

# INTERNATIONAL STANDARD

## NORME INTERNATIONALE

**Household and similar electrical appliances – Safety –  
Part 2-9: Particular requirements for grills, toasters and similar portable cooking  
appliances**

**Appareils électrodomestiques et analogues – Sécurité –  
Partie 2-9: Exigences particulières pour les grils, les grille-pain et les appareils  
de cuisson mobiles analogues**



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IEC Central Office  
3, rue de Varembe  
CH-1211 Geneva 20  
Switzerland

Tel.: +41 22 919 02 11  
[info@iec.ch](mailto:info@iec.ch)  
[www.iec.ch](http://www.iec.ch)

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INTERNATIONAL  
ELECTROTECHNICAL  
COMMISSION

COMMISSION  
ELECTROTECHNIQUE  
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# INTERNATIONAL ELECTROTECHNICAL COMMISSION

## HOUSEHOLD AND SIMILAR ELECTRICAL APPLIANCES – SAFETY –

### Part 2-9: Particular requirements for grills, toasters and similar portable cooking 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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International Standard IEC 60335-2-9 has been prepared by IEC technical committee 61: Safety of household and similar electrical appliances.

This seventh edition cancels and replaces the sixth edition published in 2008, Amendment 1: 2012 and Amendment 2:2016. This edition constitutes a technical revision.

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

- aligns the text with IEC 60335-1, Ed 5, and its Amendments 1 and 2;
- revises the abnormal tests for a toaster (19.11.2, 19.102).

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

FDIS	Report on voting
61/5797/FDIS	61/5838/RVD

Full information on the voting for the approval of this International Standard can be found in the report on voting indicated in the above table.

This document has been drafted in accordance with the ISO/IEC Directives, Part 2.

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

This part 2 is to be used in conjunction with the latest edition of IEC 60335-1 and its amendments. It was established on the basis of the fifth edition (2010) 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: *Safety requirements for grills, toasters and similar portable cooking 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 committee has decided that the contents of this document will remain unchanged until the stability date indicated on the IEC website under "<http://webstore.iec.ch>" in the data related to the specific document. At this date, the document will be

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

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

It is the recommendation of the committee that the content of this publication be adopted for implementation nationally not earlier than 12 months nor later than 36 months from the date of its publication.

The following differences exist in the countries indicated below:

- 3.1.9: Different loads and test methods are used (USA).
- 5.101: If the appliance incorporates a motor, the motor is tested at rated voltage (USA).
- 7.12: Identification of the connector is to be marked on the appliance (USA).
- 11.2: 9,5 mm thick plywood is used for the test corner (USA).
- 11.7: The test duration is based on the quantity of food (USA).
- 11.8: A temperature rise of 100 K is allowed for the wall of the test corner (USA).
- 11.101: There are no surface temperature limits on toasters having a metallic enclosure unless they are under cabinet or wall mounted, in which case it is allowed for the temperatures to reach 100 °C if a proper marking is provided (USA).
- 15.2: A different solution is used and the test is not carried out on ovens, hotplates or cookers (USA).
- 15.101: Appliances are immersed to the marked level only (USA).
- 19.2: A 300 mm deep simulated cabinet is located 400 mm above the countertop (USA).
- 19.2: The test is different. Additional tests are carried out on hotplates and cookers (USA):
- 19.101: Different test methods and numbers of cycles are used (USA).
- 19.102: A combustible cloth is placed above the toaster and the residual bread is left in place (USA).
- 19.104: Disks having different sizes are used (USA).
- 20.101: The test is not carried out (USA).
- 21.101: The test is different (USA).
- 22.105: The requirement is not applicable (USA).
- 22.108: The test is different (USA).
- 22.110: The test is different (USA).
- 22.111: The test is not carried out (USA).
- 22.112: The test is not carried out (USA).
- 24.1.3: The test is not carried out (USA).
- 24.101: The test is not carried out (USA).
- 25.7: The free length of the supply cord is specified; in some cases, it is 1,8 m to 2,1 m for appliances intended to be connected to fixed socket-outlets, while in others it is 0,6 m to 2,1 m for appliances normally used on a table or similar surface (USA).

## 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.

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

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

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

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

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

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

NOTE 2 Horizontal and generic standards 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.

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 which 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.

# HOUSEHOLD AND SIMILAR ELECTRICAL APPLIANCES – SAFETY –

## Part 2-9: Particular requirements for grills, toasters and similar portable cooking appliances

### 1 Scope

This clause of Part 1 is replaced by the following.

This International Standard deals with the safety of electric **portable appliances** for household and similar purposes that have a cooking function such as baking, roasting and grilling, their **rated voltage** being not more than 250 V.

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

- **barbecues** for indoor use;
- **breadmakers**;
- **candy floss appliances**;
- **contact grills** (griddles);
- **cookers**;
- **food dehydrators**;
- **hotplates**;
- **induction wok hotplates**;
- **pop-corn makers**;
- **portable ovens**;
- **raclette grills**;
- **radiant grills**;
- **roasters**;
- **rotary grills**;
- **rotisseries**;
- **toasters**;
- **waffle irons**;

Examples are illustrated in Figure 101.

Appliances intended for normal household and similar use and that may also be used by laymen in shops, in light industry and on farms, are within the scope of this standard. However, if the appliance is intended to be used professionally to process food for commercial consumption, the appliance is not considered to be for household and similar use only.

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

- persons (including children) whose
  - physical, sensory or mental capabilities; or
  - lack of experience and knowledgeprevents them from using the appliance safely without supervision or instruction;
- children playing with the appliance.

NOTE 102 Attention is drawn to the fact that

- for appliances intended to be used in vehicles or on board ships or aircraft, additional requirements could 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

- **stationary ovens** and **stationary grills** (IEC 60335-2-6);
- warming plates (IEC 60335-2-12);
- frying pans and deep fat fryers (IEC 60335-2-13);
- microwave ovens (IEC 60335-2-25);
- barbecues for outdoor use (IEC 60335-2-78);
- appliances intended to burn charcoal or similar combustible fuels;
- appliances intended for commercial catering;
- 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).

## 2 Normative references

This clause of part 1 is applicable except as follows.

*Replacement:*

IEC 60320-1:2015, *Appliance couplers for household and similar general purposes – Part 1: General requirements*

*Addition:*

IEC 60068-2-52, *Environmental testing – Part 2: Tests – Test Kb: Salt mist, cyclic (sodium chloride solution)*

IEC 60320-3, *Appliance couplers for household and similar general purposes – Part 3: Standard sheets and gauges*

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

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

## 3 Terms and definitions

This clause of Part 1 is applicable except as follows.

### 3.1 Definitions relating to physical characteristics

*Replacement:*

#### 3.1.9

##### **normal operation**

operation of the appliance as specified in the following subclauses:

Note 1 to entry: Appliances not mentioned, but which nevertheless perform one of the functions, are operated as specified for this function as far as possible.

**3.1.9.101 Barbecues** are operated with food supports in the lowest position. Controls are adjusted to the highest setting, any covers or shields being positioned in accordance with the instructions.

Note 1 to entry: **Barbecues** are operated without water even if the use of water is recommended.

**3.1.9.102 Breadmakers** are operated using the most unfavourable cycle and ingredients specified in the instructions.

Note 1 to entry: The most unfavourable cycle may be for a function such as jam-making that allows the heating element and the kneading motor to operate simultaneously.

**3.1.9.103 Candy floss appliances** are operated without ingredients.

**3.1.9.104 Food dehydrators** are operated empty.

**3.1.9.105 Hotplates**, other than **induction hotplates**, are operated with vessels containing water. The vessels are made of unpolished commercial quality aluminium, have a flat bottom and are covered with a lid. A suitable vessel is specified in Figure 103. Controls are adjusted to their highest setting until the water boils and then adjusted so that the water simmers. Water is added to maintain the level during simmering.

**Induction hot plates** are operated with vessels as specified in Figure 104, containing cooking oil. Controls are adjusted to their highest setting until the oil temperature reaches  $180\text{ °C} \pm 4\text{ °C}$ , and are then adjusted so that this temperature is maintained. The oil temperature is measured 1 cm above the centre of the bottom of the vessel. For appliances which cannot heat the oil to  $180\text{ °C} \pm 4\text{ °C}$ , the control is maintained at its highest setting.

**Induction wok hotplates** are operated with a wok pan supplied by the manufacturer with the **induction wok hotplate** at the point of sale.

For all **hotplates**, the diameter of the bottom of the vessel is approximately equal to the diameter of the **cooking zone** and the quantity of liquid is specified in Table 101. The vessel is positioned centrally on the **cooking zone**.

**Table 101 – Quantity of liquid in the vessel**

Diameter of cooking zone mm	Quantity of water or oil l
≤ 110	0,6
> 110 and ≤ 145	1,0
> 145 and ≤ 180	1,5
> 180 and ≤ 220	2,0
> 220 and ≤ 300	3,0

Note 1 to entry: If several **cooking zones** are marked for one **hotplate**, the most unfavourable zone is used for the test.

Note 2 to entry: For non-circular **cooking zones**, the smallest non-circular vessel is used that will cover the **cooking zone** as far as possible, taking into account the **hob** rim and other vessels. The quantity of liquid is determined on the basis of the minor diameter of the **cooking zone**.

**3.1.9.106 Ovens** are operated with the door or drawer closed. **Ovens** having a **thermostat** are operated so that the mean temperature in the centre of the cavity is maintained at  $240\text{ °C} \pm 4\text{ °C}$  or at the value obtained with the **thermostat** adjusted to its highest setting, if this results in a lower temperature. Other **ovens** are operated so that the temperature in the centre of the cavity is maintained at  $240\text{ °C} \pm 15\text{ °C}$  by switching the supply on and off.

**3.1.9.107 Pop-corn makers** are operated with the container filled with the maximum quantity of corn seeds specified in the instructions and, where relevant, with the maximum quantity of oil specified in the instructions.

**3.1.9.108 Roasters** are operated with the lid closed. The mean temperature in the centre of the container is maintained at  $240\text{ °C} \pm 4\text{ °C}$ , if necessary by switching the supply on and off.

**3.1.9.109 Radiant grills** and **rotary grills** are operated with the controls adjusted in accordance with the instructions or, if instructions are not provided, with the controls adjusted to the highest setting. Doors or lids are open unless otherwise specified in the instructions.

**Contact grills** having a **thermostat** are operated with the **thermostat** adjusted to the highest setting. Other **contact grills** are operated so that the temperature at the centre of the heated surface is maintained at  $275\text{ °C} \pm 15\text{ °C}$  by switching the supply on and off.

**Raclette grills** are operated with doors or lids open, unless otherwise specified in the instructions. Controls are adjusted in accordance with the instructions, pans being in position or removed, whichever is more unfavourable.

**3.1.9.110 Raclette appliances** are operated with the controls adjusted in accordance with the instructions or, if instructions are not provided, with the controls adjusted to the highest setting.

**3.1.9.111 Rotary grills** are operated with the load on the rotating spit shown in Figure 102.

**3.1.9.112 Toasters** are loaded with the maximum number of slices of white bread specified in the instructions and operated in cycles, each cycle consisting of an operating period and a rest period. The bread is approximately 24 h old and the dimensions of the slices are approximately  $100\text{ mm} \times 100\text{ mm} \times 10\text{ mm}$ . The rest periods have a duration of 30 s or the minimum period needed for the resetting of a control, whichever is longer. The slices of bread are replaced during each rest period. The operating period is established by adjusting controls to give the bread a golden-brown colour. For **toasters** without a control, each operating period is terminated as soon as the colour of the bread turns golden-brown.

**Toasters** incorporating a device for heating rolls are loaded with the maximum number of rolls specified in the instructions. The **toaster** is operated in cycles, each cycle consisting of an operating period followed by a rest period of 30 s when the rolls are turned or replaced. The control is adjusted in accordance with the instructions. If instructions are not given, the control is adjusted for the toasting operation.

**Sandwich-toasting attachments** are loaded with one or more sandwiches that are positioned in accordance with the instructions to produce the most unfavourable result. Each sandwich comprises two slices of white bread filled with a single slice of suitable cheese having an area equal to a slice of bread and a thickness of approximately 5 mm. The toaster is then operated in accordance with the instructions in cycles, each cycle consisting of a toasting operation followed by a rest period of 30 s, or the minimum period needed for the resetting of a control, whichever is longer.

Note 1 to entry: Processed cheese and other cheeses that readily melt when heated are suitable.

**3.1.9.113 Waffle irons** having a **thermostat** are operated with the **thermostat** adjusted to the highest setting. Other **waffle irons** are operated so that the temperature at the centre of the heated surface is maintained at  $210\text{ °C} \pm 15\text{ °C}$  by switching the supply on and off.

### 3.5 Definitions relating to types of appliances

#### 3.5.101

##### **barbecue**

**radiant grill** having a heating element located under the food support

#### 3.5.102

##### **breadmaker**

appliance intended for making bread comprising a heated compartment incorporating dough kneading facilities

#### 3.5.103

##### **candy floss appliance**

appliance comprised of a heater and a spinning head intended for preparing candy floss

#### 3.5.104

##### **contact grill**

appliance having a heated surface on which food is placed, which can have a second heated surface to cover the food

Note 1 to entry: A **contact grill** with only one heated surface is known as a "griddle".

Note 2 to entry: A sandwich maker is considered as a **contact grill** with two heated surfaces.

#### 3.5.105

##### **cooker**

appliance incorporating a **hotplate** and an **oven**

Note 1 to entry: **Cookers** may incorporate a grill.

#### 3.5.106

##### **food dehydrator**

appliance for dehydrating food by means of heated air

Note 1 to entry: The appliance may incorporate a fan.

#### 3.5.107

##### **hotplate**

appliance having one or more **heating units** on which vessels can be placed for cooking purposes

Note 1 to entry: **Hotplates** do not incorporate an **oven** or grill.

#### 3.5.108

##### **induction hotplate**

**hotplate** that can heat at least one metallic vessel by means of eddy currents

Note 1 to entry: The eddy currents are induced in the bottom of the vessel by the electromagnetic field of a coil.

#### 3.5.109

##### **induction wok hotplate**

**induction hotplate** with a surface of an approximate spherical shape to accept a wok that is supplied with the appliance at the point of sale

#### 3.5.110

##### **oven**

appliance having a heated cavity with a door or drawer and constructed so that food that may be in a container can be placed on a shelf

**3.5.111****pop-corn maker**

appliance for heating corn seeds until they pop

**3.5.112****raclette appliance**

**radiant grill** for melting the surface of a large piece of cheese

**3.5.113****raclette grill**

appliance for melting slices of cheese placed in small pans positioned under the heating element

Note 1 to entry: **Raclette grills** may have a surface that is used as a griddle.

**3.5.114****radiant grill**

appliance having a **visibly glowing heating element** and a support on which food can be placed

**3.5.115****roaster**

appliance having a heated container with a lid and constructed so that food can be placed in it

**3.5.116****rotary grill**

appliance having a **visibly glowing heating element** and a rotating spit to support the food

Note 1 to entry: A **rotary grill** is also known as a "rotisserie".

**3.5.117****toaster**

appliance intended for toasting slices of bread by radiant heat

**3.5.118****waffle iron**

appliance having two heated hinged plates that are shaped to contain batter

**3.6 Definitions relating to parts of an appliance****3.6.101****cooking zone**

area marked on a **hotplate** where the vessel is placed for heating food

**3.6.102****heating unit**

part of the appliance that fulfils an independent cooking or warming function

**3.6.103****hot functional surface**

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

**3.6.104****sandwich-toasting attachment**

accessory for use with a **toaster** for toasting sandwiches