INTERNATIONAL STANDARD

IEC 60335-2-99

First edition
2003-02

Household and similar electrical appliances – Safety –

Part 2-99: Particular requirements for commercial electric hoods

Appareils électrodomestiques et analogues – Sécurité –

Partie 2-99: Règles particulières pour les hottes de cuisine électriques à usage commercial

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INTERNATIONAL ELECTROTECHNICAL COMMISSION

HOUSEHOLD AND SIMILAR ELECTRICAL APPLIANCES – SAFETY –

Part 2-99: Particular requirements for commercial electric hoods

FOREWORD

1) The IEC (International Electrotechnical Commission) is a worldwide organization for standardization comprising all national electrotechnical committees (IEC National Committees). The object of the 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, the IEC publishes International Standards. 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. The IEC collaborates closely with the International Organization for Standardization (ISO) in accordance with conditions determined by agreement between the two organizations.
2) The formal decisions or agreements of the IEC on technical matters express, as nearly as possible, an international consensus of opinion on the relevant subjects since each technical committee has representation from all interested National Committees.
3) The documents produced have the form of recommendations for international use and are published in the form of standards, technical specifications, technical reports or guides and they are accepted by the National Committees in that sense.
4) In order to promote international unification, IEC National Committees undertake to apply IEC International Standards transparently to the maximum extent possible in their national and regional standards. Any divergence between the IEC Standard and the corresponding national or regional standard shall be clearly indicated in the latter.
5) The IEC provides no marking procedure to indicate its approval and cannot be rendered responsible for any equipment declared to be in conformity with one of its standards.
6) Attention is drawn to the possibility that some of the elements of this International Standard may be the subject of patent rights. The IEC shall not be held responsible for identifying any or all such patent rights.

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

It forms the first edition of IEC 60335-2-99.

The text of this part of IEC 60335 is based on the following documents:

FDIS	Report on voting
61E/422/FDIS	61E/425/RVD

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

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 it into the IEC standard: Safety requirements for commercial electric hoods.

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 publication will remain unchanged until 2004. At this date, the publication will be

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

The following differences exist in the countries indicated below:

– 6.1: Class 01 **hoods** are allowed (Japan).

– 6.2: For **hoods** 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 **hoods** intended to be installed in a kitchen, different values of impact energy are applicable according to the height of the impact point (France).

A bilingual version of this publication may be issued at a later date.

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.

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.

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.

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 2-99: Particular requirements for commercial electric hoods

1 Scope

This clause of Part 1 is replaced by the following.

This International Standard deals with the safety of electrically operated commercial **hoods** intended for installation above commercial cooking appliances such as ranges, griddles, griddle grills and deep fat fryers, and not intended for household use, their **rated voltage** being not more than 250 V for single phase **hoods** connected between one phase and neutral, and 480 V for other **hoods**. Only single complete units and **hoods** supplied as separate parts which when assembled form a complete working **hood,** incorporating a fan, are within the scope of the standard.

NOTE 101 **Hoods** are used, for example in restaurants, canteens, hospitals and commercial enterprises such as bakeries, butcheries, etc.

The **hood** may be used above one or more appliance of the same or different types.

So 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 **hoods** intended to be used in vehicles or on board ships or aircraft, additional requirements may be necessary;

– in many countries additional requirements including ventilation 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:

– domestic range **hoods** (IEC 60335-2-31);

– purpose-built **hoods**, although this standard can be used as a guide (a purpose-built **hood** is either constructed on-site or specially constructed in the factory and is not mass produced);

– **hoods** not incorporating a fan;

– **hoods** designed exclusively for industrial purposes;

– **hoods** intended to be used in locations where special conditions prevail, such as the presence of a corrosive or explosive atmosphere (dust, vapour or gas).

NOTE 104 Requirements for **hoods** with externally mounted fans are under consideration.

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 **hood** which 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

The **hood** is operated after installation in accordance with the instructions, except that it is not connected to a duct.

3.101
hood
motor-operated appliance intended to collect contaminated air from above cooking ranges, hobs and similar cooking appliances.

NOTE 1 The contaminated air may pass through a filter and be discharged back into the room or removed from the room.

NOTE 2 The cooking appliances may be supplied by electricity or fuels such as gas.

4 General requirement

This clause of Part 1 is applicable.

5 General conditions for the tests

This clause of Part 1 is applicable.

6 Classification

This clause of Part 1 is applicable except as follows.

6.1 *Replacement:*

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

Compliance is checked by inspection and by the relevant tests.

7 Marking and instructions

This clause of Part 1 is applicable except as follows.

7.1 *Addition:*

Hoods shall be marked on or near the lampholder with the maximum power input of replaceable illumination lamps as follows:

«lamp max..... W» or «  max.....W»

7.6 *Addition:*

Add the following symbol:

 [symbol 5021 of IEC 60417-1] equipotentiality

7.12 *Addition:*

The instructions for use shall state the substance of the following:

– there shall be adequate air intake into the room when the **hood** is used at the same time as appliances burning gas or other fuels;
– the details concerning the method and frequency of cleaning and that filters must be cleaned regularly;
– there is a fire risk if cleaning is not carried out in accordance with the instructions;
– do not flambé under the **hood**.

If Symbol 5021 of IEC 60417-1 is marked on the **hood**, its meaning shall be explained.

7.12.1 *Replacement:*

The **hood** shall be accompanied by instructions detailing any special precautions necessary for installation. The instructions for installation shall state:

– the minimum distance between the appliance and the lowest part of the **hood**;
– that regulations concerning the air intake and discharge of exhaust air have to be fulfilled;
– that ventilation requirements specified for the cooking equipment shall be observed;
– that special consideration is needed when there are other open flued appliances in the same room to prevent backsuction of flue gasses;
– that if the **hood** is used above a gas appliance, a non-self-resetting device that turns off the gas supply to the appliance if the **hood** stops operating must be installed in accordance with national gas regulations;
– that the installation of the **hood** must not infringe gas regulations;

Instructions for **user maintenance**, for example cleaning, shall also be given. They shall include a statement that the **hood** is not to be cleaned with a water jet.

Compliance is checked by inspection.

7.14 *Addition:*

The marking for maximum power input of a replaceable illumination lamp shall be visible during replacement of the lamp.

7.101 Equipotential bonding terminals shall be marked with Symbol 5021 of IEC 60417-1.

These markings shall not be placed on screws, removable washers or other parts which can be removed when conductors are being connected.

Compliance is checked by inspection.

8 Protection against access to live parts

This clause of Part 1 is applicable.

9 Starting of motor-operated appliances

This clause of Part 1 is applicable except as follows.

9.101 Fan motors providing a cooling effect in order to comply with the requirements of Clause 11 shall start under all voltage conditions which may occur in use. The supply source is such that during the test the drop in voltage does not exceed 1 %.

*Compliance is checked by starting the motor three times at a voltage equal to 0,85 times **rated voltage**, the motor being at room temperature at the beginning of the test.*

*The motor is started each time under the conditions occurring at the beginning of **normal operation** or, for automatic appliances, at the beginning of the normal cycle of operation, the motor being allowed to come to rest between successive starts. For appliances provided with motors having other than centrifugal starting switches, this test is repeated at a voltage equal to 1,06 times **rated voltage**.*

*In all cases, the motor shall start and it shall function in such a way that safety is not affected, and the overload **protection devices** of the motor shall not operate.*

10 Power input and current

This clause of Part 1 is applicable.

11 Heating

This clause of Part 1 is applicable except as follows.

11.2 *Replacement:*

*Built-in **hoods** and **hoods** intended to be suspended from the ceiling are installed in accordance with the instructions for installation. Other **hoods** are fixed to a vertical support.*

*The **hood** is placed above a hob so that the distance between its lowest point and the hob surface is the minimum distance specified in the instructions for installation. A vertical side wall extending to the top of the **hood** is placed at right angles to the vertical support, 100 mm from one side of the **hood**. Dull black-painted plywood approximately 20 mm thick is used for the vertical support, the side wall and for the installation of **built-in hoods**.*

*The hob selected for the test has an even number of uniformly distributed gas burners with a total heat input equal to 30 kW/m^2 of the gross area (width times depth) of the **hood**. If the instructions for installation indicates that the **hood** must extend beyond the sides of the appliance below it by a certain distance, it is taken into account. If no indication is given, the total heat input of the test hob is increased by 10 %.*

The gas burners are supplied with natural gas or liquid gas.

Vessels containing water are placed without lids on the gas burners, which are operated to maintain vigorous boiling. The diameters or sizes of the vessels are approximately equal to that of the hob elements.

*The **hood** is also tested with the hob in operation and the fan switched off.*

NOTE 101 This test is only conducted with gas at the minimum given distance specified in the instructions, because it gives the most unfavourable conditions.

11.7 *Replacement:*

***Hoods** are operated until steady conditions are established.*

NOTE 101 The duration of the test may consist of more than one cycle of operation.

11.8 *Modification:*

The temperature rise limit for external enclosures is not applicable.

12 Void

13 Leakage current and electric strength at operating temperature

This clause of Part 1 is applicable except as follows.

13.2 *Modification:*

Instead of the permissible leakage current for **stationary class I hoods**, the following applies:

– *for cord and plug connected **hoods***	*1 mA per kW **rated power input** of the **hood** with a maximum of 10 mA*
– *for other **hoods***	*1 mA per kW **rated power input** of the **hood** with no maximum*

14 Transient overvoltages

This clause of Part 1 is applicable.

15 Moisture resistance

This clause of Part 1 is applicable except as follows.

15.3 *Addition:*

NOTE 101 If it is not possible to place the whole **hood** in the humidity cabinet, parts containing electrical components are tested separately, taking into account the conditions which occur in the **hood**.

16 Leakage current and electric strength

This clause of Part 1 is applicable except as follows.

16.2 *Modification:*

Instead of the permissible leakage current for **stationary class I hoods**, the following applies:

– *for cord and plug connected **hoods***	*1 mA per kW **rated power input** of the **hood** with a maximum of 10 mA*
– *for other **hoods***	*1 mA per kW **rated power input** of the **hood** with no maximum*

17 Overload protection of transformers and associated circuits

This clause of Part 1 is applicable.

18 Endurance

This clause of Part 1 is not applicable.

19 Abnormal operation

This clause of Part 1 is applicable except as follows.

19.1 *Addition:*

Compliance is also checked by the test of 19.101.

19.13 *Addition:*

During the test of 19.101, the temperature of the motor windings shall not exceed the values shown in table 8.

*The **hood** shall not deform to such an extent that parts fall from it.*

19.101 *The **hood** is operated above a gas hob as specified in Clause 11, but without vessels and only the gas burners at the front or the back being switched on, whichever is the most unfavourable.*

20 Stability and mechanical hazards

This clause of Part 1 is applicable except as follows.

20.2 *Addition:*

Filters are considered to be **detachable parts**.

21 Mechanical strength

This clause of Part 1 is applicable.

22 Construction

This clause of Part 1 is applicable except as follows.

22.8 *Replacement:*

For **hoods** having compartments to which access is gained during **user maintenance**, the electrical connections shall be arranged so that they are not subjected to pulling during cleaning or other **user maintenance**.

Compliance is checked by inspection and by manual test.

***Detachable parts** are removed. It shall not be possible to grasp wiring in such a way that the connections are subjected to undue stress.*

*In case of doubt, the wiring is subjected to a pull of 10 N, applied without jerks three times in succession, in the most unfavourable direction likely to occur during **user maintenance**. There shall be no appreciable displacement of the connections.*

NOTE 101 The wiring to interconnection couplers intended to be disconnected before cleaning or **user maintenance** is not tested.

22.101 **Hoods** shall be protected in such a manner that moisture and grease will not collect in such a way as to affect **creepage distance** and **clearance** values. Electrical insulation for which **creepage distances** and **clearances** are specified, shall not be located in air ducts.

Compliance is checked by inspection.

22.102 **Thermal cut-outs** protecting motors, the unexpected starting of which may cause a hazard, shall be of the **non-self-resetting** trip-free type and shall provide **all-pole disconnection** from the supply. If the **non-self-resetting thermal cut-out** is only accessible after removing parts with the aid of a tool, the trip-free type is not required.

Compliance is checked by inspection and by manual test.

NOTE **Thermal cut-outs** of the trip-free type have an automatic action, with a reset actuating member, so constructed that the automatic action is independent of manipulation or position of the reset mechanism.

22.103 Lights, switches or push-buttons shall only be coloured red for the indication of danger, alarm or similar situations.

Compliance is checked by inspection.

22.104 **Hoods** shall be constructed so that they can be fixed securely to a wall or other support. Brackets and similar means shall be of metal which shall not be liable to creep or deform.

Compliance is checked by inspection.

NOTE Key-hole slots, hooks and similar means, without any further means to prevent the **hood** from being inadvertently lifted off the support, are not considered to be adequate means for fixing the **hood** securely.

22.105 **Hoods** shall be constructed so that parts liable to accumulate deposits of grease can be cleaned.

Compliance is checked by inspection.

NOTE Parts located behind a filter are considered to be parts which have to be cleaned.

22.106 Air filters of the electrostatic type shall not be used in a **hood**.

Compliance is checked by inspection.

23 Internal wiring

This clause of Part 1 is applicable.

24 Components

This clause of Part 1 is applicable.

25 Supply connection and external flexible cords

This clause of Part 1 is applicable except as follows.

25.3 *Addition:*

Fixed hoods shall be constructed so that the **supply cord** can be connected after the **hood** has been installed in accordance with the instructions for installation.

Terminals for permanent connection of cables to fixed wiring may also be suitable for the **type X attachment** of a **supply cord**. In this case a cord anchorage complying with 25.16 shall be fitted to the appliance.

If the **hood** is provided with a set of terminals allowing the connection of a flexible cord, they shall be suitable for the **type X attachment** of the cord.

In both cases the instructions shall give full particulars of the power **supply cord**.

Compliance is checked by inspection.

25.7 *Modification:*

Instead of the types of **supply cords** specified, the following applies:

Supply cords shall be oil-resistant, sheathed flexible cable not lighter than ordinary polychloroprene or other equivalent synthetic elastomer sheathed cord (code designation 60245 IEC 57).

26 Terminals for external conductors

This clause of Part 1 is applicable.

27 Provision for earthing

This clause of Part 1 is applicable except as follows.

27.1 *Addition:*

Metal parts which become accessible during **user maintenance** are considered to be **accessible metal parts**.

27.2 *Addition:*

Hoods shall be provided with a terminal for the connection of an external equipotential conductor. This terminal shall be in effective electrical contact with all fixed exposed metal parts of the **hood**, and shall allow the connection of a conductor having a nominal cross-sectional area of 2,5 mm^2 to 6 mm^2. It shall be located in a position convenient for the connection of the bonding conductor after installation of the **hood**.

NOTE 101 Small fixed exposed metal parts, for example name-plates and the like, are not required to be in electrical contact with the terminal.

28 Screws and connections

This clause of Part 1 is applicable.

29 Clearances, creeping distances and solid insulation

This clause of Part 1 is applicable except as follows.

29.2 *Addition:*

The micro-environment is pollution degree 3 and the insulation shall have a CTI not less than 250, unless the insulation is enclosed or located so that it is unlikely to be exposed to pollution during normal use of the appliance.

30 Resistance to heat and fire

This clause of Part 1 is applicable except as follows.

30.1 *Addition:*

The test is carried out at a minimum temperature of 105 °C ± 2 °C on exposed parts on the lower surface of the ***hood****.*

30.2.1 *Modification:*

The glow-wire test is carried out at 650 °C.

30.2.2 Not applicable.

30.101 Hoods shall not incorporate combustible material liable to extend a fire originating underneath it.

Compliance is checked as follows.

Filters of non-metallic material or metallic filters coated with non-metallic material intended for the absorption of fumes and/or grease are subjected to the burning test specified in ISO 9772 for category HBF material, if relevant, or shall be classified at least HB40 according to IEC 60695-11-10, except that the thickness of the specimen is that of the filter.

NOTE 1 It may be necessary to support the specimen.

External parts having a total mass not exceeding 0,25 kg are subjected to the glow-wire test at a temperature of 650 °C.

Other ***accessible parts*** *of the enclosure are subjected to the needle-flame test of Annex E.*

Internal air-ducts and parts within them such as fans, are subjected to the needle-flame test of Annex E, droplets of material being ignored.

NOTE 2 Grease filters are not subjected to the test of Annex E.

31 Resistance to rusting

This clause of Part 1 is applicable.

32 Radiation, toxicity and similar hazards

This clause of Part 1 is applicable.

Annexes

The annexes of Part 1 are applicable except as follows.

Annex N
(normative)

Proof tracking test

Addition:

Add 250 V to the list of specified voltages.

Bibliography

The bibliography of Part 1 is applicable except as follows.

Addition:

IEC 60335-2-31, *Household and similar electrical appliances – Safety – Part 2-31: Particular requirements for range hoods*

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