IEC 60335-2-39

Edition 7.0 2021-11

INTERNATIONAL STANDARD

NORME INTERNATIONALE

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Household and similar electrical appliances – Safety – Part 2-39: Particular requirements for commercial electric multi-purpose cooking pans

Appareils électrodomestiques et analogues – Sécurité – Partie 2-39: Exigences particulières pour les sauteuses électriques à usage commercial

IEC 60335-2-39:2021-11(en-fr)

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INTERNATIONAL ELECTROTECHNICAL COMMISSION

HOUSEHOLD AND SIMILAR ELECTRICAL APPLIANCES – SAFETY –

Part 2-39: Particular requirements for commercial electric multi-purpose cooking pans

FOREWORD

1) The International Electrotechnical Commission (IEC) is a worldwide organization for standardization comprising all national electrotechnical committees (IEC National Committees). The object of IEC is to promote international co-operation on all questions concerning standardization in the electrical and electronic fields. To this end and in addition to other activities, IEC publishes International Standards, Technical Specifications, Technical Reports, Publicly Available Specifications (PAS) and Guides (hereafter referred to as "IEC Publication(s)"). Their preparation is entrusted to technical committees; any IEC National Committee interested in the subject dealt with may participate in this preparatory work. International, governmental and non-governmental organizations liaising with the IEC also participate in this preparation. IEC collaborates closely with the International Organization for Standardization (ISO) in accordance with conditions determined by agreement between the two organizations.
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IEC 60335-2-39 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 and Amendment 1:2017. This edition constitutes a technical revision.

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

a) the text has been aligned with IEC 60335-1:2020;
b) some notes have been converted to normative text or modified (Clause 1, 15.1, 15.102, 16.2, 19.101, 27.2);
c) exclusion of battery-operated appliances and appliances used in areas open to the public (Clause 1);
d) relocation of cleaning instructions from 7.12.1 to 7.12;

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e) relocation of 24.101 to 22.115;

f) conciliation of the text of IEC 60335-2-39 with other standards under IEC/TC61/MT32;

g) clarifications and modifications to some test specifications have been made (9.101, 11.4, 15.1.1, 15.102, 20.1, 25.3).

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

Draft	Report on voting
61/6374/FDIS	61/6424/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/standardsdev/publications.

A list of all parts in the IEC 60335 series, published 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 commercial electric multi-purpose cooking pans.

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.

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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,
- replaced by a revised edition, or
- amended.

NOTE 4 The attention of National Committees is drawn to the fact that equipment manufacturers and testing organizations may need a transitional period following publication of a new, amended or revised IEC publication in which to make products in accordance with the new requirements and to equip themselves for conducting new or revised tests.

It is the recommendation of the committee that the content of this publication be adopted for implementation nationally not earlier than 12 months or later than 36 months from the date of publication.

The following differences exist in the countries indicated below.

– 6.1: Class 01 appliances are allowed (Japan).
– 13.2: Leakage current limits are different (Japan).
– 16.2: Leakage current limits are different (Japan).

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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 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.

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HOUSEHOLD AND SIMILAR ELECTRICAL APPLIANCES – SAFETY –

Part 2-39: Particular requirements for commercial electric multi-purpose cooking pans

1 Scope

This clause of Part 1 is replaced by the following.

This part of IEC 60335 deals with the safety of electrically operated commercial **multi-purpose cooking pans**, their **rated voltage** being not more than 250 V for single-phase appliances connected between one phase and neutral and 480 V for other appliances. This standard also deals with pressurized appliances and appliances with pressurized parts.

These appliances are not intended for household and similar purposes. They are used for commercial processing of food in areas not open to the public, for example in kitchens of restaurants, canteens, hospitals and in commercial enterprises such as bakeries and butcheries.

The electrical part of appliances making use of other forms of energy is also within the scope of this standard.

As far as is practicable, this standard deals with the common hazards presented by these types of appliances.

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.

This standard does not apply to

– appliances designed exclusively for industrial purposes;
– appliances intended to be used in locations where special conditions prevail, such as the presence of a corrosive or explosive atmosphere (dust, vapour or gas);
– appliances for continuous mass production of food;
– deep fat fryers (IEC 60335-2-37);
– **battery-operated appliances**.

2 Normative references

This clause of Part 1 is applicable except as follows.

Addition:

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

ISO 898-1, *Mechanical properties of fasteners made of carbon steel and alloy steel – Part 1: Bolts, screws and studs with specified property classes – Coarse thread and fine pitch thread*

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ISO 3506-1, *Fasteners – Mechanical properties of corrosion-resistant stainless steel fasteners – Part 1: Bolts, screws and studs with specified grades and property classes*

ISO 3506-2, *Fasteners – Mechanical properties of corrosion-resistant stainless steel fasteners – Part 2: Nuts with specified grades and property classes*

ISO 3506-3, *Mechanical properties of corrosion-resistant stainless steel fasteners – Part 3: Set screws and similar fasteners not under tensile stress*

ISO 3506-4, *Mechanical properties of corrosion-resistant stainless steel fasteners – Part 4: Tapping screws*

3 Terms and definitions

This clause of Part 1 is applicable except as follows.

3.1 Definitions relating to physical characteristics

3.1.4 *Addition:*

Note 101 to entry: The **rated power input** is the sum of the power inputs of all the individual elements in the appliance that can be on at one time; where there are several such combinations possible, that giving the highest power input is used in determining the **rated power input**.

3.1.9 *Replacement:*
operation of the appliance under the following conditions:

The appliance is operated in accordance with the manufacturer's instructions, with no load and with the controls set to give the temperatures as set out below, the temperature being measured at the geometrical centre of the inside of the bottom face.

Stepped controls are set to the first position that gives a temperature equal to or greater than 275 °C. Cycling controls are set so that the mean value of the temperature over the cycle is 275 °C ± 5 °C. If this temperature cannot be reached, the control is set at the maximum.

Motors and **detachable electrical parts** incorporated in the appliance are operated under the most unfavourable conditions that can be expected in normal use taking into account the manufacturer's instructions.

3.1.101
rated pressure
maximum working pressure assigned by the manufacturer to the pressurized parts of the appliance

3.5 Definitions relating to types of appliances

3.5.101
multi-purpose cooking pan
appliance comprising a pan, the base of which is evenly heated and that is intended principally for cooking or preparing meats, sauces, etc.

Note 1 to entry: The pan may be fixed or tilting.

Note 2 to entry: A **multi-purpose cooking pan** is also known as a "bratt pan".

3.5.102
atmospheric multi-purpose cooking pan
multi-purpose cooking pan in which the pressure within the vessel does not differ significantly from atmospheric pressure

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3.6 Definitions relating to parts of an appliance

3.6.101
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.

3.6.102
adjacent surface
surface that is adjacent to a **functional surface** and which can become hot through conduction

3.8 Definitions relating to miscellaneous matters

3.8.101
installation wall
special fixed construction containing supply facilities for appliances installed in conjunction with it

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.

5.5 *Addition:*

The tests are carried out with the pan in the position of normal use for cooking.

5.10 *Addition:*

*Appliances intended for installation in a bank of other appliances and appliances intended to be fixed to an **installation wall** are enclosed to obtain protection against electric shock and harmful ingress of water equivalent to that obtained when installed in accordance with the instructions provided with the appliance.*

NOTE Appropriate enclosures or additional appliances can be needed for test purposes.

5.101 *Appliances are tested as **heating appliances** when during a mode of operation electrical heaters are energized. If no electrical heaters are energized, the appliances are tested as **motor-operated appliances**.*

5.102 *Appliances, when assembled in combination with or incorporating other appliances, are tested in accordance with the requirements of this standard. The other appliances are operated simultaneously in accordance with the requirements of the relevant standards.*

6 Classification

This clause of Part 1 is applicable except as follows.

6.1 *Replacement:*

Appliances shall be **class I** with respect to protection against electric shock.

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Compliance is checked by inspection and by the relevant tests.

6.2 *Addition:*

Appliances normally used on a table shall be at least IPX3. Other appliances shall be at least IPX4.

7 Marking and instructions

This clause of Part 1 is applicable except as follows.

7.1 *Addition:*

Appliances shall be marked with the rated capacity, in litres (l), unless this is marked on the appliance by another means, for example by a level mark.

If appliances have external **accessible surfaces** or lids, 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 surfaces.

7.6 *Addition:*

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

7.10 *Addition:*

Devices that control the tilting movement of tilting parts shall be clearly marked to show the direction of movement.

7.12 *Addition:*

The instructions shall warn the user not to use the appliance as a deep fat fryer unless it is intended to be used as one.

Appliances that are provided with an appliance inlet and are intended to be immersed in water for cleaning shall be accompanied by an instruction stating that the connector shall be removed before the appliance is cleaned and that the appliance inlet shall be dried before the appliance is used again.

Unless the appliance or part is intended to be partially or completely immersed in water for cleaning, the instructions for appliances with **detachable electrical parts** and appliances, other than **stationary appliances**, shall state that the appliance or part must not be immersed.

If any of the symbols IEC 60417-5021 (2002-10) or IEC 60417-5041 (2002-10) are marked on the appliance, its meaning shall be explained.

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The instructions shall include the substance of the following warnings:

WARNING: Do not open drain cocks or other emptying devices until the pressure has been reduced to approximately atmospheric pressure.

WARNING: Opening the drain cock will lead to the outflow of the hot contents of the multi-purpose cooking pan.

The instructions shall include the substance of the following:

These appliances are intended to be used for commercial applications, for example in kitchens of restaurants, canteens, hospitals and in commercial enterprises such as bakeries and butcheries but not for continuous mass production of food.

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

Modification:

The instruction concerning persons (including children) with reduced physical, sensory or mental capabilities or lack of experience and knowledge and children playing with the appliance is not applicable.

7.12.1 *Addition:*

The appliance shall be accompanied by instructions detailing any special precautions necessary for installation. For appliances intended for installation in a bank of other appliances and appliances intended to be fixed to an **installation wall**, details of how to ensure appropriate protection against electric shock and harmful ingress of water shall be supplied. If the controls of more than one appliance are combined in a separate enclosure, detailed installation instructions shall be supplied. Instructions for **user maintenance**, for example cleaning, shall also be given. They shall include a statement that the appliance is not to be cleaned with a water jet or a steam cleaner.

For appliances that are permanently connected to fixed wiring and for which leakage currents can exceed 10 mA, particularly if disconnected or not used for long periods, or during initial installation, the instructions shall give recommendations regarding the rating of **protective devices**, such as residual current devices (RCD), to be installed.

If a **stationary appliance** is intended to be moved for cleaning, this shall be stated.

For **stationary appliances** equipped with rollers or castors or intended to be moved for cleaning, the instructions shall state the substance of the following.

This appliance is to be connected with flexible connections for equipotential bonding and connection to services such as electricity supply, water supply, gas supply and steam supply such that the appliance can be moved in the direction required for cleaning a distance not less than the dimension of the appliance in the direction of movement plus 500 mm without the flexible connections becoming taut or being subject to strain.

Compliance is checked by inspection.

7.12.4 *Addition:*

The instructions for **built-in appliances** having a separate control panel for several appliances shall state that the control panel is only to be connected to the specified appliances in order to avoid a possible hazard.

7.12.9 Not applicable.

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7.14 *Addition:*

The height of the triangle in symbol IEC 60417-5041 (2002-10) shall be at least 15 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** or **adjacent surface**.

Modification:

For **fixed appliances**, the marking of the name or trademark or identification mark of the manufacturer or responsible vendor and the model or type reference shall be marked on the appliance and, if not visible when the appliance is installed as in normal use, shall be included in the instructions or on an additional label that can be fixed near the appliance after installation.

7.101 Equipotential bonding terminals shall be marked with symbol IEC 60417-5021 (2002-10).

These markings shall not be placed on screws, removable washers or other parts that can be removed when conductors are being connected.

Compliance is checked by inspection.

7.102 Appliances or the **detachable electrical parts** of appliances intended to be partially immersed in water for cleaning shall be marked with a line that clearly indicates the maximum depth of immersion, together with the substance of the following warning:

Do not immerse beyond this line.

If there is any seam or seal that causes the appliance or part not to withstand the treatment specified in 15.102, the line indicating the maximum depth of immersion shall be at least 50 mm below any such seam or seal when the appliance or the part is in the position in which it is to be cleaned.

Compliance is checked by inspection and measurement.

8 Protection against access to live parts

This clause of Part 1 is applicable.

9 Starting of motor-operated appliances

This clause of Part 1 is applicable except as follows.

9.101 Fan motors providing a cooling effect in order to comply with the requirements of Clause 11 shall start under all voltage conditions that can occur in use.

Compliance is checked by the following tests using a supply source such that its drop in voltage does not exceed 1 % during the tests, the appliance being returned to ***room temperature*** *after each test.*

The appliance is started under the conditions occurring at the beginning of ***normal operation*** *or, for automatic appliances, at the beginning of the normal cycle of operation, a voltage equal to 0,85 times the* ***rated voltage*** *being applied to the input terminals of the appliance.*

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*For appliances provided with motors having other than centrifugal starting switches, this test is repeated at a voltage equal to 1,06 times the **rated voltage** being applied to the input terminals of the appliance.*

The tests are carried out three times.

*In all cases, the motor shall start and it shall function in such a way that safety is not affected and overload **protective devices** of the motor shall not operate.*

10 Power input and current

This clause of Part 1 is applicable except as follows.

10.1 *Addition:*

For appliances having more than one heating unit, the total power input may be determined by measuring the power input of each heating unit separately (see also 3.1.4).

11 Heating

This clause of Part 1 is applicable except as follows.

11.2 *Addition:*

Appliances intended to be fixed to the floor and appliances with a mass greater than 40 kg and not provided with rollers, castors or similar means are installed in accordance with the manufacturer's instructions. If no instructions are given, these appliances are considered as appliances normally placed on the floor.

11.3 *Addition:*

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

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

11.4 *Replacement:*

*Appliances are operated under **normal operation** such that the total power input of the appliance is 1,15 times the **rated power input**. If it is not possible to switch on all heating elements at the same time, the test is made with each of the combinations that the switch arrangement will allow, the highest load possible with each switching arrangement being in circuit.*

If the appliance is provided with a control that limits the total power input, the test is made with whichever combination of heating units, as may be selected by the control, imposes the most unfavourable condition.

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If the temperature rise limits of motors, transformers or ***electronic circuits*** *are exceeded, the test is repeated with the appliance supplied at 1,06 times the* ***rated voltage****. In this case, only the temperature rise of the components for which the temperature rise limits were exceeded are measured.*

11.7 *Replacement:*

Appliances are operated until steady conditions are established.

Steady conditions are considered to exist 60 min after reaching the temperatures defined for ***normal operation****.*

When an appliance is assembled in combination with, equipped with or incorporating accessories or other appliances, the interaction shall be covered if they are provided to operate simultaneously as stated by the manufacturer or by a common control.

Agitator motors are operated continuously unless provided with a timer, in which case they are operated for the maximum time allowed by the timer, or until steady conditions are established, whichever is the shortest.

Tilting motors are operated immediately after the appliance has reached steady conditions, for one full cycle of operation (one cycle being from the fully up position to the fully down position and back to the fully up position).

Lifting motors are similarly operated, but for three such cycles.

11.8 *Modification:*

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

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Addition:

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

Surface[a]	***Temperature rise of external accessible surfaces***[b] *K*
Bare metal	*48*
Coated metal [c]	*59*
Glass and ceramic	*65*
Plastic and plastic coating > 0,4 mm [d, e]	*74*

[a] *Temperature rises are not measured on:*
- *the underside of appliances intended to be used on a working surface or floor;*
- *the rear surface of appliances;*
- *surfaces that are inaccessible to a 75 mm diameter probe having a hemispherical end;*
- ***functional surfaces*** *and* ***adjacent surfaces****.*

[b] *The temperature rise on external* ***accessible surfaces*** *up to a distance of 100 mm from* ***adjacent surfaces*** *of the appliance (see Figure 102) may exceed the limits by up to 25 K, but the relevant part shall then be marked with symbol IEC 60417-5041 (2002-10) or the equivalent text.*

[c] *Metal is considered coated when a coating having a minimum thickness of 90 µm made of enamel 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 metal-ion batteries

This clause of Part 1 is not applicable.

13 Leakage current and electric strength at operating temperature

This clause of Part 1 is applicable except as follows.

13.2 *Modification:*

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

- *for cord and plug connected appliances* — *0,75 mA or 1 mA per kW* ***rated power input*** *of the appliance with a maximum of 10 mA, whichever is higher;*
- *for other appliances* — *0,75 mA or 1 mA per kW* ***rated power input*** *of the appliance with no maximum, whichever is higher.*

For ***portable class I appliances****, instead of the permissible leakage current, the following applies:*

- *for cord and plug connected appliances* — *0,75 mA or 1 mA per kW* ***rated power input*** *of the appliance with a maximum of 10 mA, whichever is higher.*

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14 Transient overvoltages

This clause of Part 1 is applicable.

15 Moisture resistance

This clause of Part 1 is applicable except as follows.

15.1.1 *Addition:*

In addition, appliances, except those marked IPX5 and IPX6, are subjected for 5 min to the following splash test.

The apparatus shown in Figure 103 is used. The appliance is placed in normal position of use and adjustable feet shall be set in accordance with the instruction for use to the most unfavourable height.

For appliances normally used on the floor, the bowl is placed on the floor and is moved around in such a way as to splash the appliance from all directions. During the test, the water pressure is so regulated that the water splashes up 150 mm above the bottom of the bowl. The bowl is not positioned underneath the appliance.

For all other appliances, the bowl is placed on the same plane where the appliance is placed and is moved around in such a way as to splash the appliance from all directions. During the test, the water pressure is so regulated that the water splashes up 100 mm above the bottom of the bowl. The bowl is not positioned underneath the appliance.

Care is taken that the appliance is not hit by the direct jet.

15.1.2 *Modification:*

Appliances normally used on a table are placed on a support having dimensions that are 15 cm ± 5 cm in excess of those of the orthogonal projection of the appliance on the support.

15.2 *Addition:*

Immediately after this test, appliances with tilting parts are subjected to the following test.

The pan, filled to its rated capacity or up to the level mark with the spillage solution is then tilted to any position.

15.101 Appliances that are provided with a tap intended for filling or cleaning shall be constructed so that the water from the tap cannot come into contact with **live parts**.

Compliance is checked by the following test.

The tap is fully opened for 1 min with the appliance connected to a water supply having the maximum water pressure indicated by the manufacturer. Tiltable and movable parts, including lids, are tilted or placed in the most unfavourable position. Swivelling outlets of water taps are so positioned as to direct water on to those parts that will give the most unfavourable result.

Immediately following this treatment, the appliance shall withstand an electric strength test as specified in 16.3.

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

This requirement also applies to appliances, other than **stationary appliances**, or any **detachable electrical parts** not marked with a line indicating the maximum depth of immersion, or for which there is no warning against partial or complete immersion in the instructions.

Compliance is checked by the following tests.

*The sample is operated under **normal operation**, the supply voltage being such that the power input of the appliance is 1,15 times the **rated power input**.*

When steady conditions are established, the connector is withdrawn or the supply otherwise switched off, and the sample is, if relevant, immediately emptied and then immersed completely in water having a temperature between 10 °C and 25 °C, unless it is marked with a line indicating the maximum depth of immersion, in which case it is immersed to the depth indicated.

After 1 h of immersion, the sample is removed from the water and dried, care being taken to ensure that all moisture is removed from the insulation in the vicinity of the pins of appliance inlets. The leakage current is then measured on the assembled appliance, as described in 16.2.

The leakage current shall not exceed the value specified in 16.2.

After the treatment described above and the measurement of the leakage current, the sample shall withstand an electric strength test as specified in 16.3, the test voltage being, however, reduced to 1 000 V.

*The sample is then operated as above for 10 days (240 h). During this period, the sample is allowed to cool to approximately **room temperature** five times at regular intervals.*

After this period, the connector of the sample is withdrawn or the supply otherwise switched off, and the sample immediately immersed once more in water for 1 h as described above. It is then dried and the leakage current is measured again as described in 16.2.

The leakage current shall not exceed the value specified in 16.2.

The sample shall then withstand an electric strength test as specified before, and inspection shall show that water has not entered the appliance to any appreciable extent in areas where electrical components are situated.

16 Leakage current and electric strength

This clause of Part 1 is applicable except as follows.

16.2 *Modification:*

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

– *for cord and plug connected appliances*	*0,75 mA or 1 mA per kW **rated power input** of the appliance with a maximum of 10 mA, whichever is higher;*
– *for other appliances*	*0,75 mA or 1 mA per kW **rated power input** of the appliance with no maximum, whichever is higher.*

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*For **portable class I appliances**, instead of the permissible leakage current, the following applies:*

– *for cord and plug connected appliances*	*0,75 mA or 1 mA per kW **rated power input** of the appliance with a maximum of 10 mA, whichever is higher.*

Addition:

For appliances incorporating an appliance inlet and intended to be partially or completely immersed in water for cleaning, the appliance inlet may be dried, for example by means of blotting paper, before applying the test voltage if the appliance would not otherwise withstand this test.

17 Overload protection of transformers and associated circuits

This clause of Part 1 is applicable.

18 Endurance

This clause of Part 1 is applicable.

19 Abnormal operation

This clause of Part 1 is applicable except as follows.

19.1 *Addition:*

Compliance is also checked by the test of 19.101.

A control or switching device that is intended for different settings corresponding to different functions of the same part of the appliance is in addition set in the most unfavourable setting irrespective of the manufacturer's instructions.

19.2 *Addition:*

Controls are set at maximum.

19.4 *Addition:*

Any adjustable temperature or pressure control within the appliance that is preset for correct operation but is not locked in position is adjusted to its most unfavourable position.

19.101 *Appliances provided with a control limiting the pressure during the tests of Clause 11 are also subjected to the tests of 19.4 with this control rendered inoperative.*

During this test the pressure relief device is allowed to operate.

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