

# INTERNATIONAL STANDARD



**Household and similar electrical appliances – Safety –  
Part 2-36: Particular requirements for commercial electric cooking ranges,  
ovens, hobs and hob elements**

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IEC 60335-2-36

Edition 7.0 2021-12  
COMMENTED VERSION

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INTERNATIONAL  
ELECTROTECHNICAL  
COMMISSION

ICS 97.040.20

ISBN 978-2-8322-4061-8

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## INTERNATIONAL ELECTROTECHNICAL COMMISSION

### HOUSEHOLD AND SIMILAR ELECTRICAL APPLIANCES – SAFETY –

#### Part 2-36: Particular requirements for commercial electric cooking ranges, ovens, hobs and hob elements

#### FOREWORD

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**This commented version (CMV) of the official standard IEC 60335-2-36:2021 edition 7.0 allows the user to identify the changes made to the previous IEC 60335-2-36:2017 edition 6.0. Furthermore, comments from IEC TC 61 experts are provided to explain the reasons of the most relevant changes.**

**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 60335-2-36 has been prepared by IEC technical committee 61: Safety of household and similar electrical appliances. It is an International Standard.

This seventh edition cancels and replaces the sixth edition published in 2017. This edition constitutes a technical revision.

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

- a) the text has been aligned with IEC 60335-1:2020;
- b) some notes have been converted to normative text, modified or deleted (Clause 1, 7.1, 7.15, 11.4, 13.3, 21.101, 22.101, 27.2, 30.101);
- c) conciliation of the text of IEC 60335-2-36 with other standards under IEC/TC61/MT32;
- d) exclusion of battery-operated appliances and appliances used in areas open to the public (Clause 1);
- e) relocation of cleaning instructions from 7.12.1 to 7.12;
- f) clarification of the testing procedure in 15.1.1;
- g) clarification on the test conditions in 19.1 and 23.3;
- h) introduction of 22.110;
- i) clarifications in the requirements in 25.3.

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

Draft	Report on voting
61/6377/FDIS	61/6427/RVD

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

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

This document was drafted in accordance with ISO/IEC Directives, Part 2, and developed in accordance with ISO/IEC Directives, Part 1 and ISO/IEC Directives, IEC Supplement, available at [www.iec.ch/members\\_experts/refdocs](http://www.iec.ch/members_experts/refdocs). The main document types developed by IEC are described in greater detail at [www.iec.ch/standardsdev/publications](http://www.iec.ch/standardsdev/publications).

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

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

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

This Part 2 supplements or modifies the corresponding clauses in IEC 60335-1, so as to convert that publication into the IEC standard: Particular requirements for commercial electric cooking ranges, ovens, hobs and hob elements.

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

NOTE 2 The following numbering system is used:

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

NOTE 3 The following print types are used:

- requirements: in roman type;
- *test specifications: in italic type;*
- notes: in small roman type.

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

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

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

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

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

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## INTRODUCTION

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

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

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

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

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

This standard takes into account the requirements of IEC 60364 as far as possible so that there is compatibility with the wiring rules when the appliance is connected to the supply mains. However, national wiring rules 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~~ 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 for 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. **1**

## HOUSEHOLD AND SIMILAR ELECTRICAL APPLIANCES – SAFETY –

### Part 2-36: Particular requirements for commercial electric cooking ranges, ovens, hobs and hob elements

#### 1 Scope

This clause of Part 1 is replaced by the following.

This part of IEC 60335 deals with the safety of electrically operated commercial **cooking and baking ranges**, ovens, **hobs, hob elements** and similar appliances ~~not intended for household and similar use~~, their **rated voltage** being not more than 250 V for single-phase appliances connected between one phase and neutral and 480 V for other appliances.

**NOTE 101**—These appliances are **not intended for household and similar purposes**. They are used for commercial processing of food in areas **not open to the public** **2**, for example in kitchens of restaurants, canteens, hospitals and in commercial enterprises such as bakeries, and butcheries, ~~etc.~~

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

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

**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, the national water supply authorities and similar authorities;
- in many countries, additional requirements are specified for pressure appliances.

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

- appliances designed exclusively for industrial purposes;
- appliances intended to be used in locations where special conditions prevail, such as the presence of a corrosive or explosive atmosphere (dust, vapour or gas);
- appliances for continuous mass production of food;
- steam cookers, forced and steam convection ovens (IEC 60335-2-42);
- ~~hot cupboards (IEC 60335-2-49);~~
- appliances for keeping food and crockery warm (IEC 60335-2-49);
- commercial microwave ovens (IEC 60335-2-90);
- **battery-operated appliances. 3**

## 2 Normative references

This clause of Part 1 is applicable except as follows.

*Addition:*

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

ISO 185, *Grey cast irons – Classification*

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

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

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

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

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

## 3 Terms and definitions

This clause of Part 1 is applicable except as follows.

### 3.1 Definitions relating to physical characteristics

#### 3.1.4 Addition:

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

#### 3.1.9 Replacement:

##### **normal operation**

operation of the appliance under the following conditions:

Solid **hob elements** are operated with no load and sheathed **hob elements** are operated with a load made of dull black, cold or hot rolled steel, 9 mm to 10 mm thick, that covers not less than 90 % and not more than 100 % of the element surface. The **hob elements** are operated with the controls set to give the temperatures as set out below, the temperature being measured at the geometrical centre or the hottest point of the solid element or load, if the element is unevenly heated.

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

Non-induction heating sources beneath a glass-ceramic or similar material are operated with a pan or pans containing initially cold water, the pan(s) being filled to a height of 60 mm ± 10 mm. The pan or pans are of aluminium, of ordinary quality, not brightly polished, with a base concavity not exceeding 0,1 mm. The pan or pans shall cover the **cooking zone** to the greatest extent possible.

The pan or pans are covered with a lid. The controls are set at maximum until the water boils and then adjusted to maintain boiling. Water is added to maintain the water level during boiling.

**Induction heating sources** beneath a glass-ceramic or similar material are operated with the pan or pans recommended by the manufacturer.

If one pan is used, it shall cover as closely as possible, but not less than, the full area of the **cooking zone**. The pan is positioned centrally.

For non-circular **cooking zones**, a combination of the smallest number of pans is chosen to cover as much as possible the area of the **cooking zone**.

The pan or pans in each case are filled with initially cold frying oil to a height of  $30 \text{ mm} \pm 5 \text{ mm}$ . The controls are set at maximum until the temperature of the oil attains a value of  $180 \text{ }^\circ\text{C}$  and then adjusted to maintain the oil at a temperature of  $180 \text{ }^\circ\text{C} \pm 15 \text{ }^\circ\text{C}$ . The oil temperature is measured 10 mm above the centre of the bottom of the vessel.

A further test is made using initially cold water, the pan(s) being filled to a height of  $60 \text{ mm} \pm 10 \text{ mm}$ . The pan or pans are covered with a lid. The controls are set at maximum until the water boils and then adjusted to maintain boiling. Water is added to maintain the water level during boiling.

The condition providing the most unfavourable results (oil or water) is used.

Ovens are operated with no load and with the controls set so that the mean value of the temperature over the thermostat cycle at the geometric centre of the usable space in the interior of the oven is maintained at  $240 \text{ }^\circ\text{C} \pm 4 \text{ }^\circ\text{C}$ . Stepped controls are set so that this temperature is  $240 \text{ }^\circ\text{C} \pm 15 \text{ }^\circ\text{C}$ . For ovens that are capable of attaining temperatures in excess of  $290 \text{ }^\circ\text{C}$ , the controls are set so that the temperature is  $50 \text{ }^\circ\text{C} \pm 4 \text{ }^\circ\text{C}$  below the maximum temperature attainable. For ovens that are unable to attain a temperature of  $240 \text{ }^\circ\text{C}$ , the controls are set at maximum.

**Griddle plates** are operated with no load and with the controls set so as to give the temperatures set out below, the temperature being measured at the hottest point of each controlled cooking surface. Stepped controls are set to the first position that gives a temperature equal to or greater than  $275 \text{ }^\circ\text{C}$ . Cycling controls are set so that the mean value of the temperature over the cycle is  $275 \text{ }^\circ\text{C} \pm 5 \text{ }^\circ\text{C}$ . If this temperature cannot be reached, the control is set at maximum.

Motors and **detachable electrical parts** 4 incorporated in the appliance are operated ~~in the intended manner~~ under the most unfavourable conditions that can be expected in normal use, taking into account the manufacturer's instructions.

### 3.5 Definitions relating to types of appliances

#### 3.5.101

##### **cooking and baking range**

single cooking or baking appliance incorporating one or more ovens together with one or more **hob elements** or **griddle plates** or a combination of these

Note 1 to entry: An appliance incorporating a forced convection oven, steam-convection oven or microwave oven is considered to be an appliance incorporating another appliance (see also 5.102).

#### 3.5.102

##### **hob**

appliance consisting of a **hob surface** and one or more **hob elements**

Note 1 to entry: It may be a separate appliance or part of a **cooking and baking range**.

Note 2 to entry: A **hob** may also incorporate a **griddle plate**.

## 3.6 Definitions relating to parts of an appliance

### ~~3.102~~6.101

#### **heating unit**

any part of the appliance that fulfils an independent cooking or heating function

Note 1 to entry: Examples are **hob elements**, **griddle plates** or ovens.

Note 2 to entry: If an oven incorporates more than one heating element or groups of elements that are so controlled that one element or group cannot be switched on while another element or group is energized, each of the elements or groups of elements is to be considered as a separate **heating unit** and tested accordingly.

### ~~3.103~~6.102

#### **hob element**

**heating unit** designed to accommodate a vessel or vessels on its upper surface

Note 1 to entry: A **hob element** may consist of an **induction heating source** or a non-induction heating source beneath a surface of glass-ceramic or similar material.

### ~~3.104~~6.103

#### **hob surface**

horizontal part of the appliance to which the **hob elements** are attached

~~Note 1 to entry: It may be a separate appliance or part of a **cooking range**.~~

~~Note 2 to entry: A **hob** may also incorporate a **griddle plate**.~~

### ~~3.105~~

#### ~~**hob**~~

~~**hob surface** and one or more **hob elements**~~

### ~~3.106~~6.104

#### **cooking zone**

area marked on a **hob surface** of glass-ceramic or similar material where the vessel is intended to be placed

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### ~~3.107~~6.105

#### **induction heating source**

heating source that operates by inducing eddy currents in a vessel positioned on the **hob element**

### ~~3.108~~6.106

#### **griddle plate**

**heating unit** having a cooking surface on which the food is intended to be placed directly

### ~~3.110~~6.107

#### **pan detector**

device incorporated in a **hob element** that prevents its operation unless a vessel is placed on the **cooking zone**

Note 1 to entry: A **pan detector** is not considered to be a **thermostat** or **protective device**.

### ~~3.111~~6.108

#### **functional surface**

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

Note 1 to entry: An example is the heated sheath of a tubular heating element.

### ~~3.112~~6.109

#### **adjacent surface**

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

### 3.8 Definitions relating to miscellaneous matters

#### 3.1098.101

##### installation wall

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

## 4 General requirement

This clause of Part 1 is applicable.

## 5 General conditions for the tests

This clause of Part 1 is applicable except as follows.

### 5.2 Addition:

**Hob elements** that are submitted separately are tested when installed in an appropriate **cooking range**.

*The test of 18.102 may be made on a separate sample.*

### 5.3 Addition:

*The test of 18.102 is made before the test of Clause 11 unless it is made on a separate sample.*

### 5.10 Addition:

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

NOTE ~~404~~ Appropriate enclosures or additional appliances ~~may~~ can be needed for test purposes.

**5.101** Appliances are tested as **heating appliances**, ~~even if they incorporate a motor~~ when during a mode of operation electrical heaters are energized. If no electrical heaters are energized, the appliances are tested as **motor-operated appliances**. **4**

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

## 6 Classification

This clause of Part 1 is applicable except as follows.

### 6.1 Replacement:

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

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