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मानक

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IS 302-2-31 (2009): Safety of household and similar electrical appliances, Part 2: Particular requirements, Section 31: Range Hoods [ETD 32: Electrical Appliances]



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“Knowledge is such a treasure which cannot be stolen”



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भारतीय मानक  
घरेलू और समान विद्युत साधित्रों की सुरक्षा  
भाग 2 विशेष अपेक्षाएँ  
अनुभाग 31 रेंज हुड

*Indian Standard*  
SAFETY OF HOUSEHOLD AND SIMILAR  
ELECTRICAL APPLIANCES  
PART 2 PARTICULAR REQUIREMENTS  
Section 31 Range Hoods

ICS 97.040.20;13.120

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**BUREAU OF INDIAN STANDARDS**  
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## FOREWORD

This Indian Standard (Part 2/Sec 31) was adopted by the Bureau of Indian Standards, after the draft finalized by the Electrical Appliances Sectional Committee had been approved by the Electrotechnical Division Council.

This standard covers the safety requirements of range hoods. This standard does not cover the performance requirements.

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

This standard recognizes the Indian 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.

If the functions of an appliance are covered by different parts and sections of IS 302, the relevant Part and Section 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.

NOTE — Throughout this publication, wherever Part 2 is mentioned, it refers to the relevant Part of IS 302.

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.

Application of this standard, as far as is reasonable, may be considered to appliances not mentioned in Part 2, and to appliances designed on new principles.

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, which 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.

This standard is to be read in conjunction with IS 302-1 (2008) 'Safety of household and similar electrical appliances: Part 1 General requirements'. For the sake of convenience, the clauses of this standard correspond to those of IS 302-1 (2008), instead of reproducing full text of each clause, clauses of IS 302-1 (2008) which are applicable (which means that relevant provisions of the clause apply) or not applicable and the subclauses or portion thereof which are not applicable are indicated as under:

- a) In case of a clause where it is applicable, the wording used is 'This clause of IS 302-1 (2008) is applicable/not applicable'; and
- b) In case of a subclause or part thereof 'Not applicable'.

Wherever a subclause of IS 302-1 (2008) is to be replaced by a new text, it has been indicated as under:

Replacement — followed by the new text.

Wherever a subclause of IS 302-1 (2008) is to be modified by a new text, it has been indicated as under:

Modification — followed by the new text

Any addition to the existing provision of a subclause of IS 302-1 (2008) has been indicated as under:

Addition — followed by the text of the additional matter.

Clauses/tables which are additional to those of IS 302-1 (2008) are numbered starting from 101 and additional

*(Continued on third cover)*

(Continued from second cover)

subclauses are numbered with the main clause number followed by 101, 102, etc, for example, **7.101**.

Should, however, any deviation exist between IS 302-1 (2008) and this standard, the provisions of the latter shall apply.

This standard is based on IEC 60335-2-31 (2006) 'Safety of household and similar electrical appliances — Part 2-31: Particular requirements for range hoods' issued by the International Electrotechnical Commission except for the following modification:

- a) The leakage current value is more stringent as compared to values specified to IEC Publication, and
- b) Ambient test conditions are based on National conditions.

For the purpose of deciding whether a particular requirement of this standard is complied with, the final value, observed or calculated, expressing the result of a test, shall be rounded off in accordance with IS 2 : 1960 'Rules for rounding off numerical values (*revised*)'. The number of significant places retained in the rounded off value should be the same as that of the specified value in this standard.

# *Indian Standard*

## SAFETY OF HOUSEHOLD AND SIMILAR ELECTRICAL APPLIANCES

### PART 2 PARTICULAR REQUIREMENTS

#### Section 31 Range Hoods

#### 1 SCOPE

This clause of Part 1 is replaced by the following:

This standard deals with the safety of electric range hoods intended for installing above household cooking ranges, hobs and similar cooking appliances, their rated voltage being not more than 250 V.

NOTE 101 — The cooking appliance may be supplied by electricity or other fuels, such as gas.

Appliances not intended for normal household use but that nevertheless may be a source of danger to the public, such as appliances intended to be used by laymen in shops, in light industry and on farms, are within the scope of this standard.

As far as is practicable, this standard deals with the common hazards presented by appliances that are encountered by all persons in and around the home. However, in general, it does not take into account:

- a) the use of appliances by young children or infirm persons without supervision, and
- b) playing with the appliance by young children.

NOTE 102 — Attention is drawn to the fact that:

- a) for appliances incorporating electrostatic air filters, additional requirements apply;
- b) for appliances intended to be used in vehicles or on board ships or aircraft, additional requirements may be necessary; and
- c) additional requirements are specified by the national health authorities, the national authorities responsible for the protection of labour, the national authorities responsible for buildings and similar authorities.

NOTE 103 — This standard does not apply to:

- a) appliances intended for commercial purposes; and
- b) 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).

#### 2 REFERENCES

This clause of Part 1 is applicable.

#### 3 TERMINOLOGY

This clause of Part 1 is applicable except as follows:

**3.101 Range Hood** — Motor-operated appliance intended to collect contaminated air from above a hob.

NOTE — The filtered air may be discharged back into the room or ducted away.

#### 4 GENERAL REQUIREMENTS

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 Modification

Appliances are not connected to a duct.

#### 6 CLASSIFICATION

This clause of Part 1 is applicable.

#### 7 MARKING AND INSTRUCTIONS

This clause of Part 1 is applicable except as follows.

##### 7.1 Addition

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

Lamp, *Max* .... W

##### 7.12 Addition

The instructions shall state the substance of the following:

- a) There shall be adequate ventilation of the room when the range hood is used at the same time as appliances burning gas or other fuels (not applicable to appliances that only discharge the air back into the room);
- b) The details concerning the method and frequency of cleaning;
- c) There is a fire risk, if cleaning is not carried out in accordance with the instructions; and
- d) Do not flambé under the range hood.



### 7.12.1 Addition

The installation instructions shall include the substance of the following:

- a) The air shall not be discharged into a flue that is used for exhausting fumes from appliances burning gas or other fuels (not applicable to appliances that only discharge the air back into the room).
- b) The minimum distance between the supporting surface for the cooking vessels on the hob and the lowest part of the range hood. When the range hood is located above a gas appliance, this distance shall be at least 65 cm. If the instructions for installation for the gas hob specify a greater distance, this has to be taken into account.
- c) Regulations concerning the discharge of air have to be fulfilled.

### 7.15 Addition

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

### 7.101 BIS Certification Marking

The appliances may also be marked with the Standard Mark.

The use of the Standard Mark is governed by the provisions of the *Bureau of Indian Standards Act, 1986* and the Rules and Regulations made thereunder. The details of conditions under which the licence for the use of the Standard Mark may be granted to manufacturers or producers may be obtained from the Bureau of Indian Standards.

## 8 PROTECTION AGAINST ACCESS TO LIVE PARTS

This clause of Part 1 is applicable except as follows:

### 8.2 Addition

After the removal of detachable parts during user maintenance, the basic insulation of internal wiring may be touched provided it is electrically equivalent to the insulation of cords complying with IS 694 or IS 9968 (Part 1).

## 9 STARTING OF MOTOR-OPERATED APPLIANCES

This clause of Part 1 is not applicable.

## 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 appliances are installed in accordance with the instructions. Other appliances are fixed to a vertical support.

The appliance is located above a hob so that the distance between its lowest point and the hob surface is the minimum distance specified in the instructions. A vertical side wall extending to the top of the range hood is placed at right angles to the vertical support, 100 mm from one side of the range 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 range appliances.

If the range hood is intended to be installed over a hob having four hob elements, the hob shall have two 2 kW electric elements at the back and two 1.5 kW electric elements at the front.

If the range hood is intended to be installed over a hob having six hob elements, the hob shall have three 2 kW electric elements at the back and three 1.5 kW electric elements at the front.

The layout of the hobs used in the tests is shown in Fig. 101. The hobs are centrally situated with respect to the range hood.

Vessels, without lids, containing water are placed on the hob elements. The diameter of the vessels is approximately equal to that of the hob elements. The hob elements are operated to maintain vigorous boiling.

The appliance is also tested without the hob elements in operation.

### 11.7 Replacement

Appliances are operated until steady conditions are established.

### 11.8 Addition

The temperature-rise limit for external enclosures and wood does not apply when the hob elements are in operation. When the appliance is tested without the hob elements in operation, only the temperature rises of the external enclosure and wood are measured, the temperature rise limit for wood being 65 K.

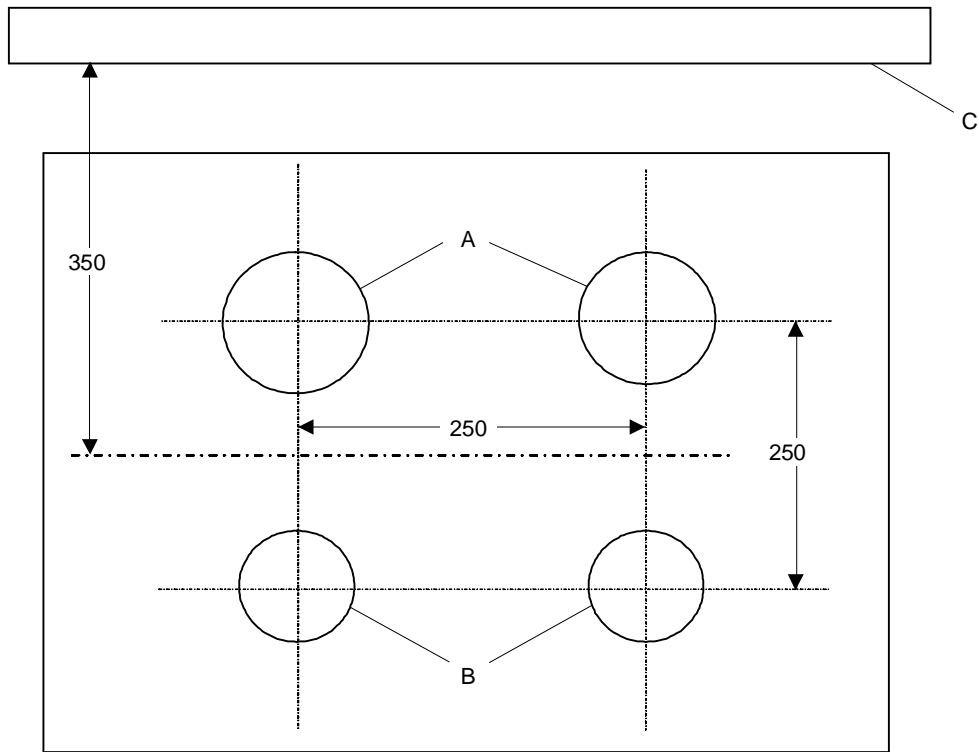
NOTE 101 — Temperature rises, especially those of lampholders, are also determined with the fan motor switched off.

## 12 VOID

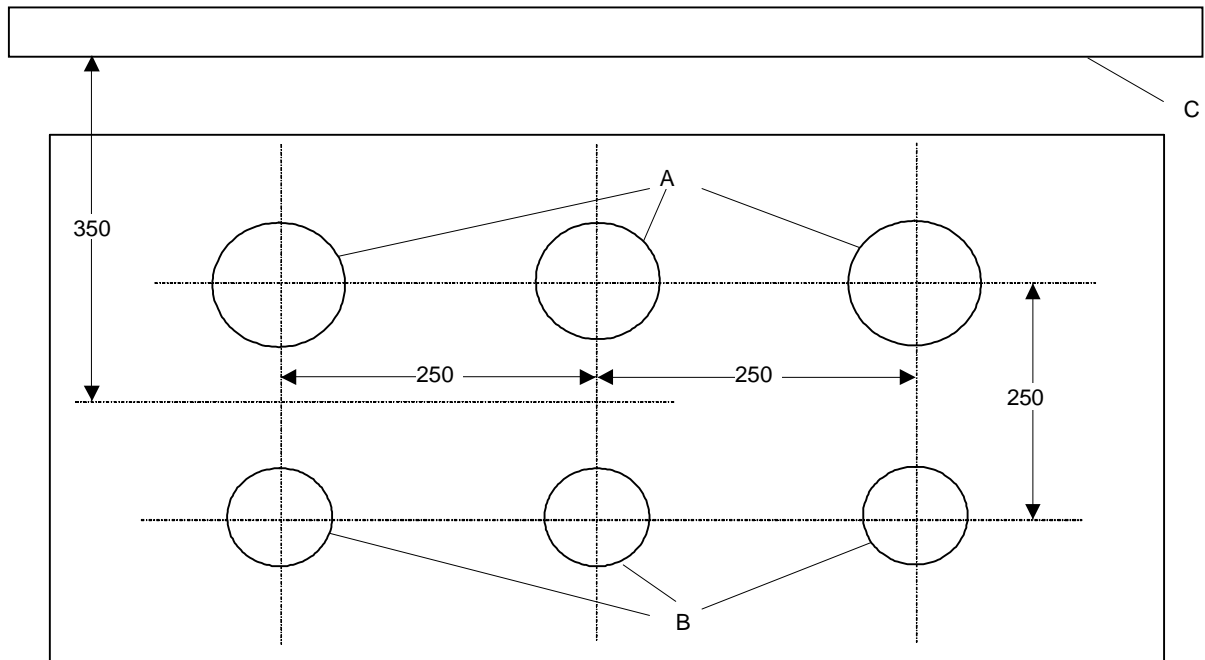
## 13 LEAKAGE CURRENT AND ELECTRIC STRENGTH AT OPERATING TEMPERATURE

This clause of Part 1 is applicable.





a) Four Element Hob



b) Six Element Hob

All dimensions in millimetres.

**Key**

A = electric hob element, 2 kW  
 B = electric hob element, 1.5 kW

C = vertical support for the range hood

FIG. 101 HOB LAYOUT FOR THE HEATING TEST

#### 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.

#### 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

Appliances are also subjected to 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 specified in Table 8. The appliance shall not deform to such an extent that parts fall from it.

**19.101** Appliances are operated above a hob as specified in **11**, but without vessels and with only the two outer hob elements at the back being energized.

#### 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 appliances 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 the following test.

Detachable parts are removed. It shall not be possible to grasp wiring likely to be touched 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** — Interconnection cords intended to be disconnected before cleaning or user maintenance are not subjected to the test.

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

Compliance is checked by inspection.

NOTE — Keyhole slots, hooks and similar means, without any further means to prevent the appliance from being inadvertently lifted off the support, are not considered to be adequate means for fixing the appliance securely.

**22.102** Appliances 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 not considered to be parts that have to be cleaned.

#### 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.

#### 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 that become accessible during user maintenance are considered to be accessible metal parts.

#### 28 SCREWS AND CONNECTIONS

This clause of Part 1 is applicable.

## 29 CLEARANCES, CREEPAGE DISTANCES AND SOLID INSULATION

This clause of Part 1 is applicable except as follows:

### 29.2 Addition

The microenvironment is pollution degree 3 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 underside of the appliance at a temperature of at least 105°C.

#### 30.2.2 Not applicable.

**30.101** Appliances shall not incorporate combustible material liable to appreciably propagate a fire originating underneath the hood.

Compliance is checked as follows:

Filters of non-metallic material intended for the absorption of grease shall meet the requirements specified in ISO 9772 for category FH3 material, except that the thickness of the specimen is that of the filter.

**NOTE 1** — It may be necessary to support the specimen during the test.

Lamp diffusers and external air-guides having a total mass not exceeding 0.35 kg are subjected to the glow-wire test of IS 11000 (Part 2/Sec 1) at a temperature of 550 °C. The glow-wire test is not carried out on parts of material classified at least HB40, provided that the test sample was no thicker than the relevant part.

Other accessible parts of the enclosure are subjected to the needle-flame test of Annex E of Part 1 of this standard.

Internal air-ducts and parts within them, such as fans, are subjected to the needle-flame test of Annex E of Part 1 of this standard, droplets of material being ignored.

**NOTE 2** — Grease filters are not subjected to this test.

## 31 RESISTANCE TO RUSTING

This clause of Part 1 is applicable.

## 32 RADIATION, TOXICITY AND SIMILAR HAZARDS

This clause of Part 1 is applicable.

## 101 TESTS

### 101.1 Type Tests

The tests specified in Table 101 shall constitute the type tests and shall be carried out on a sample selected preferably at random from regular production lot (*see 5.3*). Before commencement of the tests, the irons shall be visually examined and inspected of components, parts and their assembly, constructions, mechanical hazards, marking provision of suitable terminals for supply connections, earthing and the effectiveness screws and connection. The external surface finish shall be even and free from finishing defects.

**Table 101 Schedule of Type Tests**

Sl No. (1)	Tests (2)	Clause Reference (3)
i)	Protection against access to live parts	8
ii)	Power input and current	10
iii)	Heating	11
iv)	Leakage current and electric strength at operating temperature	13
v)	Transient overvoltages	14
vi)	Moisture resistance	15
vii)	Leakage current and electric strength	16
viii)	Overload protection of transformers and associated circuits	17
ix)	Abnormal operation	19
x)	Stability and mechanical hazards	20
xi)	Mechanical strength	21
xii)	Construction	22
xiii)	Internal wiring	23
xiv)	Components	24
xv)	Supply connection and external flexible cords	25
xvi)	Terminals for external conductors	26
xvii)	Provision for earthing	27
xviii)	Screws and connections	28
xix)	Clearances, creepage distances and solid insulation	29
xx)	Resistance to heat and fire	30
xxi)	Resistance to rusting	31
xxii)	Radiation, toxicity and similar hazards	32

#### 101.1.1 Criteria of Acceptance

Sample shall successfully pass all the type tests for proving conformity with the requirements of the standard. If the sample fails in any of the type tests, the testing authority, at its discretion, may call for fresh samples not exceeding twice the original number and subject them again to all tests or to the test(s) in which failure(s) had occurred. No failure should be permitted in the repeat test (s).

#### 101.2 Acceptance Tests

The following shall constitute the acceptance tests:

<i>Test</i> (1)	<i>Clause Reference</i> (2)
a) Protection against access to live parts	<b>8</b>
b) Power input and current	<b>10</b>
c) Heating	<b>11</b>
d) Leakage current and electric strength at operating temperature	<b>13</b>
e) Moisture resistance	<b>15</b>
f) Leakage current and electric strength	<b>16</b>
g) Provision for earthing	<b>27</b>

NOTE — For the purpose of acceptance tests, the humidity treatment shall be done for 24 h while conducting the test for moisture resistance (**15**).

**101.2.1** A recommended sampling procedure for acceptance tests is given in Annex J of IS 302-1.

**101.3 Routine Tests**

The following shall constitute the routine tests:

<i>Test</i> (1)	<i>Clause Reference</i> (2)
a) Protection against access to live parts	<b>8</b>
b) High voltage	<b>13.3.2</b> of IS 302-1
c) Provision for earthing	<b>27</b>

**ANNEXES**

The Annexes of Part 1 are applicable.

## Bureau of Indian Standards

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Amendments are issued to standards as the need arises on the basis of comments. Standards are also reviewed periodically; a standard along with amendments is reaffirmed when such review indicates that no changes are needed; if the review indicates that changes are needed, it is taken up for revision. Users of Indian Standards should ascertain that they are in possession of the latest amendments or edition by referring to the latest issue of 'BIS Catalogue' and 'Standards : Monthly Additions'.

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### Amendments Issued Since Publication

Amend No.	Date of Issue	Text Affected

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