

# INTERNATIONAL STANDARD

## NORME INTERNATIONALE

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

**Appareils électrodomestiques et analogues – Sécurité –  
Partie 2-36: Règles particulières pour les cuisinières, les fours, les tables de  
cuisson et les foyers de cuisson électriques à usage collectif**

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WILSON



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INTERNATIONAL  
ELECTROTECHNICAL  
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## INTERNATIONAL ELECTROTECHNICAL COMMISSION

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### HOUSEHOLD AND SIMILAR ELECTRICAL APPLIANCES – SAFETY –

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

#### 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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This part of International Standard IEC 60335 has been prepared by IEC subcommittee 61E: Safety of electrical commercial catering equipment, of IEC technical committee 61: Safety of household and similar electrical appliances.

This consolidated version of IEC 60335-2-36 consists of the fifth edition (2002) [documents 61E/398/FDIS and 61E/410/RVD], its amendment 1 (2004) [documents 61E/435/FDIS and 61E/437/RVD] and its amendment 2 (2008) [documents 61E/594/FDIS and 61E/609/RVD].

The technical content is therefore identical to the base edition and its amendments and has been prepared for user convenience.

It bears the edition number 5.2.

A vertical line in the margin shows where the base publication has been modified by amendments 1 and 2.

The French version of this standard has not been voted upon.

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 fourth edition (2001) 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 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 of Part 1 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 01 appliances are allowed if their rated voltage does not exceed 150 V (Japan).
- 6.2: For appliances intended to be installed in a kitchen, an appropriate degree of protection against harmful ingress of water is required according to their height of installation (France).
- 13.2: Leakage current limits are different (Japan).
- 16.2: Leakage current limits are different (Japan).
- Clause 21: For appliances intended to be installed in a kitchen, different values of impact energy are applicable according to the height of the impact point (France).

The committee has decided that the contents of the base publication and its amendments will remain unchanged until the maintenance result date indicated on the IEC web site under "<http://webstore.iec.ch>" in the data related to the specific publication. At this date, the publication will be

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

2 | 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 the amendment 2 be adopted for implementation nationally not earlier than 12 months from the date of publication.

## 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.

2 | 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.

2 | 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 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.

## 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 International Standard deals with the safety of electrically operated commercial **cooking and baking ranges**, ovens, **hobs**, **hob elements** and similar appliances not intended for household 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 used for example in restaurants, canteens, hospitals and commercial enterprises such as bakeries, 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 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.

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);
- continuous process appliances for the mass production of food;
- steam cookers, forced and steam convection ovens (IEC 60335-2-42);
- hot cupboards (IEC 60335-2-49);
- microwave ovens (IEC 60335-2-90).

#### 2 Normative references

This clause of Part 1 is applicable.

#### 3 Definitions

This clause of Part 1 is applicable except as follows.

##### 3.1.4 Addition:

NOTE 101 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 several such combinations are 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 mm ± 5 mm. The controls are set to maximum until the temperature of the oil attains a value of 180 °C and then adjusted to maintain the oil at a temperature of 180 °C ± 15 °C.

A further test is made using initially cold water, the pan(s) being filled to a height of 60 mm ± 10 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 °C ± 4 °C. Stepped controls are set so that this temperature is 240 °C ± 15 °C. For ovens that are capable of attaining temperatures in excess of 290 °C, the controls are set so that the temperature is 50 °C ± 4 °C below the maximum temperature attainable. For ovens that are unable to attain a temperature of 240 °C, the controls are set to 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 °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 to maximum.

Motors incorporated in the appliance are operated in the intended manner under the most severe conditions that can be expected in normal use, taking into account the manufacturer's instructions.

### 3.101

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

a 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 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).

### 3.102

#### **heating unit**

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

NOTE 1 Examples are **hob elements**, **griddle plates** or ovens.

NOTE 2 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

#### **hob element**

boiling plate

surface element

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

NOTE A **hob element** may consist of an **induction** or non-induction **heating source** beneath a surface of glass-ceramic or similar material.

### 3.104

#### **hob surface**

cooking top

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

### 3.105

#### **hob**

a **hob surface** and one or more **hob elements**. It may be a separate appliance or part of a **cooking range**

NOTE A **hob** may also incorporate a **griddle plate**.

### 3.106

#### **cooking zone**

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

### 3.107

#### **induction heating source**

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

### 3.108

#### **griddle plate**

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

### 3.109

#### **installation wall**

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

### 3.110

#### **pan detector**

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

NOTE A **pan detector** is not considered to be a **thermostat** or **protective device**.

## 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 18.2 may be made on a separate sample.*

### 5.3 Addition:

*The test of 18.2 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 101 Appropriate enclosures or additional appliances may be needed for test purposes.

**5.101** *Appliances are tested as **heating appliances**, even if they incorporate a motor.*

**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.*

### 2 | 6.2 Addition:

Appliances normally used on a table shall be at least IPX3. Other appliances shall be at least IPX4.

## 7 Marking and instructions

This clause of Part 1 is applicable except as follows.

### 7.1 Addition:

In addition, appliances shall be marked with

- the water pressure or range of pressures, in kilopascals (kPa), for appliances intended to be connected to a water supply, unless this is indicated in the instruction sheet.

Appliances incorporating **induction heating sources** shall in addition be marked with

- operating frequency or operating frequency range in kilohertz (kHz);
- the total power input of all the induction **heating units** that can operate simultaneously, in watts or kilowatts, unless this is indicated in the instruction sheet;

NOTE 101 The power input to be marked or declared is the highest power input any switching arrangement will allow.

- the total power input of all the non-induction **heating units** that can operate simultaneously in watts or kilowatts unless this is indicated in the instruction sheet.

NOTE 102 The power input to be marked or declared is the highest power input any switching arrangement will allow.

Any cover giving access to **live parts** at a **working voltage** exceeding 250 V shall be marked by the following:

WARNING – DANGEROUS VOLTAGE or by the symbol for dangerous voltage (see 7.6).

Covers giving access to induction coils shall be marked by the following:

CAUTION – MAGNETIC FIELD or by the symbol for non-ionizing electromagnetic radiation (see 7.6).

NOTE 103 If it is not possible to mark these warnings on the cover, they may be placed close to the cover-retaining screws.

**7.6 Addition:**



[symbol 5140 of IEC 60417-1]

non-ionizing electromagnetic radiation



[symbol 5036 of IEC 60417-1]

dangerous voltage



[symbol 5021 of IEC 60417-1]

equipotentiality

**7.12 Addition:**

If the appliance incorporates a **hob surface** of glass-ceramic or similar material that provides the enclosure of **live parts**, the instructions shall include the substance of the following warning:

**WARNING:** If the surface is cracked, immediately disconnect the appliance or appropriate part of the appliance from the supply

The instructions for appliances with **hob surfaces** of glass-ceramic or similar material shall state that aluminium foil and plastic vessels are not to be placed on the hot surfaces. They shall also state that these surfaces are not to be used for storage.

The instructions for **hobs** incorporating halogen lamps shall warn the user to avoid looking directly at the lamps when on.

The instructions for appliances incorporating **induction heating sources** shall indicate the size of the smallest cooking vessel to be used. They shall also include the substance of the following:

- metallic objects such as kitchen utensils, cutlery etc. shall not be placed on the **hob surface** within the **cooking zones** since they could get hot;
- take care when operating the appliance, as rings, watches and similar objects worn by the user could get hot when in close proximity to the **hob surface**;
- only use vessels of the type and size recommended.

The instructions for appliances incorporating **induction heating sources** shall state that users with heart pacemakers should consult with the manufacturer, unless specific details are given.

The instructions for **hobs** with **hob elements** incorporating **pan detectors** shall include the substance of the following:

After use, switch the **hob element** off by means of its control. Do not rely on the **pan detector**.

If symbol 5021, 5036 or 5140 of IEC 60417-1 is marked on the appliance, its meaning shall be explained.

**2 Modification:**

The instruction concerning persons (including children) with reduced physical, sensory or mental capabilities, or lack of experience and knowledge is not applicable.

#### 7.12.1 Replacement:

The appliance shall be accompanied by instructions detailing any special precautions necessary for installation. For appliances intended for installation in a bank of other appliances and appliances intended to be fixed to an **installation wall**, details of how to ensure appropriate protection against electric shock and harmful ingress of water shall be supplied. If the controls of more than one appliance are combined in a separate enclosure, detailed installation instructions shall be supplied. Instructions for **user maintenance**, for example cleaning, shall also be given. They shall include a statement that the appliance is not to be cleaned with a water jet.

For appliances that are permanently connected to fixed wiring and for which leakage currents may exceed 10 mA, particularly if disconnected or not used for long periods, or during initial installation, the instruction sheet shall give recommendations regarding the rating of **protective devices**, such as earth leakage relays, to be installed.

In addition, for appliances incorporating **induction heating sources**, the instructions shall state that any repairs shall be carried out only by persons trained or recommended by the manufacturer.

*Compliance is checked by inspection.*

#### 7.12.4 Addition:

For appliances incorporating **induction heating sources**, a warning that care be taken to ensure that the splashback and surrounding area are free of metallic surfaces, if this is necessary due to the design of the appliance. The instructions for **built-in appliances** having a separate control panel for several appliances shall state that the control panel is only to be connected to the specified appliances in order to avoid a possible hazard.

#### 7.15 Addition:

When it is not practical to place the marking of **fixed appliances** so that it is visible after the appliance has been installed, the relevant information shall also be included in the instructions for use or on an additional label that can be fixed near the appliance after installation.

NOTE 101 An example of such an appliance is a **built-in hob**.

**7.101** If, during the test of Clause 11, the temperature rise of the side and rear walls of the test corner above the level of the hob surface exceeds 65 K, and/or during the test of Clause 19 the temperature rise of the walls above and below the hob surface exceeds 125 K, the installation instructions provided by the manufacturer shall include the substance of the following that shall also be included on a non-permanent label, for example a tie-on type, attached to the appliance:

Where this appliance is to be positioned in close proximity to a wall, partitions, kitchen furniture, decorative finishes, etc., it is recommended that they be made of non-combustible material, or if not, that they shall be clad with a suitable non-combustible heat-insulating material, and that the closest attention be paid to fire prevention regulations.

*Compliance is checked by inspection.*

**7.102** The **cooking zones** of **hob surfaces** of glass-ceramic or similar material shall be clearly identified by appropriate marking, unless they are obvious.

*Compliance is checked by inspection.*