

CONSOLIDATED VERSION



**Household and similar electrical appliances – Safety –
Part 2-99: Particular requirements for commercial electric hoods**



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Part 2-99: Particular requirements for commercial electric hoods**

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REDLINE VERSION



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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 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 Consolidated version is not an official IEC Standard and has been prepared for user convenience. Only the current versions of the standard and its amendment(s) are to be considered the official documents.

This Consolidated version of IEC 60335-2-99 bears the edition number 1.1. It consists of the first edition (2003-02) [documents 61E/422/FDIS and 61E/425/RVD] and its amendment 1 (2017-06) [documents 61/5366/FDIS and 61/5394/RVD]. The technical content is identical to the base edition and its amendment.

In this Redline version, a vertical line in the margin shows where the technical content is modified by amendment 1. Additions are in green text, deletions are in strikethrough red text. A separate Final version with all changes accepted is available in this publication.

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.

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 the base publication and its amendment will remain unchanged until the stability 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.

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).

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.

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

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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.

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. The following extraction systems are covered as well:

- back draft ventilation systems;
- downdraft ventilation systems;
- fume extraction modules.

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 and similar 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 **kitchens** of restaurants, canteens, hospitals and in 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;
- for **hoods** incorporating a filter system with means for ionizing the air, IEC 60335-2-65 also applies.

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 **except as follows**.

Addition:

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, *Mechanical properties of corrosion-resistant stainless steel fasteners – Part 1: Bolts, screws and studs*

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

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.

3.1.4 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 and remove contaminated air from ~~above cooking ranges, hobs and similar cooking~~ catering appliances.

Note 1 to entry: The contaminated air may pass through ~~a~~ filter systems 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.~~

The instructions shall include the substance of the following:

These appliances are intended to be used for commercial applications, for example in kitchens of restaurants, canteens, hospitals and in commercial enterprises such as bakeries, butcheries, etc., but not for continuous mass production of food.

If the manufacturer wants to limit the use of the appliance to less than the above, this has to be clearly stated in the instructions.

Modification:

The instructions concerning persons (including children) with reduced physical, sensory or mental capabilities or lack of experience and knowledge and children playing with the appliance are not applicable.

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 or a steam cleaner.

Compliance is checked by inspection.

7.12.9 Not applicable.

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.~~

Hoods are operated in accordance with the manufacturer's instructions.

Hoods intended to be placed above a hob are installed so that the distance between their lowest point and the hob surface is the minimum distance specified in the instructions for installation. The hob selected for the test shall have uniformly arranged gas burners with a total heat input equal to 30 kW/m^2 of the gross area (width times depth) of the hood. Vessels containing water are placed without lids on the gas burners, which are operated to maintain boiling. The diameters or sizes of the vessels are approximately equal to that of the cooking zones.

Other hoods are operated in the most severe conditions according to the manufacturer's instructions.

Hoods intended to be used in combination with other appliances are tested in combination with the other appliance in normal operation. Hoods that are not interlocked with the appliance are also tested with the appliance in operation and the fan switched off.

Hoods are placed in a test corner as follows:

- **hoods normally fixed to a wall are fixed to one of the walls, as near to the other wall and floor or ceiling as is likely to occur, taking into account the instructions;**
- **hoods normally fixed to a ceiling are fixed to the ceiling as near to the walls as is likely to occur, taking into account the instructions;**
- **other hoods are placed as near to the walls as possible.**

Dull black-painted plywood approximately 20 mm thick is used for the test corner.

Hoods intended to be used in combination with other appliances are placed as required for the appliance.

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~~ appliances, the following applies:

- for cord and plug connected ~~hoods~~ appliances 0,75 mA or 1 mA per kW rated power input of the ~~hood~~ appliance with a maximum of 10 mA, whichever is higher.*
- for other ~~hoods~~ appliances 0,75 mA or 1 mA per kW rated power input of the ~~hood~~ appliance with no maximum, whichever is higher.*

For portable class I appliances, instead of the permissible leakage current, the following applies:

- for cord and plug connected appliances 0,75 mA or 1 mA per kW rated power input of the appliance with a maximum of 10 mA, whichever is higher.*

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 appliances**, the following applies:

- for cord and plug connected **hoods appliances** 0,75 mA or 1 mA per kW **rated power input** of the **hood appliance** with a maximum of 10 mA, whichever is higher;
- for other **hoods appliances** 0,75 mA or 1 mA per kW **rated power input** of the **hood appliance** with no maximum, whichever is higher.

For **portable class I appliances**, instead of the permissible leakage current, the following applies:

- for cord and plug connected appliances 0,75 mA or 1 mA per kW **rated power input** of the appliance with a maximum of 10 mA, whichever is higher.

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.~~ **Hoods** intended to be placed above a hob are operated as specified in 11.2, but without vessels and with all gas burners switched on.

20 Stability and mechanical hazards

This clause of Part 1 is applicable except as follows.

20.1 Addition:

Portable hoods provided with wheels are placed in the most unfavourable position against an edge with a height equal to the radius of the wheels plus 10 mm. If the wheels differ in size, that edge height that is the most unfavourable is chosen.

A force equal to 8 % of the mass of the fully equipped appliance is applied horizontally to the middle of the top edge of the appliance but not higher than 900 mm, in the most unfavourable direction.

The appliance shall not tilt.

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 For three-phase appliances, **thermal cut-outs** protecting motors the unexpected starting of which may cause a hazard shall be of the non-self-resetting and trip-free type, and shall provide **all-pole disconnection** from the related supply circuits.

For single-phase appliances, **thermal cut-outs** protecting motors the unexpected starting of which may cause a hazard shall be of the non-self-resetting and trip-free type, and shall provide at least one-pole disconnection.

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.

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.

Compliance is checked by inspection and by manual test.

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, including parts located behind a filter, 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:~~

Addition:

Supply cords shall be oil-resistant, ~~sheathed flexible cable not lighter than ordinary polychloroprene or other equivalent synthetic elastomer~~ sheathed cords. Their properties shall be at least those of ordinary polychloroprene sheathed cords (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 mm² to 6 mm². 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 *except as follows*.

28.1 *Addition:*

Screws made of carbon steel and alloy steel shall be made in accordance with ISO 898-1.

Screws made of corrosion-resistant stainless-steel shall be made in accordance with ISO 3506-1, or ISO 3506-2, or ISO 3506-3, or ISO 3506-4.

28.4 *Addition:*

Screws that make mechanical connections and electrical connections shall be so designed that the contact pressure does not change appreciably through loosening of the screwed assembly parts during operational stress and contact corrosion.

Screws that make mechanical connections and provide earthing continuity shall be so designed that the contact pressure does not change appreciably through loosening of the

screwed assembly parts due to operational stress and contact corrosion. They shall be designed so that a minimum contact pressure remains.

Compliance is checked by inspection and by measuring the assembling torques for screwed connections providing earthing continuity by applying a torque as specified in Table 102 to turn the screw in the fastening direction. The screw shall not turn.

The screw shall not have been unfastened prior to performing this test.

Table 102 – Assembling torques for screwed connections providing earthing continuity

Outer thread diameter of the screw mm	Assembling torque Nm	
	Screwed connections for the mechanical strength of the screws A2-70 according to ISO 3506-1, or ISO 3506-2, or ISO 3506-3, or ISO 3506-4 and 5.8 according to ISO 898-1	Screwed connections for the mechanical strength of the screws > 8.8 according to ISO 898-1
> 2,8 and ≤ 3,6	0,8	1,3
> 3,6 and ≤ 4,2	1,9	3,0
> 4,2 and ≤ 5,3	3,7	6,0
> 5,3 and ≤ 6,3	6,5	10,0
M 8	15,0	25,0
M 10	31,0	50,0

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 ball pressure test is carried out on the exposed parts of the appliance at a minimum temperature of at least 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. The glow-wire flammability index (GWFI) according to IEC 60695-2-12 shall be at least 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.

Annex P (informative)

Guidance for the application of this standard to appliances used in tropical climates

13 Leakage current and electric strength at operating temperature

13.2 Modification:

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

- for cord and plug connected appliances 0,5 mA or 0,5 mA per kW **rated power input** of the appliance with a maximum of 5 mA, whichever is higher;
- for other appliances 0,5 mA or 0,5 mA per kW **rated power input** of the appliance with no maximum, whichever is higher.

For **portable class I appliances**, instead of the permissible leakage current, the following applies:

- for cord and plug connected appliances 0,5 mA or 0,5 mA per kW **rated power input** of the appliance with a maximum of 5 mA, whichever is higher.

16 Leakage current and electric strength

16.2 Modification:

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

- for cord and plug connected appliances 0,5 mA or 0,5 mA per kW **rated power input** of the appliance with a maximum of 5 mA, whichever is higher;
- for other appliances 0,5 mA or 0,5 mA per kW **rated power input** of the appliance with no maximum, whichever is higher.

For **portable class I appliances**, instead of the permissible leakage current, the following applies:

- for cord and plug connected appliances 0,5 mA or 0,5 mA per kW **rated power input** of the appliance with a maximum of 5 mA, whichever is higher.

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*

IEC 60335-2-65, *Household and similar electrical appliances – Safety – Part 2-65: Particular requirements for air-cleaning appliances*

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FINAL VERSION

**Household and similar electrical appliances – Safety –
Part 2-99: Particular requirements for commercial electric hoods**

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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 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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DISCLAIMER

This Consolidated version is not an official IEC Standard and has been prepared for user convenience. Only the current versions of the standard and its amendment(s) are to be considered the official documents.

This Consolidated version of IEC 60335-2-99 bears the edition number 1.1. It consists of the first edition (2003-02) [documents 61E/422/FDIS and 61E/425/RVD] and its amendment 1 (2017-06) [documents 61/5366/FDIS and 61/5394/RVD]. The technical content is identical to the base edition and its amendment.

This Final version does not show where the technical content is modified by amendment 1. A separate Redline version with all changes highlighted is available in this publication.

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.

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 the base publication and its amendment will remain unchanged until the stability 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.

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).

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.

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. The following extraction systems are covered as well:

- back draft ventilation systems;
- downdraft ventilation systems;
- fume extraction modules.

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 and similar 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 kitchens of restaurants, canteens, hospitals and in 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;
- for **hoods** incorporating a filter system with means for ionizing the air, IEC 60335-2-65 also applies.

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 except as follows.

Addition:

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, *Mechanical properties of corrosion-resistant stainless steel fasteners – Part 1: Bolts, screws and studs*

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

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.

3.1.4 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 and remove contaminated air from catering appliances.

Note 1 to entry: The contaminated air may pass through filter systems and be discharged back into the room or removed from the room.

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»

7.12 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**.

The instructions shall include the substance of the following:

These appliances are intended to be used for commercial applications, for example in kitchens of restaurants, canteens, hospitals and in commercial enterprises such as bakeries, butcheries, etc., but not for continuous mass production of food.

If the manufacturer wants to limit the use of the appliance to less than the above, this has to be clearly stated in the instructions.

Modification:

The instructions concerning persons (including children) with reduced physical, sensory or mental capabilities or lack of experience and knowledge and children playing with the appliance are not applicable.

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 or a steam cleaner.

Compliance is checked by inspection.

7.12.9 Not applicable.

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:*

Hoods are operated in accordance with the manufacturer's instructions.

Hoods intended to be placed above a hob are installed so that the distance between their lowest point and the hob surface is the minimum distance specified in the instructions for installation. The hob selected for the test shall have uniformly arranged gas burners with a total heat input equal to 30 kW/m² of the gross area (width times depth) of the **hood**. Vessels containing water are placed without lids on the gas burners, which are operated to maintain boiling. The diameters or sizes of the vessels are approximately equal to that of the cooking zones.

Other **hoods** are operated in the most severe conditions according to the manufacturer's instructions.

Hoods intended to be used in combination with other appliances are tested in combination with the other appliance in **normal operation**. **Hoods** that are not interlocked with the appliance are also tested with the appliance in operation and the fan switched off.

Hoods are placed in a test corner as follows:

- **hoods** normally fixed to a wall are fixed to one of the walls, as near to the other wall and floor or ceiling as is likely to occur, taking into account the instructions;
- **hoods** normally fixed to a ceiling are fixed to the ceiling as near to the walls as is likely to occur, taking into account the instructions;
- other **hoods** are placed as near to the walls as possible.

Dull black-painted plywood approximately 20 mm thick is used for the test corner.

Hoods intended to be used in combination with other appliances are placed as required for the appliance.

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 appliances**, the following applies:

- for cord and plug connected appliances 0,75 mA or 1 mA per kW **rated power input** of the appliance with a maximum of 10 mA, whichever is higher.
- for other appliances 0,75 mA or 1 mA per kW **rated power input** of the appliance with no maximum, whichever is higher.

For **portable class I appliances**, instead of the permissible leakage current, the following applies:

- for cord and plug connected appliances 0,75 mA or 1 mA per kW **rated power input** of the appliance with a maximum of 10 mA, whichever is higher.

14 Transient overvoltages

This clause of Part 1 is applicable.

15 Moisture resistance

This clause of Part 1 is applicable.

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 appliances**, the following applies:

- for cord and plug connected appliances 0,75 mA or 1 mA per kW **rated power input** of the appliance with a maximum of 10 mA, whichever is higher;
- for other appliances 0,75 mA or 1 mA per kW **rated power input** of the appliance with no maximum, whichever is higher.

For **portable class I appliances**, instead of the permissible leakage current, the following applies:

- for cord and plug connected appliances 0,75 mA or 1 mA per kW **rated power input** of the appliance with a maximum of 10 mA, whichever is higher.

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.