

# 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](https://standards.iteh.ai/standards/iec/60335-2-45:2024)

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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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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](http://www.iec.ch/members_experts/refdocs). The main document types developed by IEC are described in greater detail at [www.iec.ch/publications](http://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](https://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.

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## INTRODUCTION

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

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

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

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

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

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

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

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

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

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

NOTE 2 Horizontal publications, basic safety publications and group safety publications covering a hazard are not applicable since they have been taken into consideration when developing the general and particular requirements for the IEC 60335 series of standards.

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

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

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

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

## HOUSEHOLD AND SIMILAR ELECTRICAL APPLIANCES – SAFETY –

### Part 2-45: 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 knowledgeprevents them from using the appliance safely without supervision or instruction;
- children playing with the appliance.

Attention is drawn to the fact that

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

This standard does not apply to:

- 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;