IEC 60335-2-45

Edition 4.0 2024-11
COMMENTED VERSION

INTERNATIONAL STANDARD

colour inside

Household and similar electrical appliances – Safety –
Part 2-45: Particular requirements for portable heating tools and similar appliances

IEC 60335-2-45:2024-11 CMV(en)

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Household and similar electrical appliances – Safety – Part 2-45: Particular requirements for portable heating tools and similar appliances

INTERNATIONAL ELECTROTECHNICAL COMMISSION

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INTERNATIONAL ELECTROTECHNICAL COMMISSION

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HOUSEHOLD AND SIMILAR ELECTRICAL APPLIANCES – SAFETY –

Part 2-45: Particular requirements for portable heating tools and similar appliances

FOREWORD

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This commented version (CMV) of the official standard IEC 60335-2-45:2024 edition 4.0 allows the user to identify the changes made to the previous IEC 60335-2-45:2002+ AMD1:2008+AMD2:2011 CSV edition 3.2. 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 60335-2-45 has been prepared by IEC technical committee 61: Safety of household and similar electrical appliances. It is an International Standard.

This fourth edition cancels and replaces the third edition published in 2002, Amendment 1:2008 and Amendment 2:2011. 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) deletion or conversion of some notes to normative text (Clause 1, 5.2, 15.101, 22.105, 25.7);
c) introduction of external accessible surfaces temperature limits, including addition of functional surface and hot surface requirements (3.6.101, 7.1, 7.6, 7.12, 7.14, 7.15, 11.3, 11.8);

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

Draft	Report on voting
61/7296/FDIS	61/7341/RVD

Full information on the voting for its approval can be found in the report on voting indicated in the above table.

The language used for the development of this International Standard is English.

This document was drafted in accordance with ISO/IEC Directives, Part 2, and developed in accordance with ISO/IEC Directives, Part 1 and ISO/IEC Directives, IEC Supplement, available at www.iec.ch/members_experts/refdocs. The main document types developed by IEC are described in greater detail at www.iec.ch/publications.

A list of all parts of the IEC 60335 series, under the general title: *Household and similar electrical appliances – Safety*, can be found on the IEC website.

This part 2 is to be used in conjunction with the latest edition of IEC 60335-1 and its amendments unless that edition precludes it; in that case, the latest edition that does not preclude it is used. It was established on the basis of the sixth edition (2020) of that standard.

NOTE 1 When "Part 1" is mentioned in this standard, it refers to IEC 60335-1.

This part 2 supplements or modifies the corresponding clauses in IEC 60335-1, so as to convert that publication into the IEC standard: Particular requirements for portable heating tools and similar appliances.

When a particular subclause of Part 1 is not mentioned in this part 2, that subclause applies as far as is reasonable. When this standard states "addition", "modification", or "replacement", the relevant text in Part 1 is to be adapted accordingly.

NOTE 2 The following numbering system is used:

– subclauses, tables and figures that are numbered starting from 101 are additional to those in Part 1;
– unless notes are in a new subclause or involve notes in Part 1, they are numbered starting from 101, including those in a replaced clause or subclause;
– additional annexes are lettered AA, BB, etc.

NOTE 3 The following print types are used:

– requirements: in roman type;

– *test specifications: in italic type*;

– notes: in small roman type.

Words in **bold** in the text are defined in Clause 3. When a definition concerns an adjective, the adjective and the associated noun are also in bold.

The following differences exist in the countries indicated below.

– 6.1: Class 0 appliances are allowed if their rated voltage does not exceed 150 V and class 0I appliances are allowed (Japan).

– 25.7: The modification does not apply (Japan).

The committee has decided that the contents of this document will remain unchanged until the stability date indicated on the IEC website under webstore.iec.ch in the data related to the specific document. At this date, the document will be

- reconfirmed,
- withdrawn, or
- revised.

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

IMPORTANT – The "colour inside" logo on the cover page of this document indicates that it contains colours which are considered to be useful for the correct understanding of its contents. Users should therefore print this document using a colour printer.

INTRODUCTION

It has been assumed in the drafting of this International Standard that the execution of its provisions is entrusted to appropriately qualified and experienced persons.

Guidance documents concerning the application of the safety requirements for appliances can be accessed via TC 61 supporting documents on the IEC website

https://www.iec.ch/tc61/supportingdocuments

This information is given for the convenience of users of this International Standard and does not constitute a replacement for the normative text in this standard.

This standard recognizes the internationally accepted level of protection against hazards such as electrical, mechanical, thermal, fire and radiation of appliances when operated as in normal use taking into account the manufacturer's instructions. It also covers abnormal situations that can be expected in practice and takes into account the way in which electromagnetic phenomena can affect the safe operation of appliances.

This standard takes into account the requirements of IEC 60364 as far as possible so that there is compatibility with the wiring rules when the appliance is connected to the supply mains. However, national wiring rules ~~may~~ can differ.

If an appliance within the scope of this standard also incorporates functions that are covered by another part 2 of IEC 60335, the relevant part 2 is applied to each function separately, as far as is reasonable. If applicable, the influence of one function on the other is taken into account.

When a part 2 standard does not include additional requirements to cover hazards dealt with in Part 1, Part 1 applies.

NOTE 1 This means that the technical committees responsible for the part 2 standards have determined that it is not necessary to specify particular requirements for the appliance in question over and above the general requirements.

This standard is a product family standard dealing with the safety of appliances and takes precedence over horizontal and generic standards covering the same subject.

NOTE 2 ~~Horizontal and generic standards~~ Horizontal publications, basic safety publications and group safety publications covering a hazard are not applicable since they have been taken into consideration when developing the general and particular requirements for the IEC 60335 series of standards. ~~For example, in the case of temperature requirements for surfaces on many appliances, generic standards, such as ISO 13732-1 for hot surfaces, are not applicable in addition to Part 1 or part 2 standards.~~ 1

An appliance that complies with the text of this standard will not necessarily be considered to comply with the safety principles of the standard if, when examined and tested, it is found to have other features that impair the level of safety covered by these requirements.

An appliance employing materials or having forms of construction differing from those detailed in the requirements of this standard may be examined and tested according to the intent of the requirements and, if found to be substantially equivalent, may be considered to comply with the standard.

NOTE 3 Standards dealing with non-safety aspects of household appliances are:

- IEC standards published by TC 59 concerning methods of measuring performance;
- CISPR 11, CISPR 14-1 and relevant IEC 61000-3 series standards concerning electromagnetic emissions;
- CISPR 14-2 concerning electromagnetic immunity;
- IEC standards published by TC 111 concerning environmental matters. 2

HOUSEHOLD AND SIMILAR ELECTRICAL APPLIANCES – SAFETY –

Part 2-45: Particular requirements for portable heating tools and similar appliances

1 Scope

This clause of Part 1 is replaced by the following.

This part of IEC 60335 deals with the safety of **portable electric heating tools** and similar appliances, their **rated voltage** being not more than 250 V including direct current (DC) supplied appliances and **battery-operated appliances**. 3

Appliances not intended for normal household use, but which nevertheless ~~may~~ can be a source of danger to the public, such as appliances intended to be used by ~~laymen~~ laypersons in shops, in light industry and on farms, are within the scope of this standard.

Appliances that ~~may~~ can also be used when mounted on a support are within the scope of this standard.

~~NOTE 101~~ Examples of appliances that are within the scope of this standard are

– **branding tools**;
– **burning-in pens**;
– **conduit-soldering tools**;
– **dehorning tools**;
– **desoldering irons**;
– **firelighters**;
– glue guns;
– **heat guns**;
– **household film-welding appliances**;
– **paint strippers**;
– plastic-cutting tools;
– **soldering guns**;
– **soldering irons**;
– stripping pliers;
– **thermoplastic conduit-welding tools**.

As far as is practicable, this standard deals with the common hazards presented by appliances which are encountered by all persons in and around the home. However, in general, it does not in general take into account

– persons (including children) whose
  - physical, sensory or mental capabilities; or
  - lack of experience and knowledge

  prevents them from using the appliance safely without supervision or instruction;
– children playing with the appliance.

~~NOTE 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:

– hand-held motor-operated electric tools (IEC 60745 series, IEC 62841 series);

– transportable motor-operated electric tools (IEC 61029 series, IEC 62841 series);

– appliances intended exclusively for industrial purposes;

– appliances intended to be used in locations where special conditions prevail, such as the presence of a corrosive or explosive atmosphere (dust, vapour or gas);

– tools using high-frequency heating other than **induction soldering irons**;

– arc-welding equipment.

2 Normative references

This clause of Part 1 is applicable except as follows.

Addition:

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

3 Terms and definitions

This clause of Part 1 is applicable except as follows.

3.1 Definitions relating to physical characteristics

3.1.9 ~~*Replacement*~~ *Modification:*
normal operation

Replace the first paragraph with the following: **4**

operation of appliances under the following conditions:

Appliances having a stand are operated on the stand, unless otherwise specified.

Other appliances are operated in accordance with the instructions, unless otherwise specified.

Soldering guns and plastic-cutting tools incorporating a **biased-off switch** are operated in cycles in accordance with the instructions but they are switched on for at least 12 s with rest periods not exceeding 48 s. For **soldering guns**, the on-period is such that the temperature at the tip reaches at least 300 °C at the end of the first on-period.

Household film-welding appliances are operated in cycles in accordance with the instructions but they are switched on at least for the time necessary to weld together two sheets of plastic film with rest periods not exceeding 2 min. The plastic film is high pressure (low density) polyethylene, each sheet having a thickness of 50 µm.

Heat guns are operated with the airflow horizontal.

Firelighters are operated to ignite charcoal placed in a tray having a diameter of 600 mm and a side 50 mm high. The pile of charcoal is 500 mm in diameter and 100 mm high at its centre.

Contact firelighters are positioned with the heating element horizontal and inserted in the centre of the charcoal.

Hot-air firelighters are positioned with the airflow horizontal or directed downwards up to 45° if allowed by the construction, whichever is more unfavourable.

3.5 Definitions related to types of appliances

3.~~102~~5.101
branding tool
appliance for marking wood, leather and other materials by means of a heated metal stamp

3.~~103~~5.102
burning-in pen
appliance for scribing on wood, leather and other materials by means of a heated tip

3.~~104~~5.103
conduit-soldering tool
appliance used for joining metal piping by means of solder

3.~~105~~5.104
dehorning tool
appliance for burning out horn buds

3.~~106~~5.105
desoldering iron
appliance for melting and removing solder

3.~~107~~5.106
firelighter
appliance for igniting solid fuel such as charcoal or wood

3.~~108~~5.107
contact firelighter
firelighter incorporating a heating element that is in direct contact with the fuel

3.~~109~~5.108
hot-air firelighter
firelighter that incorporates a fan and a heating element and blows hot air at the fuel

3.~~110~~5.109
heat gun
appliance that produces a jet of hot air

Note 1 to entry: **Heat guns** ~~may~~ can be used for fusing materials or for softening paint or plastics.

3.~~111~~5.110
household film-welding appliance
appliance for household use only, used for welding or cutting thin thermoplastic sheets by means of electrically heated parts between which the material is clamped

Note 1 to entry: **Household film-welding appliances** can have a suction device to remove air from a bag before welding.

3.~~112~~5.111
paint stripper
appliance for softening paint using hot air

Note 1 to entry: **Paint strippers** ~~may~~ can incorporate a scraper.

3.~~113~~5.112
soldering gun
appliance incorporating a transformer, the soldering tip being part of the secondary circuit

3.~~114~~5.113
soldering iron
appliance having a heated tip for soldering

3.~~115~~5.114
thermoplastic conduit-welding tool
appliance for welding conduit by partly melting the thermoplastic material of a separate fitting

Note 1 to entry: The fitting has an integral heating wire and is used only once.

3.~~116~~5.115
induction soldering iron
soldering iron that heats the soldering tip by means of high frequency induction eddy currents

Note 1 to entry: Eddy currents are induced in the soldering tip or heating element by the electromagnetic field of a coil.

3.6 Definitions related to parts of appliances

3.6.101
functional surface
surface that is intentionally heated by an internal heat source and has to be hot to carry out the function for which the appliance is intended

Note 1 to entry: An example is the heated tip of a soldering iron.

3.7 Definitions related to safety components

3.7.101
biased-off switch
switch that automatically returns to the off position when its actuating member is released

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:*

~~NOTE 101~~ An additional sample of a **contact firelighter** is required for the test of 21.102.

6 Classification

This clause of Part 1 is applicable except as follows.

6.1 *Modification:*

Replace the first paragraph with the following:

Dehorning tools shall be **class II** or **class III**.

Other appliances shall be **class I**, **class II** or **class III**.

6.2 *Addition:*

Class II dehorning tools and transformers for **class III dehorning tools** shall be at least IPX4.

Conduit-soldering tools and **thermoplastic conduit-welding tools** shall be at least IPX4.

Hand-held paint strippers for outdoor use shall be at least IPX4, unless the instructions state they are not to be stored or left outdoors, in which case they may be IPX0.

7 Marking and instructions

This clause of Part 1 is applicable except as follows.

7.1 *Addition:*

Contact firelighters shall be marked with the limit of insertion into the fuel.

Contact firelighters that are not at least IPX4 shall be marked with the substance of the following:

Do not expose to rain or moisture.

Thermoplastic conduit-welding tools shall be marked with the types of fittings with which they are to be used and with the corresponding settings. Each fitting shall be marked with the type of appliance with which it is to be used and with its own type reference.

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

CAUTION: Hot surfaces. **5**

7.6 *Addition:*

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

7.12 *Addition:*

The instructions for appliances having a separate stand and not incorporating a **biased-off switch** shall include the substance of the following:

WARNING: This tool must be placed on its stand when not in use.

The instructions for **class III dehorning tools** shall include the substance of the following:

WARNING: Only use the transformer provided.

The instructions for **heat guns** and **hand-held paint strippers** shall include the substance of the following:

A fire ~~may~~ can result if the appliance is not used with care, therefore

– be careful when using the appliance in places where there are combustible materials;

- do not apply to the same place for a long time;
- do not use in presence of an explosive atmosphere;
- be aware that heat ~~may~~ can be conducted to combustible materials that are out of sight;
- place the appliance on its stand after use and allow it to cool down before storage;
- do not leave the appliance unattended when it is switched on.

The instructions for **firelighters** shall include the substance of the following:

- ensure that the f**irelighter** is properly positioned;
- unplug the **firelighter** before removal from the fire;
- allow the **firelighter** to cool before storage;
- do not allow the hot parts of the **firelighter** to touch the cord or other flammable materials.

The instructions for **thermoplastic conduit-welding tools** shall state that a welding operation must not be repeated on a fitting since this can result in **live parts** becoming accessible.

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

7.14 *Addition:*

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

7.15 *Addition:*

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

8 Protection against access to live parts

This clause of Part 1 is applicable except as follows.

8.1.4 *Addition:*

Parts of **thermoplastic conduit-welding tools** operating at **safety extra-low voltage** exceeding 12 V are also considered to be **live parts**.

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.

11.2 *Modification:*

~~*Appliances are tested away from the walls of the test corner.*~~

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

– *appliances normally placed on a floor or table in use are placed away from the walls of the test corner;* **7**

11.3 *Addition:*

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

The probe may be held in place using a laboratory stand clamp or similar device. Any measuring instrument giving the same results as the probe may be used. **8**

~~NOTE 101~~ If the magnetic field of an induction soldering iron unduly influences the results, the temperature rises can be determined using a platinum resistance with twisted connecting wires or any equivalent means.

11.4 ~~*Modification*~~ *Addition:*

Soldering guns, ***induction soldering irons*** *and other appliances operated through a transformer are supplied at 1,06 times* ***rated voltage****.*

11.7 ~~*Addition*~~ *Modification:*

Replace the first paragraph with the following:

Contact firelighters *are operated for 30 min.* ***Hot-air firelighters*** *are operated for 10 min. Other appliances are operated until steady conditions are established.*

Replace the first dashed item with the following:

– *the* ***battery*** *that has been* ***fully discharged*** *is charged, while the appliance is operated for 1 h or the time specified, whichever is less, performing its intended function, if allowed by the construction of the appliance;* **9**

11.8 *Modification:*

Replace the first paragraph with the following:

During the test, the temperature rises are monitored continuously and shall not exceed the values shown in Table 3 and Table 101. **10**

The temperature rise limit specified in Table 3 for pure mica and tightly sintered ceramic material is increased to 600 K.

Add the following to footnote "k" of Table 3: "*Similar parts held for short periods include handles or grips of vents and air shutters*." **11**

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

Surface [a]	*Temperature rise of external accessible surfaces* [b] *K*
Bare metal	*42*
Coated metal [c]	*49*
Glass and ceramic	*56*
Plastic and plastic coating > 0,4 mm [d, e]	*62*
NOTE The temperature rise limits of handles, knobs, grips, keyboards, keypads and similar parts are specified in Table 3.	

[a] *Temperature rises are not measured on:*
- *the underside of appliances intended to be used on a working surface or floor;*
- ***functional surfaces**;*
- air outlet grills, nozzles and attachments directly mounted at air outlets of appliances having functional hot air (e.g. heat guns).

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

[c] *Metal is considered coated when a coating having a minimum thickness of 90 µm made of enamel, powder or non-substantially plastic coating is used.*

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

[e] *When the thickness of the plastic coating does not exceed 0,4 mm, the temperature rise limits of coated metal for underlying metal apply or the temperature rise limits for glass or ceramic material for underlying glass or ceramic material apply.*

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

This clause of Part 1 is applicable. **12**

13 Leakage current and electric strength at operating temperature

This clause of Part 1 is applicable except as follows.

13.1 *Addition:*

*Appliances supplied by a transformer and **induction soldering irons** are tested as **motor-operated appliances**.*

14 Transient overvoltages

This clause of Part 1 is applicable.

15 Moisture resistance

This clause of Part 1 is applicable except as follows.

15.101 Household film-welding appliances having a suction device shall be constructed so that suction of liquid does not impair electrical insulation.

~~NOTE~~ This requirement does not apply to parts operating at **safety extra-low voltage**.

Compliance is checked by the following test.

A plastic bag is filled with 40 ml of ~~water containing approximately 1 % NaCl~~ the spillage solution specified in 15.2 **13**. *The bag is positioned so that the surface of the water is at the same level as the suction opening of the appliance. The bag is then welded with the suction device in operation.*

The appliance shall then withstand the electric strength test of 16.3 and inspection shall show that there is no trace of water on the insulation that could result in a reduction of ***clearances*** *and* ***creepage distances*** *below the values specified in Clause 29.*

16 Leakage current and electric strength

This clause of Part 1 is applicable except as follows.

16.1 *Addition:*

Appliances supplied by a transformer and ***induction soldering irons*** *are tested as* ***motor-operated appliances****.*

17 Overload protection of transformers and associated circuits

This clause of Part 1 is applicable except as follows.

~~*Modification*~~ *Addition:*

The test is not carried out on ***soldering guns*** *and other appliances in which the heating element is part of the secondary circuit of a transformer.*

18 Endurance

This clause of Part 1 is not applicable.

19 Abnormal operation

This clause of Part 1 is applicable except as follows.

19.1 *Addition:*

For ***heat guns*** *and* ***hot-air firelighters****, compliance is also checked by the test of 19.101.*

19.2 *Replacement:*

Appliances are operated under the conditions specified in Clause 11 but supplied at 0,94 times ***rated voltage****. However, appliances in which the heating element is part of the secondary circuit of a transformer are operated continuously for 30 min unless they incorporate a* ***biased-off switch****, in which case they are operated for 5 min.* ***Firelighters*** *are operated for 2 h without adding fuel.*

__Paint strippers__ incorporating integral scrapers are held horizontally in a clamp over the entire length of the handle. A force of 70 N is exerted on the scraper edge in the direction corresponding to normal use.

19.3 *Replacement:*

The test of 19.2 is repeated but with the appliance supplied at 1,06 times __rated voltage__.

19.4 *Addition:*

__Thermoplastic conduit-welding tools__ are operated with the fastest possible sequence of welding operations.

19.13 *Addition:*

The temperature rise of the windings of __induction soldering irons__ shall not exceed the values specified in 19.7.

The electric strength test of __induction soldering irons__ is carried out immediately after switching off the appliance.

19.101 *__Heat guns__ and __hot-air firelighters__ are operated as specified in Clause 11 until steady conditions are established. The voltage at the terminals of the motor is then reduced until the running speed of the motor is just sufficient to prevent the __thermal cut-out__ from operating, the power input to the heating element being maintained at 1,15 times __rated power input__.*

The voltage is decreased at

- *1 V per minute, for motors having a __working voltage__ not exceeding 30 V;*
- *5 V per minute, for motors having a __working voltage__ exceeding 30 V.*

The appliances are then operated until steady conditions are established.

20 Stability and mechanical hazards

This clause of Part 1 is applicable except as follows.

20.1 *Addition:*

__Hand-held appliances__ are subjected to the test while placed on their stands.

20.101 **Contact firelighters** shall have adequate stability.

Compliance is checked by the following test.

The __firelighter__ is placed on a horizontal surface positioned 1 m above the floor. The maximum insertion mark specified in 7.1 is aligned with the edge of the surface. The __supply cord__ is allowed to hang freely, the remaining length allowed to lie on the floor.

The appliance shall not tilt.

21 Mechanical strength

This clause of Part 1 is applicable except as follows.

21.1 *Addition:*

*For **hand-held appliances**, compliance is also checked by the tests of 21.101.*

*For **contact firelighters**, compliance is also checked by the test of 21.102.*

21.101 *The **supply cord** of **hand-held appliances** is cut to a length of 100 mm, measured from the point where the cord, or cord guard, enters the appliance.*

The appliance is dropped from a height of 1 m on to a hardwood base having a thickness of 50 mm.

This test is carried out five times, the appliance positioned so that its major axis is horizontal and so that a different part of the appliance is exposed to the impact each time.

*The appliance is then dropped five times with its major axis vertical and with tips of **soldering irons**, or corresponding parts of other appliances, pointing downwards.*

*The appliance shall not be damaged to such an extent that compliance with this standard is impaired, in particular ~~**live parts** shall not become accessible~~ compliance with 8.1.1 shall not be impaired.* **14**

21.102 *The handle of a new **contact firelighter** is held firmly between two lightly padded surfaces with the heating element in a horizontal plane. The **firelighter** is supplied at **rated voltage**. After 3 min a mass of 4,5 kg is suspended at the end of the heating element for 1 min. The mass is removed and the element is allowed to cool. If the element has been bent, it is straightened to its original position.*

*After the test, the ~~**live parts** shall not be accessible~~ appliance shall comply with 8.1.1* **15** *and the **firelighter** shall withstand the electric strength test of 16.3.*

22 Construction

This clause of Part 1 is applicable except as follows.

22.6 *Addition:*

If a drain hole is needed to comply with this standard, it shall be at least 5 mm in diameter or 20 mm^2 in area with a width at least 3 mm. Holes that do not meet these dimensions are considered to be blocked when determining compliance.

Compliance is checked by inspection and by measurement. **16**

22.101 **Hand-held appliances** intended to be used away from a workshop shall incorporate a stand.

EXAMPLE 1 Appliances intended to be used away from a workshop are

– **branding tools**;
– **conduit-soldering tools**;
– **dehorning tools**;
– **heat guns**;
– **paint strippers**.

Hand-held appliances intended to be used on a ~~table or similar~~ supporting surface, such as a table, shall incorporate a stand or be provided with a separate stand.

EXAMPLE 2 Appliances intended to be used on ~~a table or similar~~ supporting surface are

– **burning-in pens**;
– **desoldering irons**;
– **firelighters**;
– **soldering irons**.

These requirements do not apply to appliances complying with test of Clause 11 without a stand.

Compliance is checked by inspection and by the test of Clause 11.

22.102 Desoldering irons shall incorporate a device for collecting the solder.

Compliance is checked by inspection.

22.103 Soldering guns shall incorporate a **biased-off switch**.

Compliance is checked by inspection.

~~**22.104** If a drain hole is provided in **household film-welding appliances**, it shall be at least 5 mm in diameter or 20 mm^2 in area with a width at least 3 mm.~~

~~*Compliance is checked by inspection and by measurement.*~~

22.~~105~~104 Thermoplastic conduit-welding tools shall incorporate a timer that provides **all-pole disconnection** of the welding circuit and has to be reset before a further operation.

Repetition of the welding operation on the same fitting shall be prevented, such as an appliance that has to be disconnected from the supply mains or from the fitting before restarting the welding operation.

Compliance is checked by inspection.

~~NOTE Repetition of the welding operation is considered to be prevented if the appliance has first to be disconnected from the supply mains or from the fitting.~~

22.~~106~~105 Thermoplastic conduit-welding tools shall be constructed so that the connecting terminals are supplied with **extra-low voltage** not exceeding 24 V when the appliance is operated without fittings.

Compliance is checked by measurement.

22.~~107~~106 Fittings for **thermoplastic conduit-welding tools** shall be constructed so that at least **basic insulation** is provided on surfaces that are only accessible before the fitting is placed on the conduit.

Compliance is checked by inspection.

22.~~108~~107 Class III dehorning tools shall be supplied with a transformer.

Compliance is checked by inspection.

23 Internal wiring

This clause of Part 1 is applicable.

24 Components

This clause of Part 1 is applicable except as follows.

24.1.3 *Addition:*

Switches incorporated in the hand-held part of appliances not intended exclusively for household use are subjected to 50 000 cycles of operation.

25 Supply connection and external flexible cords

This clause of Part 1 is applicable except as follows.

25.5 *Addition:*

Type Z attachment is allowed for

– **class III appliances**;

– other appliances, unless they have a polyvinyl chloride sheathed cord and the temperature rise of **accessible metal parts** exceeds 75 K.

25.7 *Addition:*

Light polyvinyl chloride sheathed cords may be used for **class III appliances** and other **hand-held appliances**, regardless of the mass of the appliance.

Polyvinyl chloride sheathed cords may be used for **hand-held appliances** having a **rated power input** not exceeding 100 W and a mass, excluding the mass of the **supply cord**, not exceeding 100 g, and for appliances provided with a **biased-off switch**, regardless of the temperature rise of external metal parts.

~~NOTE 101 The mass is determined without the **supply cord**.~~

Polyvinyl sheathed cords are not allowed for **thermoplastic conduit-welding tools** and **firelighters**.

The **supply cord** of **class II dehorning tools** shall be polychloroprene sheathed and not be lighter than heavy polychloroprene sheathed cord (code designation 60245 IEC 66).

25.8 *Addition:*

The length of the **supply cord** shall be at least

– 1,5 m, for **firelighters**;

– 6 m, for **class II dehorning tools**.

25.15 ~~*Modification:*~~

~~*Instead of the first line in Table 12, the following applies For* ***hand-held appliances****.*~~

~~*Mass of the appliance kg*~~	~~*Pull force N*~~	~~*Torque Nm*~~
~~*≤ 0,3*~~	~~*15*~~	~~*0,05*~~
~~*> 0,3 and ≤ 1,0*~~	~~*30*~~	~~*0,1*~~

Addition:

For ***hand-held appliances*** *with a mass of no more than 0,3 kg, the pull force is 15 N and the torque is 0.05 Nm.*

25.23 *Addition:*

The length of the **interconnection cord** of **class III dehorning tools** shall be at least 4 m.

26 Terminals for external conductors

This clause of Part 1 is applicable.

27 Provision for earthing

This clause of Part 1 is applicable except as follows.

27.2 *Addition:*

NOTE 101 **Class II soldering irons** and **class II soldering guns** used for soldering electronic equipment ~~may~~ can have an equipotential bonding terminal for which the dimensional requirements are not 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.

29.3 *Modification:*

Replace the second dashed item of the test specification by the following:

– *by an electric strength test in accordance with 29.3.2, if the insulation consists of more than one separate layer,* ~~*other than flakey material similar to natural mica, or by*~~ *or*

29.3.2 ~~*Addition*~~ *Replacement:*

Each layer of material, other than natural mica and similar flaky material, shall withstand the electric strength test of 16.3 for ***supplementary insulation****.* ***Supplementary insulation*** *shall consist of at least 2 layers of material and* ***reinforced insulation*** *of at least 3 layers.* **17**

If natural mica in thin sheet form is used,

– *for* ***supplementary insulation****, there shall be at least six layers, and any three layers together shall withstand the electric strength test of 16.3* ***for supplementary insulation****;*

– *for* ***reinforced insulation****, there shall be at least ten layers, and any five layers together shall withstand the electric strength test of 16.3 for* ***reinforced insulation****.*

30 Resistance to heat and fire

This clause of Part 1 is applicable except as follows.

30.2 ~~*Addition*~~ *Modification:*

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

– *for* ***contact firelighters****, 30.2.3 is applicable;*

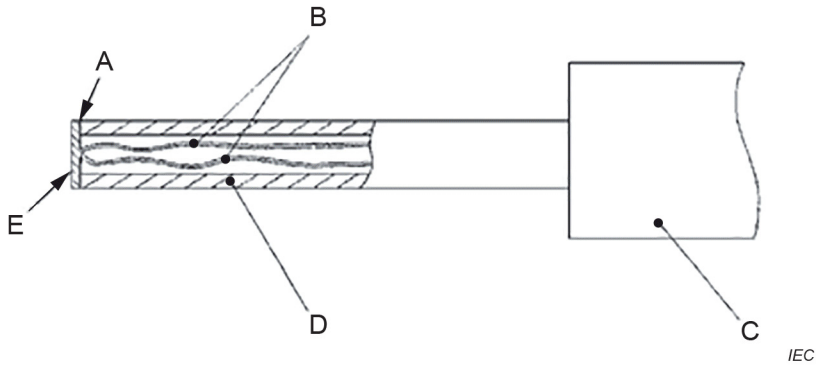
– *for other appliances, 30.2.2 is applicable.*

31 Resistance to rusting

This clause of Part 1 is applicable.

32 Radiation, toxicity and similar hazards

This clause of Part 1 is applicable.



Key

A adhesive

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

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

D polycarbonate tube: inside diameter 3 mm, outside diameter 5 mm

E tinned copper disc: 5 mm diameter, 0,5 mm thick with a flat contact face

Figure 101 – Probe for measuring surface temperatures

Annexes

The annexes of Part 1 are applicable except as follows.

Annex A
(informative)

Routine tests

This annex of Part 1 is applicable except as follows.

A.~~2~~3 Electric strength test

Addition:

*An electric strength test is carried out between the input and output circuits of appliances incorporating a **safety isolating transformer**, the test voltage being*

– *2 000 V, for heating tools having a **rated voltage** not exceeding 150 V;*
– *2 500 V, for other heating tools.*

Annex B
(normative)

Battery-operated appliances, separable batteries and detachable batteries for battery-operated appliances

This annex of Part 1 is applicable except as follows.

B.11.1 *Addition*:

*The appliance is operated for the duration specified in 11.7 or until it no longer operates due to depletion of the **battery**, whichever occurs first.* **18**

Bibliography

The Bibliography of Part 1 is applicable except as follows.

Addition:

IEC 60745 (all parts), *Hand-held motor-operated electric tools – Safety*

IEC 61029 (all parts), *Safety of transportable motor-operated electric tools*

IEC 62841 (all parts), *Electric motor-operated hand-held tools, transportable tools and lawn and garden machinery*

ISO 13732-1, *Ergonomics of the thermal environment – Methods for the assessment of human responses to contact with surfaces – Part 1: Hot surfaces*

List of comments

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

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

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

4 This revision maintains the normal operation while charging as specified in IEC 60335-1:2020.

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

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

7 The text being modified from the Part 1 Standard is clarified.

8 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.

9 This modification is for alignment with IEC 60335-1:2020 and aligns the test duration for operation of battery-operated appliances with that of mains operated appliances.

10 Limits on the temperature rise of external accessible surfaces are introduced to address the risk of thermal injury from contact with external accessible surfaces based on IEC Guide 117 for Temperatures of touchable hot surfaces.

11 This addition clarifies that these parts are considered to be held for short periods only.

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

13 This revision is for alignment with Subclause 15.2 of IEC 60335-1:2020.

14 This modification is made to indicate that the accessibility of live parts after the test is determined as specified in Subclause 8.1.1.

15 This modification is made to indicate that the accessibility of live parts after the test is determined as specified in Subclause 8.1.1.

16 This is relocated from Subclause 22.104 and modified to align with other Part 2 Standard to clarify that a drain hole needs to meet the minimum dimensions or it is considered to be blocked when determining compliance.

17 Subclauses 29.3 and 29.3.2 are modified to clarify that mica can be used as supplementary or reinforced insulation if it complies with Subclause 29.3.2. Other flaky materials cannot be evaluated using Subclause 29.3.2 to determine their suitability to act as supplementary or reinforced insulation.

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

IEC 60335-2-45

Edition 4.0 2024-11

INTERNATIONAL STANDARD

NORME INTERNATIONALE

Household and similar electrical appliances – Safety –
Part 2-45: Particular requirements for portable heating tools and similar appliances

Appareils électrodomestiques et analogues – Sécurité –
Partie 2-45: Exigences particulières pour les outils chauffants mobiles et appareils analogues

IEC 60335-2-45:2024-11(en-fr)

CONTENTS

INTERNATIONAL ELECTROTECHNICAL COMMISSION

_____

HOUSEHOLD AND SIMILAR ELECTRICAL APPLIANCES – SAFETY –

Part 2-45: Particular requirements for portable heating tools and similar appliances

FOREWORD

1) The International Electrotechnical Commission (IEC) is a worldwide organization for standardization comprising all national electrotechnical committees (IEC National Committees). The object of IEC is to promote international co-operation on all questions concerning standardization in the electrical and electronic fields. To this end and in addition to other activities, IEC publishes International Standards, Technical Specifications, Technical Reports, Publicly Available Specifications (PAS) and Guides (hereafter referred to as "IEC Publication(s)"). Their preparation is entrusted to technical committees; any IEC National Committee interested in the subject dealt with may participate in this preparatory work. International, governmental and non-governmental organizations liaising with the IEC also participate in this preparation. IEC collaborates closely with the International Organization for Standardization (ISO) in accordance with conditions determined by agreement between the two organizations.
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IEC 60335-2-45 has been prepared by IEC technical committee 61: Safety of household and similar electrical appliances. It is an International Standard.

This fourth edition cancels and replaces the third edition published in 2002, Amendment 1:2008 and Amendment 2:2011. 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) deletion or conversion of some notes to normative text (Clause 1, 5.2, 15.101, 22.105, 25.7);

c) introduction of external accessible surfaces temperature limits, including addition of functional surface and hot surface requirements (3.6.101, 7.1, 7.6, 7.12, 7.14, 7.15, 11.3, 11.8);

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

Draft	Report on voting
61/7296/FDIS	61/7341/RVD

Full information on the voting for its approval can be found in the report on voting indicated in the above table.

The language used for the development of this International Standard is English.

This document was drafted in accordance with ISO/IEC Directives, Part 2, and developed in accordance with ISO/IEC Directives, Part 1 and ISO/IEC Directives, IEC Supplement, available at www.iec.ch/members_experts/refdocs. The main document types developed by IEC are described in greater detail at www.iec.ch/publications.

A list of all parts of the IEC 60335 series, under the general title: *Household and similar electrical appliances – Safety*, can be found on the IEC website.

This part 2 is to be used in conjunction with the latest edition of IEC 60335-1 and its amendments unless that edition precludes it; in that case, the latest edition that does not preclude it is used. It was established on the basis of the sixth edition (2020) of that standard.

NOTE 1 When "Part 1" is mentioned in this standard, it refers to IEC 60335-1.

This part 2 supplements or modifies the corresponding clauses in IEC 60335-1, so as to convert that publication into the IEC standard: Particular requirements for portable heating tools and similar appliances.

When a particular subclause of Part 1 is not mentioned in this part 2, that subclause applies as far as is reasonable. When this standard states "addition", "modification", or "replacement", the relevant text in Part 1 is to be adapted accordingly.

NOTE 2 The following numbering system is used:

– subclauses, tables and figures that are numbered starting from 101 are additional to those in Part 1;

– unless notes are in a new subclause or involve notes in Part 1, they are numbered starting from 101, including those in a replaced clause or subclause;

– additional annexes are lettered AA, BB, etc.

NOTE 3 The following print types are used:

– requirements: in roman type;

– *test specifications: in italic type*;

– notes: in small roman type.

Words in **bold** in the text are defined in Clause 3. When a definition concerns an adjective, the adjective and the associated noun are also in bold.

The following differences exist in the countries indicated below.

– 6.1: Class 0 appliances are allowed if their rated voltage does not exceed 150 V and class 0I appliances are allowed (Japan).

– 25.7: The modification does not apply (Japan).

The committee has decided that the contents of this document will remain unchanged until the stability date indicated on the IEC website under webstore.iec.ch in the data related to the specific document. At this date, the document will be

- reconfirmed,
- withdrawn, or
- revised.

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

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 2-45: Particular requirements for portable heating tools and similar appliances

1 Scope

This clause of Part 1 is replaced by the following.

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

Appliances not intended for normal household use, but which nevertheless can be a source of danger to the public, such as appliances intended to be used by laypersons in shops, in light industry and on farms, are within the scope of this standard.

Appliances that can also be used when mounted on a support are within the scope of this standard.

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

– **branding tools**;
– **burning-in pens**;
– **conduit-soldering tools**;
– **dehorning tools**;
– **desoldering irons**;
– **firelighters**;
– glue guns;
– **heat guns**;
– **household film-welding appliances**;
– **paint strippers**;
– plastic-cutting tools;
– **soldering guns**;
– **soldering irons**;
– stripping pliers;
– **thermoplastic conduit-welding tools**.

As far as is practicable, this standard deals with the common hazards presented by appliances which are encountered by all persons in and around the home. However, in general, it does not in general take into account

– persons (including children) whose
  - physical, sensory or mental capabilities; or
  - lack of experience and knowledge

  prevents them from using the appliance safely without supervision or instruction;
– children playing with the appliance.

Attention is drawn to the fact that

– for appliances intended to be used in vehicles or on board ships or aircraft, additional requirements can be necessary;
– in many countries additional requirements are specified by the national health authorities, the national authorities responsible for the protection of labour and similar authorities.

This standard does not apply to:

– hand-held motor-operated electric tools (IEC 60745 series, IEC 62841 series);
– transportable motor-operated electric tools (IEC 61029 series, IEC 62841 series);
– appliances intended exclusively for industrial purposes;
– appliances intended to be used in locations where special conditions prevail, such as the presence of a corrosive or explosive atmosphere (dust, vapour or gas);
– tools using high-frequency heating other than **induction soldering irons**;
– arc-welding equipment.

2 Normative references

This clause of Part 1 is applicable except as follows.

Addition:

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

3 Terms and definitions

This clause of Part 1 is applicable except as follows.

3.1 Definitions relating to physical characteristics

3.1.9 *Modification:*
normal operation

Replace the first paragraph with the following:

operation of appliances under the following conditions:

Appliances having a stand are operated on the stand, unless otherwise specified.

Other appliances are operated in accordance with the instructions, unless otherwise specified.

Soldering guns and plastic-cutting tools incorporating a **biased-off switch** are operated in cycles in accordance with the instructions but they are switched on for at least 12 s with rest periods not exceeding 48 s. For **soldering guns**, the on-period is such that the temperature at the tip reaches at least 300 °C at the end of the first on-period.

Household film-welding appliances are operated in cycles in accordance with the instructions but they are switched on at least for the time necessary to weld together two sheets of plastic film with rest periods not exceeding 2 min. The plastic film is high pressure (low density) polyethylene, each sheet having a thickness of 50 µm.

Heat guns are operated with the airflow horizontal.

Firelighters are operated to ignite charcoal placed in a tray having a diameter of 600 mm and a side 50 mm high. The pile of charcoal is 500 mm in diameter and 100 mm high at its centre.

Contact firelighters are positioned with the heating element horizontal and inserted in the centre of the charcoal.

Hot-air firelighters are positioned with the airflow horizontal or directed downwards up to 45° if allowed by the construction, whichever is more unfavourable.

3.5 Definitions related to types of appliances

3.5.101
branding tool
appliance for marking wood, leather and other materials by means of a heated metal stamp

3.5.102
burning-in pen
appliance for scribing on wood, leather and other materials by means of a heated tip

3.5.103
conduit-soldering tool
appliance used for joining metal piping by means of solder

3.5.104
dehorning tool
appliance for burning out horn buds

3.5.105
desoldering iron
appliance for melting and removing solder

3.5.106
firelighter
appliance for igniting solid fuel such as charcoal or wood

3.5.107
contact firelighter
firelighter incorporating a heating element that is in direct contact with the fuel

3.5.108
hot-air firelighter
firelighter that incorporates a fan and a heating element and blows hot air at the fuel

3.5.109
heat gun
appliance that produces a jet of hot air

Note 1 to entry: **Heat guns** can be used for fusing materials or for softening paint or plastics.

3.5.110
household film-welding appliance
appliance for household use only, used for welding or cutting thin thermoplastic sheets by means of electrically heated parts between which the material is clamped

Note 1 to entry: **Household film-welding appliances** can have a suction device to remove air from a bag before welding.

3.5.111
paint stripper
appliance for softening paint using hot air

Note 1 to entry: **Paint strippers** can incorporate a scraper.

3.5.112
soldering gun
appliance incorporating a transformer, the soldering tip being part of the secondary circuit

3.5.113
soldering iron
appliance having a heated tip for soldering

3.5.114
thermoplastic conduit-welding tool
appliance for welding conduit by partly melting the thermoplastic material of a separate fitting

Note 1 to entry: The fitting has an integral heating wire and is used only once.

3.5.115
induction soldering iron
soldering iron that heats the soldering tip by means of high frequency induction eddy currents

Note 1 to entry: Eddy currents are induced in the soldering tip or heating element by the electromagnetic field of a coil.

3.6 Definitions related to parts of appliances

3.6.101
functional surface
surface that is intentionally heated by an internal heat source and has to be hot to carry out the function for which the appliance is intended

Note 1 to entry: An example is the heated tip of a soldering iron.

3.7 Definitions related to safety components

3.7.101
biased-off switch
switch that automatically returns to the off position when its actuating member is released

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:*

An additional sample of a **contact firelighter** is required for the test of 21.102.

6 Classification

This clause of Part 1 is applicable except as follows.

6.1 *Modification:*

Replace the first paragraph with the following:

Dehorning tools shall be **class II** or **class III**.

Other appliances shall be **class I**, **class II** or **class III**.

6.2 *Addition:*

Class II dehorning tools and transformers for **class III dehorning tools** shall be at least IPX4.

Conduit-soldering tools and **thermoplastic conduit-welding tools** shall be at least IPX4.

Hand-held paint strippers for outdoor use shall be at least IPX4, unless the instructions state they are not to be stored or left outdoors, in which case they may be IPX0.

7 Marking and instructions

This clause of Part 1 is applicable except as follows.

7.1 *Addition:*

Contact firelighters shall be marked with the limit of insertion into the fuel.

Contact firelighters that are not at least IPX4 shall be marked with the substance of the following:

Do not expose to rain or moisture.

Thermoplastic conduit-welding tools shall be marked with the types of fittings with which they are to be used and with the corresponding settings. Each fitting shall be marked with the type of appliance with which it is to be used and with its own type reference.

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

CAUTION: Hot surfaces.

7.6 *Addition:*

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

7.12 *Addition:*

The instructions for appliances having a separate stand and not incorporating a **biased-off switch** shall include the substance of the following:

WARNING: This tool must be placed on its stand when not in use.

The instructions for **class III dehorning tools** shall include the substance of the following:

WARNING: Only use the transformer provided.

The instructions for **heat guns** and **hand-held paint strippers** shall include the substance of the following:

A fire can result if the appliance is not used with care, therefore

– be careful when using the appliance in places where there are combustible materials;

- do not apply to the same place for a long time;
- do not use in presence of an explosive atmosphere;
- be aware that heat can be conducted to combustible materials that are out of sight;
- place the appliance on its stand after use and allow it to cool down before storage;
- do not leave the appliance unattended when it is switched on.

The instructions for **firelighters** shall include the substance of the following:

- ensure that the f**irelighter** is properly positioned;
- unplug the **firelighter** before removal from the fire;
- allow the **firelighter** to cool before storage;
- do not allow the hot parts of the **firelighter** to touch the cord or other flammable materials.

The instructions for **thermoplastic conduit-welding tools** shall state that a welding operation must not be repeated on a fitting since this can result in **live parts** becoming accessible.

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

7.14 *Addition:*

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

7.15 *Addition:*

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

8 Protection against access to live parts

This clause of Part 1 is applicable except as follows.

8.1.4 *Addition:*

Parts of **thermoplastic conduit-welding tools** operating at **safety extra-low voltage** exceeding 12 V are also considered to be **live parts**.

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.

11.2 *Modification:*

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

– *appliances normally placed on a floor or table in use are placed away from the walls of the test corner;*

11.3 *Addition:*

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

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

If the magnetic field of an induction soldering iron unduly influences the results, the temperature rises can be determined using a platinum resistance with twisted connecting wires or any equivalent means.

11.4 *Addition:*

Soldering guns*,* ***induction soldering irons*** *and other appliances operated through a transformer are supplied at 1,06 times* ***rated voltage****.*

11.7 *Modification:*

Replace the first paragraph with the following:

Contact firelighters *are operated for 30 min.* ***Hot-air firelighters*** *are operated for 10 min. Other appliances are operated until steady conditions are established.*

Replace the first dashed item with the following:

– *the* ***battery*** *that has been* ***fully discharged*** *is charged, while the appliance is operated for 1 h or the time specified, whichever is less, performing its intended function, if allowed by the construction of the appliance;*

11.8 *Modification:*

Replace the first paragraph with the following:

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

The temperature rise limit specified in Table 3 for pure mica and tightly sintered ceramic material is increased to 600 K.

Add the following to footnote "k" of Table 3: "*Similar parts held for short periods include handles or grips of vents and air shutters*."

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

Surface [a]	*Temperature rise of external accessible surfaces* [b] *K*
Bare metal	*42*
Coated metal [c]	*49*
Glass and ceramic	*56*
Plastic and plastic coating > 0,4 mm [d, e]	*62*
NOTE The temperature rise limits of handles, knobs, grips, keyboards, keypads and similar parts are specified in Table 3.	
[a] *Temperature rises are not measured on:* – *the underside of appliances intended to be used on a working surface or floor;* – ***functional surfaces**;* – air outlet grills, nozzles and attachments directly mounted at air outlets of appliances having functional hot air (e.g. heat guns). [b] *When the required values are not met, the maximum temperature rise shall not be higher than two times the values indicated.* [c] *Metal is considered coated when a coating having a minimum thickness of 90 µm made of enamel, powder or non-substantially plastic coating is used.* [d] *The temperature rise limit of plastic also applies for plastic material having a metal finish of thickness less than 0,1 mm.* [e] *When the thickness of the plastic coating does not exceed 0,4 mm, the temperature rise limits of coated metal for underlying metal apply or the temperature rise limits for glass or ceramic material for underlying glass or ceramic material apply.*	

12 Charging of metal-ion batteries

This clause of Part 1 is applicable.

13 Leakage current and electric strength at operating temperature

This clause of Part 1 is applicable except as follows.

13.1 *Addition:*

*Appliances supplied by a transformer and **induction soldering irons** are tested as **motor-operated appliances**.*

14 Transient overvoltages

This clause of Part 1 is applicable.

15 Moisture resistance

This clause of Part 1 is applicable except as follows.

15.101 Household film-welding appliances having a suction device shall be constructed so that suction of liquid does not impair electrical insulation.

This requirement does not apply to parts operating at **safety extra-low voltage**.

Compliance is checked by the following test.

A plastic bag is filled with 40 ml of the spillage solution specified in 15.2. The bag is positioned so that the surface of the water is at the same level as the suction opening of the appliance. The bag is then welded with the suction device in operation.

*The appliance shall then withstand the electric strength test of 16.3 and inspection shall show that there is no trace of water on the insulation that could result in a reduction of **clearances** and **creepage distances** below the values specified in Clause 29.*

16 Leakage current and electric strength

This clause of Part 1 is applicable except as follows.

16.1 *Addition:*

*Appliances supplied by a transformer and **induction soldering irons** are tested as **motor-operated appliances**.*

17 Overload protection of transformers and associated circuits

This clause of Part 1 is applicable except as follows.

Addition:

*The test is not carried out on **soldering guns** and other appliances in which the heating element is part of the secondary circuit of a transformer.*

18 Endurance

This clause of Part 1 is not applicable.

19 Abnormal operation

This clause of Part 1 is applicable except as follows.

19.1 *Addition:*

*For **heat guns** and **hot-air firelighters**, compliance is also checked by the test of 19.101.*

19.2 *Replacement:*

*Appliances are operated under the conditions specified in Clause 11 but supplied at 0,94 times **rated voltage**. However, appliances in which the heating element is part of the secondary circuit of a transformer are operated continuously for 30 min unless they incorporate a **biased-off switch**, in which case they are operated for 5 min. **Firelighters** are operated for 2 h without adding fuel.*

***Paint strippers** incorporating integral scrapers are held horizontally in a clamp over the entire length of the handle. A force of 70 N is exerted on the scraper edge in the direction corresponding to normal use.*

19.3 *Replacement:*

The test of 19.2 is repeated but with the appliance supplied at 1,06 times ***rated voltage****.*

19.4 *Addition:*

Thermoplastic conduit-welding tools *are operated with the fastest possible sequence of welding operations.*

19.13 *Addition:*

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

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

19.101 ***Heat guns*** *and* ***hot-air firelighters*** *are operated as specified in Clause 11 until steady conditions are established. The voltage at the terminals of the motor is then reduced until the running speed of the motor is just sufficient to prevent the* ***thermal cut-out*** *from operating, the power input to the heating element being maintained at 1,15 times* ***rated power input****.*

The voltage is decreased at

– *1 V per minute, for motors having a* ***working voltage*** *not exceeding 30 V;*
– *5 V per minute, for motors having a* ***working voltage*** *exceeding 30 V.*

The appliances are then operated until steady conditions are established.

20 Stability and mechanical hazards

This clause of Part 1 is applicable except as follows.

20.1 *Addition:*

Hand-held appliances *are subjected to the test while placed on their stands.*

20.101 **Contact firelighters** shall have adequate stability.

Compliance is checked by the following test.

The ***firelighter*** *is placed on a horizontal surface positioned 1 m above the floor. The maximum insertion mark specified in 7.1 is aligned with the edge of the surface. The* ***supply cord*** *is allowed to hang freely, the remaining length allowed to lie on the floor.*

The appliance shall not tilt.

21 Mechanical strength

This clause of Part 1 is applicable except as follows.

21.1 *Addition:*

For ***hand-held appliances****, compliance is also checked by the tests of 21.101.*

*For **contact firelighters**, compliance is also checked by the test of 21.102.*

21.101 *The **supply cord** of **hand-held appliances** is cut to a length of 100 mm, measured from the point where the cord, or cord guard, enters the appliance.*

The appliance is dropped from a height of 1 m on to a hardwood base having a thickness of 50 mm.

This test is carried out five times, the appliance positioned so that its major axis is horizontal and so that a different part of the appliance is exposed to the impact each time.

*The appliance is then dropped five times with its major axis vertical and with tips of **soldering irons**, or corresponding parts of other appliances, pointing downwards.*

The appliance shall not be damaged to such an extent that compliance with this standard is impaired, in particular compliance with 8.1.1 shall not be impaired.

21.102 *The handle of a new **contact firelighter** is held firmly between two lightly padded surfaces with the heating element in a horizontal plane. The **firelighter** is supplied at **rated voltage**. After 3 min a mass of 4,5 kg is suspended at the end of the heating element for 1 min. The mass is removed and the element is allowed to cool. If the element has been bent, it is straightened to its original position.*

*After the test, the appliance shall comply with 8.1.1 and the **firelighter** shall withstand the electric strength test of 16.3.*

22 Construction

This clause of Part 1 is applicable except as follows.

22.6 *Addition:*

If a drain hole is needed to comply with this standard, it shall be at least 5 mm in diameter or 20 mm^2 in area with a width at least 3 mm. Holes that do not meet these dimensions are considered to be blocked when determining compliance.

Compliance is checked by inspection and by measurement.

22.101 **Hand-held appliances** intended to be used away from a workshop shall incorporate a stand.

EXAMPLE 1 Appliances intended to be used away from a workshop are

– **branding tools**;
– **conduit-soldering tools**;
– **dehorning tools**;
– **heat guns**;
– **paint strippers**.

Hand-held appliances intended to be used on a supporting surface, such as a table, shall incorporate a stand or be provided with a separate stand.

EXAMPLE 2 Appliances intended to be used on supporting surface are

– **burning-in pens**;
– **desoldering irons**;
– **firelighters**;

– **soldering irons**.

These requirements do not apply to appliances complying with test of Clause 11 without a stand.

Compliance is checked by inspection and by the test of Clause 11.

22.102 Desoldering irons shall incorporate a device for collecting the solder.

Compliance is checked by inspection.

22.103 Soldering guns shall incorporate a **biased-off switch**.

Compliance is checked by inspection.

22.104 Thermoplastic conduit-welding tools shall incorporate a timer that provides **all-pole disconnection** of the welding circuit and has to be reset before a further operation.

Repetition of the welding operation on the same fitting shall be prevented, such as an appliance that has to be disconnected from the supply mains or from the fitting before restarting the welding operation.

Compliance is checked by inspection.

22.105 Thermoplastic conduit-welding tools shall be constructed so that the connecting terminals are supplied with **extra-low voltage** not exceeding 24 V when the appliance is operated without fittings.

Compliance is checked by measurement.

22.106 Fittings for **thermoplastic conduit-welding tools** shall be constructed so that at least **basic insulation** is provided on surfaces that are only accessible before the fitting is placed on the conduit.

Compliance is checked by inspection.

22.107 Class III dehorning tools shall be supplied with a transformer.

Compliance is checked by inspection.

23 Internal wiring

This clause of Part 1 is applicable.

24 Components

This clause of Part 1 is applicable except as follows.

24.1.3 *Addition:*

Switches incorporated in the hand-held part of appliances not intended exclusively for household use are subjected to 50 000 cycles of operation.

25 Supply connection and external flexible cords

This clause of Part 1 is applicable except as follows.

25.5 *Addition:*

Type Z attachment is allowed for

– **class III appliances**;

– other appliances, unless they have a polyvinyl chloride sheathed cord and the temperature rise of **accessible metal parts** exceeds 75 K.

25.7 *Addition:*

Light polyvinyl chloride sheathed cords may be used for **class III appliances** and other **hand-held appliances**, regardless of the mass of the appliance.

Polyvinyl chloride sheathed cords may be used for **hand-held appliances** having a **rated power input** not exceeding 100 W and a mass, excluding the mass of the **supply cord**, not exceeding 100 g, and for appliances provided with a **biased-off switch**, regardless of the temperature rise of external metal parts.

Polyvinyl sheathed cords are not allowed for **thermoplastic conduit-welding tools** and **firelighters**.

The **supply cord** of **class II dehorning tools** shall be polychloroprene sheathed and not be lighter than heavy polychloroprene sheathed cord (code designation 60245 IEC 66).

25.8 *Addition:*

The length of the **supply cord** shall be at least

– 1,5 m, for **firelighters**;

– 6 m, for **class II dehorning tools**.

25.15 *Addition:*

*For **hand-held appliances** with a mass of no more than 0,3 kg, the pull force is 15 N and the torque is 0.05 Nm.*

25.23 *Addition:*

The length of the **interconnection cord** of **class III dehorning tools** shall be at least 4 m.

26 Terminals for external conductors

This clause of Part 1 is applicable.

27 Provision for earthing

This clause of Part 1 is applicable except as follows.

27.2 *Addition:*

NOTE 101 **Class II soldering irons** and **class II soldering guns** used for soldering electronic equipment can have an equipotential bonding terminal for which the dimensional requirements are not 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.

29.3 *Modification:*

Replace the second dashed item of the test specification by the following:

– *by an electric strength test in accordance with 29.3.2, if the insulation consists of more than one separate layer, or*

29.3.2 *Replacement:*

Each layer of material, other than natural mica and similar flaky material, shall withstand the electric strength test of 16.3 for ***supplementary insulation****.* ***Supplementary insulation*** *shall consist of at least 2 layers of material and* ***reinforced insulation*** *of at least 3 layers.*

If natural mica in thin sheet form is used,

– *for* ***supplementary insulation****, there shall be at least six layers, and any three layers together shall withstand the electric strength test of 16.3* ***for supplementary insulation****;*
– *for* ***reinforced insulation****, there shall be at least ten layers, and any five layers together shall withstand the electric strength test of 16.3 for* ***reinforced insulation****.*

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:

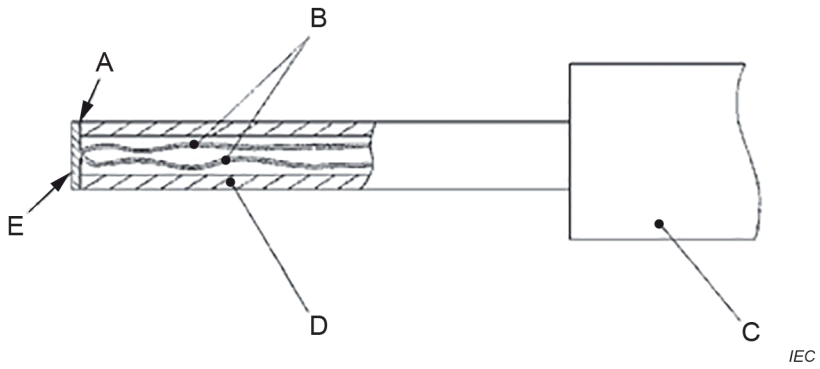
– *for* ***contact firelighters****, 30.2.3 is applicable;*
– *for other appliances, 30.2.2 is applicable.*

31 Resistance to rusting

This clause of Part 1 is applicable.

32 Radiation, toxicity and similar hazards

This clause of Part 1 is applicable.



Key

A adhesive

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

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

D polycarbonate tube: inside diameter 3 mm, outside diameter 5 mm

E tinned copper disc: 5 mm diameter, 0,5 mm thick with a flat contact face

Figure 101 – Probe for measuring surface temperatures

Annexes

The annexes of Part 1 are applicable except as follows.

Annex A
(informative)

Routine tests

This annex of Part 1 is applicable except as follows.

A.3 Electric strength test

Addition:

*An electric strength test is carried out between the input and output circuits of appliances incorporating a **safety isolating transformer**, the test voltage being*

– *2 000 V, for heating tools having a **rated voltage** not exceeding 150 V;*
– *2 500 V, for other heating tools.*

Annex B
(normative)

Battery-operated appliances, separable batteries and detachable batteries for battery-operated appliances

This annex of Part 1 is applicable except as follows.

B.11.1 *Addition*:

*The appliance is operated for the duration specified in 11.7 or until it no longer operates due to depletion of the **battery**, whichever occurs first.*

Bibliography

The Bibliography of Part 1 is applicable except as follows.

Addition:

IEC 60745 (all parts), *Hand-held motor-operated electric tools – Safety*

IEC 61029 (all parts), *Safety of transportable motor-operated electric tools*

IEC 62841 (all parts), *Electric motor-operated hand-held tools, transportable tools and lawn and garden machinery*

ISO 13732-1, *Ergonomics of the thermal environment – Methods for the assessment of human responses to contact with surfaces – Part 1: Hot surfaces*

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SOMMAIRE

COMMISSION ÉLECTROTECHNIQUE INTERNATIONALE

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APPAREILS ÉLECTRODOMESTIQUES ET ANALOGUES – SÉCURITÉ –

Partie 2-45: Exigences particulières pour les outils chauffants mobiles et appareils analogues

AVANT-PROPOS

1) La Commission Électrotechnique Internationale (IEC) est une organisation mondiale de normalisation composée de l'ensemble des comités électrotechniques nationaux (Comités nationaux de l'IEC). L'IEC a pour objet de favoriser la coopération internationale pour toutes les questions de normalisation dans les domaines de l'électricité et de l'électronique. À cet effet, l'IEC – entre autres activités – publie des Normes internationales, des Spécifications techniques, des Rapports techniques, des Spécifications accessibles au public (PAS) et des Guides (ci-après dénommés "Publication(s) de l'IEC"). Leur élaboration est confiée à des comités d'études, aux travaux desquels tout Comité national intéressé par le sujet traité peut participer. Les organisations internationales, gouvernementales et non gouvernementales, en liaison avec l'IEC, participent également aux travaux. L'IEC collabore étroitement avec l'Organisation Internationale de Normalisation (ISO), selon des conditions fixées par accord entre les deux organisations.
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8) L'attention est attirée sur les références normatives citées dans cette publication. L'utilisation de publications référencées est obligatoire pour une application correcte de la présente publication.
9) L'IEC attire l'attention sur le fait que la mise en application du présent document peut entraîner l'utilisation d'un ou de plusieurs brevets. L'IEC ne prend pas position quant à la preuve, à la validité et à l'applicabilité de tout droit de brevet revendiqué à cet égard. À la date de publication du présent document, l'IEC n'a pas reçu notification qu'un ou plusieurs brevets pouvaient être nécessaires à sa mise en application. Toutefois, il y a lieu d'avertir les responsables de la mise en application du présent document que des informations plus récentes sont susceptibles de figurer dans la base de données de brevets, disponible à l'adresse https://patents.iec.ch. L'IEC ne saurait être tenue pour responsable de ne pas avoir identifié de tels droits de brevets.

L'IEC 60335-2-45 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 quatrième édition annule et remplace la troisième édition parue en 2002, l'Amendement 1:2008 et l'Amendement 2:2011. Cette édition constitue une révision technique.

Cette édition inclut les modifications techniques majeures suivantes par rapport à l'édition précédente:

a) texte aligné sur l'IEC 60335-1:2020;

b) suppression ou transformation de certaines notes en texte normatif (Article 1 et paragraphes 5.2, 15.101, 22.105, 25.7);

c) des limites de température ont été introduites pour les surfaces accessibles extérieures, notamment par l'ajout d'exigences pour les surfaces fonctionnelles et les surfaces chaudes (3.6.101, 7.1, 7.6, 7.12, 7.14, 7.15, 11.3, 11.8).

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

Projet	Rapport de vote
61/7296/FDIS	61/7341/RVD

Le rapport de vote indiqué dans le tableau ci-dessus donne toute information sur le vote ayant abouti à son approbation.

La langue employée pour l'élaboration de cette Norme internationale est l'anglais.

Ce document a été rédigé selon les Directives ISO/IEC, Partie 2, il a été développé selon les Directives ISO/IEC, Partie 1 et les Directives ISO/IEC, Supplément IEC, disponibles sous www.iec.ch/members_experts/refdocs. Les principaux types de documents développés par l'IEC sont décrits plus en détail sous www.iec.ch/publications.

Une liste de toutes les parties de la série IEC 60335, publiées sous le titre général: *Appareils électrodomestiques et analogues – Sécurité*, se trouve sur le site web de l'IEC.

La présente partie 2 doit être utilisée conjointement avec la dernière édition de l'IEC 60335-1 et ses amendements sauf si cette édition l'exclut; dans ce cas, la dernière édition qui n'exclut pas la présente partie 2 est utilisée. Elle a été établie sur la base de la sixième édition (2020) de cette norme.

NOTE 1 L'expression "la Partie 1" utilisée dans la présente norme fait référence à l'IEC 60335-1.

La présente partie 2 complète ou modifie les articles correspondants de l'IEC 60335-1, de façon à transformer cette publication en norme IEC: Exigences particulières pour les outils chauffants mobiles et appareils analogues.

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;

– notes: 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 figurant en caractères **gras** dans le texte sont définis à l'Article 3. Lorsqu'une définition concerne un adjectif, l'adjectif et le nom associé figurent également en gras.

Les différences suivantes existent dans les pays indiqués ci-après.

– 6.1: Les appareils de la classe 0 sont admis si leur tension assignée ne dépasse pas 150 V, et les appareils de la classe 0I sont admis (Japon).

– 25.7: La modification ne s'applique pas (Japon).

Le comité a décidé que le contenu de ce document ne sera pas modifié avant la date de stabilité indiquée sur le site web de l'IEC sous webstore.iec.ch dans les données relatives au document recherché. À cette date, le document sera

- reconduit,
- supprimé, ou
- révisé.

NOTE 4 L'attention des Comités nationaux est attirée sur le fait que les fabricants d'appareils et les organismes d'essai peuvent avoir besoin d'une période transitoire après la publication d'une nouvelle publication IEC, ou d'une publication amendée ou révisée, pour fabriquer des produits conformes aux nouvelles exigences et pour adapter leurs équipements aux nouveaux essais ou aux essais révisés.

INTRODUCTION

Il a été admis par hypothèse, en établissant la présente Norme internationale, que l'exécution de ses dispositions était confiée à des personnes expérimentées et ayant une qualification appropriée.

Les documents de recommandations concernant l'application des exigences de sécurité pour les appareils peuvent être consultés dans les documents de support du CE 61, accessibles sur le site web de l'IEC à l'adresse:

https://www.iec.ch/tc61/supportingdocuments

Cette information est donnée à l'intention des utilisateurs de la présente Norme internationale et ne constitue nullement un remplacement du texte normatif de la présente norme.

La présente norme reconnaît le niveau de protection internationalement accepté contre les risques électriques, mécaniques, thermiques, liés au feu et au rayonnement des appareils, lorsqu'ils fonctionnent comme en usage normal en tenant compte des instructions du fabricant. Elle couvre également les situations anormales auxquelles on peut s'attendre dans la pratique et elle tient compte de la façon dont les phénomènes électromagnétiques peuvent affecter le fonctionnement sûr des appareils.

La présente norme tient compte autant que possible des exigences de l'IEC 60364, de façon à rester compatible avec les règles d'installation quand l'appareil est raccordé au réseau d'alimentation. Cependant, les 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 de l'aptitude à la fonction;
– les normes CISPR 11, CISPR 14-1 et les normes applicables de la série IEC 61000-3 concernant les émissions électromagnétiques;
– la norme CISPR 14-2 concernant l'immunité électromagnétique;
– les normes IEC publiées par le comité d'études 111 concernant l'environnement.

APPAREILS ÉLECTRODOMESTIQUES ET ANALOGUES – SÉCURITÉ –

Partie 2-45: Exigences particulières pour les outils chauffants mobiles et appareils analogues

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 **outils électriques chauffants mobiles** et appareils analogues dont la **tension assignée** est inférieure ou égale à 250 V, y compris les appareils alimentés en courant continu et les **appareils alimentés par batteries**.

Les appareils non destinés à un usage domestique normal, mais qui peuvent néanmoins constituer une source de danger pour le public, tels que les appareils destinés à être utilisés par des usagers non avertis dans des magasins, chez des artisans et dans des fermes, sont compris dans le domaine d'application de la présente norme.

Les appareils qui peuvent également être utilisés lorsqu'ils sont montés sur un support sont compris dans le domaine d'application de la présente norme.

La liste suivante répertorie les exemples d'appareils qui relèvent du domaine d'application de la présente norme

– Les **fers à marquer**.
– Les **pyrograveurs**.
– Les **outils à souder les conduits**.
– Les **appareils à décorner les animaux**.
– Les **fers à dessouder**.
– Les **appareils à allumer le feu**.
– Les pistolets à colle.
– **Les pistolets à air chaud**.
– Les **appareils à souder les films à usage domestique**.
– Les **appareils de décapage de la peinture**.
– Les outils à couper le plastique.
– Les **fers instantanés**.
– Les **fers à souder**.
– Les pinces à dénuder.
– Les **outils à souder les conduits thermoplastiques**.

Dans la mesure du possible, la présente norme traite des dangers courants présentés par les appareils, encourus par tous les individus à l'intérieur et autour de l'habitation. Cependant, elle ne tient en général pas compte

– Des personnes (y compris des enfants) dont
  - Les capacités physiques, sensorielles ou mentales. ou
  - Le manque d'expérience et de connaissance.

  Les empêchent d'utiliser l'appareil en toute sécurité sans surveillance ou instruction.
– De l'utilisation de l'appareil comme jouet par des enfants.

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 analogues.

La présente norme ne s'applique pas:

– Aux outils électroportatifs à moteur (série IEC 60745, série IEC 62841).
– Aux machines-outils électriques semi-fixes (série IEC 61029, série IEC 62841).
– Aux appareils prévus exclusivement pour des usages industriels.
– Aux appareils destinés à être utilisés dans des locaux qui présentent des conditions particulières, telles que la présence d'une atmosphère corrosive ou explosive (poussière, vapeur ou gaz).
– Aux outils qui utilisent du chauffage haute fréquence autres que les **fers à souder à induction**.
– Aux matériels de soudage à l'arc.

2 Références normatives

L'article de la Partie 1 s'applique avec l'exception suivante.

Addition:

IEC 60584-1, *Couples thermoélectriques – Partie 1: Spécifications et tolérances en matière de FEM*

3 Termes et définitions

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

3.1 Définitions relatives aux caractéristiques physiques

3.1.9 *Modification:*
conditions de fonctionnement normal

Remplacer le premier alinéa par ce qui suit:

fonctionnement des appareils dans les conditions suivantes:

Les appareils qui possèdent un support sont mis en fonctionnement sur leur support, sauf spécification contraire.

Les autres appareils sont mis en fonctionnement conformément aux instructions, sauf spécification contraire.

Les **fers instantanés** et les outils à couper le plastique qui comportent un **interrupteur sans verrouillage** sont mis en fonctionnement en cycles conformément aux instructions, mais ils sont mis sous tension pendant au moins 12 s, avec des périodes de repos qui ne dépassent pas 48 s. Pour les **fers instantanés**, la période de marche est telle que la température à l'extrémité est d'au moins 300 °C à la fin de la première période de marche.

Les **appareils à souder les films à usage domestique** sont mis en fonctionnement en cycles conformément aux instructions, mais ils sont mis sous tension au moins pendant le temps nécessaire pour souder ensemble deux feuilles de film plastique, avec des périodes de repos qui ne dépassent pas 2 min. Le film plastique est en polyéthylène à haute pression (polyéthylène basse densité), chaque feuille ayant une épaisseur de 50 µm.

Les **pistolets à air chaud** sont mis en fonctionnement avec le flux d'air horizontal.

Les **appareils à allumer le feu** sont mis en fonctionnement pour enflammer du charbon de bois placé dans un récipient avec un diamètre de 600 mm et un bord de 50 mm de hauteur. Le tas de charbon de bois présente un diamètre de 500 mm et une hauteur de 100 mm en son centre.

Les **appareils à allumer le feu par contact** sont placés avec l'élément chauffant horizontal et inséré au centre du charbon.

Les **appareils à allumer le feu à air chaud** sont placés de façon telle que le flux d'air soit horizontal ou, si la construction le permet, dirigé vers le bas jusqu'à 45° , si cette position est plus défavorable.

3.5 Définitions relatives aux types d'appareils

3.5.101
fer à marquer
appareil pour marquer le bois, le cuir et autres matériaux au moyen d'une empreinte métallique chauffée

3.5.102
pyrograveur
appareil pour marquer le bois, le cuir et autres matériaux au moyen d'une extrémité chauffée

3.5.103
outil à souder les conduits
appareil pour raccorder des tuyauteries métalliques au moyen de soudures

3.5.104
appareil à décorner les animaux
appareil pour brûler les bourgeons des cornes

3.5.105
fer à dessouder
appareil pour faire fondre et enlever les soudures

3.5.106
appareil à allumer le feu
appareil pour enflammer des combustibles solides tels que le charbon de bois ou le bois

3.5.107
appareil à allumer le feu par contact
appareil à allumer le feu qui comporte un élément chauffant qui est en contact direct avec le combustible

3.5.108
appareil à allumer le feu à air chaud
appareil à allumer le feu qui comporte un ventilateur et un élément chauffant et qui souffle de l'air chaud sur le combustible

3.5.109
pistolet à air chaud
appareil qui produit un jet d'air chaud

Note 1 à l'article: Les **pistolets à air chaud** peuvent être utilisés pour faire fondre des matériaux ou pour ramollir la peinture ou la matière plastique.

3.5.110
appareil à souder les films à usage domestique
appareil à usage domestique seulement, utilisé pour souder ou pour couper de fines feuilles thermoplastiques au moyen de parties chauffées électriquement entre lesquelles le matériau est serré

Note 1 à l'article: Les **appareils à souder les films à usage domestique** peuvent être équipés d'un dispositif d'aspiration pour évacuer l'air d'un sac avant la soudure.

3.5.111
appareil de décapage de la peinture
appareil qui utilise de l'air chaud pour ramollir la peinture

Note 1 à l'article: Un **appareil de décapage de la peinture** peut comporter un racloir.

3.5.112
fer instantané
appareil qui comporte un transformateur, la panne faisant partie du circuit secondaire

3.5.113
fer à souder
appareil qui comporte une extrémité chauffée pour la soudure

3.5.114
outil à souder les conduits thermoplastiques
appareil pour souder les conduits en faisant fondre partiellement le matériau thermoplastique d'un accessoire séparé

Note 1 à l'article: L'accessoire comporte un fil chauffant incorporé et n'est utilisé qu'une seule fois.

3.5.115
fer à souder à induction
fer à souder qui chauffe la panne au moyen de courants de Foucault par induction haute fréquence

Note 1 à l'article: Les courants de Foucault sont induits dans la panne ou l'élément chauffant par le champ électromagnétique d'une bobine.

3.6 Définitions relatives aux parties d'appareils

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: L'extrémité chauffée d'un fer à souder constitue un exemple.

3.7 Définitions relatives aux composants de sécurité

3.7.101
interrupteur sans verrouillage
interrupteur qui revient automatiquement en position arrêt lorsque son organe de manœuvre est relâché

4 Exigence générale

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 échantillon supplémentaire d'**appareil à allumer le feu par contact** est exigé pour l'essai du 21.102.

6 Classification

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

6.1 *Modification:*

Remplacer le premier alinéa par ce qui suit:

Les **appareils à décorner les animaux** doivent être de la **classe II** ou de la **classe III**.

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

6.2 *Addition:*

Les **appareils à décorner les animaux de la classe II** et les transformateurs utilisés pour les **appareils à décorner les animaux de la classe III** doivent être au moins IPX4.

Les **outils à souder les conduits** et les **outils à souder les conduits thermoplastiques** doivent être au moins IPX4.

Les **appareils de décapage de la peinture portatifs** pour usage à l'extérieur doivent être au moins IPX4, sauf si les instructions indiquent qu'ils ne doivent pas être entreposés ou laissés à l'extérieur, auquel cas ils peuvent être IPX0.

7 Marquage et instructions

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

7.1 *Addition:*

Les **appareils à allumer le feu par contact** doivent porter le marquage de la limite d'insertion dans le combustible.

Les **appareils à allumer le feu par contact** qui ne sont pas au moins IPX4 doivent porter, en substance, l'indication suivante:

Ne pas exposer à la pluie ou à l'humidité.

Les **outils à souder les conduits thermoplastiques** doivent porter le marquage des types d'accessoires avec lesquels ils doivent être utilisés et des réglages correspondants. Chaque accessoire doit porter le marquage du type d'appareil avec lequel il doit être utilisé et de sa propre référence de type.

Si des appareils possèdent des **surfaces accessibles** extérieures, pour lesquelles des limites d'échauffement sont spécifiées dans le Tableau 101 et pour lesquelles les dispositions de la note de bas de tableau b du Tableau 101 s'appliquent, l'appareil doit porter un marquage sur lequel est apposé le symbole IEC 60417-5041(2002-10), ou qui comporte en substance l'indication suivante:

ATTENTION: Surfaces très chaudes.

7.6 *Addition:*

[symbole IEC 60417-5041 (2002-10)] attention, surface très chaude

7.12 *Addition:*

Les instructions des appareils qui possèdent un support séparé et qui ne comportent pas d'**interrupteur sans verrouillage** doivent indiquer, en substance:

MISE EN GARDE: Cet outil doit être placé sur son support lorsqu'il n'est pas utilisé.

Les instructions des **appareils à décorner les animaux de la classe III** doivent indiquer, en substance:

MISE EN GARDE: N'utiliser que le transformateur fourni avec l'appareil.