

INTERNATIONAL STANDARD



**Household and similar electrical appliances – Safety –
Part 2-49: Particular requirements for commercial electric appliances for
keeping food and crockery warm**

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INTERNATIONAL ELECTROTECHNICAL COMMISSION

HOUSEHOLD AND SIMILAR ELECTRICAL APPLIANCES – SAFETY –

Part 2-49: Particular requirements for commercial electric appliances for keeping food and crockery warm

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 redline version of the official IEC Standard allows the user to identify the changes made to the previous edition IEC 60335-2-49:2002+AMD1:2008+AMD2:2017 CSV. A vertical bar appears in the margin wherever a change has been made. Additions are in green text, deletions are in strikethrough red text.

IEC 60335-2-49 has been prepared by IEC technical committee 61: Safety of household and similar electrical appliances. It is an International Standard.

This fifth edition cancels and replaces the fourth edition published in 2002, Amendment 1:2008 and Amendment 2:2017. 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) introduction of requirements for appliances intended for use in areas open to the public, including external accessible surface temperatures (Clause 1, 7.12, 11.8, Table 102);
- c) exclusion of battery-operated appliances (Clause 1);
- d) clarification of applicable standard for appliances for use by laymen (Clause 1, 7.12);
- e) relocation of cleaning instructions from 7.12.1 to 7.12;
- f) relocation of 24.101 to 22.106;
- g) conciliation of the text of IEC 60335-2-49 with other standards under IEC/TC61/MT32;
- h) some notes have been converted to normative text, modified or deleted (Clause 1, 7.1, 7.15, 11.3, 11.7, 15.2, 19.2, 22.101, 23.3);
- i) additional requirements for measurement of input current;
- j) clarification of the testing procedure in 15.1.1;
- k) clarification of the test conditions in 20.1 and 23.3;
- l) clarifications of the requirements in 25.3.

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

FDIS	Report on voting
61/6365/FDIS	61/6411/RVD

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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/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 appliances for keeping food and crockery warm.

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 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.

The following differences exist in the countries indicated below.

- 6.1: Class 01 appliances are allowed (Japan).
- 13.2: Leakage current limits are different (Japan).

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 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 **generic standards** 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.**

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.

HOUSEHOLD AND SIMILAR ELECTRICAL APPLIANCES – SAFETY –

Part 2-49: Particular requirements for commercial electric appliances for keeping food and crockery warm

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 appliances for keeping food and crockery warm ~~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.

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

- **hot cupboards**, with or without **heated tops**;
- **heated tops**;
- **heated display cases**;
- **heated crockery dispensers**;
- **heated tables**;
- **radiant heaters**.

NOTE 101—These appliances are not intended for household and similar purposes. They are used for commercial purposes, processing of food ~~and/or rethermalising it~~, also in **areas open to the public**, 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;
- ~~for appliances intended to be used outdoors, additional requirements may be necessary.~~
- 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;

- commercial electric bains-marie (IEC 60335-2-50);
- **battery-operated appliances**;
- warming plates and similar appliances for household use covered by IEC 60335-2-12 used in the following environments by laymen:
 - staff kitchen areas in shops, offices and other working environments;
 - farm houses;
 - hotels, motels and other residential type environments;
 - bed and breakfast type environments.

2 Normative references

This clause of Part 1 is applicable except as follows.

Addition:

IEC 60436, *Electric dishwashers for household use – Methods for measuring the performance*

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

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 grade and property classes*

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

Appliances are operated empty and with any controls intended to be operated by the user set at the maximum.

If the appliance cannot be operated empty, then the manufacturer's instructions are taken into account.

Doors, covers or lids, if any, are placed in their intended positions.

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

Appliances incorporating **induction heating sources** are operated with the **induction crockery** placed on **induction trays**. All tray supports are loaded, but partial up to full load shall be possible.

All controls are set to maximum, and the **induction crockery** is half-filled with initially cold water. Covers (cloches) are in their position.

The appliances consist of several units, which can form up to three separated modules; they are connected together during operation. These units are the heating module with the **induction heating source**, the rack with the **coil carriers** and the enclosure with the supports for the **induction trays** including the **induction crockery**.

3.5 Definitions relating to types of appliances

3.5.101

hot cupboard

appliance that is used for maintaining the temperature of hot food and for the warming of crockery

~~3.102~~

~~heated top~~

~~the top surface of a **hot cupboard**, that is designed to maintain the required temperature. It may be heated indirectly by the **hot cupboard** heating elements or directly by separate heating elements~~

~~3.103~~5.102

heated display case

hot cupboard in which food is displayed, the heated food being served from the display

~~3.104~~5.103

heated crockery dispenser

appliance designed specifically for the storage, warming and dispensing of plates, etc.

~~3.105~~

~~installation wall~~

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

~~3.106~~5.104

heated table

appliance designed for warm-holding on the surface

~~3.107~~5.105

radiant heater

stationary appliance for keeping food and crockery warm by means of radiant heat

Note 1 to entry: A part of the appliance can be swivelling.

3.6 Definitions relating to parts of an appliance

~~3.108~~6.101

heating unit

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

3.109~~6.102~~

induction heating source

heating source that operates by inducing eddy currents in **induction crockery**

3.110~~6.103~~

coil carrier

insulation device containing the induction winding

3.111~~6.104~~

induction crockery

crockery suitable to be heated by induction for heating up or keeping food warm

3.112~~6.105~~

induction tray

tray adapted to **induction crockery**, as recommended by the manufacturer

3.113~~6.106~~

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.

3.114~~6.107~~

adjacent surface

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

3.6.108

heated top

top surface of a **hot cupboard**, that is designed to maintain the required temperature.

Note 1 to entry: The **heated top** can be heated indirectly by the **hot cupboard** heating elements or directly by separate heating elements.

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3.8 Definitions relating to miscellaneous matters

3.8.101

area open to the public

area in which the general public, including children, can have access

Note 1 to entry: Examples are canteens and self-service restaurants.

3.8.102

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.

5.10 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 appliance.*

NOTE ~~101~~ 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.*

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** or **class II**.

Compliance is checked by inspection and by the relevant tests.

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:

Appliances incorporating **induction heating sources** shall ~~also~~ be marked with:

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

NOTE ~~101~~—The total power input to be marked or ~~declared~~ indicated in the instructions is the highest power input that any switch arrangement will allow.

Covers ~~giving~~, that if removed, can give direct access to induction coils shall be marked with symbol IEC 60417-5140 (2003-04), or with the substance of the following ~~warning~~:

~~Caution—MAGNETIC FIELD~~

Caution: Magnetic field

NOTE ~~102~~—If it is not possible to mark ~~these warnings~~ the symbol or caution on the cover, ~~they may~~ it can be placed close to the cover-retaining screws.