shall be constructed so that the pressure in the container is not excessive when the lid is not closed or is incorrectly fitted.

*Compliance is checked by the following test.*

*The pressure cooker is operated under the conditions of Clause 11 with the lid and any seal, or combination of the two, fitted in the most unfavourable position that allows the pressure cooker to operate.*

*The pressure in the container shall not exceed 4,0 kPa.*

**22.110 Feeding-bottle heaters** with a control to set a pre-determined temperature or time shall emit a visible or audible signal to indicate that the pre-determined temperature or time has been reached.

*Compliance is checked by inspection during the test of Clause 11.*

**22.111 Espresso coffee-makers**, incorporating a pressurized reservoir filled by the user, shall be constructed so that there is no spillage of water or sudden jets of steam or hot water likely to expose the user to a hazard when the appliance is used in accordance with the instructions.

When removing the filling cap of the pressurized reservoir, before the cap is removed completely, the pressure shall be relieved in a controlled manner in order to avoid the emission of jets of steam or hot water that are likely to expose the user to a hazard.

*Compliance is checked by inspection during the test of Clause 11 and by removing the filling cap at the end of the test.*

**22.112 Soy milk makers** shall be constructed so that steam or hot water are not ejected which ~~may~~ can expose the user to a hazard.

*Compliance is checked by inspection.*

**22.113** Appliances with moving mechanical parts shall be constructed so that lubricants are prevented from polluting food compartments.

*Compliance is checked by inspection.*

**22.114** Appliances shall be constructed so that food or liquids are prevented from penetrating into places that could cause electrical or mechanical faults.

*Compliance is checked by inspection.*

**22.115** Coffee-makers shall be constructed so that it is not possible to rotate the frothing nozzle or hot water nozzle through an angle of more than 45° upwards from the downwards facing vertical position, unless one or more of the following conditions are fulfilled:

– the rotation is in the lateral direction and oriented towards the centre of the machine. In this case the rotation can be up to 75°; or

NOTE The rotation of the frothing or hot water nozzle is shown in Figure 111.

– there is no release of steam or hot water possible when frothing nozzles or hot water nozzles rotate to more than 45° upwards from the downwards facing vertical position. In this case there is no limit to the rotation angle in any direction. **33**

*Compliance is checked by inspection and by manual test.*

*If compliance relies on the operation of an **electronic circuit**, the test is repeated under the following conditions applied separately:*

– *the fault conditions in a) to g) of 19.11.2 are applied one at a time to the **electronic circuit**;*
– *the electromagnetic phenomena tests of 19.11.4.2 and 19.11.4.5 are applied to the appliance. The tests are carried out with surge protective devices disconnected, unless they incorporate spark gaps.*

*If the **electronic circuit** is programmable, the software shall contain measures to control the fault/error conditions specified in Table R.1 and is evaluated in accordance with the relevant requirements of normative Annex R.* **34**

**22.116** For appliances that are controlled by programmable **electronic circuits** that limit the number of heating elements and motors from being energized at the same time, simultaneous activation of any combination of heating elements and motors shall not render the appliance unsafe.

*Compliance is checked as follows:*

– *the fault/error conditions specified in Table R.1 are applied and evaluated in accordance with the relevant requirements of normative Annex R; or*

– *the appliance is operated under the conditions of Clause 11 while being supplied at **rated voltage**, the programmable **electronic circuits** being modified to allow simultaneous activation of all heaters and motors under their control. Under these conditions, compliance with 19.13 shall not be impaired.* **35**

## 23 Internal wiring

This clause of Part 1 is applicable.

## 24 Components

This clause of Part 1 is applicable except as follows.

**24.1.3** *Addition:*

*Switches incorporated in **espresso coffee-makers** for initiating brewing or steaming are subjected to 10 000 cycles of operation.*

*Switches incorporated in **dynamic pressure cookers** for controlling heaters are subjected to 50 000 cycles of operation and are tested under the conditions of Clause 11 with the appliance supplied at **rated voltage**.*

**24.1.4** *Addition:*

***Self-resetting thermal cut-outs** required for compliance with the test of 19.101 are subjected to 3 000 cycles of operation.*

**24.1.5** *Addition:*

*For appliance couplers incorporating **thermostats**, **thermal cut-outs** or fuses in the connectors, IEC 60320-1 is applicable except that:*

– *the earthing contact of the connector is allowed to be accessible, provided that this contact is not likely to be gripped during insertion or withdrawal of the connector;*

– *the temperature required for the test of Clause 18 is that measured on the pins of the appliance inlet during the test of Clause 11 of this standard;*

– *the breaking-capacity test of Clause 19 is carried out using the inlet of the appliance;*

– *the temperature rise of current-carrying parts specified in Clause 21 is not determined.*

*Thermal controls are not allowed in connectors complying with the standard sheets of IEC 60320-1.*

**24.4** *Addition:*

This requirement is not applicable to the connection between the appliance and the stand of **cordless appliances**.

**24.101** Devices incorporated in appliances, other than kettles, for compliance with 19.4, shall be non-self-resetting. However, **self-resetting thermal cut-outs** are allowed for **fixed water boilers** if they have been subjected to 10 000 cycles of operation.

*Compliance is checked by inspection and during the test of 19.4.*

*If appliances, other than:*

– ***fixed water boilers*** *incorporating* ***self-resetting thermal cut-outs*** *that have been subjected to 10 000 cycles of operation, and*

– *kettles,*

*incorporate* ***self-resetting thermal cut-outs****, these shall be short-circuited or rendered inoperative for the test of 19.4.*

## 25 Supply connection and external flexible cords

This clause of Part 1 is applicable except as follows.

~~**25.1** *Addition:*~~

~~Appliances incorporating an appliance inlet, other than those standardized in IEC 60320-1, shall be supplied with a cord set.~~ **36**

**25.5** *Addition:*

**Type Z attachment** is allowed for egg boilers, **feeding-bottle heaters**, steam sterilizers, yoghurt makers and stands of **cordless appliances**.

**25.7** *Addition:*

The **supply cord** of livestock feed boilers shall be polychloroprene sheathed.

**25.8** *Addition:*

**Portable appliances** having a **rated current** up to 10 A may incorporate a **supply cord** having a nominal cross-sectional area of 0,75 $mm^2$, if the length is less than 2 m.

**25.22** *Addition:*

**Soy milk maker** inlets shall be located so that pollution by soy milk is unlikely to occur during normal use.

*Compliance is checked by inspection.*

**25.101** **Supply cords** of kettles shall not be longer than 75 cm, unless they are helically coiled.

*Compliance is checked by measurement.*

*If a **cordless kettle** has a cord storage facility, the length of the cord is measured after storing as much of the cord as possible.*

*The length of the cord is measured between the plug and the point where the cord or cord guard enters the appliance.*

## 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 except as follows.

**29.2** *Addition:*

The microenvironment is pollution degree 3 if the insulation can be polluted by condensation from steam produced during normal use of the appliance.

## 30 Resistance to heat and fire

This clause of Part 1 is applicable except as follows.

**30.1** *Addition:*

*For coffee-makers, egg boilers, kettles and **steam cookers**, the temperature rises occurring during the tests of 19.4, 19.5 and 19.101 are not taken into account.*

**30.2** *Addition:*

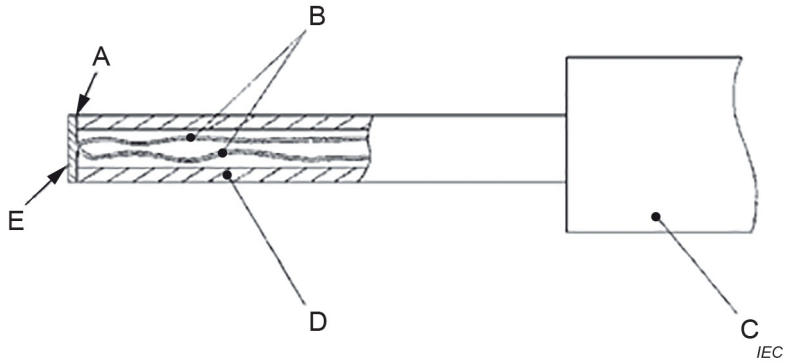
*For water distillers, appliances incorporating a delayed start timer and appliances intended to maintain liquid or food at a particular temperature, 30.2.3 is applicable. For other appliances, 30.2.2 is applicable.*

## 31 Resistance to rusting

This clause of Part 1 is applicable.

## 32 Radiation, toxicity and similar hazards

This clause of Part 1 is applicable.




**Key**

A adhesive

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

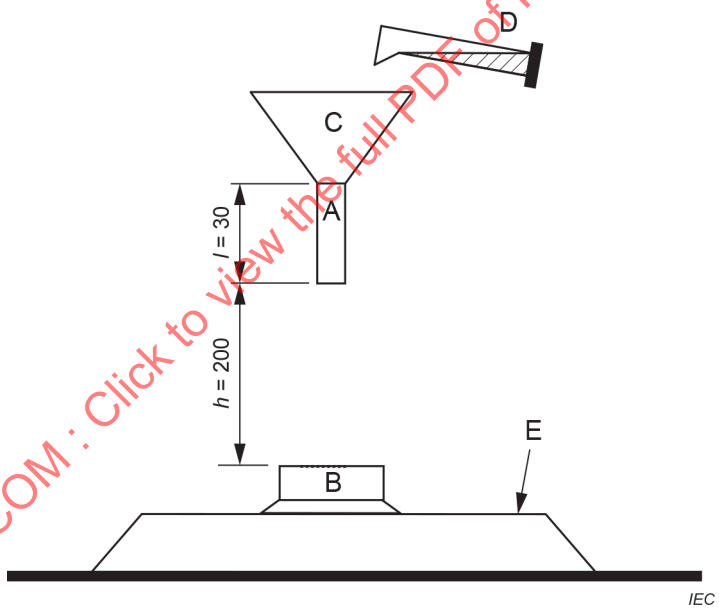
C handle arrangement permitting a contact force of 4 N ± 1 N

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**

Dimensions in millimetres




**Key**

A funnel tube with inner diameter of 8 mm

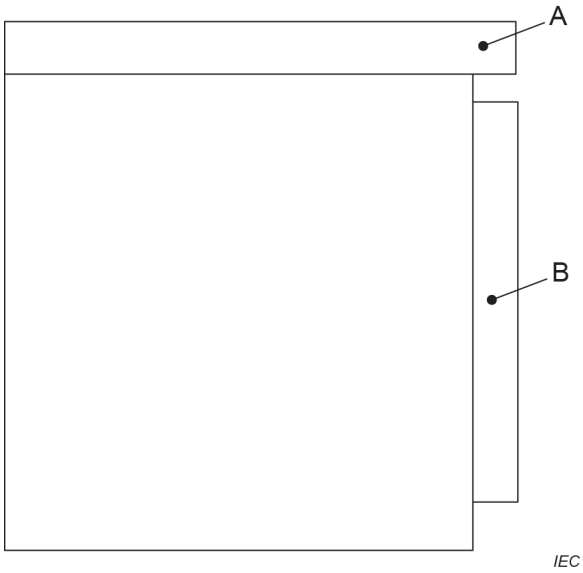
B item under test

C funnel

D container with 30 ml of saline solution

E horizontal surface

**Figure ~~101~~ 102 – Schematic representation of the 30 ml spillage test**

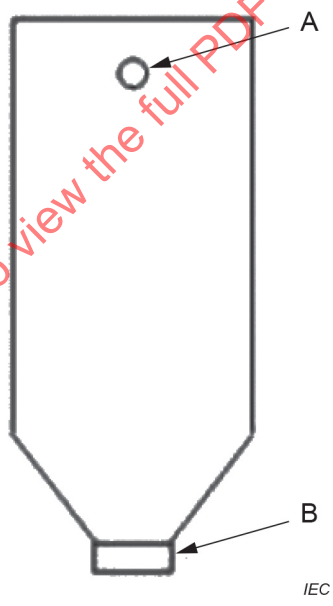



**Key**

A work surface

B appliance

**Figure 103 – Arrangement of work surface for spillage test on built-in appliances**

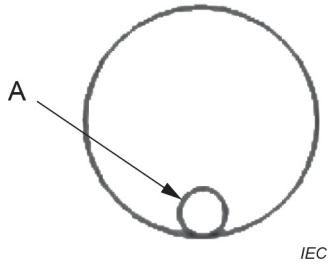



**Key**

A bottle hole with diameter 8 mm

B bottle cap

**Figure 104 – Spillage solution bottle**

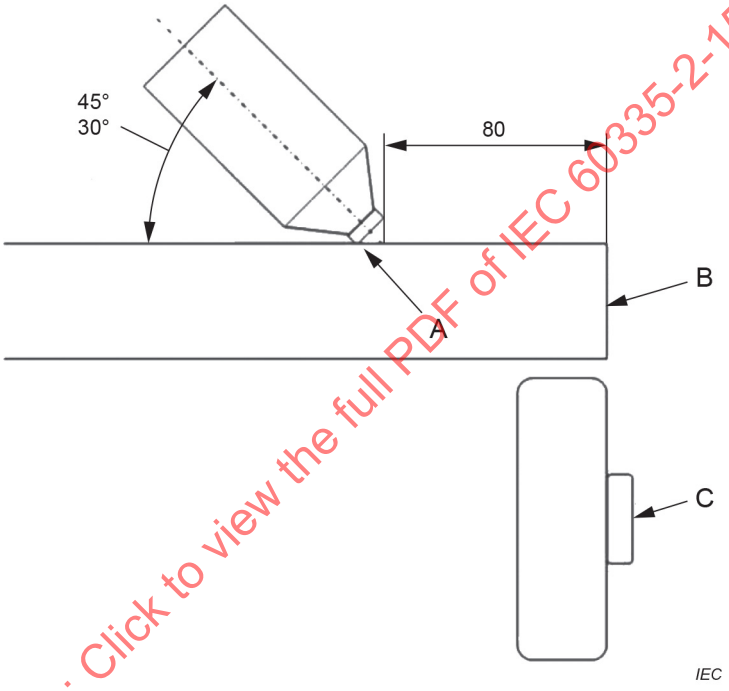



**Key**

A bottle cap hole – diameter 8 mm

**Figure 105 – Detail of bottle cap and position of hole**

Dimensions in millimetres



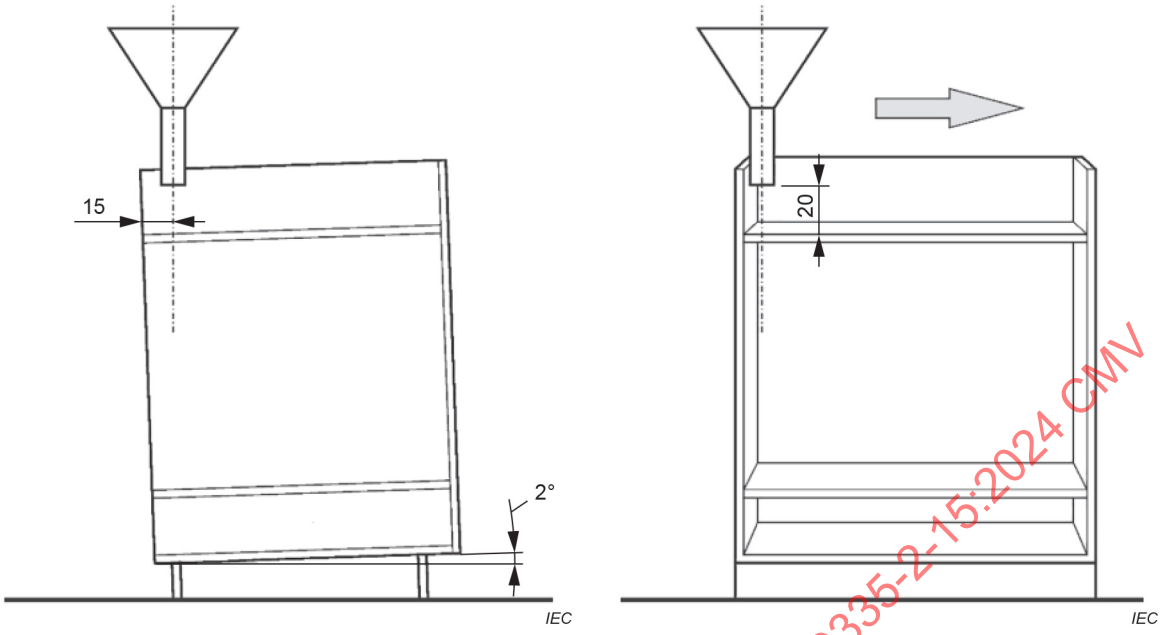

**Key**

A bottle cap hole position

B edge of work surface

C front of the appliance

**Figure 106 – Bottle position for the spillage test**




a) Side view

b) Front view

**Figure 107 – Test cabinet including separation board, position of funnel and example for direction of tilt**

Dimensions in millimetres

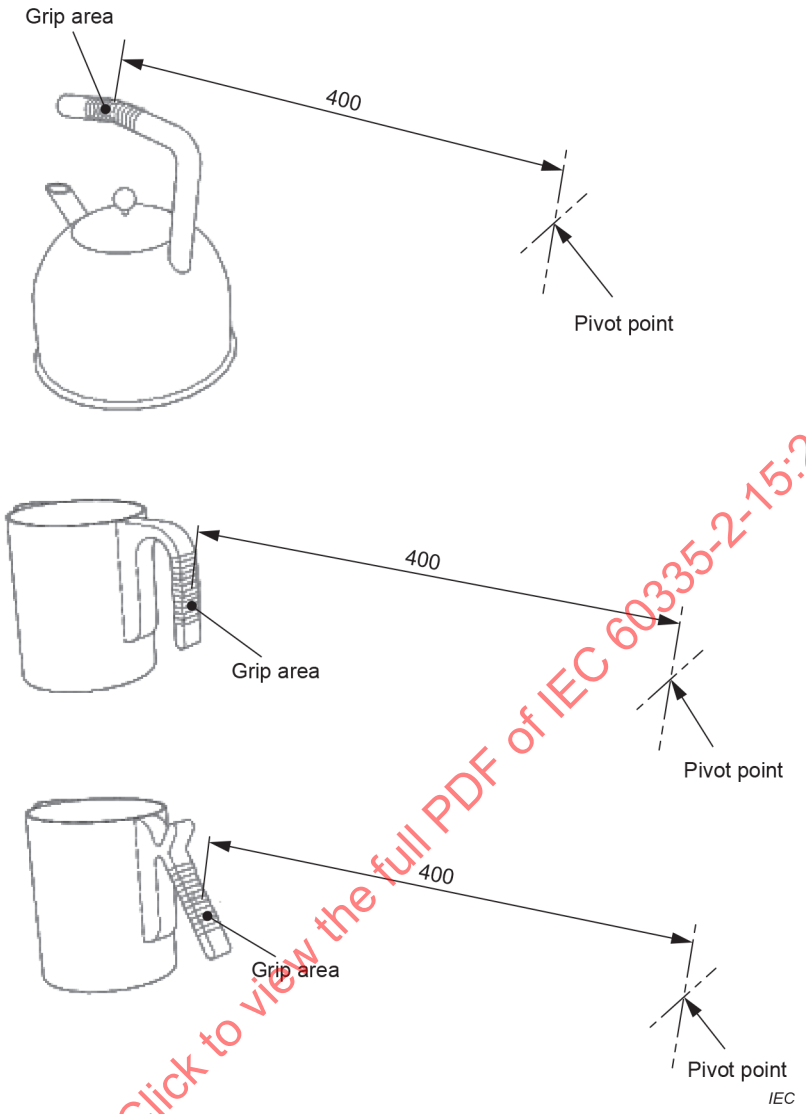



**Figure 108 – Schematic representation of the clamp position of different designs**

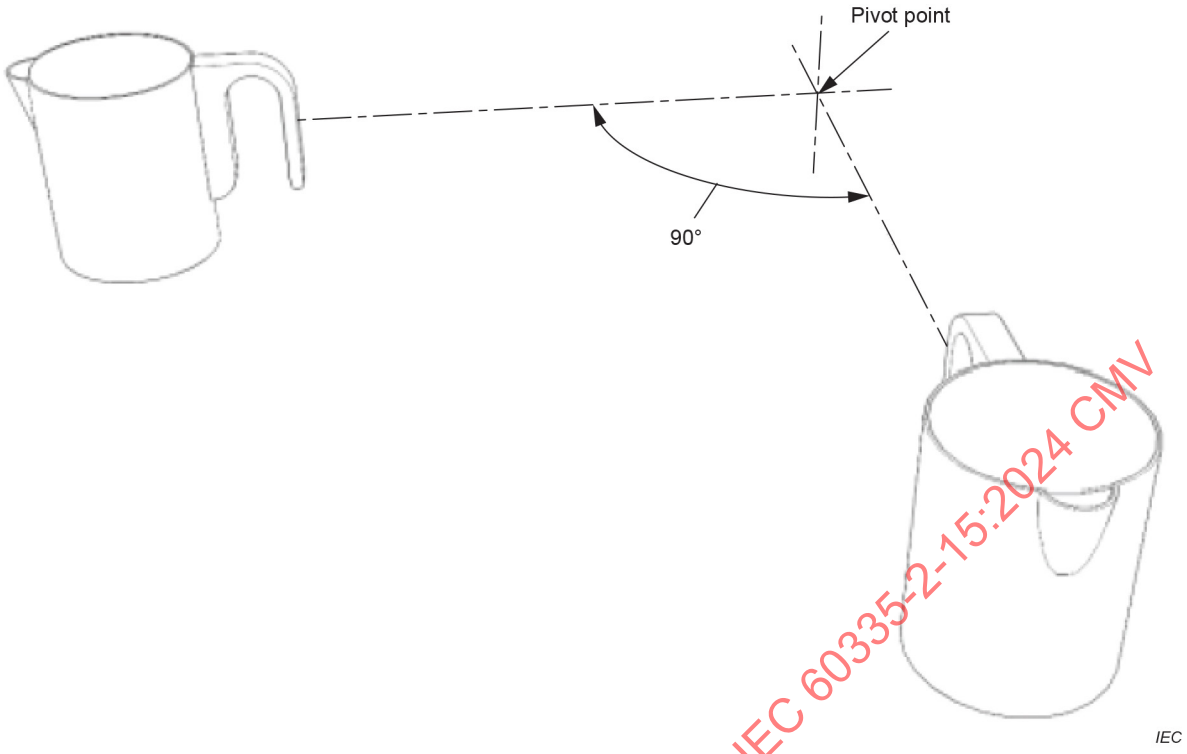



**Figure 109 – Schematic representation of the horizontal movement test**

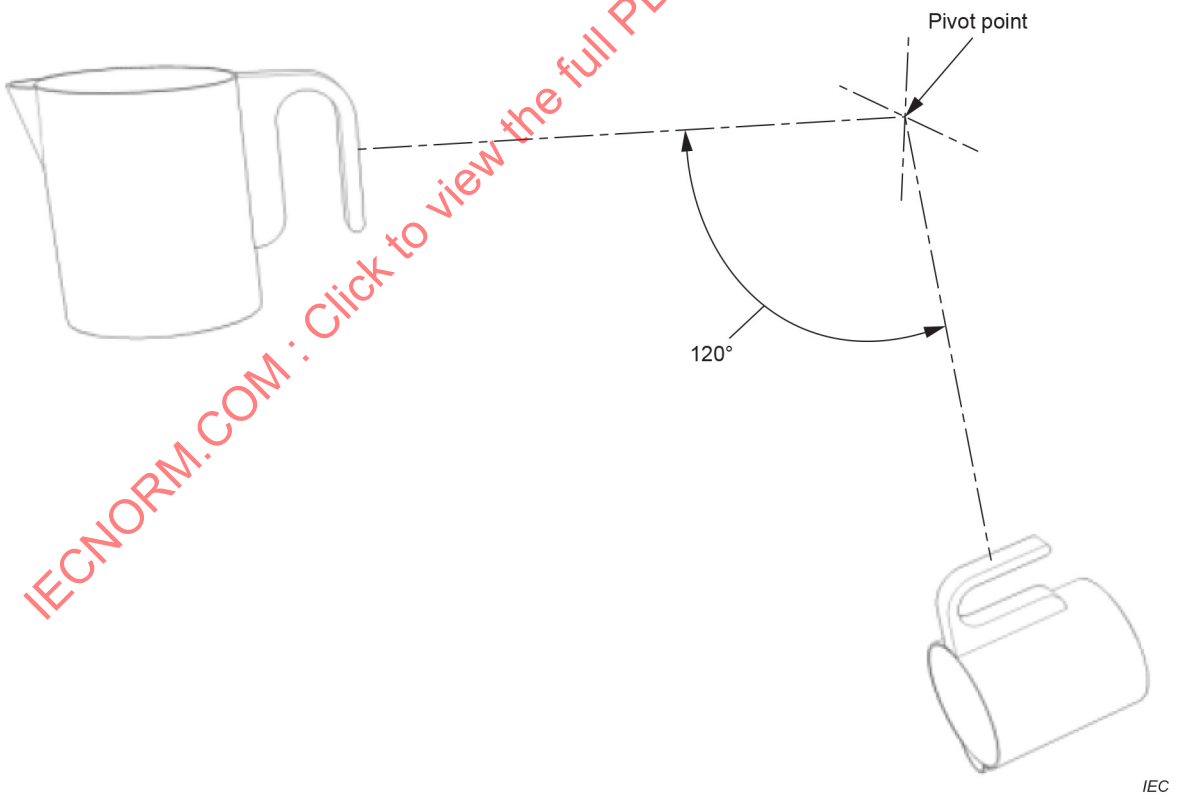



**Figure 110 – Schematic representation of the vertical movement test**

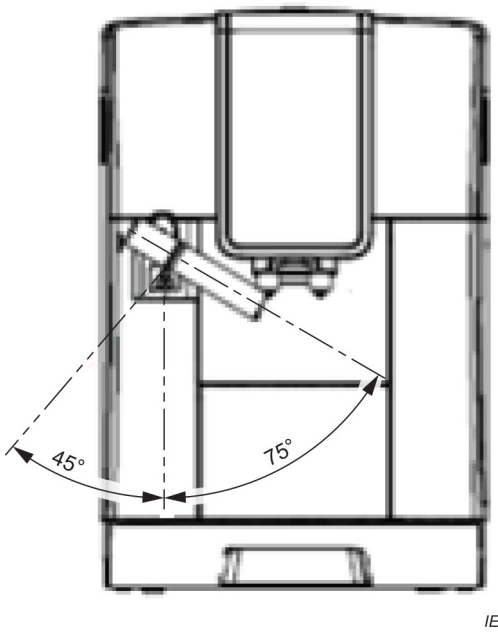



**Figure 111 – Rotation of the frothing or hot water nozzle**

## 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

This annex of Part 1 is applicable except as follows.

**B.11.1** *Modification:*

Replace the first, second and third paragraphs with the following:

***Battery-operated appliances*** *are tested under the conditions of* ***normal operation*** *with the appliance operated as specified in 11.7 or until it cannot perform its intended function due to the depletion of* ***battery***.

*For appliances incorporating* ***integral batteries*** *or* ***separable batteries*** *not disconnected from the appliance for charging purposes, and that cannot perform their intended function while the* ***batteries*** *are being charged, the appliance is operated as specified until it cannot perform its intended function due to the depletion of the* ***batteries***. **37**

# Annex C
(normative)

## Ageing test on motors

This annex of Part 1 is applicable except as follows.

*Modification:*

The value of *p* in Table C.1 is 2 000.

# Annex R
(normative)

## Software evaluation

This annex of Part 1 is applicable except as follows.

**R.2.2.5** *Modification:*

Replace the first paragraph with the following:

For programmable **electronic circuits** with functions requiring software incorporating measures to control the fault/error conditions specified in Table R.1, detection or a fault/error shall occur before compliance with Clause 19, 20.103, 22.115 or 22.116 is impaired.

**R.2.2.9** *Modification:*

Replace the first sentence with the following:

The software and safety-related hardware under its control shall be initialized and shall terminate before compliance with Clause 19, 20.103, 22.115 or 22.116 is impaired. **38**

# Bibliography

The Bibliography of Part 1 is applicable except as follows.

*Addition:*

IEC 60335-2-13, *Household and similar electrical appliances – Safety – Part 2-13: Particular requirements for deep fat fryers, frying pans and similar appliances*

IEC 60335-2-21, *Household and similar electrical appliances – Safety – Part 2-21: Particular requirements for storage water heaters*

IEC 60335-2-35, *Household and similar electrical appliances – Safety – Part 2-35: Particular requirements for instantaneous water heaters*

IEC 60335-2-54, *Household and similar electrical appliances – Safety – Part 2-54: Particular requirements for surface-cleaning appliances for household use employing liquids or steam*

IEC 60335-2-74, *Household and similar electrical appliances – Safety – Part 2-74: Particular requirements for portable immersion heaters*

IEC 60335-2-75, *Household and similar electrical appliances – Safety – Part 2-75: Particular requirements for commercial dispensing appliances and vending machines*

IEC 60335-2-98, *Household and similar electrical appliances – Safety – Part 2-98: Particular requirements for humidifiers*

## 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 Functional and adjacent surfaces of heating appliances are known to be hot due to the intended function of the appliance. Identification of other hot surfaces is required when the temperatures in Table 101 are exceeded as noted in footnote b.

6 It is common to require the meaning of symbols used in place of marking text to be explained in the instructions.

7 Polycarbonate materials can degrade due to exposure to some cleaning agents. This can result in a scald hazard due to cracking or breaking of liquid containers.

8 These additional instructions are intended to prevent damage to the appliance due to operation without the heated surface being completely covered in water.

9 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.

10 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.

11 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.

12 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.

13 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.

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

15 Kettles are not tested with the spillage solution in the Part 1 Standard because they are only intended to be filled with water in normal use.

16 This test is modified to conduct the test with the spillage solution with the rinsing agent, but without the appliance operating to heat the solution.

17 The test is modified for clarity and alignment with testing in other Part 2 Standards.

18 This test is added based on similar testing in IEC 60335-2-25 for microwave and recent changes in IEC 60335-2-6 to address the potential for spillage of liquids over the edge of a work surface and onto the appliance that is installed below the work surface.

19 This test is added based on similar testing in IEC 60335-2-25 for microwave to address the potential for spillage of liquids from an appliance installed above the appliance for built-in appliances.

20 Accessibility of the cutting blades of a soy milk maker is evaluated with the modified test probe B as specified in Subclause 20.2 of IEC 60335-1:2020. If a lid interlock is required to comply with Subclause 20.2, then Subclause 20.103 is also applicable.

21 The test probes are applied to the interlock actuator, not to the blades. Accessibility of the blades is evaluated in Subclause 20.2.

Test probe 18 is added to align with the requirement in Subclause 20.2 of the Part 1 Standard. The force applied to test probe B and test probe 18 is also aligned with the force specified in Subclause 20.2 of the Part 1 Standard.

22 When the interlock function relies upon the operation of an electronic function, additional testing is specified to verify that the interlock function is maintained under a component fault condition, when subjected to electromagnetic phenomena or due to a fault in the software.

23 Breakage of a glass container of hot liquid can result in a scalding injury, so the breakage of the glass container is prohibited.

24 Breakage of loosening of the handle of a kettle can result in a scald hazard. This test is added to represent movements expected in normal use of a kettle to evaluate the strength of the handle securement means.

25 Breakage or loosening of the handle of a kettle can result in a scald hazard. This test is added to evaluate the ability of the handle and its securement means to withstand the forces encountered during normal use.

26 Clarification that a drain hole needs to meet the minimum dimensions or it is considered to be blocked when determining compliance.

27 Additional requirements for remote operation were added to IEC 60335-1:2020. However, the duration of operation does not need to be set before remote operation for appliances that switch off automatically at the end of the cycle or that can operate continuously without giving rise to a hazard.

28 For these appliances, the appliance must be provided with a control that can be set for remote operation and a visual indication on the appliance must show when it is set for remote operation.

29 The intent of this test is to represent normal use, not excessive force which would be considered mechanical abuse.

30 The test is then continued if the construction permits by applying other means, to achieve the test condition at the specified lid opening force or torque.

31 The test specification is updated to increase the force applied to the handle or lid from 100 N to 150 N. A torque is introduced to test pressure cookers constructions where application of a torque is necessary to open the lid.

32 This evaluates whether the appliance can be pressurised without the lid locked in position immediately after the applying the forces to the handle, knob or lid as specified in Subclause 20.108.1.

33 When the nozzle is rotating toward the centre of the machine, a larger angle is allowable. Rotation beyond the specified angle is allowed if the appliances is constructed to prevent the release of steam or hot water when the angle exceeds 45°.

34 When compliance with this requirement relies upon the operation of an electronic function, additional testing is specified to verify that compliance is maintained under a component fault condition, when subjected to electromagnetic phenomena or due to a fault in the software.

35 This is added to align with requirements in other Part 2 Standards, where the appliance may have multiple heating elements or motors that are not intended to operate simultaneously.

36 This requirement is now covered by Subclause 22.58 of IEC 60335-1:2020, so it is removed from the Part 2 Standard.

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

38 These changes are necessary due to the reference to Table R.1 and Annex R in Subclauses 20.103, 22.115 and 22.116.

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# IEC 60335-2-15

Edition 7.0 2024-11

# INTERNATIONAL STANDARD

# NORME INTERNATIONALE



**Household and similar electrical appliances – Safety –**
**Part 2-15: Particular requirements for appliances for heating liquids**

**Appareils électrodomestiques et analogues – Sécurité –**
**Partie 2-15: Exigences particulières pour les appareils de chauffage des liquides**

IEC 60335-2-15:2024-11(en-fr)

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INTERNATIONAL ELECTROTECHNICAL COMMISSION

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# HOUSEHOLD AND SIMILAR ELECTRICAL APPLIANCES – SAFETY –

## Part 2-15: Particular requirements for appliances for heating liquids

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IEC 60335-2-15 has been prepared by IEC technical committee 61: Safety of household and similar electrical appliances. It is an International Standard.

This seventh edition cancels and replaces the sixth edition published in 2012, Amendment 1:2016 and Amendment 2:2018. 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, 8.1.2, 11.7.104, 15.2, 15.101);
c) introduction of surface temperature limits (3.6.102, 7.1, 7.6, 7.12, 7.14, 7.15, 11.1, 11.3, 11.101);

d) addition of instructions for appliances with liquid containers made from polycarbonate material and kettles (7.12);

e) introduction of test probe 18 and clarification of the application force for test probes in 20.103;

f) improvement of spillage test for coffee-makers with a removable coffee pot and addition of test for appliances with a surface that will support a cup of vessel (15.2);

g) specified that kettles are to be tested with NaCl instead of the spillage solution (15.2);

h) addition of spillage tests for built-in appliances (15.104, 15.105);

i) addition of compliance criteria for impact testing on glass containers of kettles, coffee-makers and tea makers (21.1);

j) addition of requirements for the strength of kettle handles (21.101, 21.102);

k) clarification of requirements for drain holes (22.6);

l) added requirements for remote operation (22.49, 22.51);

m) clarification of test method evaluation of appliance couplers for cordless appliances (22.103);

n) clarification of requirements for pressure cookers (22.108, 22.108.1, 22.108.2, 22.109);

o) revision of requirements for the maximum rotation angle of a frothing or hot water nozzle (22.115, R.2.2.5, R.2.2.9);

p) addition of requirements for programmable electronic circuits that limit the number of heating elements and motors able to operate at the same time (22.116, R.2.2.5, R.2.2.9).

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

| Draft | Report on voting |
|---|---|
| 61/7289/FDIS | 61/7332/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 appliances for heating liquids.

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 following differences exist in the countries indicated below.

– 1: In AU and NZ, there are additional construction and abnormal requirements for all-in-one appliances that do not have pressure cooker functions

– 19.101: The test is not applicable (Japan).

– 25.8: A supply cord having a cross-sectional area of 0,75 $mm^2$ is not allowed for appliances having a rated current exceeding 6 A (Japan).

– 25.8: Longer supply cords are allowed (Japan).

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 can 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 2-15: Particular requirements for appliances for heating liquids

## 1 Scope

This clause of Part 1 is replaced by the following.

This part of IEC 60335 deals with the safety of electrical appliances for heating liquids for household and similar purposes, their **rated voltage** being not more than 250 V including direct current (DC) supplied appliances and **battery-operated appliances**.

Some appliances in this standard are used for heating food.

Examples of appliances that are within the scope of this standard are:

– coffee-makers;
– cooking pans;
– egg boilers;
– **feeding-bottle heaters**;
– kettles and other appliances for boiling water, having a **rated capacity** not exceeding 10 l;
– milk heaters;
– pressure cookers having a **rated cooking pressure** not exceeding 140 kPa and a **rated capacity** not exceeding 10 l;
– **rice cookers**;
– slow cookers;
– **steam cookers**;
– **soy milk makers**;
– tea makers;
– wash boilers;
– yoghurt makers.

Appliances can have more than one function.

Appliances intended for normal household and similar use and that can also be used by laypersons in shops, in light industry and on farms, are within the scope of this standard. Examples of such appliances are glue pots with a water jacket, livestock feed boilers and sterilizers.

If the appliance is intended to be used professionally to process food for commercial consumption, the appliance is not considered to be for household and similar use only.

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, the national water supply authorities and similar authorities;
  - additional national requirements for pressure vessels are specified for pressure cookers.

This standard does not apply to

– frying pans and deep fat fryers (IEC 60335-2-13);
– storage water heaters (IEC 60335-2-21);
– instantaneous water heaters (IEC 60335-2-35);
– surface-cleaning appliances employing liquids or steam (IEC 60335-2-54);
– portable immersion heaters (IEC 60335-2-74);
– commercial dispensing appliances and vending machines (IEC 60335-2-75);
– appliances for medical purposes (IEC 60601);
– 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);
– appliances for high-frequency heating;
– pressure sterilizers;
– humidifiers for household and similar use (IEC 60335-2-98).

## 2 Normative references

This clause of Part 1 is applicable except as follows.

*Addition:*

IEC 60584-1, *Thermocouples – Part 1: EMF specifications and tolerances*

## 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 conditions specified in 3.1.9.101 to 3.1.9.107

**3.1.9.101** Kettles, thermal pots, urns and other appliances for boiling water, cooking pans, glue pots, milk heaters, slow cookers, sterilizers, wash boilers and yoghurt makers are operated with their container filled with the **rated capacity** of water, any lid being closed. The quantity of water in slow cookers is maintained above 50 % of their **rated capacity**.

Coffee-makers are operated in accordance with their instructions with the water container filled to its **rated capacity** and bean container, if any, filled with coffee beans. The warming plate and all other energy consuming functions, if any, are switched on.

Appliances with a heated surface intended to keep the liquid warm are operated with or without the container, whichever is the more unfavourable.

**3.1.9.102** Egg boilers and **steam cookers** are operated with their containers filled with the maximum quantity of water specified in the instructions.

**3.1.9.103** **Feeding-bottle heaters** are operated with a bottle of heat-resistant glass, round or hexagonal in shape, having a mass between 190 g and 200 g and a capacity of approximately 225 ml, unless a particular bottle is specified, in which case that bottle is used. The bottle is filled to approximately its **rated capacity** of water or 200 ml, whichever is less, and is placed in the **feeding-bottle heater**. The heater is filled with water to the level specified in the instructions or, in the absence of instructions, to the maximum level.

**3.1.9.104** Livestock feed boilers are operated with the lid closed; the container being filled with half its **rated capacity** of water.

**3.1.9.105** Pressure cookers are operated in accordance with the instructions but with the container filled with water to a depth of 25 mm.

**3.1.9.106** **Rice cookers** are operated with the rice container filled with water to the level of maximum **rated capacity**. Water is added to maintain the level during boiling as necessary.

When operated in the keep-warm mode, the **rice cooker** is operated with the rice container empty.

**3.1.9.107** **Soy milk makers** are operated with the container filled with soy beans in accordance with the instructions and water to the **rated capacity**.

**3.1.101**
**rated capacity**
capacity assigned to the appliance by the manufacturer

**3.1.102**
**rated cooking pressure**
pressure assigned to the appliance by the manufacturer

### 3.5 Definitions relating to types of appliances

**3.5.101**
**espresso coffee-maker**
coffee-maker in which water is heated and forced through the ground coffee by steam pressure or by means of a pump

Note 1 to entry: **Espresso coffee-makers** can have an outlet for supplying steam or hot water.

**3.5.102**
**feeding-bottle heater**
appliance for heating prepared baby food in a feeding-bottle, heat being transferred by means of water

Note 1 to entry: **Feeding-bottle heaters** can have a control to set the temperature or time to a predetermined level.

**3.5.103**
**cordless kettle**
kettle incorporating a heating element and which is connected to the supply only when placed on its associated stand

**3.5.104**
**steam cooker**
appliance in which food is heated by steam generated at atmospheric pressure

**3.5.105**
**rice cooker**
appliance for cooking rice that is placed in a **detachable container**, the container being placed within the appliance when cooking

Note 1 to entry: **Rice cookers** can have a keep warm function.

Note 2 to entry: **Rice cookers** can cook food other than rice.

**3.5.106**
**induction rice cooker**
**rice cooker** that heats the rice container by means of eddy currents

Note 1 to entry: The eddy currents are induced in the rice container or lid or rice container and lid by the electromagnetic field of a coil.

**3.5.107**
**cordless appliance**
appliance incorporating a heating element and which is connected to the supply only when placed on its associated stand

**3.5.108**
**dynamic pressure cooker**
pressure cooker which reduces the pressure by a dynamic action of an elastic part

**3.5.109**
**soy milk maker**
appliance with heating, pulverising and agitating functions that are intended to make soy milk

### 3.6 Definitions relating to parts of an appliance

**3.6.101**
**decorative door**
part of an appliance having the same function as a cabinet door

**3.6.102**
**functional surface**
surface that is intentionally heated by an internal heat source and has to be hot to carry out the function for which the appliance is intended

Note 1 to entry: An example is the heated sheath of a tubular heating element.

### 3.7 Definitions relating to safety components

**3.7.101**
**pressure regulator**
control that maintains the pressure at a particular value during normal use

**3.7.102**
**pressure-relief device**
control that limits the pressure under abnormal operating conditions

## 4 General requirement

This clause of Part 1 is applicable.

## 5 General conditions for the tests

This clause of Part 1 is applicable except as follows.

**5.2** *Addition:*

*If the test of 15.101 has to be carried out, three additional samples are required.*

*The tests of 21.101 and 21.102 may be carried out on separate appliances.*

**5.3** *Addition:*

*The test of 19.101 is carried out after the other tests.*

*The tests of 22.102, 22.110 and 22.111 are carried out during the test of Clause 11.*

**5.101** ***Induction rice cookers*** *are tested as* ***motor-operated appliances****.*

## 6 Classification

This clause of Part 1 is applicable except as follows.

**6.2** *Addition:*

Wash boilers and livestock feed boilers shall be at least IPX3.

## 7 Marking and instructions

This clause of Part 1 is applicable except as follows.

**7.1** *Addition:*

Appliances intended to be partially immersed in water for cleaning shall be marked with the maximum level of immersion and with the substance of the following:

Do not immerse beyond this level.

Kettles shall have a level mark or other means to indicate when they are filled to **rated capacity**, unless they cannot be filled beyond the **rated capacity**. This indication shall be visible when the kettle is in the filling position. If the level mark is not self-evident, there shall be a reference to this mark on the outside of the kettle which shall be visible when the kettle is in its normal position of use.

If the closed position of the lid of a pressure cooker is not obvious, this position shall be marked on the appliance.

Stands provided with **cordless appliances** shall be marked with:

– the name, trademark or identification mark of the manufacturer or responsible vendor;
– the model or type reference.

**Soy milk makers** shall have a level mark or other means to indicate when they are filled to **rated capacity**, unless they cannot be filled beyond the **rated capacity**.

If appliances have external **accessible surfaces**, for which temperature rise limits are specified in Table 101 and for which the provisions of footnote b to Table 101 apply, then the appliance shall be marked with symbol IEC 60417-5041(2002-10), or with the substance of the following:

CAUTION: Hot surface

**7.6** *Add the following*

[symbol IEC 60417-5041 (2002-10)] caution, hot surface

**7.12** *Addition:*

The instructions for appliances shall include the substance of the following:

This appliance is intended to be used in household and similar applications such as:

- staff kitchen areas in shops, offices and other working environments;
- farm houses;
- by clients in hotels, motels and other residential type environments;
- bed and breakfast type environments.

If the manufacturer wants to limit the use of the appliance to less than the above, this shall be clearly stated in the instructions.

The instructions for appliances incorporating an appliance inlet, and intended to be partially or fully immersed in water for cleaning, shall state that the connector must be removed before the appliance is cleaned and that the appliance inlet must be dried before the appliance is used again.

The instructions for appliances normally cleaned after use, and not intended to be immersed in water for cleaning, shall state that the appliance must not be immersed. This requirement normally applies to coffee-makers, cooking pans, milk heaters, pressure cookers, **steam cookers**, slow cookers, **soy milk makers** and yoghurt makers.

The instructions for appliances intended to be used with a connector incorporating a **thermostat** shall state that only the appropriate connector must be used.

Unless kettles are constructed so that a hazard cannot arise from boiling water being ejected, the instructions shall state that if the kettle is overfilled, boiling water can be ejected.

The instructions for kettles filled through a lid aperture situated below the handle shall include the substance of the following:

– WARNING: Do not remove the lid while the water is boiling.
– CAUTION: Position the lid so that steam is directed away from the handle.

The caution statement is not required if the lid can only be closed so that steam is directed away from the handle.

The instructions for **cordless appliances** shall state that the appliance is only to be used with the stand provided.

If the appliance and stand of **cordless appliances** can be lifted together by gripping the handle of the appliance, the instructions shall include the substance of the following:

– CAUTION: Ensure that the appliance is switched off before removing it from its stand.

The instructions for **feeding-bottle heaters** shall state:

– that the food should not be heated for too long;
– how to check that the correct food temperature has not been exceeded.

The instructions for **feeding-bottle heaters** that do not switch off automatically shall additionally include an instruction to switch off the **feeding-bottle heater** after use.

The instructions for pressure cooker**s**, other than **dynamic pressure cookers**, shall state that the ducts in the **pressure regulator** allowing the escape of steam should be checked regularly to ensure that they are not blocked.

The instructions for pressure cookers shall also give details of how to open the container safely and state that the container must not be opened until the pressure has decreased sufficiently.

The instructions for egg boilers provided with a pricking device shall contain the substance of the following:

CAUTION: Avoid injuries from the egg pricking device.

For **espresso coffee-makers** incorporating a pressurized reservoir filled by the user, the instructions shall contain information for the safe refilling of the water reservoir and the substance of the following:

WARNING: The filling aperture must not be opened during use.

The instructions for all appliances shall include:

– a warning to avoid spillage on the connector;
– details on how to clean the surfaces in contact with food;
– a warning of potential injury from misuse;
– a statement that the heating element surface is subject to residual heat after use.

The instructions for **soy milk makers** shall also include a statement that care shall be taken when handling the sharp cutting blades, emptying the container and during cleaning.

The instruction for **soy milk makers** incorporating a switch necessary for compliance with 22.40 shall include the substance of the following:

Switch off the appliance and disconnect from supply before changing accessories or approaching parts that move in use.

The instructions for coffee-makers other than **built-in coffee-makers** or those tested in a cabinet, shall state that the coffee-maker shall not be placed in a cabinet when in use.

For coffee-makers having an additional **decorative door**, and for coffee-makers intended to be used in a cabinet, the instructions shall state that the coffee-maker must be operated with the **decorative door** open or the cabinet door open.

The instructions for coffee-makers having surfaces of glass, ceramic or similar material that forms part of the enclosure of **live parts** shall include the substance of the following:

WARNING: Do not use the appliance if the surface is cracked.

The instructions for coffee-makers shall state that cleaning and **user maintenance** shall not be made by children without supervision.

If symbol IEC 60417-5041(2002-10) is marked on the appliance, its meaning shall be explained.

The instructions for appliances with liquid containers made from polycarbonate material that are accessible to the user shall state the substance of the following:

CAUTION: To prevent damage to the appliance, do not use aggressive cleaning agents when cleaning. Use a soft cloth and a mild detergent.

CAUTION: Do not use the appliance if the enclosure is damaged or has visible cracks.

The instructions for kettles shall state the substance of the following:

CAUTION: Do not operate the kettle on an inclined plane. Do not switch on the kettle if there is no water in the kettle. Do not move the kettle while it is switched on.

**7.12.4** *Addition:*

For coffee-makers suitable for operation when placed in a cabinet, the minimum dimensions of the cabinet shall be given.

**7.14** *Addition:*

The height of the triangle in symbol IEC 60417-5041 (2002-10) shall be at least 8 mm.

**7.15** *Addition:*

The marking specified for external **accessible surfaces** shall be visible when the appliance is operated as in normal use, including when actuating any switch, adjusting any control or opening a lid or door. It shall not be placed on a **functional surface**.

## 8 Protection against access to live parts

This clause of Part 1 is applicable except as follows.

**8.1.2** *Addition:*

Connecting devices in stands of **cordless appliances** are not considered to be socket-outlets.

## 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:*

*The power input of automatic coffee-makers is measured during one operating cycle that is selectable by the user, such as cleaning, descaling, or selecting a beverage. The measurement starts with the appliance at* ***room temperature****.*

*The operating cycle starts with the activation by the user and ends when the appliance stops the cycle automatically and the next operating cycle can be started by the user.*

**10.2** *Addition:*

*The input current of automatic coffee-makers is measured during one operating cycle that is selectable by the user, such as cleaning, descaling, or selecting a beverage. The measurement starts with the appliance at* ***room temperature****.*

*The operating cycle starts with the activation by the user and ends when the appliance stops the cycle automatically and the next operating cycle can be started by the user.*

## 11 Heating

This clause of Part 1 is applicable except as follows.

**11.1** *Addition:*

*Compliance is also checked by the test of 11.101.*

**11.2** *Addition:*

***Portable appliances*** *are tested away from the walls of the test corner. Coffee-makers with a* ***decorative door*** *or intended to be used in a cabinet shall be tested with the door open.*

**11.3** *Addition:*

*During the test of 11.101, 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.*

NOTE 101 If the magnetic field of an **induction rice cooker** unduly influences the results, the temperature rises can be determined using platinum resistances with twisted connecting wires or any equivalent means.

**11.4** *Addition:*

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

**11.6** *Addition:*

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

**11.7** *Modification:*

Replace the first paragraph with the following:

*Appliances are operated for the duration specified in 11.7.101 to 11.7.106.*

*For appliances incorporating* ***integral batteries*** *or* ***separable batteries*** *not disconnected from the appliance for charging purposes, the* ***battery*** *that has been* ***fully discharged*** *is charged while the appliance is operated as specified for 1 h or the time specified in 11.7.101 to 11.7.106, whichever comes first, if allowed by the construction of the appliance.*

Replace the first dashed item of the third paragraph with the following:

– *the* ***battery*** *that has been* ***fully discharged*** *is charged while the appliance is operated as specified for 1 h or the time specified 11.7.101 to 11.7.106, whichever comes first, if allowed by the construction of the appliance;*

**11.7.101** *For kettles incorporating a* ***temperature limiter****, the* ***temperature limiter*** *is reset 1 min after it has operated or as soon as possible afterwards. The test is terminated after the* ***temperature limiter*** *has operated for the second time.*

*For kettles incorporating a* ***thermostat****, the test is terminated 15 min after the water has attained a temperature of 95 °C.*

*For other kettles, the test is terminated 5 min after the water has attained a temperature of 95 °C.*

**11.7.102** *For cooking pans, egg boilers,* ***feeding-bottle heaters****, glue pots, livestock feed boilers, milk heaters, sterilizers, wash boilers and for appliances that boil water other than kettles, the test is terminated*

– *for appliances without a thermal control, 15 min after the water in the container has attained a temperature of 95 °C or the maximum temperature it can attain if this is lower;*

– *for **portable appliances** provided with a thermal control, 15 min after the thermal control has operated for the first time;*

– *for **fixed appliances** provided with a thermal control, 30 min after the thermal control has operated for the first time;*

– *1 min after a continuous or repetitive acoustic signal having intervals of less than 5 s has sounded;*

– *when steady conditions are established, for egg boilers having provision for keeping eggs warm, and appliances having a heated surface intended to keep liquid warm.*

**11.7.103** *Slow cookers, **rice cookers**, **steam cookers** and yoghurt makers are operated until steady conditions are established. Slow cookers are prewarmed in the dry state if this instruction is given.*

**11.7.104** *For **espresso coffee-makers**, the brewing period is followed by a rest period of 1 min or the period stated in the instructions, if this is longer. The water container is refilled during the rest periods.*

*For automatic **espresso coffee-makers** and **espresso coffee-makers** provided with a coffee pot, the brewing period is the time necessary to produce the maximum quantity of coffee allowed by the timer or by the capacity of the coffee pot.*

*For manual **espresso coffee-makers**, if the maximum quantity of coffee to be produced is not specified in the instructions, the brewing period is the time necessary to produce 100 ml of coffee for each cycle.*

*For **espresso coffee-makers** having an outlet for supplying steam or hot water, the brewing period is immediately followed by a period during which the steam or water is supplied for the time stated in the instructions or for the following periods, whichever is more unfavourable:*

– *for **espresso coffee-makers** having an outlet for supplying steam, 1 min;*

– *for **espresso coffee-makers** having an outlet for supplying hot water, the time necessary to produce 100 ml of water.*

– *for **espresso coffee-makers** having an outlet for supplying steam and an outlet for supplying hot water, 1 min period supplying steam is followed by time necessary to produce 100 ml of water.*

*The steam is blown into a vessel containing cold water.*

***Espresso coffee-makers** are operated until steady conditions are established.*

*Other coffee-makers are operated for the time necessary to make the maximum quantity of coffee stated in the instructions. The container is then refilled as quickly as possible and the coffee-maker operated again.*

*The procedure is repeated until steady conditions are established.*

**11.7.105** *Pressure cookers are operated for 15 min after attaining the maximum cooking pressure.*

**11.7.106** ***Soy milk makers** are operated for a complete operating cycle.*

**11.8** *Addition:*

*When an appliance connector incorporates a **thermostat**, the temperature rise limit for the pins of the inlet does not apply.*

*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**.*

**11.101** *Appliances are placed as specified in 11.2 and are operated at **rated power input** under **normal operation** for the duration specified in 11.7.*

*During the test, the temperature rise of surfaces shall not exceed the values specified in Table 101.*

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

| ***Surface*** | ***Temperature rise of external accessible surfaces*** [a, b] ***K*** | |
|---|---|---|
| | ***Surfaces of appliances intended to be placed or installed less than 850 mm from the floor*** | ***Surfaces of appliances intended to be placed or installed at or above 850 mm from the floor*** |
| *Bare metal* | *38* | *42* |
| *Coated metal* [c] | *42* | *49* |
| *Glass and ceramic* | *51* | *56* |
| *Plastic and plastic coating > 0,4 mm* [d, e] | *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:*

- *the underside of appliances intended to be used on a working surface or floor, where these surfaces are inaccessible to a 75 mm diameter probe having a hemispherical end;*
- *the fittings and hoses for hot water, vapour, coffee, tea and similar fluids, including **pressure regulators** and **pressure-relief devices**;*
- ***functional surfaces**;*
- *surfaces within 25 mm of the outline of the **functional surfaces**;*
- *lids and covers;*
- *surfaces within 25 mm from the edge of lids;*
- *surfaces within 25 mm from ventilation openings;*
- *vessels that contain hot liquids and that become hot through conduction by a heated part of the appliance (e.g. coffee pots and coffee filter holders in percolator type coffee-makers and kettles).*

[b] *When the required values are not met, the maximum temperature rise shall not be higher than two times the values indicated.*

[c] *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.*

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

[e] *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.*



## 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.

**15.2** *Addition:*

For kettles, replace the first paragraph of the test specification by the following:

*For kettles, compliance is checked by the following test using a solution comprising water containing approximately 1 % NaCl.*

For steam sterilizers, replace the fifth paragraph of the test specification by the following:

*Steam sterilizers are placed on a horizontal surface and 30 ml of the spillage solution is poured onto the top rim in the most unfavourable place. The spillage solution is poured steadily through a tube having an inner diameter of 8 mm over a period of 2 s, the lower end of the tube being 200 mm above the appliance.*

NOTE 101 A schematic representation of the test arrangement is shown in Figure 102.

*The test is only carried out with the appliance connector in position.*

*For **rice cookers**, the test specified in Part 1 shall be conducted with the rice container in place.*

*In case of doubt, the spillage test is carried out with the appliance deviating from the normal position of use by an angle not exceeding 5°.*

*Kettles are filled to **rated capacity** with water. They are placed on a plane inclined at an angle of 20° to the horizontal with their spout facing up the slope of the inclined plane. Water shall not be discharged from the kettle.*

*Kettles that can be filled through the spout are also tested on a plane inclined at an angle of 20° to the horizontal, with the spout uppermost. The kettle is filled with water containing approximately 1 % NaCl to the maximum level, if this indication is visible from the filling position, otherwise until water spills from the kettle. A further quantity, equal to 15 % of the **rated capacity** of the kettle, is then added as quickly as possible.*

*For **cordless appliances**, the test with the appliance on the horizontal plane is carried out with the appliance both on and off its stand. The additional test for kettles that can be filled through the spout is carried out only with the **cordless kettle** off its stand, the kettle being replaced on its stand in order to carry out the electric strength test of 16.3.*

*For coffee-makers provided with a removable coffee pot, the funnel is placed in position but without placing the coffee pot in position. The spillage solution is manually poured steadily into the funnel without the solution overflowing from the funnel. The quantity of the spillage solution is the maximum capacity of the water supply tank. If the top opening of the funnel is enclosed in the coffee- maker, the funnel is moved out, filled with its capacity of the spillage solution, and set back into the coffee-maker, this operation being repeated until the maximum quantity of the solution is poured. If there is an anti-drop mechanism in the funnel, the mechanism is rendered inoperative.*

*Coffee-makers dispensing liquid into a serving container, such as a cup or jug, are tested by steadily pouring 0,5 l of the spillage solution over the surface where the container is filled or the container is transported and removed by the user. If a drop container is placed beneath this surface, the drop container is completely filled before the test is carried out.*

*Coffee-makers having external surfaces on which it is possible to place a vessel, such as a cup or jug, are tested by pouring 0,2 l of the spillage solution rapidly over the top of the appliance in the most unfavourable way so that the spillage solution also flows over the surface of the appliance that incorporates controls and other places where it can penetrate the appliance enclosure, the controls being placed in the most unfavourable position. The controls are then operated through their working range, this operation being repeated after 5 min. If necessary, the test is repeated until all different controls or gaps are covered by the spillage test, the appliance being dried between each test. External surfaces with a minimum linear dimension of a horizontal or near horizontal top surface of 75 mm or less are not considered to be surfaces on which it is possible to place a vessel or cup.*

*For coffee-makers, after each overfilling test or application of liquid, all residues are then removed and the appliance is dried.*

**15.101** Appliances intended to be partially or completely immersed in water for cleaning shall have adequate protection against the effects of immersion.

*Compliance is checked by the following tests, which are carried out on three additional appliances.*

*The appliances are operated under **normal operation** at 1,15 times **rated power input**, until the **thermostat** operates for the first time. Appliances without a **thermostat** are operated until steady conditions are established. The appliances are disconnected from the supply, any appliance connector being withdrawn. They are then completely immersed in water containing approximately 1 % NaCl and having a temperature between 10 °C and 25 °C, unless they are marked with the maximum level of immersion, in which case they are immersed 50 mm deeper than this level.*

*After 1 h, the appliances are removed from the saline solution, dried and subjected to the leakage current test of 16.2.*

*Care is taken to ensure that all moisture is removed from the insulation around the pins of appliance inlets.*

*This test is carried out four more times, after which the appliances shall withstand the electric strength test of 16.3, the voltage being as specified in Table 4.*

*The appliance having the highest leakage current after the fifth immersion is dismantled and inspection shall show that there is no trace of liquid on insulation that could result in a reduction of **clearances** and **creepage distances** below the values specified in Clause 29.*

*The remaining two appliances are operated under **normal operation** at 1,15 times **rated power input** for 240 h. After this period, the appliances are disconnected from the supply and immersed again for 1 h. They are then dried and subjected to the electric strength test of 16.3, the voltage being as specified in Table 4.*

*Inspection shall show that there is no trace of liquid on insulation that could result in a reduction of **clearances** and **creepage distances** below the values specified in Clause 29.*

**15.102** The connecting devices of stands for **cordless appliances** shall not be affected by water.

*Compliance is checked by the following test.*

*The stand is placed on a horizontal surface and 30 ml of water containing approximately 1 % NaCl is poured onto the connecting device. The solution is poured steadily through a tube having an inner diameter of 8 mm over a period of 2 s, the lower end of the tube being 200 mm above the connecting device.*

NOTE A schematic representation of the test arrangement is shown in Figure 102.

*The stand shall then withstand the electric strength test of 16.3, the test voltage for **reinforced insulation** being 2 500 V.*

**15.103** The interior of **rice cookers** shall not be affected by water.

*Compliance is checked by the following test.*

*The **rice cooker** is placed on a horizontal surface, with the rice container removed and 30 ml of water containing approximately 1 % NaCl is poured on to the centre of the bottom of the interior of the **rice cooker**. The saline solution is poured steadily through a tube having an inner diameter of 8 mm and a length of 30 mm, over a period of 2 s, the lower end of the tube being 200 mm above the bottom of the **rice cooker**.*

NOTE A schematic representation of the test arrangement is shown in Figure 102.

*The **rice cooker** shall then withstand the electric strength test of 16.3.*

**15.104** **Built-in appliances** intended to be installed in a cabinet and therefore subject to spillage of liquid onto work surfaces located above the appliance after installation shall be constructed so that such spillage does not affect their electrical insulation.

*Compliance is checked by the following test.*

*The appliance is subjected to a spillage test with 0,5 l of the spillage solution specified in 15.2. The appliance shall be installed according to the manufacturer's instructions except that the front surface of the appliances (excluding control knobs, handles) shall align with the front edge of a 30 mm thick wooden work surface with a square front edge, see Figure 103. The spillage solution shall be poured on the work surface at the area which gives the most unfavourable conditions representing the pouring likely to occur, so that the spillage solution flows down the front surface of the appliance over controls, joints, vents and similar openings. If necessary, the test is repeated until all different controls or gaps are covered by the spillage test. The appliance is dried between each test.*

*The test is performed as follows:*

*A bottle with a shape similar to the one in Figure 104 and a cap is filled with 0,5 l of the spillage solution.*

*The cap of the bottle shall have a hole of 8 mm diameter, placed off-centre according to Figure 105. The bottle shall also have a hole of 8 mm diameter near the bottle base (see Figure 104) to equalize the liquid pressure.*

*Other suitable containers may be used provided the spillage solution amount is poured over the appliance under test in the same manner.*

*The hole in the cap of the bottle is put on the horizontal work surface at approximately 80 mm horizontal distance with respect to the front of the appliance. The inclination of the bottle shall be higher than 30° and lower than 45° to allow the spillage solution to flow over the front of the appliance. The lower part of the bottle hole in the cap shall be in contact with the work surface, with the hole in the cap placed down closest to the surface. See Figure 106.*

*When using holes of 8 mm diameter, the specified solution amount is spilled in about 15 s.*

*When the 0,5 l of spillage solution has been poured, the remaining solution on the work surface is pushed towards the front so that the remaining solution spills homogeneously over the front with a suitably flat means.*

*Immediately after the test, the appliance shall 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** or **creepage distances** below the values specified in Clause 29.*

**15.105 Built-in appliances** intended to be installed in cabinets below other **built-in appliances** and therefore subject to spillage of liquid during use of these other appliances shall be constructed so that such spillage does not affect their electrical insulation.

*Compliance is checked by the following test (see Figure 107). The appliance is built-in as specified in the instructions. The test cabinet is tilted to an angle of 2° in the most unfavourable direction. 200 ml of the spillage solution specified in 15.2 is poured steadily over a period of 8 s through a funnel onto the complete width of the separation board above the appliance being tested. The funnel has an outlet diameter of approximately 8 mm and the lower edge of its outlet is positioned 20 mm above the separation board. The centre of the funnel is positioned 15 mm inwards from the leading edge of the separation board.*

*If the manufacturer states in the installation instructions that a separation board above the appliance is not required, the test shall be repeated while pouring the spillage solution directly onto the complete width of the top surface of the appliance. The lower edge of the funnel outlet is positioned 20 mm above the top surface of the appliance and its centre is positioned 15 mm inwards from the leading edge of the appliance.*

*Immediately after the test, the appliance shall 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** or **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:*

*Kettles are not subjected to the test of 19.2.*

*Kettles are also subjected to the test of 19.101, unless the appliance incorporates a* ***non-self-resetting thermal cut-out*** *that is not resettable by the user, in order to comply with 19.4.*

*Kettles for which compliance with 19.101 relies on the operation of a* ***self-resetting thermal cut-out*** *are also subjected to the test of 19.102.*

*For appliances with an external surface providing a keep warm function, the test of 19.106 applies.*

*For coffee-makers having a* ***decorative door****, the test of 19.107 applies.*

*For automatic coffee-makers of the coffee bean type, the tests of 19.108 applies.*

**19.2** *Addition:*

*Appliances are placed as near as possible to the walls of the test corner. They are tested empty with lids open or closed whichever is more unfavourable.*

***Induction rice cookers*** *are operated under the conditions of Clause 11 with the rice container empty.*

**19.3** *Addition:*

*Kettles are operated empty at 1,15 times* ***rated power input****.*

*The test is also carried out with the kettle filled with sufficient water to cover the heating element, or to a depth of 10 mm if the heating element is not positioned inside the container, the lid being open or closed, whichever is more unfavourable.*

**19.4** *Addition:*

*For pressure cookers,*

– *all* ***pressure regulating devices*** *are rendered inoperative; and*

– *in other than* ***dynamic pressure cookers****, all* ***protective devices*** *that vent steam and* ***intentionally weak parts*** *that vent steam are rendered inoperative; and*

– *in* ***dynamic pressure cookers****, all* ***protective devices****, other than* ***intentionally weak parts****, that vent steam are rendered inoperative.*

**19.7** *Addition:*

***Espresso coffee-makers*** *incorporating a pump are operated for a period of 5 min.*

***Soy milk makers*** *are operated for one cycle of operation.*

**19.13** *Addition:*

*During the test of 19.4,* ***protective devices*** *of pressure cookers other than* ***dynamic pressure cookers*** *shall operate before the pressure has reached 350 kPa.*

*During the test of 19.4,* ***protective devices*** *or* ***intentionally weak parts*** *of* ***dynamic pressure cookers*** *shall operate before the pressure has reached 250 kPa.*

*The temperature rise of the windings of* ***induction rice cookers*** *shall not exceed the values specified in 19.7.*

*The electric strength test of* ***induction rice cookers*** *is carried out immediately after switching off the appliance.*

**19.101** *Kettles are placed on a plywood board having a thickness of approximately 20 mm. The* ***thermal cut-out*** *that operates during the test of 19.4 and all thermal controls that operate during the test of Clause 11 are short circuited simultaneously and the kettle is operated empty at 0,85 times* ***rated power input*** *or 1,15 times* ***rated power input****, whichever is more unfavourable. If the kettle incorporates more than one* ***thermal cut-out*** *that could operate during the test of 19.4, they are short circuited in turn.*

*During the test, any flames shall be kept within the enclosure of the kettle and the supporting surface shall not ignite.*

*After the test, and when the insulation has cooled down to approximately* ***room temperature****,* ***live parts*** *shall not be accessible, and the kettle shall pass the dielectric strength test in 16.3 with the test voltage specified in Table 4.*

*The humidity treatment of 15.3 is not applied before the electric strength test is carried out.*

*The kettle is filled to its* ***rated capacity*** *with water for 24 h before the electric strength test is carried out. Other requirements of 19.13 are not applicable.*

**19.102** *Kettles are placed on a plywood board having a thickness of approximately 20 mm.*

*Kettles incorporating two* ***self-resetting thermal cut-outs*** *are operated with one of the* ***thermal cut-outs*** *short circuited. The kettle is operated empty at 0,85 times* ***rated power input*** *or 1,15 times* ***rated power input****, whichever is more unfavourable.*

*Within 2 s of the other* ***thermal cut-out*** *operating, the kettle is filled with water having a temperature of 15 °C ± 5 °C. After 1 min, the kettle is emptied.*

*The test is carried out 100 times.*

**19.103** For appliances with **detachable liquid containers**, the automatic transfer of liquid from one container to another shall not give rise to an electrical hazard if they are incorrectly positioned.

*Compliance is checked by assembling the appliance with its receiving container incorrectly positioned or removed. The water discharge pipe is incorrectly positioned if this is more unfavourable. The appliance is operated as specified in Clause 11 but for one cycle only.*

*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 the reduction of **clearances** and **creepage distances** below the values specified in Clause 29.*

**19.104** The overloading of a **soy milk maker** shall not result in a hazard.

*Compliance is checked by the following test.*

***Soy milk makers** are placed on a plywood board having a thickness of approximately 20 mm and operated under the conditions of Clause 11 with the container filled with 2 times the maximum mass of the soy beans specified in the instructions and water to **rated capacity**.*

*During the test, any flames shall be kept within the enclosure and the supporting surface shall not ignite.*

*After the test, **live parts** shall not be accessible.*

**19.105** When a **soy milk maker** is disconnected from the supply accidently during normal use, it shall not result in a hazard.

*Compliance is checked by the following test.*

***Soy milk makers** are placed on a plywood board having a thickness of approximately 20 mm and operated under the conditions of Clause 11. The appliance shall be disconnected from the supply at the most unfavourable time during the cycle. The **soy milk maker** is then restarted with a new cycle of operation without changing the load.*

*During the test, any flames shall be kept within the enclosure and the supporting surface shall not ignite.*

*After the test, **live parts** shall not be accessible.*

**19.106** *The appliance is operated at **rated power input** with the heated surface completely covered with two layers of textile material of pre-washed double-hemmed cotton sheets until steady conditions are established.*

*The textile material consists of pre-washed double-hemmed cotton sheet having dimensions approximately 700 mm × 700 mm and specific mass between 140 g/m$^2$ and 175 g/m$^2$ in the dry condition.*

*If a **thermostat** operates, the test is repeated with the one-third of the heated surface furthest from the temperature-sensing element covered.*

*The textile material shall not ignite.*

**19.107** *Coffee-makers with a **decorative door** or intended to be used in a cabinet are operated under the conditions specified in Clause 11 but with the **decorative door** or cabinet door closed.*

**19.108** *Automatic coffee-makers of the coffee bean type, other than automatic **espresso coffee-makers** of the coffee bean type, are supplied at **rated voltage** and operated under **normal operation** five times with rest periods.*

*Automatic **espresso coffee-makers** of the coffee bean type are supplied at **rated voltage** and are set to maximum quantity of coffee powder, with the smallest amount of coffee in the cup according to the instructions without rest periods.*

*The duration of the operating period is:*

– *for appliances incorporating a timer, the longest period allowed by the timer;*
– *for other appliances, as follows:*
  - *for automatic coffee-makers incorporating coffee mills of the grinding type, 30 s longer than the time needed to fill the collecting container or the time required to empty the hopper, whichever is shorter;*
  - *for automatic coffee-makers incorporating other coffee mills, 1 min.*

*The duration of the rest period is:*

– *10 s, for appliances provided with a collecting container;*
– *60 s, for other appliances.*

*The temperature of the windings shall not exceed the values shown in Table 8.*

## 20 Stability and mechanical hazards

This clause of Part 1 is applicable except as follows.

**20.2** *Addition:*

For **soy milk makers**, test probe 18 is not applied to the cutting blades.

**20.101** The container and cutting blades of **soy milk makers** shall have adequate mechanical strength.

*Compliance is checked by the following test.*

*The **soy milk maker** is supplied at **rated voltage** and is operated continuously with the container filled with dry soy beans to the **rated capacity**. The test is carried out as follows:*

– *for appliances with accumulated working time of the motor during one cycle not exceeding 4 min, the test is conducted for the accumulated working time of the motor during one complete working cycle plus 1 min;*
– *for appliances with accumulated working time of the motor during one cycle exceeding 4 min, the test is conducted for the accumulated working time of the motor during one complete working cycle.*

*Care needs to be taken to ensure that the cutting blades are not jammed by the soy beans, and that they rotate continuously during the test.*

*After the test, the container and cutting blades shall not be broken; however, distorted and blunt edges are ignored.*

**20.102** The rotating parts of **soy milk makers** shall be secured so that they do not become loose during operation.

*Compliance is checked by inspection and manual test.*

*Fastening of screws and nuts in a direction opposite to the direction of rotation of the rotating parts is considered to be a suitable means of securing the rotating parts.*

**20.103** The lid interlock, if any, of **soy milk makers** shall be constructed so that accidental operation of the appliance is prevented. Lid interlock switches shall be **biased-off switches**.

If there is an interlock between the lid and the main switch, the lid shall be locked when the switch is in the on position. When the lid is not correctly closed, the switch shall be locked in the **off position**.

*Compliance is checked by inspection, by manual test and by applying test probe B of IEC 61032 with a force not exceeding 5 N and test probe 18 of IEC 61032 with a force not exceeding 2,5 N to the lid interlock actuator.*

*If compliance relies on the operation of an **electronic circuit** for the interlock function the moving parts shall not operate with the lid removed under the following conditions applied separately:*

*a) The fault conditions in a) to g) of 19.11.2 are applied one at a time to the **electronic circuit**.*

*b) The electromagnetic phenomena tests of 19.11.4.2 and 19.11.4.5 are applied. The tests are carried out with surge protective devices disconnected, unless they incorporate spark gaps.*

*If the **electronic circuit** is programmable, the software shall contain measures to control the fault/error conditions specified in Table R.1 and is evaluated in accordance with the relevant requirements of normative Annex R.*

## 21 Mechanical strength

This clause of Part 1 is applicable except as follows.

**21.1** *Addition:*

*Breakage of glass parts, other than glass water containers of kettles and glass coffee or tea containers of coffee-makers and tea makers, is neglected provided that compliance with 8.1, 15.1 and 15.101 is not impaired.*

*The glass of the water container of a kettle and the glass of the coffee or tea container of a coffee-maker or tea maker shall not break.*

NOTE In Australia and New Zealand the energy is increased to 1 J for glass kettles.

**21.101** The handle of kettles and its securement means shall be constructed to withstand the stresses occurring during normal use.

*Compliance is checked by inspection and by the following test.*

*Kettles shall be subjected to the following pre-treatment.*

*The empty kettle shall be placed in a heating cabinet. The cabinet is a single chamber type heating oven in accordance with IEC 60216-4-1 with regard to specimen mounting arrangement, temperature, differences, fluctuation and variations appropriate to the test temperature. The temperature of the cabinet is maintained at 80 °C ± 2 °C. The kettle is suspended at the centre of the grip area of the handle, taking care that the kettle is well balanced with the spout pointing radially outwards in a cabinet.*

*The kettle shall be at least 50 mm from all parts of the cabinet.*

*The kettle is kept in the cabinet for 168 h and then at **room temperature** for at least 16 h.*

NOTE 1 A schematic representation of the grip area is shown in Figure 108.

*The kettle is then loaded with sand sealed in a plastic bag to a mass that corresponds to 1,2 times the **rated capacity** of the kettle.*

*The load shall be prevented from falling out during the test.*

NOTE 2 There is no specific requirement for the type of sand and moisture content.

*For movement tests, the kettle is attached to the test apparatus at its handle in the grip area, taking care that the kettle is well balanced with the spout pointing radially outwards.*

*Between the test apparatus and the handle shall be of rubber of a thickness of 5 mm and a hardness of 50 Shore ± 10 Shore.*

*The clamping position shall be in the centre of the grip area of the handle. The distance between the pivot point and the centre of the grip area of the handle shall be 400 mm ± 10 mm.*

NOTE 3 A schematic representation of the clamp position is shown in samples in Figure 108.

*For the horizontal movement test, the kettle is moved, while maintaining the kettle in vertical orientation, to the left and back to the right in an arc of 90°. The movement is repeated 2 500 times at a rate of approximately 10 times per minute with uniform acceleration and deceleration.*

NOTE 4 A schematic representation of the test arrangement is shown in Figure 109.

*For a vertical movement test, the kettle is moved down and up in a pouring motion of 120°. The movement is repeated for 5 000 times at a rate of approximately 10 times per minute with uniform acceleration and deceleration.*

NOTE 5 A schematic representation of the test arrangement is shown in Figure 110.

*The kettle, the handle and its securement means shall not break, crack or loosen.*

**21.102** Kettles shall be constructed so that there are no sudden breaks of the handle or its securement means likely to expose the user to a hazard when the appliance is used as in normal use.

*Compliance checked by the following test.*

*The kettle is filled with the **rated capacity** of water when determining the mass of the filled kettle. A mass that is 2 times the mass of the filled kettle is hung from the centre of the bottom of the empty kettle. The kettle is gently lifted and suspended by the handle for 5 min.*

*The kettle, the handle and its securement mean shall not break, crack or loosen.*

## 22 Construction

This clause of Part 1 is applicable except as follows.

**22.6** *Addition:*

A drain hole that is necessary to comply with the standard shall be at least 5 mm in diameter or 20 $mm^2$ in area with a width of at least 3 mm. Holes that do not meet these dimensions are considered to be blocked when determining compliance.

*Compliance is also checked by measurement.*

**22.7** *Addition:*

***Espresso coffee-makers*** *are filled with water to their* ***rated capacity*** *and operated at* ***rated power input*** *with the coffee filter blocked and outlet closed. The maximum pressure attained is measured. The appliance is then subjected to twice the measured pressure for 5 min.*

*The overpressure may be supplied from an external source, care being taken to ensure that the* ***espresso coffee-maker*** *is at the normal temperature for brewing.*

*If the valve for steam supply is linked to the switch used for starting the production of steam, this link is not to be disturbed while measuring the maximum pressure.*

*The appliance shall not rupture and there shall be no leakage other than through a self-resetting* ***pressure-relief device*** *or* ***intentionally weak part****. If a self-resetting* ***pressure-relief device*** *operates, the appliance shall be suitable for further use.*

*Controls that limit the pressure are rendered inoperative and the appliance is operated again as described for determining the maximum pressure.*

*The appliance shall not explode or emit hazardous jets of steam. If an* ***intentionally weak part*** *ruptures, the test is repeated on a second appliance and shall be terminated in the same mode.*

*All pressure regulating devices and all* ***protective devices*** *and* ***intentionally weak parts*** *are rendered inoperative and the lid is closed.*

*For pressure cookers, other than* ***dynamic pressure cookers****, the pressure is gradually increased hydraulically to two times the operating pressure of the* ***protective device*** *during the test of 19.4.*

*For* ***dynamic pressure cookers****, the pressure is gradually increased hydraulically to 50 kPa in excess of the operating pressure of the* ***protective device*** *or* ***intentionally weak part*** *during the test of 19.4.*

*The container shall not rupture.*

**22.40** *Addition:*

For **soy milk makers**, any switch controlling the motor shall also disconnect **electronic circuits**, if their malfunction would impair compliance with this standard.

*Compliance is checked by the tests of Clause 19.*

**22.49** *Replacement:*

For **remote operation**, the duration of operation of the function that is going to be remotely operated shall be set before the function is started, unless:

– the function switches off automatically at the end of a cycle, or

– the function can operate continuously without giving rise to a hazard.

Slow cookers, **rice cookers**, **steam cookers** and yoghurt makers, and appliances that automatically change to a keep warm function after the cooking or brewing cycle is completed are considered to be functions that can operate continuously without giving rise to a hazard.

*Compliance is checked by inspection.*

**22.51** *Replacement:*

A control on the appliance shall be manually adjusted to the setting for **remote operation** before the appliance can be operated in this mode. There shall be a visual indication on the appliance showing that the appliance is adjusted for **remote operation**.

*Compliance is checked by inspection.*

**22.101** Kettles shall be constructed so that the lid does not fall off when water is poured out.

*Compliance is checked by the following test.*

*The kettle is filled to its **rated capacity** and the lid closed in accordance with the instructions. The kettle is supplied at **rated voltage** and operated until the water boils. Approximately 90 % of the water is poured from the kettle in the normal way. The lid shall not fall off and water shall only be emitted from the spout.*

**22.102** Kettles shall be constructed so that there are no sudden jets of steam or hot water likely to expose the user to a hazard when the appliance is used as in normal use.

NOTE Normal use takes into account the instructions concerning the position of the lid and the likely position of the user's hands when gripping the handle.

*Compliance is checked by inspection during the test of Clause 11.*

**22.103** The appliance coupler of **cordless appliances** shall be constructed to withstand the stresses occurring during normal use.

*Compliance is checked by the following test.*

*The two **live pin**s of the appliance are connected together and an external resistive load is connected in series with the supply. The external load is such that the current is 1,1 times **rated current**.*

*The appliance is placed on its stand and withdrawn*

- *for **cordless kettles**, 10 000 times*
- *for **cordless coffee-makers**, 10 000 times*
- *for other **cordless appliances**, 6 000 times*

*at a rate of approximately 10 times per minute. The test is continued without current flowing for a further 10 000 times for **cordless kettles** and **cordless coffee-makers** and 6 000 times for other **cordless appliances**.*

*If a single stand is supplied with more than one **cordless appliance**, the test for each **cordless appliance** shall be carried out using the same stand.*

*The test shall be performed with the **cordless appliance** empty, placed without appreciable force, and withdrawn in a motion perpendicular to the stand. The appliance shall be placed and withdrawn at the same position from the stand, without rotation, throughout the test.*

*After the test, the appliance shall be suitable for further use and compliance with 8.1, 16.3, 27.5 and Clause 29 shall not be impaired.*

*The test is carried out without current flowing if the connection contacts cannot make or break on load.*

**22.104** **Portable appliances** for boiling water that have a **rated capacity** exceeding 3 l, and which are liable to overturn, shall be constructed so that the rate of discharge is limited.

*Compliance is checked by the following test, appliances incorporating an appliance inlet being fitted with a cord set.*

*The appliance is filled with water to its **rated capacity** and the lid closed in accordance with the instructions. It is placed on a horizontal plane in any position of normal use but orientated to produce the most unfavourable result.*

*The plane is slowly inclined to an angle of 25°. If the appliance overturns, it is left in this position for 10 s and then returned to its normal position. The quantity of water remaining is measured. The rate of discharge of water is determined from the formula:*

$$D = \frac{60\,(C_1 - C_2)}{t}$$

*where*

*D* *is the rate of discharge of water;*

$C_1$ *is the **rated capacity** in litres;*

$C_2$ *is the remaining quantity of water in litres;*

*t* *is the duration of the discharge in seconds, measured from the time the appliance overturns.*

*The rate of discharge of water shall not exceed 16 l/min.*

NOTE Suitable means can be used to prevent the appliance from slipping on the inclined plane.

**22.105** **Fixed appliances** for boiling water shall be constructed so that the container is always open to the atmosphere through an aperture of at least 5 mm in diameter, or 20 $mm^2$ in area with a width of at least 3 mm. The aperture shall be located so that it is unlikely to be obstructed in normal use.

If the appliance has provision for discharging steam or for water overflow, the discharge aperture shall be at the base of the appliance and shall discharge vertically downwards.

*Compliance is checked by inspection and by measurement.*

**22.106** **Espresso coffee-makers** shall be constructed so that it is not possible to remove the coffee filter by a simple operation while there is a hazardous pressure within the container.

*Compliance is checked by inspection and by manual test. This requirement is considered to be met if the coffee filter can only be removed after it has been rotated through an angle of at least 30°.*

**22.107** Pressure cookers shall incorporate a non-self-resetting pressure or temperature responsive **pressure-relief device**.

*Compliance is checked by inspection.*

**22.108** Pressure cookers shall be constructed so that:

– the lid cannot be removed while the pressure within the container is excessive;

– there is no build-up of pressure within the container unless the lid is locked.

They shall incorporate a means to release the pressure to a value such that the lid can be removed without risk.

*Compliance is checked by inspection and the tests of 22.108.1 and 22.108.2.*

**22.108.1** *The pressure cooker is operated as specified in Clause 11 until the **pressure regulator** operates for the first time.*

*The pressure cooker is then disconnected from the supply and a force of 150 N is immediately applied to the most unfavourable point where the lid or its handle or knob can be gripped or a torque of 15 N m is applied to the handle or knob about the axis of rotation for opening the lid, applying the most unfavourable condition. It shall not be possible to remove the lid.*

*If the lid, handle or knob breaks, there shall be no ejection of the **pressure cooker** contents. The test shall then be continued if the construction permits.*

*The internal pressure is then gradually reduced, the force of 150 N or the torque of 15 N m being applied, taking care to ensure that the force or torque is applied in a manner that does not prevent a lid locking mechanism from operating to release the lid before a safe internal pressure is obtained. The internal pressure is allowed to decrease until the internal pressure does not exceed 4 kPa when the test is stopped. There shall be no hazardous displacement of the lid or of the pressure cooker contents when the lid is released.*

*This test is not carried out on pressure cookers when the lid is secured by screw clamps or other devices that ensure that the pressure is automatically reduced in a controlled manner before the lid can be removed.*

**22.108.2** *Immediately after the test of 22.108.1, the pressure cooker is then tested by placing the lid on the appliance in the most unfavourable position without allowing the lid safety locking mechanism to lock. Attempts are made to gradually pressurise the container hydraulically. The internal pressure of the container shall not exceed 4 kPa.*

**22.109** Pressure cookers shall be constructed so that the pressure in the container is not excessive when the lid is not closed or is incorrectly fitted.

*Compliance is checked by the following test.*

*The pressure cooker is operated under the conditions of Clause 11 with the lid and any seal, or combination of the two, fitted in the most unfavourable position that allows the pressure cooker to operate.*

*The pressure in the container shall not exceed 4,0 kPa.*

**22.110** **Feeding-bottle heaters** with a control to set a pre-determined temperature or time shall emit a visible or audible signal to indicate that the pre-determined temperature or time has been reached.

*Compliance is checked by inspection during the test of Clause 11.*

**22.111** **Espresso coffee-makers**, incorporating a pressurized reservoir filled by the user, shall be constructed so that there is no spillage of water or sudden jets of steam or hot water likely to expose the user to a hazard when the appliance is used in accordance with the instructions.

When removing the filling cap of the pressurized reservoir, before the cap is removed completely, the pressure shall be relieved in a controlled manner in order to avoid the emission of jets of steam or hot water that are likely to expose the user to a hazard.

*Compliance is checked by inspection during the test of Clause 11 and by removing the filling cap at the end of the test.*

**22.112** **Soy milk makers** shall be constructed so that steam or hot water are not ejected which can expose the user to a hazard.

*Compliance is checked by inspection.*

**22.113** Appliances with moving mechanical parts shall be constructed so that lubricants are prevented from polluting food compartments.

*Compliance is checked by inspection.*

**22.114** Appliances shall be constructed so that food or liquids are prevented from penetrating into places that could cause electrical or mechanical faults.

*Compliance is checked by inspection.*

**22.115** Coffee-makers shall be constructed so that it is not possible to rotate the frothing nozzle or hot water nozzle through an angle of more than 45° upwards from the downwards facing vertical position, unless one or more of the following conditions are fulfilled:

– the rotation is in the lateral direction and oriented towards the centre of the machine. In this case the rotation can be up to 75°; or

NOTE The rotation of the frothing or hot water nozzle is shown in Figure 111.

– there is no release of steam or hot water possible when frothing nozzles or hot water nozzles rotate to more than 45° upwards from the downwards facing vertical position. In this case there is no limit to the rotation angle in any direction.

*Compliance is checked by inspection and by manual test.*

*If compliance relies on the operation of an **electronic circuit**, the test is repeated under the following conditions applied separately:*

– *the fault conditions in a) to g) of 19.11.2 are applied one at a time to the **electronic circuit**;*
– *the electromagnetic phenomena tests of 19.11.4.2 and 19.11.4.5 are applied to the appliance. The tests are carried out with surge protective devices disconnected, unless they incorporate spark gaps.*

*If the **electronic circuit** is programmable, the software shall contain measures to control the fault/error conditions specified in Table R.1 and is evaluated in accordance with the relevant requirements of normative Annex R.*

**22.116** For appliances that are controlled by programmable **electronic circuits** that limit the number of heating elements and motors from being energized at the same time, simultaneous activation of any combination of heating elements and motors shall not render the appliance unsafe.

*Compliance is checked as follows:*

– *the fault/error conditions specified in Table R.1 are applied and evaluated in accordance with the relevant requirements of normative Annex R; or*
– *the appliance is operated under the conditions of Clause 11 while being supplied at **rated voltage**, the programmable **electronic circuits** being modified to allow simultaneous activation of all heaters and motors under their control. Under these conditions, compliance with 19.13 shall not be impaired.*

## 23 Internal wiring

This clause of Part 1 is applicable.

## 24 Components

This clause of Part 1 is applicable except as follows.

**24.1.3** *Addition:*

*Switches incorporated in **espresso coffee-makers** for initiating brewing or steaming are subjected to 10 000 cycles of operation.*

*Switches incorporated in **dynamic pressure cookers** for controlling heaters are subjected to 50 000 cycles of operation and are tested under the conditions of Clause 11 with the appliance supplied at **rated voltage**.*

**24.1.4** *Addition:*

***Self-resetting thermal cut-outs** required for compliance with the test of 19.101 are subjected to 3 000 cycles of operation.*

**24.1.5** *Addition:*

*For appliance couplers incorporating **thermostats**, **thermal cut-outs** or fuses in the connectors, IEC 60320-1 is applicable except that:*

- *the earthing contact of the connector is allowed to be accessible, provided that this contact is not likely to be gripped during insertion or withdrawal of the connector;*
- *the temperature required for the test of Clause 18 is that measured on the pins of the appliance inlet during the test of Clause 11 of this standard;*
- *the breaking-capacity test of Clause 19 is carried out using the inlet of the appliance;*
- *the temperature rise of current-carrying parts specified in Clause 21 is not determined.*

*Thermal controls are not allowed in connectors complying with the standard sheets of IEC 60320-1.*

**24.4** *Addition:*

This requirement is not applicable to the connection between the appliance and the stand of **cordless appliances**.

**24.101** Devices incorporated in appliances, other than kettles, for compliance with 19.4, shall be non-self-resetting. However, **self-resetting thermal cut-outs** are allowed for **fixed water boilers** if they have been subjected to 10 000 cycles of operation.

*Compliance is checked by inspection and during the test of 19.4.*

*If appliances, other than:*

- ***fixed water boilers** incorporating **self-resetting thermal cut-outs** that have been subjected to 10 000 cycles of operation, and*
- *kettles,*

*incorporate **self-resetting thermal cut-outs**, these shall be short-circuited or rendered inoperative for the test of 19.4.*

## 25 Supply connection and external flexible cords

This clause of Part 1 is applicable except as follows.

**25.5** *Addition:*

**Type Z attachment** is allowed for egg boilers, **feeding-bottle heaters**, steam sterilizers, yoghurt makers and stands of **cordless appliances**.

**25.7** *Addition:*

The **supply cord** of livestock feed boilers shall be polychloroprene sheathed.

**25.8** *Addition:*

**Portable appliances** having a **rated current** up to 10 A may incorporate a **supply cord** having a nominal cross-sectional area of 0,75 $mm^2$, if the length is less than 2 m.

**25.22** *Addition:*

**Soy milk maker** inlets shall be located so that pollution by soy milk is unlikely to occur during normal use.

*Compliance is checked by inspection.*

**25.101** **Supply cords** of kettles shall not be longer than 75 cm, unless they are helically coiled.

*Compliance is checked by measurement.*

*If a **cordless kettle** has a cord storage facility, the length of the cord is measured after storing as much of the cord as possible.*

*The length of the cord is measured between the plug and the point where the cord or cord guard enters the appliance.*

## 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 except as follows.

**29.2** *Addition:*

The microenvironment is pollution degree 3 if the insulation can be polluted by condensation from steam produced during normal use of the appliance.

## 30 Resistance to heat and fire

This clause of Part 1 is applicable except as follows.

**30.1** *Addition:*

*For coffee-makers, egg boilers, kettles and **steam cookers**, the temperature rises occurring during the tests of 19.4, 19.5 and 19.101 are not taken into account.*

**30.2** *Addition:*

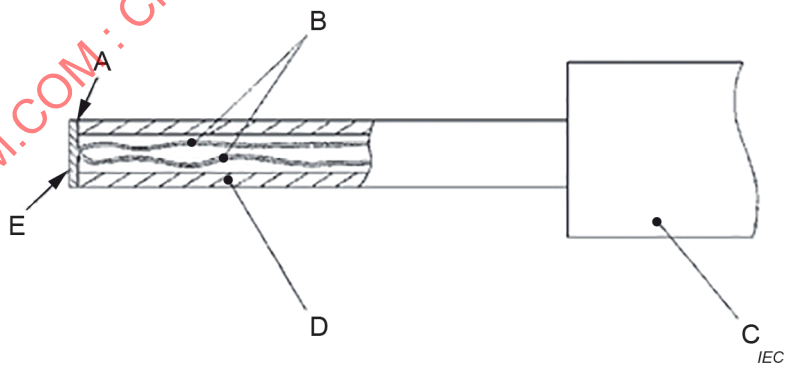
*For water distillers, appliances incorporating a delayed start timer and appliances intended to maintain liquid or food at a particular temperature, 30.2.3 is applicable. For other appliances, 30.2.2 is applicable.*

## 31 Resistance to rusting

This clause of Part 1 is applicable.

## 32 Radiation, toxicity and similar hazards

This clause of Part 1 is applicable.




**Key**

A adhesive

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

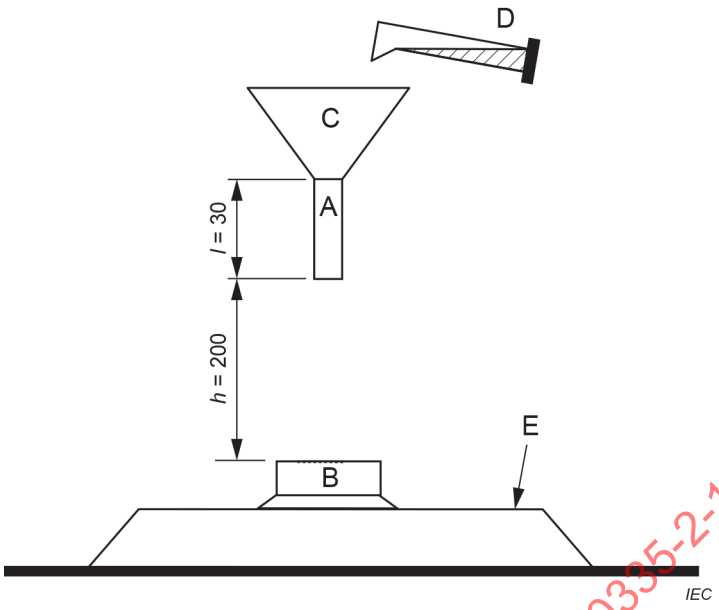
C handle arrangement permitting a contact force of 4 N ± 1 N

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**

Dimensions in millimetres




**Key**

A funnel tube with inner diameter of 8 mm

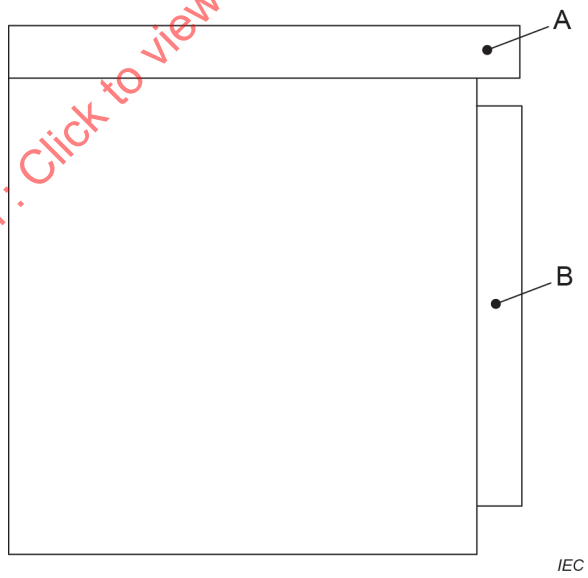
B item under test

C funnel

D container with 30 ml of saline solution

E horizontal surface

**Figure 102 – Schematic representation of the 30 ml spillage test**

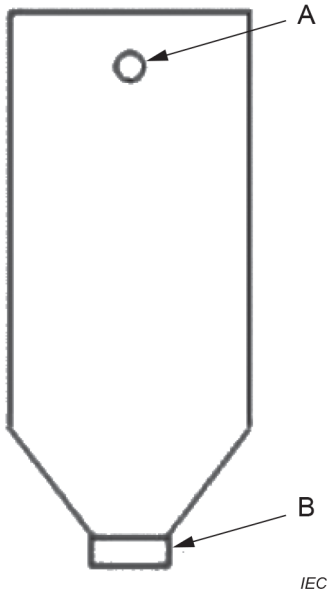



**Key**

A work surface

B appliance

**Figure 103 – Arrangement of work surface for spillage test on built-in appliances**

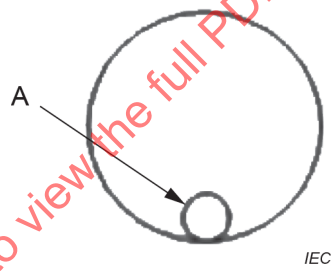



**Key**

A bottle hole with diameter 8 mm

B bottle cap

**Figure 104 – Spillage solution bottle**

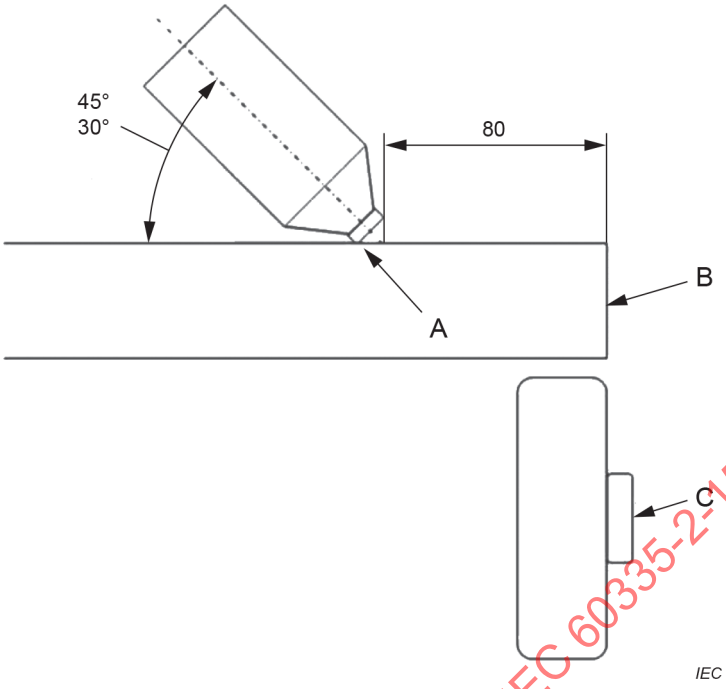



**Key**

A bottle cap hole – diameter 8 mm

**Figure 105 – Detail of bottle cap and position of hole**

Dimensions in millimetres



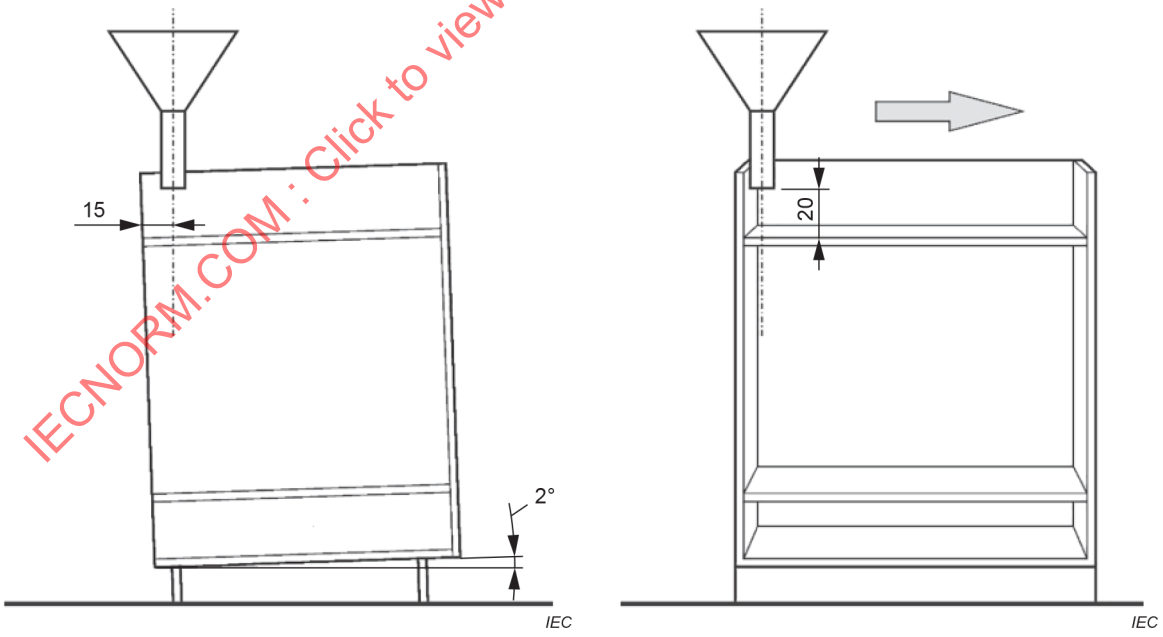

**Key**

A bottle cap hole position

B edge of work surface

C front of the appliance

**Figure 106 – Bottle position for the spillage test**




a) Side view

b) Front view

**Figure 107 – Test cabinet including separation board, position of funnel and example for direction of tilt**

Dimensions in millimetres

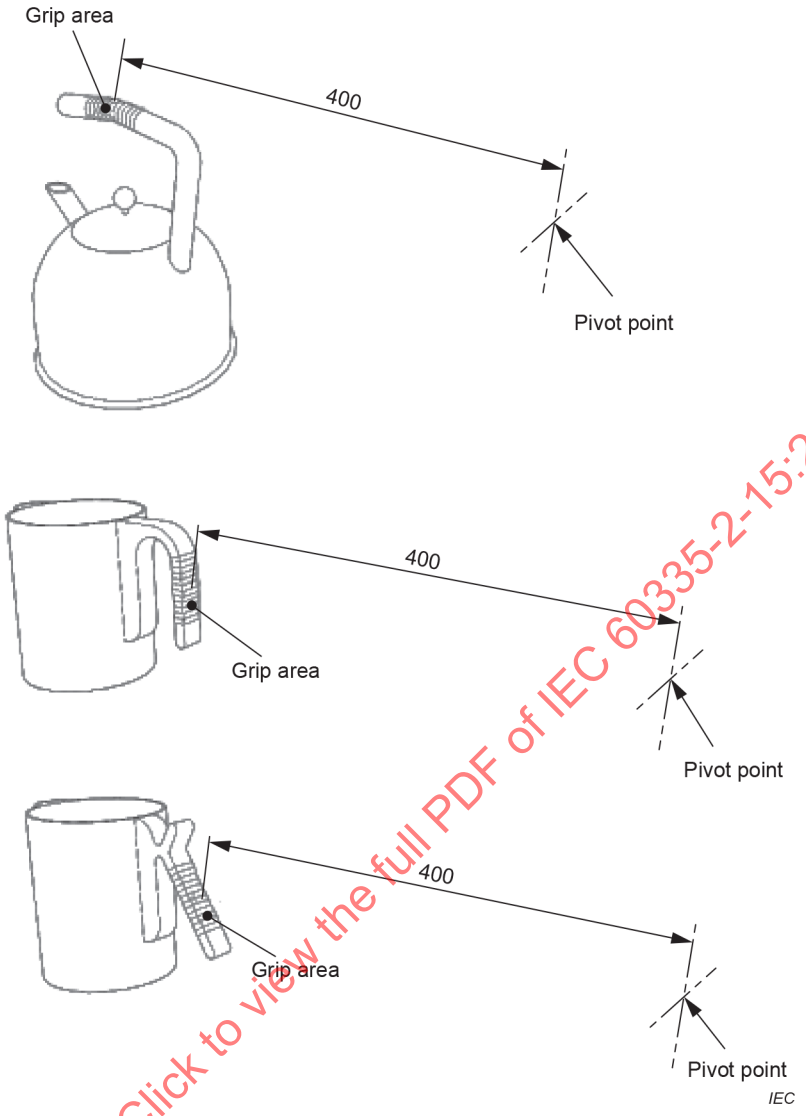



**Figure 108 – Schematic representation of the clamp position of different designs**

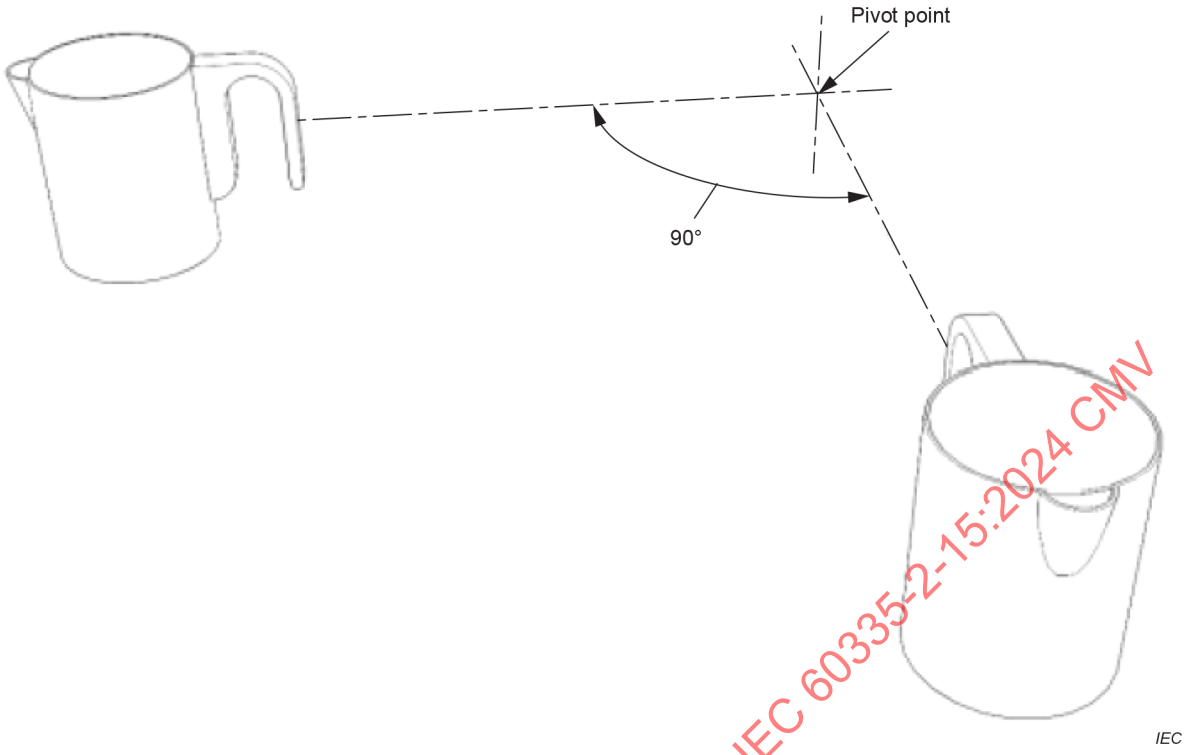



**Figure 109 – Schematic representation of the horizontal movement test**

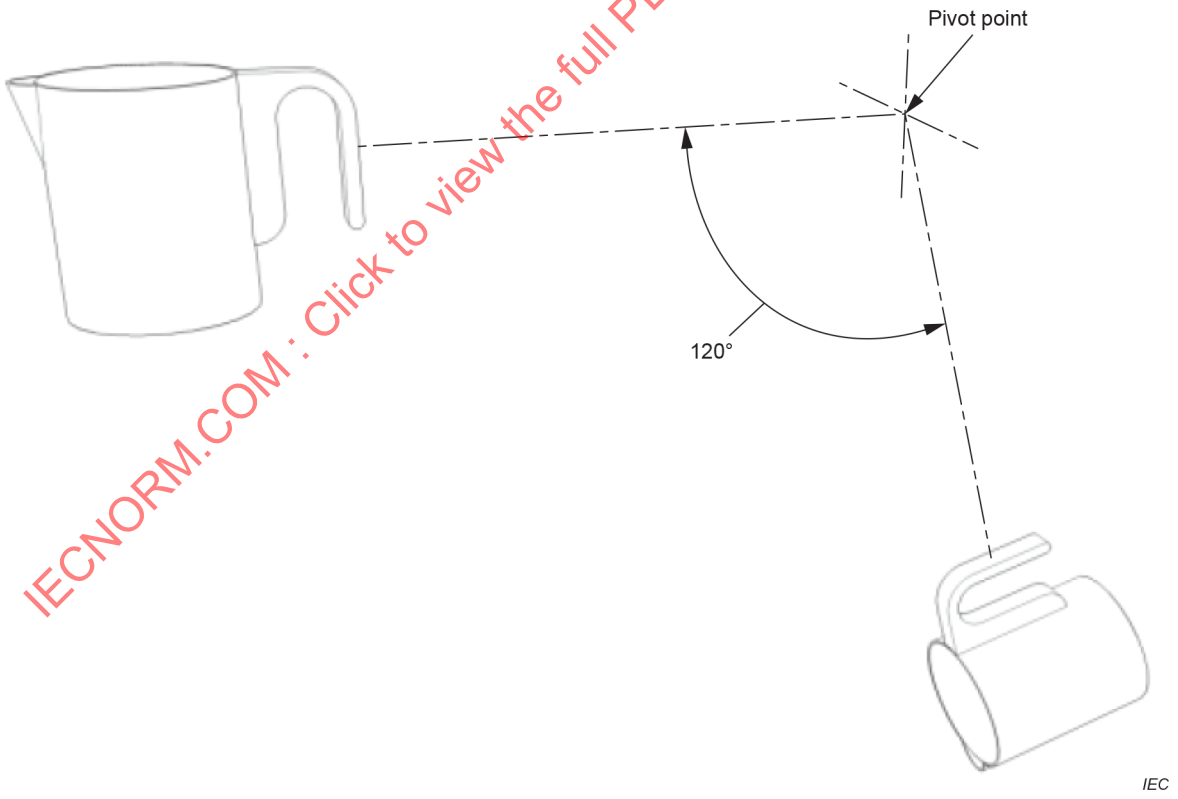



**Figure 110 – Schematic representation of the vertical movement test**

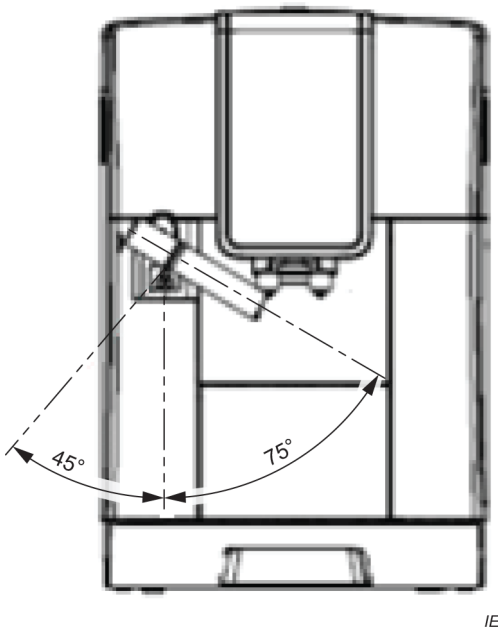



**Figure 111 – Rotation of the frothing or hot water nozzle**

## 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

This annex of Part 1 is applicable except as follows.

**B.11.1** *Modification:*

Replace the first, second and third paragraphs with the following:

***Battery-operated appliances*** *are tested under the conditions of* ***normal operation*** *with the appliance operated as specified in 11.7 or until it cannot perform its intended function due to the depletion of* ***battery****.*

*For appliances incorporating* ***integral batteries*** *or* ***separable batteries*** *not disconnected from the appliance for charging purposes, and that cannot perform their intended function while the* ***batteries*** *are being charged, the appliance is operated as specified until it cannot perform its intended function due to the depletion of the* ***batteries****.*

# Annex C
(normative)

## Ageing test on motors

This annex of Part 1 is applicable except as follows.

*Modification:*

The value of *p* in Table C.1 is 2 000.

# Annex R
(normative)

## Software evaluation

This annex of Part 1 is applicable except as follows.

**R.2.2.5** *Modification:*

Replace the first paragraph with the following:

For programmable **electronic circuits** with functions requiring software incorporating measures to control the fault/error conditions specified in Table R.1, detection or a fault/error shall occur before compliance with Clause 19, 20.103, 22.115 or 22.116 is impaired.

**R.2.2.9** *Modification:*

Replace the first sentence with the following:

The software and safety-related hardware under its control shall be initialized and shall terminate before compliance with Clause 19, 20.103, 22.115 or 22.116 is impaired.

# Bibliography

The Bibliography of Part 1 is applicable except as follows.

*Addition:*

IEC 60335-2-13, *Household and similar electrical appliances – Safety – Part 2-13: Particular requirements for deep fat fryers, frying pans and similar appliances*

IEC 60335-2-21, *Household and similar electrical appliances – Safety – Part 2-21: Particular requirements for storage water heaters*

IEC 60335-2-35, *Household and similar electrical appliances – Safety – Part 2-35: Particular requirements for instantaneous water heaters*

IEC 60335-2-54, *Household and similar electrical appliances – Safety – Part 2-54: Particular requirements for surface-cleaning appliances for household use employing liquids or steam*

IEC 60335-2-74, *Household and similar electrical appliances – Safety – Part 2-74: Particular requirements for portable immersion heaters*

IEC 60335-2-75, *Household and similar electrical appliances – Safety – Part 2-75: Particular requirements for commercial dispensing appliances and vending machines*

IEC 60335-2-98, *Household and similar electrical appliances – Safety – Part 2-98: Particular requirements for humidifiers*

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# SOMMAIRE

COMMISSION ÉLECTROTECHNIQUE INTERNATIONALE

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# APPAREILS ÉLECTRODOMESTIQUES ET ANALOGUES – SÉCURITÉ –

## Partie 2-15: Exigences particulières pour les appareils de chauffage des liquides

## AVANT-PROPOS

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L'IEC 60335-2-15 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 septième édition annule et remplace la sixième édition parue en 2012, l'Amendement 1:2016 et l'Amendement 2:2018. 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, 8.1.2, 11.7.104, 15.2, 15.101);

c) des limites de température de surface ont été introduites (3.6.102, 7.1, 7.6, 7.12, 7.14, 7.15, 11.1, 11.3, 11.101);

d) des instructions ont été ajoutées pour les appareils avec des réservoirs de liquide en matériau polycarbonate et les bouilloires (7.12);

e) le calibre d'essai 18 a été introduit et la force d'application des calibres d'essai a été clarifiée en 20.103;

f) l'essai de débordement a été amélioré pour les cafetières à verseuse amovible et un essai a été ajouté pour les appareils avec une surface de support pour tasse ou récipient (15.2);

g) il est désormais spécifié que les bouilloires doivent être soumises à l'essai avec du NaCl en lieu et place de la solution de débordement (15.2);

h) des essais de débordement ont été ajoutés pour les appareils à encastrer (15.104, 15.105);

i) des critères de conformité pour les essais de choc sur les réservoirs en verre des bouilloires, des cafetières et des théières ont été ajoutés (21.1);

j) des exigences concernant la robustesse des poignées des bouilloires ont été ajoutées (21.101, 21.102);

k) les exigences concernant les orifices d'écoulement ont été clarifiées (22.6);

l) des exigences concernant la commande à distance ont été ajoutées (22.49, 22.51);

m) l'évaluation de la méthode d'essai des connecteurs d'appareils sans câble a été clarifiée (22.103);

n) les exigences concernant les cuiseurs sous pression ont été clarifiées (22.108, 22.108.1, 22.108.2, 22.109);

o) les exigences concernant l'angle maximal de rotation d'une buse de moussage ou d'eau chaude ont été révisées (22.115, R.2.2.5, R.2.2.9);

p) des exigences ont été ajoutées pour les circuits électroniques programmables qui limitent le nombre d'éléments chauffants et de moteurs capables de fonctionner en même temps (22.116, R.2.2.5, R.2.2.9).

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

| Projet | Rapport de vote |
|---|---|
| 61/7289/FDIS | 61/7332/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 chauffage des liquides.

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.

Les différences suivantes existent dans les pays indiqués ci-après.

– Article 1: En Australie et en Nouvelle-Zélande, il existe des exigences de construction et de fonctionnement anormal supplémentaires pour les appareils tout-en-un qui ne disposent pas de fonctions de cuisson sous pression.

– 19.101: L'essai ne s'applique pas (Japon).

– 25.8: Un câble d'alimentation qui a une section de 0,75 $mm^2$ n'est pas autorisé pour les appareils dont le courant assigné dépasse 6 A (Japon).

– 25.8: Des câbles d'alimentation plus longs sont admis (Japon).

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 2-15: Exigences particulières pour les appareils de chauffage des liquides

## 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 électriques de chauffage des liquides pour usages domestiques et analogues, dont la **tension assignée** est inférieure ou égale à 250 V, y compris les appareils alimentés en courant continu et les **appareils alimentés par batteries**.

Certains appareils de la présente norme sont utilisés pour chauffer des aliments.

La liste suivante répertorie les exemples d'appareils qui relèvent du domaine d'application de la présente norme:

– les cafetières;
– les sauteuses;
– les cuiseurs à œufs;
– les **chauffe-biberons**;
– les bouilloires et autres appareils pour faire bouillir de l'eau, dont la **capacité assignée** ne dépasse pas 10 l;
– les chauffe-lait;
– les appareils de cuisson sous pression dont la **pression de cuisson assignée** ne dépasse pas 140 kPa et dont la **capacité assignée** ne dépasse pas 10 l;
– les **cuiseurs à riz**;
– les mijoteuses;
– les **cuiseurs à vapeur**;
– les **préparateurs de lait de soja**;
– les théières;
– les lessiveuses;
– les yaourtières.

Les appareils peuvent avoir plusieurs fonctions.

Les appareils destinés à un usage domestique normal et analogue et qui peuvent également être utilisés par des usagers non avertis dans des magasins, chez des artisans et dans des fermes, sont compris dans le domaine d'application de la présente norme. Les chauffe-colle à bain-marie, les chaudrons-cuiseurs et les stérilisateurs sont des exemples de tels appareils.

Si un appareil est destiné à être utilisé par des professionnels pour la préparation d'aliments à des fins commerciales, cet appareil n'est pas considéré comme étant uniquement à usage domestique et analogue.

Dans la mesure du possible, la présente norme traite des dangers courants présentés par les appareils, encourus par tous les individus à l'intérieur et autour de l'habitation. Cependant, elle ne tient en général pas compte:

– 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, par les organismes nationaux responsables de l'alimentation en eau et par des organismes similaires;
  - des exigences supplémentaires relatives aux récipients sous pression sont spécifiées pour les cuiseurs sous pression.

La présente norme ne s'applique pas

– aux poêles à frire et aux friteuses (IEC 60335-2-13);
– aux chauffe-eau à accumulation (IEC 60335-2-21);
– aux chauffe-eau instantanés (IEC 60335-2-35);
– aux appareils de nettoyage des surfaces qui utilisent des liquides ou de la vapeur (IEC 60335-2-54);
– aux thermoplongeurs mobiles (IEC 60335-2-74);
– aux distributeurs commerciaux avec ou sans moyen de paiement (IEC 60335-2-75);
– aux appareils destinés à des usages médicaux (IEC 60601);
– 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);
– aux appareils de chauffage à haute fréquence;
– aux stérilisateurs à pression;
– aux humidificateurs pour usages domestiques et analogues (IEC 60335-2-98).



## 2 Références normatives

L'article de la Partie 1 s'applique, avec l'exception suivante.

*Addition:*

IEC 60584-1, *Couples thermoélectriques – Partie 1: Spécifications et tolérances en matière de FEM*

## 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:*
**fonctionnement normal**

Remplacer le premier alinéa par ce qui suit:

fonctionnement de l'appareil dans les conditions spécifiées du 3.1.9.101 au 3.1.9.107

**3.1.9.101** Les bouilloires, pots chauffants, urnes et autres appareils pour faire bouillir de l'eau, les sauteuses, les chauffe-colle, les chauffe-lait, les mijoteuses, les stérilisateurs, les lessiveuses et les yaourtières sont mis en fonctionnement avec leur réservoir rempli de leur **capacité assignée** d'eau, tout couvercle étant fermé. La quantité d'eau dans les mijoteuses est maintenue à plus de 50 % de leur **capacité assignée**.

Les cafetières sont mises en fonctionnement conformément aux instructions les concernant, avec leur réservoir d'eau rempli à sa **capacité assignée** et, le cas échéant, avec leur réservoir de grains rempli de grains de café. La plaque chauffante et toutes les éventuelles autres fonctions qui consomment de l'énergie sont mises en marche.

Les appareils qui comportent une surface chauffée destinée à maintenir un liquide au chaud sont mis en fonctionnement avec ou sans réservoir, si cette condition est la plus défavorable.

**3.1.9.102** Les cuiseurs à œufs et les **cuiseurs à vapeur** sont mis en fonctionnement avec leur réservoir rempli de la quantité maximale d'eau spécifiée dans les instructions.

**3.1.9.103** Les **chauffe-biberons** sont mis en fonctionnement avec un biberon en verre résistant à la chaleur, de forme ronde ou hexagonale, dont la masse est comprise entre 190 g et 200 g et dont la capacité est d'environ 225 ml, sauf si un biberon particulier est spécifié, auquel cas ce biberon est utilisé. Le biberon est rempli d'une quantité d'eau approximativement égale à sa **capacité assignée** ou à 200 ml, si cette valeur est plus faible, et est placé dans le **chauffe-biberon**. Celui-ci est rempli d'eau jusqu'au niveau spécifié dans les instructions ou, en l'absence d'instructions, jusqu'au niveau maximal.

**3.1.9.104** Les chaudrons cuiseurs sont mis en fonctionnement avec le couvercle fermé, le réservoir étant rempli d'une quantité d'eau égale à la moitié de la **capacité assignée**.

**3.1.9.105** Les appareils de cuisson sous pression sont mis en fonctionnement conformément aux instructions, mais avec le réservoir rempli d'eau jusqu'à une hauteur de 25 mm.

**3.1.9.106** Les **cuiseurs à riz** sont mis en fonctionnement avec la cuve qui contient le riz remplie au niveau de la **capacité assignée** maximale. De l'eau est ajoutée de façon à maintenir le niveau pendant l'ébullition autant que nécessaire.

Pour la fonction de maintien au chaud, le **cuiseur à riz** est mis en fonctionnement avec la cuve qui contient le riz vide.

**3.1.9.107** Les **préparateurs de lait de soja** sont mis en fonctionnement avec le bol rempli de fèves de soja conformément aux instructions et d'un volume d'eau égal à la **capacité assignée**.

**3.1.101**
**capacité assignée**
capacité assignée à l'appareil par le fabricant

**3.1.102**
**pression de cuisson assignée**
pression assignée à l'appareil par le fabricant

### 3.5 Définitions relatives aux types d'appareils

**3.5.101**
**cafetière expresso**
cafetière dans laquelle l'eau est chauffée et passe de force à travers le café moulu sous l'effet de la pression de la vapeur ou au moyen d'une pompe

Note 1 à l'article: Les **cafetières expresso** peuvent être équipées d'une sortie pour fournir de la vapeur ou de l'eau chaude.

**3.5.102**
**chauffe-biberon**
appareil pour chauffer, dans un biberon, de la nourriture pour enfants et dans lequel le transfert de chaleur est effectué par de l'eau

Note 1 à l'article: Les **chauffe-biberons** peuvent être équipés d'un dispositif de commande qui permet de régler la température ou la durée jusqu'à un niveau prédéterminé.

**3.5.103**
**bouilloire sans câble**
bouilloire qui comporte un élément chauffant et qui n'est raccordée au réseau d'alimentation que lorsqu'elle est placée sur le socle qui lui est associé

**3.5.104**
**cuiseur à vapeur**
appareil dans lequel la nourriture est chauffée par de la vapeur produite à la pression atmosphérique

**3.5.105**
**cuiseur à riz**
appareil destiné à cuire du riz dans une **cuve amovible**, la cuve étant intégrée à l'appareil pendant la cuisson

Note 1 à l'article: Les **cuiseurs à riz** peuvent avoir une fonction de maintien au chaud.

Note 2 à l'article: Les **cuiseurs à riz** peuvent cuire d'autres aliments que le riz.

**3.5.106**
**cuiseur à riz à induction**
**cuiseur à riz** qui chauffe la cuve qui contient le riz par courants de Foucault

Note 1 à l'article: Les courants de Foucault sont induits dans la cuve qui contient le riz ou dans le couvercle, ou dans la cuve qui contient le riz et dans le couvercle, par le champ électromagnétique d'un inducteur.

**3.5.107**
**appareil sans câble**
appareil qui comporte un élément chauffant et qui n'est raccordé au réseau d'alimentation que lorsqu'il est placé sur le socle qui lui est associé

**3.5.108**
**appareil de cuisson sous pression dynamique**
appareil de cuisson sous pression qui réduit la pression par une action dynamique d'une partie élastique

**3.5.109**
**préparateur de lait de soja**
appareil qui assure les fonctions de chauffage, de broyage et de brassage et qui est destiné à préparer du lait de soja

### 3.6 Définitions relatives aux parties d'un appareil

**3.6.101**
**porte décorative**
partie d'un appareil qui assure la même fonction que la porte d'un meuble

**3.6.102**
**surface fonctionnelle**
surface qui est volontairement chauffée par une source de chaleur interne et qui doit être chaude pour assurer la fonction prévue de l'appareil

Note 1 à l'article: La gaine chauffée d'un élément chauffant tubulaire constitue un exemple.

### 3.7 Définitions relatives aux composants de sécurité

**3.7.101**
**régulateur de pression**
dispositif de commande qui maintient, en usage normal, la pression à une valeur donnée

**3.7.102**
**limiteur de pression**
dispositif de commande qui limite la pression dans des conditions de fonctionnement anormal

## 4 Exigences générales

L'article de la Partie 1 s'applique.

## 5 Conditions générales d'essais

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

**5.2** *Addition:*

*Si l'essai du 15.101 doit être réalisé, trois échantillons supplémentaires sont exigés.*

*Les essais du 21.101 et du 21.102 peuvent être effectués sur des appareils distincts.*

**5.3** *Addition:*

*L'essai du 19.101 est effectué après les autres essais.*

*Les essais du 22.102, 22.110 et 22.111 sont réalisés pendant l'essai de l'Article 11.*

**5.101** *Les **cuiseurs à riz à induction** sont soumis aux essais comme des **appareils à moteur**.*

## 6 Classification

L'article de la Partie 1 s'applique, avec l'exception suivante.

**6.2** *Addition:*

Les lessiveuses et les chaudrons cuiseurs doivent être au moins IPX3.

## 7 Marquage et instructions

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

**7.1** *Addition:*

Les appareils destinés à être immergés partiellement dans l'eau pour le nettoyage doivent porter un marquage, qui indique le niveau maximal d'immersion et qui comporte en substance l'indication suivante:

Ne pas immerger au-dessus de ce niveau.

Les bouilloires doivent comporter une marque de niveau ou un autre moyen pour indiquer lorsqu'elles sont remplies à la **capacité assignée**, sauf si elles ne peuvent être remplies au-dessus de la **capacité assignée**. Cette indication doit être visible lorsque la bouilloire est en position de remplissage. Si la marque de niveau n'est pas évidente, un rappel de cette marque doit être porté sur la face externe de la bouilloire et doit être visible lorsque la bouilloire est dans sa position normale d'utilisation.

Si la position fermée du couvercle d'un appareil de cuisson sous pression n'est pas évidente, cette position doit être marquée sur l'appareil.

Les socles fournis avec les **appareils sans câble** doivent porter les marquages suivants:

– le nom, la marque commerciale ou la marque d'identification du fabricant ou du vendeur responsable;
– la référence du modèle ou du type.

Les **préparateurs de lait de soja** doivent comporter une marque de niveau ou un autre moyen pour indiquer lorsqu'ils sont remplis à la **capacité assignée**, sauf s'ils ne peuvent être remplis au-dessus de la **capacité assignée**.

Si un appareil possède des **surfaces accessibles** extérieures, pour lesquelles des limites d'échauffement sont spécifiées dans le Tableau 101 et pour lesquelles les dispositions de la note de bas de tableau b du Tableau 101 s'appliquent, l'appareil doit porter un marquage sur lequel est apposé le symbole IEC 60417-5041 (2002-10), ou qui comporte en substance l'indication suivante:

ATTENTION: Surface très chaude

**7.6** *Ajouter ce qui suit*:

[symbole IEC 60417-5041 (2002-10)] Attention: surface très chaude

**7.12** *Addition:*

Les instructions applicables aux appareils doivent comporter, en substance, les indications suivantes:

Cet appareil est destiné à être utilisé dans des applications domestiques et analogues telles que:

- les coins cuisines réservés au personnel des magasins, bureaux et autres environnements professionnels;
- les fermes;
- par les clients dans les hôtels, les motels et autres environnements résidentiels;
- les environnements de type chambre d'hôtes.

Si le fabricant souhaite limiter l'utilisation de l'appareil à un domaine plus restreint que celui décrit ci-dessus, cette restriction doit être clairement indiquée dans les instructions.

Les instructions pour les appareils qui sont équipés d'un socle de connecteur, et qui sont destinés à être partiellement ou complètement immergés dans l'eau pour le nettoyage, doivent indiquer que la prise mobile de connecteur doit être débranchée avant de nettoyer l'appareil et que le socle de connecteur doit être séché avant une nouvelle utilisation de l'appareil.

Les instructions des appareils qui sont normalement nettoyés après utilisation et qui ne sont pas destinés à être immergés dans l'eau pour leur nettoyage doivent indiquer que l'appareil ne doit pas être immergé. Cette exigence s'applique en général aux cafetières, sauteuses, chauffe-lait, appareils de cuisson sous pression, **cuiseurs à vapeur**, mijoteuses, **préparateurs de lait de soja** et yaourtières.

Les instructions pour les appareils destinés à être utilisés avec une prise mobile de connecteur qui comportent un **thermostat** doivent préciser que seule la prise mobile adéquate doit être utilisée.

À moins que la bouilloire ne soit conçue de façon telle qu'aucun danger ne puisse provenir de l'éjection d'eau bouillante, les instructions doivent indiquer que si la bouilloire est trop remplie, de l'eau bouillante peut être éjectée.

Les instructions des bouilloires remplies par un orifice du couvercle situé sous la poignée doivent inclure, en substance, les indications suivantes:

– MISE EN GARDE: Ne pas enlever le couvercle lorsque l'eau bout;
– ATTENTION: Mettre le couvercle en place de façon telle que la vapeur ne soit pas dirigée vers la poignée.

Cet avertissement n'est pas exigé si le couvercle ne peut être fermé de façon telle que la vapeur soit dirigée vers la poignée.

Les instructions pour les **appareils sans câble** doivent indiquer que l'appareil ne doit être utilisé qu'avec le socle qui lui est associé.

Si l'appareil et le socle d'un **appareil sans câble** peuvent être soulevés ensemble en saisissant la poignée de l'appareil, les instructions doivent comporter, en substance, l'indication suivante:

– ATTENTION: S'assurer que l'appareil est hors tension avant de la retirer de son socle.

Les instructions des **chauffe-biberons** doivent indiquer:

– qu'il convient de ne pas chauffer la nourriture pendant une trop longue durée;
– comment vérifier que la température correcte de la nourriture n'a pas été dépassée.

Les instructions pour les **chauffe-biberons** dont la mise hors tension n'est pas automatique doivent comprendre une instruction supplémentaire qui indique de mettre hors tension le **chauffe-biberon** après utilisation.

Les instructions des appareils de cuisson sous pression, autres que les **appareils de cuisson sous pression dynamique**, doivent indiquer qu'il convient de vérifier régulièrement les conduits prévus dans le **régulateur de pression** pour permettre à la vapeur de s'échapper afin de s'assurer qu'ils ne sont pas obstrués.

Les instructions pour les appareils de cuisson sous pression doivent également fournir des détails sur la façon d'ouvrir le récipient de façon sûre et indiquer que le récipient ne doit pas être ouvert avant que la pression n'ait suffisamment diminué.

Les instructions des cuiseurs à œufs équipés d'un brise-coquille doivent comporter, en substance, l'indication suivante:

ATTENTION: Éviter de se blesser avec le brise-coquille.

Pour les **cafetières expresso** qui comportent un réservoir sous pression rempli par l'utilisateur, les instructions doivent comporter une information pour le remplissage en toute sécurité du réservoir d'eau et doivent comporter, en substance, la mise en garde suivante:

MISE EN GARDE: L'orifice de remplissage ne doit pas être ouvert en cours d'utilisation.

Les instructions pour tous les appareils doivent inclure:

– une mise en garde pour éviter tout débordement sur le connecteur;
– des détails sur la façon de nettoyer les surfaces en contact avec les aliments;
– une mise en garde concernant les risques de blessures en cas de mauvaise utilisation;
– une indication mentionnant que la surface de l'élément chauffant présente une chaleur résiduelle après utilisation.

Les instructions des **préparateurs de lait de soja** doivent aussi comporter une indication des précautions qui doivent être prises lors de la manipulation des lames tranchantes affûtées, lorsque le bol est vidé et pendant le nettoyage.

Les instructions des **préparateurs de lait de soja** qui comportent un interrupteur nécessaire pour assurer la conformité au 22.40 doivent indiquer, en substance:

Mettre l'appareil à l'arrêt et le déconnecter de l'alimentation avant de changer les accessoires ou d'approcher les parties qui sont mobiles lors du fonctionnement.

Les instructions pour les cafetières qui ne sont pas des **cafetières à encastrer** ou pour celles qui ne sont pas soumises à des essais à l'intérieur d'un meuble doivent indiquer que la cafetière ne doit pas être placée à l'intérieur d'un meuble lorsqu'elle est en cours d'utilisation.

Pour les cafetières qui sont équipées d'une **porte décorative** supplémentaire et pour celles qui sont destinées à être utilisées à l'intérieur d'un meuble, les instructions doivent indiquer que lorsque la cafetière fonctionne, la **porte décorative** ou la porte du meuble doit être ouverte.

Les instructions pour les cafetières qui possèdent des surfaces en verre, en céramique ou en matériaux similaires qui constituent une partie de l'enveloppe des **parties actives** doivent inclure, en substance, l'indication suivante:

MISE EN GARDE: Ne pas utiliser l'appareil si la surface est fissurée.

Les instructions pour les cafetières doivent indiquer que le nettoyage et l'**entretien par l'utilisateur** ne doivent pas être réalisés par des enfants sans surveillance.

Si le symbole IEC 60417-5041 (2002-10) est marqué sur l'appareil, sa signification doit être expliquée.

Les instructions pour les appareils avec des réservoirs de liquide en matériau polycarbonate qui sont accessibles à l'utilisateur doivent comporter, en substance, les indications suivantes:

ATTENTION: Pour éviter d'endommager l'appareil, ne pas utiliser d'agents nettoyants agressifs. Utiliser un chiffon doux et un détergent doux.

ATTENTION: Ne pas utiliser l'appareil si l'enveloppe est endommagée ou présente des fissures visibles.

Les instructions pour les bouilloires doivent comporter, en substance, l'indication suivante:

ATTENTION: Ne pas utiliser la bouilloire sur un plan incliné. Ne pas mettre la bouilloire sous tension si elle ne contient pas d'eau. Ne pas déplacer l'appareil lorsqu'il est sous tension.

**7.12.4** *Addition:*

Pour les cafetières qui sont adaptées pour un fonctionnement à l'intérieur d'un meuble, les dimensions minimales du meuble doivent être données.

**7.14** *Addition:*

La hauteur du triangle dans le symbole IEC 60417-5041 (2002-10) doit être d'au moins 8 mm.

**7.15** *Addition:*

Le marquage spécifié pour les **surfaces accessibles** extérieures doit être visible lorsque l'appareil est mis en fonctionnement comme en usage normal, y compris lors de l'actionnement d'un interrupteur, du réglage d'un dispositif de commande ou de l'ouverture d'un couvercle ou d'une porte. Il ne doit pas être apposé sur une **surface fonctionnelle**.

## 8 Protection contre l'accès aux parties actives

L'article de la Partie 1 s'applique, avec l'exception suivante.

**8.1.2** *Addition:*

Les dispositifs de raccordement des socles des **appareils sans câble** ne sont pas considérés comme des socles de prise de courant.

## 9 Démarrage des appareils à moteur

L'article de la Partie 1 ne s'applique pas.

## 10 Puissance et courant

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

**10.1** *Addition:*

*La puissance des cafetières automatiques est mesurée au cours d'un cycle de fonctionnement que l'utilisateur peut choisir, comme le nettoyage, le détartrage ou la sélection d'une boisson. Le mesurage commence lorsque l'appareil est à la* ***température ambiante****.*

*Le cycle de fonctionnement démarre au moment où l'utilisateur l'active et se termine lorsque l'appareil l'arrête automatiquement et que le cycle de fonctionnement suivant peut être lancé par l'utilisateur.*

**10.2** *Addition:*

*Le courant d'entrée des cafetières automatiques est mesuré au cours d'un cycle de fonctionnement que l'utilisateur peut choisir, comme le nettoyage, le détartrage ou la sélection d'une boisson. Le mesurage commence lorsque l'appareil est à la* ***température ambiante****.*

*Le cycle de fonctionnement démarre au moment où l'utilisateur l'active et se termine lorsque l'appareil l'arrête automatiquement et que le cycle de fonctionnement suivant peut être lancé par l'utilisateur.*

## 11 Échauffements

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

**11.1** *Addition:*

*La vérification est également effectuée par l'essai du 11.101.*

**11.2** *Addition:*

*Les* ***appareils mobiles*** *sont soumis aux essais à distance des parois du coin d'essai. Les cafetières équipées d'une* ***porte décorative*** *ou destinées à être utilisées à l'intérieur d'un meuble doivent être soumises aux essais avec la porte en position ouverte.*

**11.3** *Addition:*

*Pendant l'essai du 11.101, lorsque les* ***surfaces accessibles*** *extérieures sont suffisamment planes et que l'accès le permet, le calibre d'essai de la Figure 101 est utilisé pour mesurer les échauffements des* ***surfaces accessibles*** *extérieures spécifiées dans le Tableau 101. Le calibre est appliqué sur la surface avec une force de 4 N ± 1 N de manière à établir le meilleur contact possible entre le calibre et la surface. Le mesurage est effectué après une durée de contact de 30 s.*

*Le calibre peut être maintenu en place à l'aide d'une pince de laboratoire sur statif ou d'un dispositif analogue. Tout instrument de mesure qui donne les mêmes résultats que le calibre peut être utilisé.*

NOTE 101 Si le champ magnétique d'un **cuiseur à riz à induction** influence les résultats de manière excessive, les échauffements peuvent être déterminés en utilisant des résistances de platine avec conducteurs de connexions torsadés ou tout autre moyen équivalent.

**11.4** *Addition:*

*Si les limites d'échauffement sont dépassées dans les appareils qui incorporent des moteurs, des transformateurs ou des* ***circuits électroniques****, et si la puissance est inférieure à la* ***puissance assignée****, l'essai est répété en alimentant l'appareil à 1,06 fois la* ***tension assignée****. Les appareils qui comportent des dispositifs de commande de puissance électroniques sont mis en fonctionnement comme des* ***appareils combinés****.*

**11.6** *Addition:*

*Les* ***appareils combinés*** *sont mis en fonctionnement comme des* ***appareils chauffants****.*

**11.7** *Modification:*

Remplacer le premier alinéa par ce qui suit:

*Les appareils sont mis en fonctionnement pendant la durée spécifiée dans les 11.7.101 à 11.7.106.*

*Pour les appareils qui comportent des **batteries intégrées** ou des **batteries séparables** non déconnectées de l'appareil pour la charge, la **batterie** qui a été **complètement déchargée** est chargée pendant 1 h ou le temps spécifié du 11.7.101 au 11.7.106, si cette durée est plus courte, l'appareil étant mis en fonctionnement de la manière spécifiée, si cela est admis par la construction de l'appareil.*

Remplacer le premier tiret du troisième alinéa par ce qui suit:

– *la **batterie** qui a été **complètement déchargée** est chargée pendant 1 h ou le temps spécifié du 11.7.101 au 11.7.106 , si cette durée est plus courte, l'appareil étant mis en fonctionnement de la manière spécifiée si cela est admis par la construction de l'appareil;*

**11.7.101** *Pour les bouilloires qui comportent un **limiteur de température**, le **limiteur de température** est réarmé 1 min après son fonctionnement ou aussitôt que possible. L'essai est terminé après que le **limiteur de température** a fonctionné pour la deuxième fois.*

*Pour les bouilloires qui comportent un **thermostat**, l'essai est terminé 15 min après que l'eau a atteint la température de 95 °C.*

*Pour les autres bouilloires, l'essai est terminé 5 min après que l'eau a atteint la température de 95 °C.*

**11.7.102** *Pour les sauteuses, les cuiseurs à œufs, les **chauffe-biberons**, les chauffe-colle, les chaudrons cuiseurs, les chauffe-lait, les stérilisateurs, les lessiveuses et les appareils pour faire bouillir de l'eau autres que les bouilloires, l'essai est terminé:*

– *pour les appareils sans dispositif de commande thermique, 15 min après que l'eau dans le récipient a atteint une température de 95 °C ou la température maximale qui peut être atteinte si celle-ci est inférieure;*
– *pour les **appareils mobiles** qui comportent un dispositif de commande thermique, 15 min après que le dispositif de commande thermique a fonctionné pour la première fois;*
– *pour les **appareils installés à poste fixe** qui comportent un dispositif de commande thermique, 30 min après que le dispositif de commande thermique a fonctionné pour la première fois;*
– *1 min après le retentissement d'un signal acoustique continu ou répétitif à intervalles de moins de 5 s;*
– *lorsque des conditions de régime sont établies, pour les cuiseurs à œufs qui comportent des dispositions qui permettent de maintenir les œufs au chaud et pour les appareils qui comportent une surface chauffée destinée à maintenir un liquide au chaud.*

**11.7.103** *Les mijoteuses, les **cuiseurs à riz**, les **cuiseurs à vapeur** et les yaourtières sont mis en fonctionnement jusqu'à établissement des conditions de régime. Les mijoteuses sont préchauffées à sec si cela est spécifié dans les instructions.*

**11.7.104** *Pour les **cafetières expresso**, la période de préparation du café est suivie par une période de repos de 1 min ou par la période indiquée dans les instructions, si celle-ci est plus longue. Le réservoir d'eau est rempli à nouveau pendant les périodes de repos.*

*Pour les **cafetières expresso** automatiques et les **cafetières expresso** équipées d'une verseuse, la période de préparation du café est la durée nécessaire pour produire la quantité maximale de café autorisée par la minuterie ou par la capacité de la verseuse.*

*Pour les **cafetières expresso manuelles**, si la quantité maximale de café à produire n'est pas spécifiée dans les instructions, la période de préparation du café est la durée nécessaire pour produire 100 ml de café pour chaque cycle.*

*Pour les **cafetières expresso** qui comportent une sortie pour fournir de la vapeur ou de l'eau chaude, la période de préparation du café est immédiatement suivie d'une période au cours de laquelle la vapeur ou l'eau est fournie pendant la durée indiquée dans les instructions ou pendant les durées indiquées ci-après, si celles-ci sont plus défavorables:*

- *pour les **cafetières expresso** qui comportent une sortie pour fournir de la vapeur, 1 min;*
- *pour les **cafetières expresso** qui comportent une sortie pour fournir de l'eau chaude, la durée nécessaire pour produire 100 ml d'eau;*
- *pour les **cafetières expresso** qui comportent une sortie pour fournir de la vapeur et une sortie pour fournir de l'eau chaude, une période de 1 min en fourniture de vapeur est suivie d'une période de la durée nécessaire pour produire 100 ml d'eau.*

*La vapeur est émise dans un récipient qui contient de l'eau froide.*

*Les **cafetières expresso** sont mises en fonctionnement jusqu'à établissement des conditions de régime.*

*Les autres cafetières sont mises en fonctionnement pendant la durée nécessaire pour obtenir la quantité maximale de café indiquée dans les instructions. Le réservoir est alors rempli aussi vite que possible et la cafetière est remise en fonctionnement.*

*Ce processus est répété jusqu'à établissement des conditions de régime.*

**11.7.105** *Les appareils de cuisson sous pression sont mis en fonctionnement pendant 15 min après avoir atteint la pression maximale de cuisson.*

**11.7.106** *Les **préparateurs de lait de soja** sont mis en fonctionnement pendant un cycle de fonctionnement complet.*

**11.8** *Addition:*

*Lorsqu'une prise mobile de connecteur comporte un **thermostat**, la limite d'échauffement des broches du socle de connecteur ne s'applique pas.*

*Les limites d'échauffement des moteurs, des transformateurs et des composants des **circuits électroniques**, y compris des parties directement influencées par ceux-ci, peuvent être dépassées lorsque l'appareil est mis en fonctionnement à 1,15 fois la **puissance assignée**.*

**11.101** *Les appareils sont placés comme cela est spécifié en 11.2 et sont mis en **fonctionnement normal** à la **puissance assignée** pendant la durée spécifiée en 11.7.*

*Pendant cet essai, l'échauffement des surfaces ne doit pas dépasser les valeurs spécifiées dans le Tableau 101.*

**Tableau 101 – Échauffements maximaux pour les surfaces accessibles extérieures spécifiées en conditions de fonctionnement normal**

| ***Surface*** | ***Échauffement des surfaces accessibles extérieures*** [a, b] ***K*** | |
|---|---|---|
| | ***Surfaces des appareils destinés à être placés ou installés à moins de 850 mm au-dessus du sol*** | ***Surfaces des appareils destinés à être placés ou installés à 850 mm ou plus au-dessus du sol*** |
| *Métal nu* | *38* | *42* |
| *Métal recouvert* [c] | *42* | *49* |
| *Verre et céramique* | *51* | *56* |
| *Plastique et revêtement plastique > 0,4 mm* [d, e] | *58* | *62* |

*NOTE Les limites d'échauffement des poignées, boutons, manettes, claviers, pavés numériques et parties analogues sont spécifiées dans le Tableau 3.*

[a] *Les échauffements ne sont pas mesurés sur:*

- *la face inférieure des appareils destinés à être utilisés sur un plan de travail ou sur le sol, lorsque ces surfaces sont inaccessibles par un calibre de 75 mm de diamètre et à extrémité hémisphérique;*
- *les raccords et les flexibles qui acheminent de l'eau chaude, de la vapeur, du café, du thé et des liquides analogues, y compris les* ***régulateurs de pression*** *et les* ***limiteurs de pression****;*
- les ***surfaces fonctionnelles****;*
- *les surfaces situées à moins de 25 mm du contour des* ***surfaces fonctionnelles****.*
- *les couvercles;*
- *les surfaces situées à 25 mm au maximum du bord des couvercles;*
- *les surfaces situées à 25 mm au maximum des ouvertures de ventilation;*
- *les récipients qui contiennent des liquides chauds et qui deviennent chauds par conduction par une partie chauffée de l'appareil (par exemple, verseuses et porte-filtres des cafetières de type percolateur et bouilloires).*

[b] *Lorsque les valeurs exigées ne sont pas respectées, l'échauffement maximal ne doit pas dépasser le double des valeurs indiquées.*

[c] *Un métal est considéré comme recouvert lorsqu'un revêtement en émail d'une épaisseur minimale de 90 µm ou qu'un revêtement non constitué majoritairement de plastique est utilisé.*

[d] *La limite d'échauffement du plastique s'applique également aux matières plastiques dont l'épaisseur de la finition métallique est inférieure à 0,1 mm.*

[e] *Lorsque l'épaisseur du revêtement plastique ne dépasse pas 0,4 mm, les limites d'échauffement du métal recouvert pour le métal sous-jacent s'appliquent ou les limites d'échauffement du matériau en verre ou céramique pour le matériau en verre ou céramique sous-jacent s'appliquent.*



## 12 Charge des batteries à ions métalliques

L'article de la Partie 1 s'applique.

## 13 Courant de fuite et rigidité diélectrique à la température de régime

L'article de la Partie 1 s'applique.

## 14 Surtensions transitoires

L'article de la Partie 1 s'applique.

## 15 Résistance à l'humidité

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

**15.2** *Addition:*

Pour les bouilloires, remplacer le premier alinéa des modalités d'essais par ce qui suit:

*Pour les bouilloires, la vérification est effectuée par l'essai suivant en utilisant solution à base d'eau contenant approximativement 1 % de NaCl.*

Pour les stérilisateurs à vapeur, remplacer le cinquième alinéa des modalités d'essais par ce qui suit:

*Les stérilisateurs à vapeur sont placés sur une surface horizontale et 30 ml de solution de débordement sont versés sur le bord supérieur, à l'endroit le plus défavorable. La solution de débordement est versée régulièrement, en 2 s, à travers un tube d'un diamètre intérieur de 8 mm, l'extrémité inférieure du tube étant située à 200 mm au-dessus de l'appareil.*

NOTE 101 Une représentation schématique du dispositif d'essai est donnée à la Figure 102.

*L'essai est effectué uniquement avec la prise mobile de connecteur en place.*

*Pour les **cuiseurs à riz**, l'essai spécifié dans la Partie 1 doit être effectué avec la cuve qui contient le riz en position.*

*En cas de doute, l'essai de débordement est effectué alors que l'appareil est dans une position qui s'écarte de 5° au maximum de la position normale d'utilisation.*

*Les bouilloires sont remplies d'eau à la **capacité assignée**. Elles sont placées sur un plan incliné de 20° par rapport à l'horizontale, le bec dirigé vers le haut de la pente du plan incliné. L'eau ne doit pas être déversée de la bouilloire.*

*Les bouilloires qui peuvent être remplies par le bec sont également soumises à l'essai sur un plan incliné de 20° par rapport à l'horizontale, le bec dirigé vers le haut. La bouilloire est remplie d'eau qui contient environ 1 % de NaCl jusqu'au niveau maximal, si son indication est visible dans la position de remplissage, ou dans le cas contraire, jusqu'à ce que l'eau déborde de la bouilloire. Une quantité complémentaire, égale à 15 % de la **capacité assignée** de la bouilloire, est alors ajoutée aussi rapidement que possible.*

*Pour les **appareils sans câble**, l'essai avec l'appareil sur le plan horizontal est effectué alors que l'appareil est sur son socle, puis hors de son socle. L'essai complémentaire pour les bouilloires qui peuvent être remplies par le bec est effectué uniquement sur la **bouilloire sans câble** hors de son socle, la bouilloire étant replacée sur son socle pour effectuer l'essai de rigidité diélectrique du 16.3.*

*Pour les cafetières équipées d'une verseuse amovible, l'entonnoir est mis en place, mais pas la verseuse. La solution de débordement est versée manuellement et régulièrement dans l'entonnoir, sans faire déborder la solution de l'entonnoir. La quantité de solution de débordement correspond à la capacité maximale du réservoir d'alimentation en eau. Si l'ouverture supérieure de l'entonnoir est enfermée dans la cafetière, l'entonnoir est retiré, rempli à sa capacité de solution de débordement, puis replacé dans la cafetière, cette opération étant répétée jusqu'à avoir versé la quantité maximale de solution. Si l'entonnoir dispose d'un mécanisme antichute, ce mécanisme est rendu inopérant.*

*Les cafetières qui envoient le liquide dans un récipient destiné au service, comme une tasse ou un pichet, sont soumises à l'essai en versant régulièrement 0,5 l de solution de débordement sur la surface où le récipient est rempli ou transporté et déposé par l'utilisateur. Si un bac de récupération se trouve sous cette surface, celui-ci est complètement rempli avant d'effectuer l'essai.*

*Les cafetières qui possèdent des surfaces extérieures sur lesquelles il est possible de placer un récipient, comme une tasse ou un pichet, sont soumises à l'essai en versant rapidement 0,2 l de solution de débordement sur le dessus de l'appareil dans la condition la plus défavorable, de sorte que la solution de débordement coule sur la surface de l'appareil qui intègre les dispositifs de commande et à d'autres emplacements où elle peut pénétrer dans l'enveloppe de l'appareil, les dispositifs de commande étant placés dans la position la plus défavorable. Les dispositifs de commande sont ensuite mis en fonctionnement sur leur plage de fonctionnement complète, cette opération étant répétée après un délai de 5 min. Si nécessaire, l'essai est répété jusqu'à ce que l'ensemble des dispositifs de commande ou espaces soit couvert par l'essai de débordement, l'appareil étant séché après chaque essai. Les surfaces extérieures dont la dimension linéaire minimale de surface supérieure horizontale ou pratiquement horizontale est inférieure ou égale à 75 mm ne sont pas considérées comme étant des surfaces sur lesquelles il est possible de placer un récipient ou une tasse.*

*Pour les cafetières, après chaque essai de débordement ou versement d'un liquide, tous les résidus sont éliminés et l'appareil est séché.*

**15.101** Les appareils destinés à être partiellement ou complètement immergés dans l'eau pour le nettoyage doivent avoir une protection suffisante contre les effets de l'immersion.

*La vérification est effectuée par les essais suivants, qui sont effectués sur trois appareils supplémentaires.*

*Les appareils sont mis en fonctionnement dans les **conditions de fonctionnement normal** à 1,15 fois la **puissance assignée**, jusqu'au premier déclenchement du **thermostat**. Les appareils sans **thermostat** sont mis en fonctionnement jusqu'à l'établissement des conditions de régime. Les appareils sont déconnectés de l'alimentation, toutes les prises mobiles de connecteurs étant enlevées. Ils sont ensuite complètement immergés dans de l'eau qui contient environ 1 % de NaCl et dont la température est comprise entre 10 °C et 25 °C, à moins qu'ils ne portent l'indication du niveau maximal d'immersion, auquel cas ils sont immergés jusqu'à 50 mm au-dessus de ce niveau.*

*Après 1 h, les appareils sont retirés de la solution saline, séchés et soumis à l'essai de courant de fuite du 16.2.*

*Des précautions sont prises pour s'assurer que toute humidité est éliminée de l'isolation autour des broches des socles de connecteur.*

*Cet essai est effectué quatre fois supplémentaires, après quoi les appareils doivent satisfaire à l'essai de rigidité diélectrique du 16.3, selon la tension spécifiée dans le Tableau 4.*

*L'appareil dont le courant de fuite est le plus élevé après la cinquième immersion est démonté et l'examen ne doit révéler aucune trace de liquide sur l'isolation susceptible d'entraîner une réduction des **distances dans l'air** et des **lignes de fuite** au-dessous des valeurs spécifiées à l'Article 29.*

*Les deux autres appareils sont mis en fonctionnement dans les **conditions de fonctionnement normal** pendant 240 h à 1,15 fois la **puissance assignée**. Après cette période, les appareils sont déconnectés de l'alimentation et à nouveau immergés pendant 1 h. Ils sont ensuite séchés et soumis à l'essai de rigidité diélectrique du 16.3, selon la tension spécifiée dans le Tableau 4.*