

# INTERNATIONAL STANDARD



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

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household use employing liquids or steam**

INTERNATIONAL  
ELECTROTECHNICAL  
COMMISSION

ICS 13.120; 97.180

ISBN 978-2-8322-5872-9

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## INTERNATIONAL ELECTROTECHNICAL COMMISSION

### HOUSEHOLD AND SIMILAR ELECTRICAL APPLIANCES – SAFETY –

#### Part 2-54: Particular requirements for surface-cleaning appliances for household use employing liquids or steam

#### FOREWORD

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**This commented version (CMV) of the official standard IEC 60335-2-54:2022 edition 5.0 allows the user to identify the changes made to the previous IEC 60335-2-54:2008+AMD1:2015+AMD2:2019 CSV edition 4.2. 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 60335-2-54 has been prepared by IEC technical committee 61: Safety of household and similar electrical appliances. It is an International Standard.

This fifth edition cancels and replaces the fourth edition published in 2008, Amendment 1: 2015 and Amendment 2: 2019. 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, 15.2, 21.103, 21.105, 22.103);
- c) addition of external accessible surface temperature limits (3.6.102, 3.6.103, 7.1, 11.3, 11.8)
- d) exception for hand-held appliances (20.1);

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

| Draft        | Report on voting |
|--------------|------------------|
| 61/6672/FDIS | 61/6749/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](http://www.iec.ch/members_experts/refdocs). The main document types developed by IEC are described in greater detail at [www.iec.ch/standardsdev/publications](http://www.iec.ch/standardsdev/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 surface-cleaning appliances for household use employing liquids or steam.

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 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](http://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.

**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~~ 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 2-54: Particular requirements for surface-cleaning appliances for household use employing liquids or steam

#### 1 Scope

This clause of Part 1 is replaced by the following.

This part of IEC 60335 deals with the safety of electric cleaning appliances for household use that are intended for cleaning surfaces by using liquid cleansing agents or steam, their **rated voltage** being not more than 250 V including direct current (DC) supplied appliances and **battery-operated appliances** 3. It also covers wallpaper strippers and surface cleaning appliances incorporating heating elements or means for pressurizing the liquid container.

~~NOTE 101—Appliances may incorporate heating elements or means for pressurizing the liquid container.~~

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 knowledgeprevents them from using the appliance safely without supervision or instruction;
- children playing with the appliance.

~~NOTE 102—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, and similar authorities.

~~NOTE 103—This standard does not apply to~~

- floor treatment and wet scrubbing machines (IEC 60335-2-10);
- cleaning appliances that are permanently fixed to a building;
- cleaning appliances covered by IEC 60335-2-79, namely those having a
  - pressure exceeding 2,5 MPa;
  - pressurised volume over 5 l;
  - product of pressure (in MPa) and container volume (in l) exceeding 5;
  - liquid temperature exceeding 160 °C;
  - **rated power input** exceeding 3 500 W;
- cleaning appliances intended for commercial or industrial use;
- 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);
- fabric steamers (IEC 60335-2-85).

## 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 6344-2, *Coated abrasives – Determination and designation of grain size—analysis distribution – Part 2: ~~Determination of grain size distribution of~~ Macrogrits sizes P12 to P220*

## 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~~ Addition: **4** ~~normal operation~~

operation of the appliance under the most unfavourable conditions specified in the instructions

The cleaning head is pressed with a force of 30 N against a vertical pane of plain glass and moved up and down over a length of 1 m at a rate of 15 cycles per minute. A film of water is maintained on the pane of glass by continuously applying water having a temperature of 20° C ± 5 °C.

For steam cleaners and wallpaper strippers, a sheet of stainless steel is used instead of glass, without additional wetting. However, if the steam outlet is not intended to be pressed against the surface, the appliance is operated with the outlet in free air directed downwards at an angle of approximately 45°.

For steam cleaners intended to clean horizontal surfaces, the sheet of stainless steel is horizontal and the appliance is moved forward and backward over a length of 1 m at a rate of 15 cycles per minute instead of up and down. No additional force other than the weight of the appliance is applied.

### 3.5 Definitions relating to types of appliances

#### 3.5.101

##### **pressurised appliance**

appliance in which steam is produced in a boiler at a pressure exceeding 50 kPa and in which the pressure does not drop to atmospheric pressure when the steam is not supplied

Note 1 to entry: The boiler ~~may~~ can be incorporated in the appliance or connected to the appliance by a hose.

### 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 steam output, but not the surfaces of a boiler or heated reservoir.

### 3.6.102

#### **adjacent surface**

surface that is within 25 mm of a **functional surface** and which can become hot due to the proximity to the **functional surface**

Note 1 to entry: Examples of **adjacent surfaces** are the surface of the enclosure within 25 mm of the steam output, water inlet and boiler service opening.

## 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:

*A new hose is used for each of the tests of 21.101 to 21.105.*

**5.101** *Appliances incorporating heating elements are tested as **heating appliances** even if they incorporate motors.*

## 6 Classification

This clause of Part 1 is applicable except as follows.

### 6.1 Modification:

Appliances shall be **class I**, **class II** or **class III**.

### 6.2 Addition:

**Class I and class II hand-held appliances** dispensing liquids shall be at least IPX7. Other appliances shall be at least IPX4. **Class III appliances** not exceeding 24 V can be IPX0.

## 7 Marking and instructions

This clause of Part 1 is applicable except as follows.

### 7.1 Modification:

Appliances shall be marked with their **rated power input** in watts.

### *Addition:*

Appliances intended to be connected to the water mains shall be marked with their maximum permissible water pressure, in megapascals.

Steam cleaners, wallpaper strippers and appliances dispensing liquids having a temperature exceeding 50 °C shall be marked with symbol IEC 60417-5597 (2002-10/2014-06) or with the following:

WARNING: Danger of scalding.

NOTE 101 This symbol is a warning sign and the rules of ISO 3864-1 apply.

~~Appliance outlets for accessories shall be marked with their maximum load, in watts.~~

~~NOTE 102 This marking may be on the appliance close to the appliance outlet.~~ **5**

The sum of the **rated power input** and the maximum load of the appliance outlet shall also be marked on the appliance.

If appliances have external **accessible surfaces**, 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. **6**

#### 7.6 Addition:



[symbol IEC 60417-5597  
(~~2002-10~~2014-06)]

steam



[symbol IEC 60417-5041  
(2002-10)]

caution, hot surface

#### 7.12 Addition:

The instructions shall state that the liquid or steam must not be directed towards equipment containing electrical components, such as the interior of ovens.

For **pressurised appliances**, the instructions shall state that the filling aperture must not be opened during use. Instructions for ~~the safe~~ refilling of the water container shall be given.

The instructions shall state that the appliance ~~has to~~ must be unplugged after use and before carrying out **user maintenance** on the appliance.

The instructions for appliances intended to clean swimming pools shall include the substance of the following:

Do not use in swimming pools containing water.

If symbol IEC 60417-5597 (2014-06) or symbol IEC 60417-5041 (2002-10) is used, its meaning shall be explained.

#### 7.14 Addition:

The height of the symbol IEC 60417-5597 (2014-06) and the height of the triangle in symbol IEC 60417-5041 (2002-10) shall be at least 10 mm. **7**

#### 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**. **8**

## 8 Protection against access to live parts

This clause of Part 1 is applicable.

## 9 Starting of motor-operated appliances

This clause of Part 1 is not applicable.

## 10 Power input and current

This clause of Part 1 is applicable.

## 11 Heating

This clause of Part 1 is applicable except as follows.

### 11.3 Addition: 9

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  $4\text{ N} \pm 1\text{ N}$  to the surface in such a way that the best possible contact between the probe and the surface is ensured. 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 Addition:

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

### 11.7 ~~Replacement~~ Modification: 10

Appliances are operated until steady conditions are established.

NOTE 101 Water is added as necessary to maintain the emission of liquid or steam.

Appliances generating steam are also operated without emission of steam.

Appliances incorporating an automatic cord reel are operated with one-third of the total length of the cord unreel for 30 min, after which the cord is completely unreel.

### 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. 11

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

| Surface                                              | Temperature rise of accessible external surfaces <sup>a, b</sup>   |                                                                    |
|------------------------------------------------------|--------------------------------------------------------------------|--------------------------------------------------------------------|
|                                                      | Surfaces of portable appliances situated on the floor <sup>f</sup> | Surfaces of hand-held appliances and other appliances <sup>g</sup> |
| Bare metal                                           | 38                                                                 | 42                                                                 |
| Coated metal <sup>c</sup>                            | 42                                                                 | 49                                                                 |
| Glass and ceramic                                    | 51                                                                 | 56                                                                 |
| Plastic and plastic coating > 0,4 mm <sup>d, e</sup> | 58                                                                 | 62                                                                 |

NOTE The temperature rise limits of knobs, grips, keyboards, keypads and similar parts are specified in Table 3.

- <sup>a</sup> Temperature rises are not measured on
- **functional surfaces and adjacent surfaces;**
  - 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 applied with a force of 1 N;
  - the rear surface of **stationary appliances** which, according to the instructions, shall be placed against a wall and where these surfaces are inaccessible to a 75 mm diameter probe having a hemispherical end applied with a force of 1 N.
- <sup>b</sup> The temperature rise on external **accessible surfaces** up to a distance of 100 mm from **adjacent surfaces** of the appliance 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. The temperature rise of accessible external surfaces that enclose boilers or heated reservoirs may also 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.
- <sup>c</sup> Metal is considered coated when a coating having a minimum thickness of 90 µm made of enamel or non-substantially plastic coating is used.
- <sup>d</sup> The temperature rise limit of plastic also applies for plastic material having a metal finish of thickness less than 0,1 mm.
- <sup>e</sup> 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.
- <sup>f</sup> Within 25 mm from air outlets, the above values can be increased by 10 K.
- <sup>g</sup> Within 25 mm from air outlets, the above values can be increased by 5 K.

Addition:

Temperature rises of **accessible surfaces** of hoses that supply steam to parts held in the hand shall comply with the temperature rise limits for handles that are held for short periods only in normal use. However, if a non-metallic hose is covered by textile material, the temperature rise of the surface of the textile material shall not exceed 80 K.

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**.

NOTE 101 The pressure in **pressurised appliances** is measured so that the test of 22.7 can be carried out.

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

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.

### 15.1.1 Addition:

*Parts of liquid-dispensing appliances that are held in the hand during normal use, and that incorporate electrical components, are subjected to the test specified for IPX7 appliances, unless they are of **class III construction** not exceeding 24 V.*

### 15.2 Addition:

*Liquid containers of appliances or parts of appliances that are not classified as IPX7 are filled with ~~water containing approximately 1 % NaCl~~ the spillage solution 13. If the container is in a hand-held part, the part is placed in the most unfavourable position. Other parts having containers are placed on a horizontal surface and overturned to the most unfavourable stable position. After 5 min, the part is returned to its normal position.*

NOTE 101 ~~This test is not carried out on parts classified as IPX7.~~ It can be necessary to conduct the test in various positions to determine the most unfavourable position.

## 16 Leakage current and electric strength

This clause of Part 1 is applicable except as follows.

### 16.3 Addition:

*Current-carrying hoses, except for their electrical connections, are immersed for 1 h in water containing approximately 1 % NaCl and having a temperature of  $20\text{ °C} \pm 5\text{ °C}$ . While the hose is still immersed, a voltage of 2 000 V is applied for 5 min between each conductor and all the other conductors connected together. A voltage of 3 000 V is then applied for 1 min between all the conductors and the saline solution.*

## 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.

### 19.2 Addition:

*Appliances are not connected to the water mains and are operated with their containers empty.*

**19.4 Addition:**

*For steam cleaners and wallpaper strippers, any control that limits the pressure during the test of Clause 11 is rendered inoperative.*

**20 Stability and mechanical hazards**

This clause of Part 1 is applicable except as follows.

**20.1 Addition:**

*Appliances intended to be held in the hand during normal use while also being supported by the cleaning surface, such as a steam mop, are not subjected to this test.*

However, if these appliances have an integral rest or are provided with a storage or charging stand, they are subjected to this test when placed on the rest or stand. 14

**20.2 Addition:**

NOTE 101 The requirement regarding moving parts does not apply to brushes and similar devices.

**20.101** Appliances shall be operated by a switch constructed so that inadvertent operation is unlikely or they shall be operated by a switch that automatically returns to the **off-position** when its actuating member is released.

*For appliances operated by a switch that automatically returns to the **off-position** when its actuating member is released, compliance is checked by inspection.*

*For other appliances, compliance is checked by applying a cylindrical rod, having a diameter of 40 mm and a hemispherical end, to the switch. The appliance shall not operate.*

**21 Mechanical strength**

This clause of Part 1 is applicable except as follows.

**21.1 Addition:**

*Compliance is also checked by holding*

- **hand-held appliances** and hand-held parts of appliances incorporating electrical components in the most unfavourable position at a height of 2 m and dropping them onto a concrete floor;
- appliances carried on the operator's body in the most unfavourable position at a height of 1 m and dropping them onto a concrete floor.

*These tests are carried out three times.*

NOTE 101 It can be necessary to conduct the test in various positions to determine the most unfavourable position.

**21.101** Current-carrying hoses shall be resistant to crushing.

*Compliance is checked by the following test.*

The hose is placed between two parallel steel plates each having a length of 100 mm, a width of 50 mm and the edges of the longer sides rounded with a radius of 1 mm. The axis of the hose is positioned at right angles to the longer sides of the plates. The plates are placed at a distance of approximately 350 mm from one end of the hose.

The steel plates are pressed together at a rate of 50 mm/min  $\pm$  5 mm/min until the applied force is 1,5 kN. The force is then released and the electric strength test of 16.3 is carried out between the conductors connected together and the saline solution.

**21.102** Current-carrying hoses shall be resistant to abrasion.

Compliance is checked by the following test.

One end of the hose is attached to the connecting rod of the crank mechanism shown in Figure 102. The crank rotates at 30 r/min resulting in the end of the hose moving horizontally backwards and forwards over a distance of 300 mm.

The hose is supported by a rotating smooth roller over which a belt of abrasive cloth moves at a speed of 0,1 m/min. The abrasive is corundum grit, size P100 as specified in ISO 6344-2. A mass of 1 kg is suspended from the other end of the hose, which is guided to avoid rotation. In the lowest position, the mass has a maximum distance of 600 mm from the centre of the roller.

The test is carried out for 100 revolutions of the crank.

After the test, **basic insulation** shall not be exposed and the electric strength test of 16.3 is carried out between the conductors connected together and the saline solution.

**21.103** Current-carrying hoses shall be resistant to flexing.

Compliance is checked by the following test.

The end of the hose intended to be connected to the motorized cleaning head is attached to the pivoting arm of the test equipment shown in Figure 103. The distance between the pivot axis of the arm and the point where the hose enters the rigid part is 300 mm  $\pm$  5 mm. The arm can be raised from the horizontal position by an angle of 40°  $\pm$  1°. A mass of 5 kg is suspended from the other end of the hose or from a convenient point along the hose so that when the arm is in the horizontal position, the mass is supported and there is no tension on the hose.

NOTE 1 It may be necessary to reposition the mass during the test.

The mass slides against an inclined plate so that the maximum deflection of the hose is 3°. The arm is raised and lowered by means of a crank that rotates at a speed of 10 r/min  $\pm$  1 r/min.

The test is carried out for 1 250 revolutions of the crank after which the fixed end of the hose is turned through 90° and the test continued for a further 1 250 revolutions. The test is repeated in each of the other two 90° positions.

NOTE 2 If the hose ruptures before 5 000 revolutions of the crank, the flexing is terminated.

After the test, the hose shall withstand the electric strength test of 16.3.

**21.104** Current-carrying hoses shall be resistant to torsion.

Compliance is checked by the following test.

*One end of the hose is held in a horizontal position with the remainder of the hose freely suspended. This end is rotated in cycles, each cycle consisting of five turns in one direction and five turns in the opposite direction, at a rate of 10 r/min.*

*The test is carried out for 1 000 cycles.*

*After the test, the hose shall withstand the electric strength test of 16.3 and shall not be damaged to such an extent that compliance with this standard is impaired.*

**21.105** Current-carrying hoses shall be resistant to low temperatures.

*Compliance is checked by the following test.*

*A 600 mm length of hose is bent as shown in Figure 104 and the ends are tied together over a length of 25 mm. The hose is then placed for 2 h in a cabinet having a temperature of  $-15\text{ °C} \pm 2\text{ °C}$ . Immediately after the hose is removed from the cabinet, it is flexed three times, as shown in Figure 105, at a rate of one flexing per second.*

*The test is carried out three times.*

*There shall be no cracks or breaks in the hose and it shall withstand the electric strength test of 16.3.*

~~NOTE~~ Any discolouration is neglected.

## 22 Construction

This clause of Part 1 is applicable except as follows.

### 22.6 Addition:

A drain hole that is needed to comply with the standard shall be at least 5 mm in diameter or 20 mm<sup>2</sup> 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. **15**

### 22.7 Replacement:

**Pressurised appliances** and instantaneous steam cleaners shall incorporate adequate safeguards against the risk of excessive pressure.

If jets of steam or liquids are emitted through **protective devices**, the electrical insulation shall not be affected or the user exposed to a hazard.

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

*The maximum pressure occurring during the test of Clause 11 is measured. All pressure-regulating devices that operated during the test are rendered inoperative and the pressure measured again. The pressure shall not exceed three times the pressure measured during the test in Clause 11. Any pressure-limiting **protective device** is then rendered inoperative and the pressure in the boiler is raised hydraulically to five times the pressure measured originally or twice the pressure measured with the pressure-regulating device rendered inoperative, whichever is higher. The pressure is maintained for a period of 60 s. There shall be no leakage from the boiler.*

*Steam cleaners incorporating hoses and having a device regulating the steam supply are operated as specified in Clause 11, but with all pressure-regulating devices operating during the test of Clause 11 rendered inoperative. The steam outlet is sealed and the device regulating the steam supply is opened. There shall be no leakage from the hose except at an intentionally weak place within the enclosure of the boiler. If this occurs, the test is repeated on another appliance that shall also leak in the same way.*

*The steam outlet of instantaneous steam cleaners is sealed and the pressure in the water container is raised hydraulically until the pressure-limiting **protective device** operates. The pressure shall not exceed three times the pressure measured during the test of Clause 11. The outlet of the **protective device** is then sealed and the pressure is further raised to twice the previous value. The pressure is maintained for a period of 60 s. There shall be no leakage from the container.*

NOTE 101 An instantaneous steam cleaner is an appliance in which small quantities of water are pumped from the water container, the steam being produced when the water contacts the heated surface of the steam chamber. The water container and the steam chamber are at atmospheric pressure.

**22.101** Rotating parts shall be secured against loosening.

*Compliance is checked by inspection.*

NOTE This requirement ~~may~~ can be met by using a counter-rotating thread.

**22.102 Pressurised appliances** 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. Except for steam cleaners intended exclusively for floor cleaning, steam emission shall stop when the switch actuator is released.

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

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

**22.103** For appliances, other than instantaneous steam cleaners, the pressure-limiting **protective devices** that operate during the tests of 19.4 and 22.7 shall have an inlet aperture at least 5 mm in diameter or 20 mm<sup>2</sup> in area and a width of at least 4 mm. The area of the aperture at the outlet shall not be less than that of the aperture at the inlet.

~~NOTE The requirement is not applicable to instantaneous steam cleaners.~~

*Compliance is checked by measurement.*

**22.104** For appliances having more than one boiler connected together, each boiler provided with a heating element shall incorporate a pressure-limiting **protective device**.

*Compliance is checked by the test of 22.7 after blocking the connection between the boilers.*

## **23 Internal wiring**

This clause of Part 1 is applicable.

## **24 Components**

This clause of Part 1 is applicable, except as follows.

**24.101 Protective devices** incorporated in appliances for compliance with 19.4 shall be not self-resetting and shall only be accessible by using a **tool**.

*Compliance is checked by inspection.*

## **25 Supply connection and external flexible cords**

This clause of Part 1 is applicable except as follows.

### **25.5 Addition:**

**Type X attachment** is not allowed for appliances classified as IPX7.

### **25.23 Addition:**

Conductors in a flexible hose shall have an insulation and sheath thickness at least equivalent to that specified for a cord of  $(2 \times 0,75) \text{ mm}^2$  having a code designation 60227 IEC 53.

NOTE 101 The conductors ~~may~~ can consist of copper-plated steel wires.

## **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 unless the insulation is enclosed or located so that it is unlikely to be exposed to pollution during normal use of the appliance.

## **30 Resistance to heat and fire**

This clause of Part 1 is applicable except as follows.

### **30.2 Modification:**

Replace the two dashed items in the compliance criteria with the following:

- *for surface cleaning appliances and wall paper strippers, 30.2.2 is applicable.*

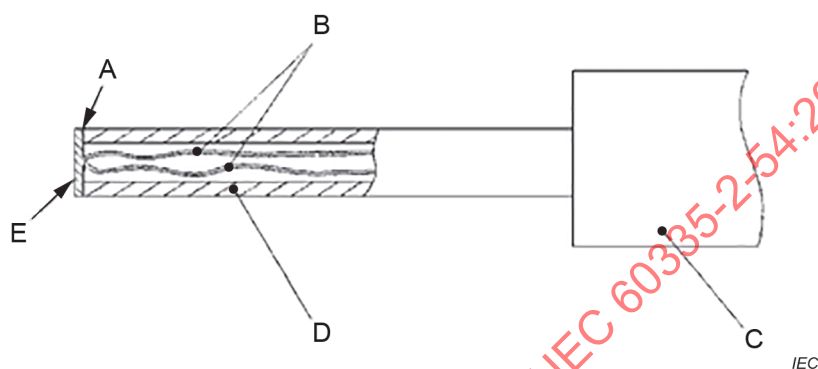
~~30.2.3 Not applicable.~~ 16

### 31 Resistance to rusting

This clause of Part 1 is applicable.

### 32 Radiation, toxicity and similar hazards

This clause of Part 1 is applicable.

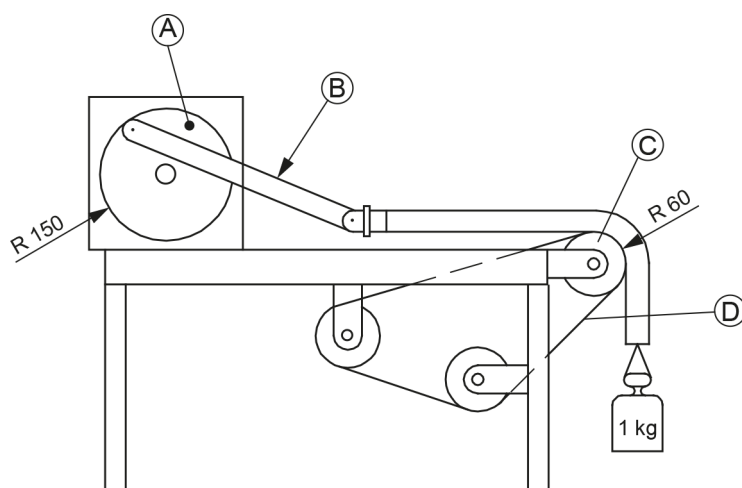


#### Key

- A adhesive
- B thermocouple wires 0,3 mm diameter to IEC 60584-1 Type K
- C handle arrangement permitting a contact force of  $4\text{ N} \pm 1\text{ N}$
- 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

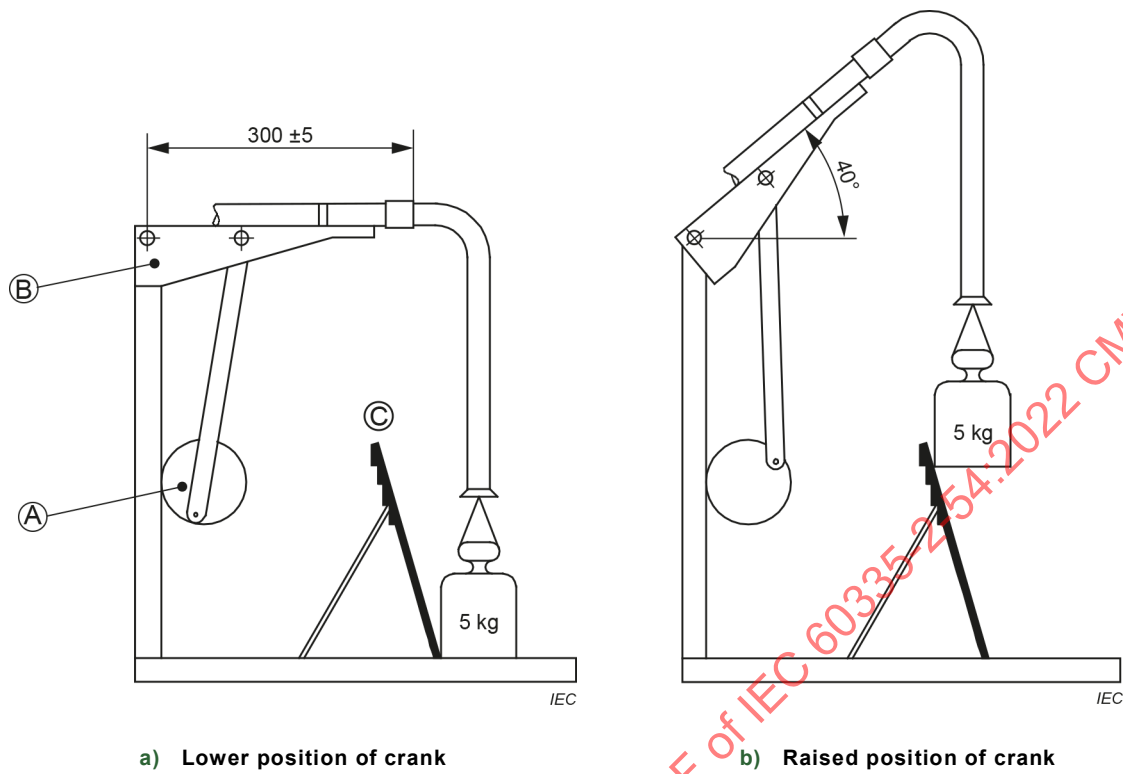


**Key**

- A crank mechanism
- B connecting rod
- C roller
- D abrasive belt

**Figure 102 – Apparatus for testing the abrasion resistance of current-carrying hoses**

Dimensions in millimetres



**Key**

- A crank mechanism
- B arm
- C inclined plane

**Figure 103 103 – Apparatus for testing the resistance to flexing of current-carrying hoses**

Dimensions in millimetres

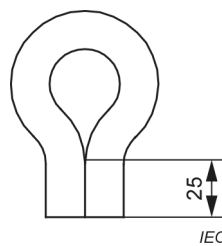


**Figure 104 104 – Configuration of the hose for the freezing treatment**

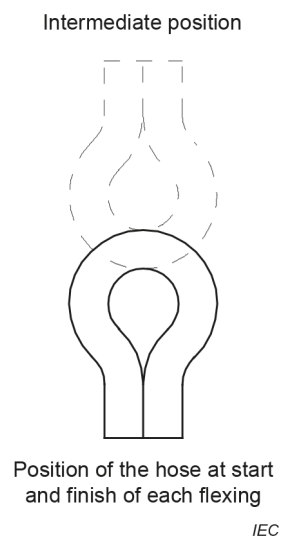


**Figure-104 105 – Flexing positions for the hose after removal from the freezing cabinet**

## **Annexes**

The annexes of Part 1 are applicable.

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## Bibliography

The bibliography of Part 1 is applicable except as follows.

### *Addition:*

IEC 60335-2-10, *Household and similar electrical appliances – Safety – Part 2-10: Particular requirements for floor treatment machines and wet scrubbing machines*

IEC 60335-2-79, *Household and similar electrical appliances – Safety – Part 2-79: Particular requirements for high pressure cleaners and steam cleaners*

IEC 60335-2-85, *Household and similar electrical appliances – Safety – Part 2-85: Particular requirements for fabric steamers*

ISO 3864-1, *Graphical symbols – Safety colours and safety signs – Part 1: Design principles for safety signs in workplaces and ~~public areas~~ safety markings*

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### 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 This is now covered by IEC 60335-1:2020.
  - 6 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.
  - 7 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.
  - 8 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.
  - 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 This revision maintains the test duration while charging as specified in IEC 60335-1:2020.
  - 11 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.
  - 12 This revision is for alignment with IEC 60335-1:2020.
  - 13 This revision is for alignment with IEC 60335-1:2020.
  - 14 Appliances held in the hand while also being supported by the cleaning surface in normal use are not subjected to the stability test unless they have an integral rest or are provided with a storage of charging stand.
  - 15 Clarification that a drain hole needs to meet the minimum dimensions or it is considered to be blocked when determining compliance.
  - 16 These tests may be applicable for appliances for remote operation and for parts connected to the supply mains during the charging period as specified in Subclause 30.2 of IEC 60335-1:2020. This is now clarified in the modification to Subclause 30.2.
-

# INTERNATIONAL STANDARD

## NORME INTERNATIONALE

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

**Appareils électrodomestiques et analogues – Sécurité –  
Partie 2-54: Exigences particulières pour les appareils de nettoyage des  
surfaces à usage domestique, utilisant des liquides ou de la vapeur**

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## INTERNATIONAL ELECTROTECHNICAL COMMISSION

**HOUSEHOLD AND SIMILAR ELECTRICAL APPLIANCES –  
SAFETY –****Part 2-54: Particular requirements for surface-cleaning appliances  
for household use employing liquids or steam**

## 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.
- 2) The formal decisions or agreements of IEC on technical matters express, as nearly as possible, an international consensus of opinion on the relevant subjects since each technical committee has representation from all interested IEC National Committees.
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- 8) Attention is drawn to the Normative references cited in this publication. Use of the referenced publications is indispensable for the correct application of this publication.
- 9) Attention is drawn to the possibility that some of the elements of this IEC Publication may be the subject of patent rights. IEC shall not be held responsible for identifying any or all such patent rights.

IEC 60335-2-54 has been prepared by IEC technical committee 61: Safety of household and similar electrical appliances. It is an International Standard.

This fifth edition cancels and replaces the fourth edition published in 2008, Amendment 1: 2015 and Amendment 2: 2019. 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, 15.2, 21.103, 21.105, 22.103);
- c) addition of external accessible surface temperature limits (3.6.102, 3.6.103, 7.1, 11.3, 11.8)
- d) exception for hand-held appliances (20.1);

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

| Draft        | Report on voting |
|--------------|------------------|
| 61/6672/FDIS | 61/6749/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](http://www.iec.ch/members_experts/refdocs). The main document types developed by IEC are described in greater detail at [www.iec.ch/standardsdev/publications](http://www.iec.ch/standardsdev/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 surface-cleaning appliances for household use employing liquids or steam.

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 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](http://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.

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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 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 2-54: Particular requirements for surface-cleaning appliances for household use employing liquids or steam

#### 1 Scope

This clause of Part 1 is replaced by the following.

This part of IEC 60335 deals with the safety of electric cleaning appliances for household use that are intended for cleaning surfaces by using liquid cleansing agents or steam, their **rated voltage** being not more than 250 V including direct current (DC) supplied appliances and **battery-operated appliances**. It also covers wallpaper strippers and surface cleaning appliances incorporating heating elements or means for pressurizing the liquid container.

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 knowledgeprevents 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, and similar authorities.

This standard does not apply to

- floor treatment and wet scrubbing machines (IEC 60335-2-10);
- cleaning appliances that are permanently fixed to a building;
- cleaning appliances covered by IEC 60335-2-79, namely those having a
  - pressure exceeding 2,5 MPa;
  - pressurised volume over 5 l;
  - product of pressure (in MPa) and container volume (in l) exceeding 5;
  - liquid temperature exceeding 160 °C;
  - **rated power input** exceeding 3 500 W;
- cleaning appliances intended for commercial or industrial use;
- 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);
- fabric steamers (IEC 60335-2-85).

## 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 6344-2, *Coated abrasives – Determination and designation of grain size distribution – Part 2: Macrogrit sizes P12 to P220*

## 3 Terms and definitions

This clause of Part 1 is applicable except as follows.

### 3.1 Definitions relating to physical characteristics

#### 3.1.9 *Addition:*

operation of the appliance under the most unfavourable conditions specified in the instructions

The cleaning head is pressed with a force of 30 N against a vertical pane of plain glass and moved up and down over a length of 1 m at a rate of 15 cycles per minute. A film of water is maintained on the pane of glass by continuously applying water having a temperature of 20° C  $\pm$  5 °C.

For steam cleaners and wallpaper strippers, a sheet of stainless steel is used instead of glass, without additional wetting. However, if the steam outlet is not intended to be pressed against the surface, the appliance is operated with the outlet in free air directed downwards at an angle of approximately 45°.

For steam cleaners intended to clean horizontal surfaces, the sheet of stainless steel is horizontal and the appliance is moved forward and backward over a length of 1 m at a rate of 15 cycles per minute instead of up and down. No additional force other than the weight of the appliance is applied.

### 3.5 Definitions relating to types of appliances

#### 3.5.101

##### **pressurised appliance**

appliance in which steam is produced in a boiler at a pressure exceeding 50 kPa and in which the pressure does not drop to atmospheric pressure when the steam is not supplied

Note 1 to entry: The boiler can be incorporated in the appliance or connected to the appliance by a hose.

### 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 steam output, but not the surfaces of a boiler or heated reservoir.

### 3.6.102

#### **adjacent surface**

surface that is within 25 mm of a **functional surface** and which can become hot due to the proximity to the **functional surface**

Note 1 to entry: Examples of **adjacent surfaces** are the surface of the enclosure within 25 mm of the steam output, water inlet and boiler service opening.

## 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:

*A new hose is used for each of the tests of 21.101 to 21.105.*

**5.101** Appliances incorporating heating elements are tested as **heating appliances** even if they incorporate motors.

## 6 Classification

This clause of Part 1 is applicable except as follows.

### 6.1 Modification:

Appliances shall be **class I**, **class II** or **class III**.

### 6.2 Addition:

**Class I and class II hand-held appliances** dispensing liquids shall be at least IPX7. Other appliances shall be at least IPX4. **Class III appliances** not exceeding 24 V can be IPX0.

## 7 Marking and instructions

This clause of Part 1 is applicable except as follows.

### 7.1 Modification:

Appliances shall be marked with their **rated power input** in watts.

### *Addition:*

Appliances intended to be connected to the water mains shall be marked with their maximum permissible water pressure, in megapascals.

Steam cleaners, wallpaper strippers and appliances dispensing liquids having a temperature exceeding 50 °C shall be marked with symbol IEC 60417-5597 (2014-06) or with the following:

WARNING: Danger of scalding.

NOTE 101 This symbol is a warning sign and the rules of ISO 3864-1 apply.

The sum of the **rated power input** and the maximum load of the appliance outlet shall also be marked on the appliance.

If appliances have external **accessible surfaces**, 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 60417-5597  
(2014-06)]

steam



[symbol IEC 60417-5041  
(2002-10)]

caution, hot surface

#### 7.12 Addition:

The instructions shall state that the liquid or steam must not be directed towards equipment containing electrical components, such as the interior of ovens.

For **pressurised appliances**, the instructions shall state that the filling aperture must not be opened during use. Instructions for refilling of the water container shall be given.

The instructions shall state that the appliance must be unplugged after use and before carrying out **user maintenance** on the appliance.

The instructions for appliances intended to clean swimming pools shall include the substance of the following:

Do not use in swimming pools containing water.

If symbol IEC 60417-5597 (2014-06) or symbol IEC 60417-5041 (2002-10) is used, its meaning shall be explained.

#### 7.14 Addition:

The height of the symbol IEC 60417-5597 (2014-06) and the height of the triangle in symbol IEC 60417-5041 (2002-10) shall be at least 10 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**.

## 8 Protection against access to live parts

This clause of Part 1 is applicable.

## 9 Starting of motor-operated appliances

This clause of Part 1 is not applicable.

## 10 Power input and current

This clause of Part 1 is applicable.

## 11 Heating

This clause of Part 1 is applicable except as follows.

### 11.3 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  $4\text{ N} \pm 1\text{ N}$  to the surface in such a way that the best possible contact between the probe and the surface is ensured. 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 Addition:

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

### 11.7 Modification:

Appliances are operated until steady conditions are established.

NOTE 101 Water is added as necessary to maintain the emission of liquid or steam.

Appliances generating steam are also operated without emission of steam.

Appliances incorporating an automatic cord reel are operated with one-third of the total length of the cord unreel for 30 min, after which the cord is completely unreel.

### 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.

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

| Surface                                              | Temperature rise of accessible external surfaces <sup>a, b</sup>   |                                                                    |
|------------------------------------------------------|--------------------------------------------------------------------|--------------------------------------------------------------------|
|                                                      | Surfaces of portable appliances situated on the floor <sup>f</sup> | Surfaces of hand-held appliances and other appliances <sup>g</sup> |
| Bare metal                                           | 38                                                                 | 42                                                                 |
| Coated metal <sup>c</sup>                            | 42                                                                 | 49                                                                 |
| Glass and ceramic                                    | 51                                                                 | 56                                                                 |
| Plastic and plastic coating > 0,4 mm <sup>d, e</sup> | 58                                                                 | 62                                                                 |

NOTE The temperature rise limits of knobs, grips, keyboards, keypads and similar parts are specified in Table 3.

- <sup>a</sup> Temperature rises are not measured on
- **functional surfaces** and **adjacent surfaces**;
  - 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 applied with a force of 1 N;
  - the rear surface of **stationary appliances** which, according to the instructions, shall be placed against a wall and where these surfaces are inaccessible to a 75 mm diameter probe having a hemispherical end applied with a force of 1 N.
- <sup>b</sup> The temperature rise on external **accessible surfaces** up to a distance of 100 mm from **adjacent surfaces** of the appliance 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. The temperature rise of accessible external surfaces that enclose boilers or heated reservoirs may also 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.
- <sup>c</sup> Metal is considered coated when a coating having a minimum thickness of 90 µm made of enamel or non-substantially plastic coating is used.
- <sup>d</sup> The temperature rise limit of plastic also applies for plastic material having a metal finish of thickness less than 0,1 mm.
- <sup>e</sup> 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.
- <sup>f</sup> Within 25 mm from air outlets, the above values can be increased by 10 K.
- <sup>g</sup> Within 25 mm from air outlets, the above values can be increased by 5 K.

Addition:

Temperature rises of **accessible surfaces** of hoses that supply steam to parts held in the hand shall comply with the temperature rise limits for handles that are held for short periods only in normal use. However, if a non-metallic hose is covered by textile material, the temperature rise of the surface of the textile material shall not exceed 80 K.

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**.

NOTE 101 The pressure in **pressurised appliances** is measured so that the test of 22.7 can be carried out.

## 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.

### 15.1.1 Addition:

*Parts of liquid-dispensing appliances that are held in the hand during normal use, and that incorporate electrical components, are subjected to the test specified for IPX7 appliances, unless they are of **class III construction** not exceeding 24 V.*

### 15.2 Addition:

*Liquid containers of appliances or parts of appliances that are not classified as IPX7 are filled with the spillage solution. If the container is in a hand-held part, the part is placed in the most unfavourable position. Other parts having containers are placed on a horizontal surface and overturned to the most unfavourable stable position. After 5 min, the part is returned to its normal position.*

NOTE 101 It can be necessary to conduct the test in various positions to determine the most unfavourable position.

## 16 Leakage current and electric strength

This clause of Part 1 is applicable except as follows.

### 16.3 Addition:

*Current-carrying hoses, except for their electrical connections, are immersed for 1 h in water containing approximately 1 % NaCl and having a temperature of  $20\text{ °C} \pm 5\text{ °C}$ . While the hose is still immersed, a voltage of 2 000 V is applied for 5 min between each conductor and all the other conductors connected together. A voltage of 3 000 V is then applied for 1 min between all the conductors and the saline solution.*

## 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.

### 19.2 Addition:

*Appliances are not connected to the water mains and are operated with their containers empty.*

#### 19.4 Addition:

*For steam cleaners and wallpaper strippers, any control that limits the pressure during the test of Clause 11 is rendered inoperative.*

## 20 Stability and mechanical hazards

This clause of Part 1 is applicable except as follows.

#### 20.1 Addition:

*Appliances intended to be held in the hand during normal use while also being supported by the cleaning surface, such as a steam mop, are not subjected to this test.*

However, if these appliances have an integral rest or are provided with a storage or charging stand, they are subjected to this test when placed on the rest or stand.

#### 20.2 Addition:

NOTE 101 The requirement regarding moving parts does not apply to brushes and similar devices.

**20.101** Appliances shall be operated by a switch constructed so that inadvertent operation is unlikely or they shall be operated by a switch that automatically returns to the **off-position** when its actuating member is released.

*For appliances operated by a switch that automatically returns to the **off-position** when its actuating member is released, compliance is checked by inspection.*

*For other appliances, compliance is checked by applying a cylindrical rod, having a diameter of 40 mm and a hemispherical end, to the switch. The appliance shall not operate.*

## 21 Mechanical strength

This clause of Part 1 is applicable except as follows.

#### 21.1 Addition:

*Compliance is also checked by holding*

- **hand-held appliances** and hand-held parts of appliances incorporating electrical components in the most unfavourable position at a height of 2 m and dropping them onto a concrete floor;
- appliances carried on the operator's body in the most unfavourable position at a height of 1 m and dropping them onto a concrete floor.

*These tests are carried out three times.*

NOTE 101 It can be necessary to conduct the test in various positions to determine the most unfavourable position.

**21.101** Current-carrying hoses shall be resistant to crushing.

*Compliance is checked by the following test.*

*The hose is placed between two parallel steel plates each having a length of 100 mm, a width of 50 mm and the edges of the longer sides rounded with a radius of 1 mm. The axis of the hose is positioned at right angles to the longer sides of the plates. The plates are placed at a distance of approximately 350 mm from one end of the hose.*

*The steel plates are pressed together at a rate of 50 mm/min  $\pm$  5 mm/min until the applied force is 1,5 kN. The force is then released and the electric strength test of 16.3 is carried out between the conductors connected together and the saline solution.*

**21.102** Current-carrying hoses shall be resistant to abrasion.

*Compliance is checked by the following test.*

*One end of the hose is attached to the connecting rod of the crank mechanism shown in Figure 102. The crank rotates at 30 r/min resulting in the end of the hose moving horizontally backwards and forwards over a distance of 300 mm.*

*The hose is supported by a rotating smooth roller over which a belt of abrasive cloth moves at a speed of 0,1 m/min. The abrasive is corundum grit, size P100 as specified in ISO 6344-2. A mass of 1 kg is suspended from the other end of the hose, which is guided to avoid rotation. In the lowest position, the mass has a maximum distance of 600 mm from the centre of the roller.*

*The test is carried out for 100 revolutions of the crank.*

*After the test, **basic insulation** shall not be exposed and the electric strength test of 16.3 is carried out between the conductors connected together and the saline solution.*

**21.103** Current-carrying hoses shall be resistant to flexing.

*Compliance is checked by the following test.*

*The end of the hose intended to be connected to the motorized cleaning head is attached to the pivoting arm of the test equipment shown in Figure 103. The distance between the pivot axis of the arm and the point where the hose enters the rigid part is 300 mm  $\pm$  5 mm. The arm can be raised from the horizontal position by an angle of 40°  $\pm$  1°. A mass of 5 kg is suspended from the other end of the hose or from a convenient point along the hose so that when the arm is in the horizontal position, the mass is supported and there is no tension on the hose.*

NOTE It can be necessary to reposition the mass during the test.

*The mass slides against an inclined plate so that the maximum deflection of the hose is 3°. The arm is raised and lowered by means of a crank that rotates at a speed of 10 r/min  $\pm$  1 r/min.*

*The test is carried out for 1 250 revolutions of the crank after which the fixed end of the hose is turned through 90° and the test continued for a further 1 250 revolutions. The test is repeated in each of the other two 90° positions.*

*If the hose ruptures before 5 000 revolutions of the crank, the flexing is terminated.*

*After the test, the hose shall withstand the electric strength test of 16.3.*

**21.104** Current-carrying hoses shall be resistant to torsion.

*Compliance is checked by the following test.*

*One end of the hose is held in a horizontal position with the remainder of the hose freely suspended. This end is rotated in cycles, each cycle consisting of five turns in one direction and five turns in the opposite direction, at a rate of 10 r/min.*

*The test is carried out for 1 000 cycles.*

*After the test, the hose shall withstand the electric strength test of 16.3 and shall not be damaged to such an extent that compliance with this standard is impaired.*

**21.105** Current-carrying hoses shall be resistant to low temperatures.

*Compliance is checked by the following test.*

*A 600 mm length of hose is bent as shown in Figure 104 and the ends are tied together over a length of 25 mm. The hose is then placed for 2 h in a cabinet having a temperature of  $-15\text{ °C} \pm 2\text{ °C}$ . Immediately after the hose is removed from the cabinet, it is flexed three times, as shown in Figure 105, at a rate of one flexing per second.*

*The test is carried out three times.*

*There shall be no cracks or breaks in the hose and it shall withstand the electric strength test of 16.3. Any discolouration is neglected.*

## **22 Construction**

This clause of Part 1 is applicable except as follows.

### **22.6 Addition:**

A drain hole that is needed to comply with the standard shall be at least 5 mm in diameter or 20 mm<sup>2</sup> 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.

### **22.7 Replacement:**

**Pressurised appliances** and instantaneous steam cleaners shall incorporate adequate safeguards against the risk of excessive pressure.

If jets of steam or liquids are emitted through **protective devices**, the electrical insulation shall not be affected or the user exposed to a hazard.

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

*The maximum pressure occurring during the test of Clause 11 is measured. All pressure-regulating devices that operated during the test are rendered inoperative and the pressure measured again. The pressure shall not exceed three times the pressure measured during the test in Clause 11. Any pressure-limiting **protective device** is then rendered inoperative and the pressure in the boiler is raised hydraulically to five times the pressure measured originally or twice the pressure measured with the pressure-regulating device rendered inoperative, whichever is higher. The pressure is maintained for a period of 60 s. There shall be no leakage from the boiler.*

*Steam cleaners incorporating hoses and having a device regulating the steam supply are operated as specified in Clause 11, but with all pressure-regulating devices operating during the test of Clause 11 rendered inoperative. The steam outlet is sealed and the device regulating the steam supply is opened. There shall be no leakage from the hose except at an intentionally weak place within the enclosure of the boiler. If this occurs, the test is repeated on another appliance that shall also leak in the same way.*

*The steam outlet of instantaneous steam cleaners is sealed and the pressure in the water container is raised hydraulically until the pressure-limiting **protective device** operates. The pressure shall not exceed three times the pressure measured during the test of Clause 11. The outlet of the **protective device** is then sealed and the pressure is further raised to twice the previous value. The pressure is maintained for a period of 60 s. There shall be no leakage from the container.*

NOTE 101 An instantaneous steam cleaner is an appliance in which small quantities of water are pumped from the water container, the steam being produced when the water contacts the heated surface of the steam chamber. The water container and the steam chamber are at atmospheric pressure.

**22.101** Rotating parts shall be secured against loosening.

*Compliance is checked by inspection.*

NOTE This requirement can be met by using a counter-rotating thread.

**22.102 Pressurised appliances** 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. Except for steam cleaners intended exclusively for floor cleaning, steam emission shall stop when the switch actuator is released.

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

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

**22.103** For appliances, other than instantaneous steam cleaners, the pressure-limiting **protective devices** that operate during the tests of 19.4 and 22.7 shall have an inlet aperture at least 5 mm in diameter or 20 mm<sup>2</sup> in area and a width of at least 4 mm. The area of the aperture at the outlet shall not be less than that of the aperture at the inlet.

*Compliance is checked by measurement.*

**22.104** For appliances having more than one boiler connected together, each boiler provided with a heating element shall incorporate a pressure-limiting **protective device**.

*Compliance is checked by the test of 22.7 after blocking the connection between the boilers.*

## **23 Internal wiring**

This clause of Part 1 is applicable.

## **24 Components**

This clause of Part 1 is applicable, except as follows.

**24.101 Protective devices** incorporated in appliances for compliance with 19.4 shall be not self-resetting and shall only be accessible by using a **tool**.

*Compliance is checked by inspection.*

## **25 Supply connection and external flexible cords**

This clause of Part 1 is applicable except as follows.

### **25.5 Addition:**

**Type X attachment** is not allowed for appliances classified as IPX7.

### **25.23 Addition:**

Conductors in a flexible hose shall have an insulation and sheath thickness at least equivalent to that specified for a cord of  $(2 \times 0,75) \text{ mm}^2$  having a code designation 60227 IEC 53.

NOTE 101 The conductors can consist of copper-plated steel wires.

## **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 unless the insulation is enclosed or located so that it is unlikely to be exposed to pollution during normal use of the appliance.

## **30 Resistance to heat and fire**

This clause of Part 1 is applicable except as follows.

### **30.2 Modification:**

Replace the two dashed items in the compliance criteria with the following:

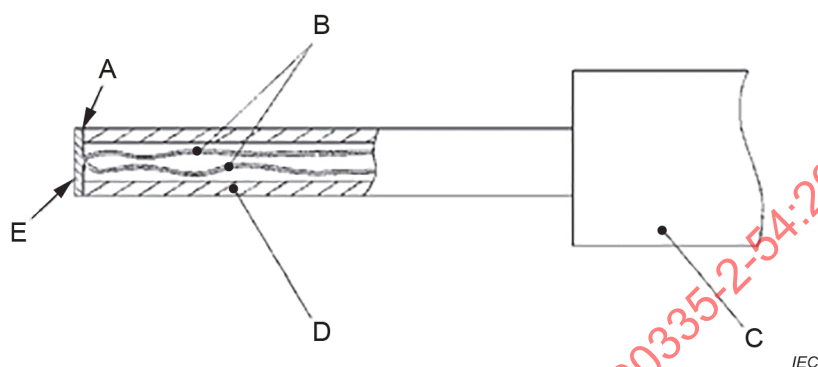
- *for surface cleaning appliances and wall paper strippers, 30.2.2 is applicable.*

### 31 Resistance to rusting

This clause of Part 1 is applicable.

### 32 Radiation, toxicity and similar hazards

This clause of Part 1 is applicable.

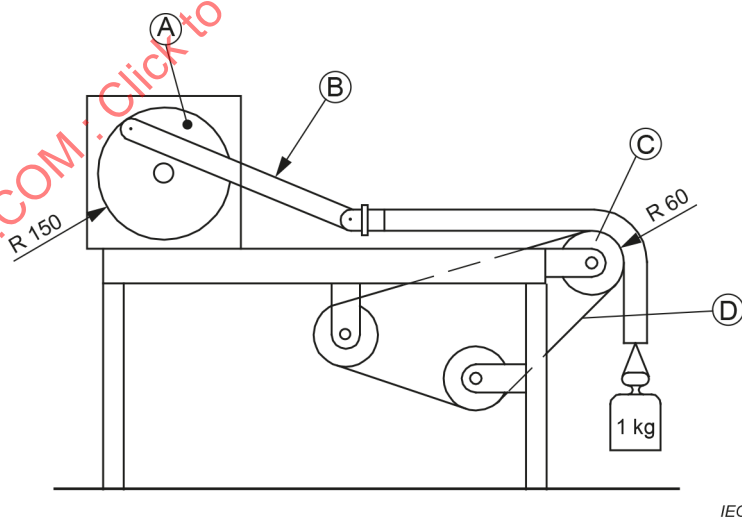


#### Key

- A adhesive
- B thermocouple wires 0,3 mm diameter to IEC 60584-1 Type K
- C handle arrangement permitting a contact force of  $4 \text{ N} \pm 1 \text{ N}$
- 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

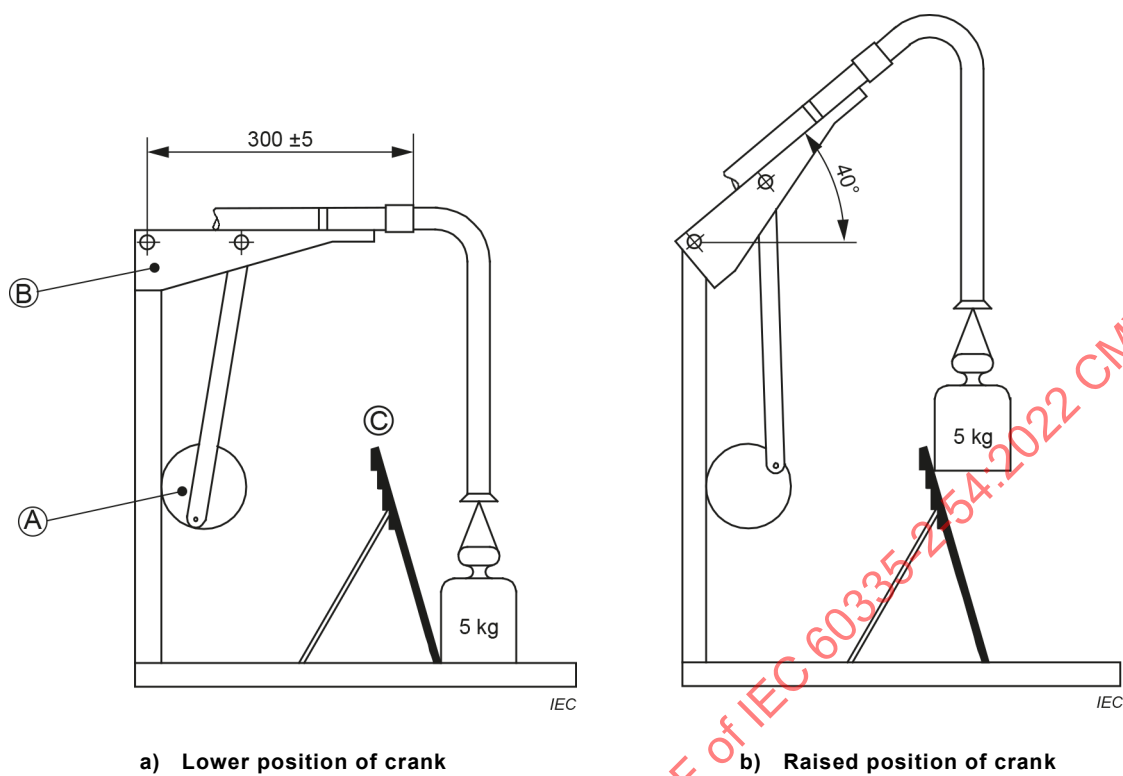


#### Key

- A crank mechanism
- B connecting rod
- C roller
- D abrasive belt

**Figure 102 – Apparatus for testing the abrasion resistance of current-carrying hoses**

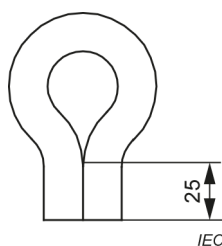
Dimensions in millimetres

**Key**

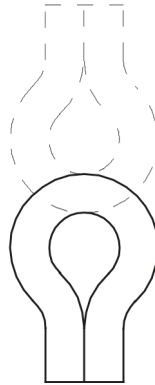
- A crank mechanism
- B arm
- C inclined plane

**Figure 103 – Apparatus for testing the resistance to flexing of current-carrying hoses**

Dimensions in millimetres

**Figure 104 – Configuration of the hose for the freezing treatment**

Intermediate position



Position of the hose at start  
and finish of each flexing

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**Figure 105 – Flexing positions for the hose after removal from the freezing cabinet**

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## **Annexes**

The annexes of Part 1 are applicable.

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## Bibliography

The bibliography of Part 1 is applicable except as follows.

### *Addition:*

IEC 60335-2-10, *Household and similar electrical appliances – Safety – Part 2-10: Particular requirements for floor treatment machines and wet scrubbing machines*

IEC 60335-2-79, *Household and similar electrical appliances – Safety – Part 2-79: Particular requirements for high pressure cleaners and steam cleaners*

IEC 60335-2-85, *Household and similar electrical appliances – Safety – Part 2-85: Particular requirements for fabric steamers*

ISO 3864-1, *Graphical symbols – Safety colours and safety signs – Part 1: Design principles for safety signs in workplaces and safety markings*

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## COMMISSION ÉLECTROTECHNIQUE INTERNATIONALE

**APPAREILS ÉLECTRODOMESTIQUES ET ANALOGUES –  
SÉCURITÉ –****Partie 2-54: Exigences particulières pour les appareils de nettoyage  
des surfaces à usage domestique, utilisant des liquides ou de la vapeur****AVANT-PROPOS**

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L'IEC 60335-2-54 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 cinquième édition annule et remplace la quatrième édition parue en 2008, l'Amendement 1:2015 et l'Amendement 2:2019. 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, 15.2, 21.103, 21.105, 22.103);

- c) des limites de température ont été ajoutées pour les surfaces accessibles extérieures (3.6.102, 3.6.103, 7.1, 11.3, 11.8);
- d) une exception a été introduite pour les appareils portatifs (20.1).

Le texte de cette Norme internationale est issu des documents suivants:

| Projet       | Rapport de vote |
|--------------|-----------------|
| 61/6672/FDIS | 61/6749/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](http://www.iec.ch/members_experts/refdocs). Les principaux types de documents développés par l'IEC sont décrits plus en détail sous [www.iec.ch/standardsdev/publications](http://www.iec.ch/standardsdev/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 nettoyage des surfaces à usage domestique, utilisant des liquides ou de la vapeur.

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.

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](http://webstore.iec.ch) dans les données relatives au document recherché. A cette date, le document sera

- reconduit,
- supprimé,
- remplacé par une édition révisée, ou
- amendé.

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.

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## 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 qui peuvent être attendues dans la pratique et elle tient compte de la façon dont les phénomènes électromagnétiques peuvent altérer 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 nationales d'installation 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.

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## APPAREILS ÉLECTRODOMESTIQUES ET ANALOGUES – SÉCURITÉ –

### Partie 2-54: Exigences particulières pour les appareils de nettoyage des surfaces à usage domestique, utilisant des liquides ou de la vapeur

#### 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 de nettoyage électriques à usage domestique, destinés au nettoyage des surfaces à l'aide d'agents de nettoyage liquides ou de la vapeur, et 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**. Elle s'applique également aux décolleuses de papier peint et aux appareils de nettoyage des surfaces comportant des éléments chauffants ou des dispositifs pour mettre sous pression les réservoirs à liquide.

Dans la mesure du possible, la présente norme traite des dangers courants que présentent les appareils et auxquels sont exposés tous les individus situés 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 connaissanceles 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 et par des organismes similaires;

La présente norme ne s'applique pas

- aux appareils de traitement des sols et machines à broser les sols mouillés (IEC 60335-2-10);
- aux appareils de nettoyage qui sont fixés en permanence à un bâtiment;
- aux appareils de nettoyage couverts par l'IEC 60335-2-79, notamment ceux dont
  - la pression est supérieure à 2,5 MPa;
  - le récipient sous pression a une capacité supérieure à 5 l;
  - le produit de la pression (en MPa) par le volume du réservoir (en l) est supérieur à 5;
  - la température du liquide dépasse 160 °C;
  - la **puissance assignée** dépasse 3 500 W;
- aux appareils de nettoyage prévus pour des usages industriels ou commerciaux;

- 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 à vapeur pour tissus (IEC 60335-2-85).

## 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*

ISO 6344-2, *Abrasifs appliqués – Détermination et désignation de la distribution granulométrique – Partie 2: Macrograins P12 à P220*

## 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 *Addition:*

fonctionnement de l'appareil dans les conditions les plus défavorables spécifiées dans les instructions

La tête de nettoyage est appuyée avec une force de 30 N contre une plaque verticale de verre ordinaire et déplacée de haut en bas sur une longueur de 1 m à une cadence de 15 cycles par minute. Un film d'eau est maintenu sur la vitre en humidifiant continuellement celle-ci avec de l'eau à une température de  $20^{\circ}\text{C} \pm 5^{\circ}\text{C}$ .

Pour les nettoyeurs à vapeur et les décolleuses de papier peint, une plaque d'acier inoxydable est utilisée en lieu et place de la vitre, sans l'humidifier. Toutefois, si la sortie de vapeur n'est pas destinée à être appuyée sur la surface, l'appareil est mis en fonctionnement en émettant de la vapeur à l'air libre, la buse étant dirigée vers le bas à un angle d'environ  $45^{\circ}$ .

Pour les nettoyeurs à vapeur destinés au nettoyage des surfaces horizontales, la plaque d'acier inoxydable est horizontale et l'appareil est déplacé d'avant en arrière, et non de haut en bas, sur une longueur de 1 m à une cadence de 15 cycles par minute. Aucune force supplémentaire autre que celle du poids de l'appareil n'est appliquée.

### 3.5 Définitions relatives aux types d'appareils

#### 3.5.101

##### **appareil sous pression**

appareil dans lequel la vapeur est produite dans un bouilleur à une pression supérieure à 50 kPa et dans lequel la pression ne chute pas à la pression atmosphérique en l'absence d'apport de vapeur

Note 1 à l'article: Le bouilleur peut être incorporé dans l'appareil ou être raccordé à celui-ci par un flexible.

### 3.6 Définitions relatives aux parties d'un appareil

#### 3.6.101

##### **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 sortie de vapeur constitue un exemple, mais pas les surfaces d'un bouilleur ou d'un réservoir chauffant.

#### 3.6.102

##### **surface adjacente**

surface située à 25 mm d'une **surface fonctionnelle** et qui peut devenir chaude du fait de la proximité de la **surface fonctionnelle**

Note 1 à l'article: La surface de l'enveloppe située à 25 mm de la sortie de vapeur, l'entrée d'eau et l'ouverture de service du bouilleur constituent des exemples de **surfaces adjacentes**.

## 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 l'exception suivante.

### 5.2 *Addition:*

*Un flexible neuf est utilisé pour chacun des essais du 21.101 au 21.105.*

**5.101** Les appareils comportant des éléments chauffants sont soumis à l'essai comme des **appareils chauffants** même s'ils comportent des moteurs.

## 6 Classification

L'article de la Partie 1 s'applique, avec les exceptions suivantes.

### 6.1 *Modification*

Les appareils doivent être de la **classe I**, de la **classe II** ou de la **classe III**.

### 6.2 *Addition:*

Les **appareils portatifs de la classe I et de la classe II** qui délivrent des liquides doivent être classés au moins IPX7. Les autres appareils doivent être classés au moins IPX4. Les **appareils de la classe III** qui ne dépassent pas 24 V peuvent être classés IPX0.

## 7 Marquage et instructions

L'article de la Partie 1 s'applique, avec les exceptions suivantes.

### 7.1 *Modification:*

Les appareils doivent porter le marquage de leur **puissance assignée** en watts.

*Addition:*

Les appareils destinés à être raccordés au réseau d'alimentation en eau doivent porter un marquage de la pression d'eau maximale admissible, en mégapascals.

Les nettoyeurs à vapeur, les décolleuses de papier peint et les appareils qui délivrent des liquides dont la température dépasse 50 °C doivent porter un marquage sur lequel est apposé le symbole IEC 60417-5597 (2014-06) ou l'indication suivante:

MISE EN GARDE: Danger de brûlure par liquide chaud.

NOTE 101 Ce symbole est un symbole de mise en garde, et les règles de l'ISO 3864-1 s'appliquent.

La somme de la **puissance assignée** et de la charge maximale sur le socle de connecteur doit également être marquée sur l'appareil.

Si un appareil possède des **surfaces accessibles** extérieures, 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: Surfaces très chaudes.

**7.6** *Addition:*



[symbole IEC 60417-5597  
(2014-06)]

appoint de vapeur



[symbole IEC 60417-5041  
(2002-10)]

Attention: surface très  
chaude

**7.12** *Addition:*

Les instructions doivent indiquer que la vapeur ou le liquide ne doit pas être dirigé vers des équipements qui comportent des composants électriques, comme l'intérieur des fours.

Pour les **appareils sous pression**, les instructions doivent indiquer que l'orifice de remplissage ne doit pas être ouvert en cours d'utilisation. Des instructions doivent être fournies pour effectuer l'appoint du réservoir d'eau.

Les instructions doivent indiquer que l'appareil doit être débranché après usage et avant **l'entretien par l'utilisateur**.

Les instructions pour les appareils destinés au nettoyage des piscines doivent comporter en substance les indications suivantes:

Ne pas utiliser dans une piscine remplie d'eau.

Si le symbole IEC 60417-5597 (2014-06) ou IEC 60417-5041 (2002-10) est utilisé, sa signification doit être expliquée.

**7.14** *Addition:*

La hauteur du symbole IEC 60417-5597 (2014-06) et la hauteur du triangle dans le symbole IEC 60417-5041 (2002-10) doivent être d'au moins 10 mm.