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INTERNATIONAL STANDARD

colour inside

Household and similar electrical appliances – Safety – Part 2-14: Particular requirements for kitchen machines

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FOREWORD

1) The International Electrotechnical Commission (IEC) is a worldwide organization for standardization comprising all national electrotechnical committees (IEC National Committees). The object of IEC is to promote international co-operation on all questions concerning standardization in the electrical and electronic fields. To this end and in addition to other activities, IEC publishes International Standards, Technical Specifications, Technical Reports, Publicly Available Specifications (PAS) and Guides (hereafter referred to as "IEC Publication(s)"). Their preparation is entrusted to technical committees; any IEC National Committee interested in the subject dealt with may participate in this preparatory work. International, governmental and non-governmental organizations liaising with the IEC also participate in this preparation. IEC collaborates closely with the International Organization for Standardization (ISO) in accordance with conditions determined by agreement between the two organizations.
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This redline version of the official IEC Standard allows the user to identify the changes made to the previous edition. A vertical bar appears in the margin wherever a change has been made. Additions are in green text, deletions are in strikethrough red text.

International Standard IEC 60335-2-14 has been prepared by IEC technical committee 61: Safety of household and similar electrical appliances.

This sixth edition cancels and replaces the fifth edition published in 2006, its Amendment 1 (2008) and its Amendment 2 (2012). This edition constitutes a technical revision.

The principal changes in this edition as compared with the fifth edition of IEC 60335-2-14 are as follows (minor changes are not listed):

- requirements for **noodle makers** with a mixing function have been introduced (3.1.9.116, 11.7.118, 19.103);
- requirements for appliances having a feed screw or auger have been changed (20.106);
- the definition of normal operation has been changed (3.1.9);
- the method of carrying out the heating test has been changed (11.7);
- the requirement in 20.114 has been modified to align with the test specification;
- some notes in Subclauses 5.2, 11.7.107, 11.7.110, 11.7.116, 20.103, 20.107, 20.108, 20.117, 20.119, 25.14, and Annex AA were converted to normative text.

The text of this standard is based on the following documents:

FDIS	Report on voting
61/5136/FDIS	61/5172/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 publication has been drafted in accordance with the ISO/IEC Directives, Part 2.

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 fifth edition (2010) of that standard.

NOTE 1 When “Part 1” is mentioned in this standard, it refers to IEC 60335-1.

This part 2 supplements or modifies the corresponding clauses in IEC 60335-1, so as to convert that publication into the IEC standard: Safety requirements for electric kitchen machines.

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 the stability date indicated on the IEC website 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.

NOTE 4 The attention of National Committees is drawn to the fact that equipment manufacturers and testing organizations may need a transitional period following publication of a new, amended or revised IEC publication in which to make products in accordance with the new requirements and to equip themselves for conducting new or revised tests.

It is the recommendation of the committee that the content of this publication be adopted for implementation nationally not earlier than 12 months or later than 36 months from the date of publication.

The following differences exist in the countries indicated below.

– 3.1.9: Different loads are used (USA).
– 11.7: The operating times are different (USA).
– 19.7: The test is applicable to all appliances and the tests of 19.101 and 19.102 are not applicable (USA).
– Clause 20: Many of the tests are different (USA).
– 22.103: The test is not conducted (USA).
– 22.104: The specified probe is not applied to knife sharpeners (USA).
– 24.1.3: Switches are required to have 6000 cycles of operation (USA).
– 25.5: Type Z attachment is allowed for all appliances (USA).
– 25.14: The test is not conducted (USA).

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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 and takes into account the way in which electromagnetic phenomena can affect the safe operation of appliances.

This standard takes into account the requirements of IEC 60364 as far as possible so that there is compatibility with the wiring rules when the appliance is connected to the supply mains. However, national wiring rules may differ.

If an appliance within the scope of this standard also incorporates functions that are covered by another part 2 of IEC 60335, the relevant part 2 is applied to each function separately, as far as is reasonable. If applicable, the influence of one function on the other is taken into account.

When a part 2 standard does not include additional requirements to cover hazards dealt with in Part 1, Part 1 applies.

NOTE 1 This means that the technical committees responsible for the part 2 standards have determined that it is not necessary to specify particular requirements for the appliance in question over and above the general requirements.

This standard is a product family standard dealing with the safety of appliances and takes precedence over horizontal and generic standards covering the same subject.

NOTE 2 Horizontal and generic standards covering a hazard are not applicable since they have been taken into consideration when developing the general and particular requirements for the IEC 60335 series of standards. For example, in the case of temperature requirements for surfaces on many appliances, generic standards, such as ISO 13732-1 for hot surfaces, are not applicable in addition to Part 1 or part 2 standards.

An appliance that complies with the text of this standard will not necessarily be considered to comply with the safety principles of the standard if, when examined and tested, it is found to have other features that impair the level of safety covered by these requirements.

An appliance employing materials or having forms of construction differing from those detailed in the requirements of this standard may be examined and tested according to the intent of the requirements and, if found to be substantially equivalent, may be considered to comply with the standard.

HOUSEHOLD AND SIMILAR ELECTRICAL APPLIANCES – SAFETY –

Part 2-14: Particular requirements for kitchen machines

1 Scope

This clause of Part 1 is replaced by the following.

This part of IEC 60335 deals with the safety of electric kitchen machines for household and similar purposes, their **rated voltage** being not more than 250 V.

NOTE 101 Examples of appliances that are within the scope of this standard are

- bean slicers;
- berry-juice extractors;
- **blenders**;
- can openers;
- centrifugal juicers;
- churns;
- citrus-fruit squeezers;
- coffee mills not exceeding 500 g hopper capacity;
- cream whippers;
- egg beaters;
- **food mixers**;
- **food processors**;
- grain grinders not exceeding 3 l hopper capacity;
- graters;
- ice-cream machines, including those for use in refrigerators and freezers;
- knife sharpeners;
- knives;
- **mincers**;
- **noodle makers;**
- potato peelers;
- shredders;
- sieving machines;
- slicing machines.

Appliances intended for normal household and similar use and that may also be used by laymen in shops, in light industry and on farms, are within the scope of this standard. However, if the appliance is intended to be used professionally to process food for commercial consumption, the appliance is not considered to be for household and similar use only.

NOTE 102 Use of a kitchen machine in bed and breakfast premises, for example, is considered to be household use.

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

- ~~the use of appliances by young children or infirm~~ persons (including children) whose
  - physical, sensory or mental capabilities; or

- lack of experience and knowledge

  prevents them from using the appliance safely without supervision or instruction;

– children playing with the appliance ~~by young children~~.

NOTE 103 Attention is drawn to the fact that

– for appliances intended to be used in vehicles or on board ships or aircraft, additional requirements may be necessary;

– in many countries additional requirements are specified by the national health authorities, the national authorities responsible for the protection of labour and similar authorities.

NOTE 104 This standard does not apply to

– slicing machines having a circular knife the blade of which is inclined at an angle exceeding 45° to the vertical;

– food waste disposers (IEC 60335-2-16);

– ice-cream appliances with incorporated motor compressors (IEC 60335-2-24);

– kitchen machines intended for commercial purposes (IEC 60335-2-64);

– kitchen machines intended for industrial purposes;

– kitchen machines 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 Normative references

This clause of Part 1 is applicable except as follows.

Addition:

~~IEC 60811-1-4:1985, *Common Test methods for insulating and sheathing materials of electric cables – Part 1: Methods for general application – Section Four – tests at low temperature*~~
~~Amendment 1 (1993)~~
~~Amendment 2 (2001)~~

IEC 60811-504:2012, *Electric and optical fibre cables – Test methods for non-metallic materials – Part 504: Mechanical tests – Bending tests at low temperature for insulation and sheaths*

IEC 60811-505:2012, *Electric and optical fibre cables – Test methods for non-metallic materials – Part 505: Mechanical tests – Elongation at low temperature for insulations and sheaths*

3 Terms and definitions

This clause of Part 1 is applicable except as follows.

3.1.9 *Replacement:*

normal operation
operation of the appliance under the conditions specified in 3.1.9.101 to 3.1.9.119~~, or at **rated power input** if this is more unfavourable~~ followed by operation with the most unfavourable load indicated in the instructions.

~~NOTE 101~~ If the conditions are not specified, the appliance is operated with the most unfavourable load indicated in the instructions.

~~NOTE 102 **Rated power input** is obtained by applying a constant torque to the appliance placed in its normal position of use and without subjecting it to imbalance forces greater than those occurring in normal use.~~

~~NOTE 103 Operation at **rated power input** is considered to be more unfavourable if the power input determined during the test of 10.1 differs from the **rated power input** by more than~~

~~– 20 % for appliances having a **rated power input** not exceeding 300 W;~~

~~– 15 % (or 60 W if greater) for appliances having a **rated power input** exceeding 300 W.~~

3.1.9.101 Berry-juice extractors are fed with 1 kg of berries, such as currants, gooseberries or grapes. Pushers are pressed with a force of 5 N against the berries.

3.1.9.102 **Food blenders** are operated with the bowl filled to its maximum indicated level with a mixture comprising two parts by mass of soaked carrots and three parts water. If this level is not indicated, the bowl is filled to two-thirds of its total capacity. The carrots are soaked in water for 24 h and cut so that the dimensions of the pieces do not exceed 15 mm. If the bowl is not provided, a cylindrical bowl is used which has a capacity of approximately 1 l and an inner diameter of approximately 110 mm.

Liquid blenders are operated with water instead of the mixture.

3.1.9.103 Can openers are operated with cans of tinned steel having a diameter of approximately 100 mm.

3.1.9.104 ~~Centrifugal~~ Juicers are operated with carrots that have been soaked in water for approximately 24 h. 5 kg of soaked carrots are gradually fed into juicers having separate outlets for the juice and residue. Other juicers are fed with batches of 0,5 kg of carrots, unless otherwise indicated in the instructions. Pushers are pressed with a force of 5 N against the carrots.

3.1.9.105 Cheese graters are operated with a 250 g piece of hard Parmesan cheese selected from a block of cheese about 16 months old and which has at least one plane surface. A force of 10 N is applied to the cheese unless the force is applied automatically.

3.1.9.106 Churns are filled with a mixture of eight parts by mass of heavy cream and one part of buttermilk. The quantity of the mixture is the maximum that allows the churn to operate without spillage.

3.1.9.107 Citrus-fruit squeezers are operated with orange halves pressed against the reamer with a force of 50 N.

3.1.9.108 Coffee mills having a separate container for collecting the ground coffee are operated with the hopper filled with roasted coffee beans.

Other coffee mills are operated with the hopper filled with the maximum quantity of roasted coffee beans stated in the instructions.

Note 1 to entry: If necessary, the coffee beans are conditioned for 24 h at a temperature of 30 °C ± 2 °C and a relative humidity of ~~(~~60 % ± 2~~)~~ %.

Controls are set to the position resulting in the smallest grain size.

3.1.9.109 Cream whippers and egg beaters are operated in water with 80 % of the length of the effective part immersed in a bowl of water.

3.1.9.110 **Food mixers** with beaters for mixing cake batter are operated with the beater blades as close as possible to the bottom of a bowl containing dry sand having a grain size between 170 μm and 250 μm. The height of the sand in the bowl is approximately 80 % of the length of the effective part of the beater.

Food mixers with kneaders for mixing yeast dough are operated with the kneaders in a bowl filled with a mixture of flour and water.

Note 1 to entry: The flour has a protein content of ~~(~~10 % ± 1~~)~~ %, based on a negligible water content of the flour and without chemical additives.

Note 2 to entry: In case of doubt, the flour is more than two weeks but less than four months old. It is stored in plastic bags with as little air as possible.

The bowl is filled with a mass of flour in grams equal to 35 % of its capacity in cm^3, 72 g of water at a temperature of 25 °C ± 1 °C being added for each 100 g of flour.

Note 3 to entry: In case of doubt, the quantity of water is 1,2 times that necessary for the consistency of the mixture to be 500 Brabender units at 29 °C ± 1 °C, measured using a farinograph.

For **hand-held food mixers**, the kneaders are moved in a figure-of-eight movement at a rate of 10 to 15 movements per minute. The kneaders are to touch the wall of the bowl at opposite points and be in contact with the bottom of the bowl. If a bowl is not provided, a bowl is used that has a height of approximately 130 mm and an inner diameter of approximately 170 mm at the top, tapering down to approximately 150 mm at the bottom. Its inner surface is smooth and the wall and bottom blend smoothly.

3.1.9.111 **Food processors** are operated as specified for **food mixers** with kneaders for mixing yeast dough. However, the quantity of the mixture is the maximum stated in the instructions. If an accessory rotating at high speed is used to prepare the dough, only 60 g of water is used for each 100 g of flour.

Note 1 to entry: In case of doubt when using an accessory rotating at high speed, the quantity of water is that necessary for the consistency of the mixture to be 500 Brabender units at 29 °C ± 1 °C, measured using a farinograph.

Note 2 to entry: If instructions for mixing yeast dough are not provided, the **food processor** is operated using the recipe which results in the most unfavourable conditions.

3.1.9.112 Grain grinders are operated with the hopper filled with wheat, controls being set to the position resulting in the smallest grain size.

Note 1 to entry: If necessary, the wheat is conditioned for 24 h at a temperature of 30 °C ± 2 °C and a relative humidity of ~~(~~60 % ± 2~~)~~ %.

Note 2 to entry: Corn is used instead of wheat when instructions state that it can be ground.

3.1.9.113 Ice-cream machines are operated with a mixture of 60 % water, 30 % sugar, 5 % lemon juice and 5 % beaten egg white by mass. The quantity of the mixture is the maximum stated in the instructions. If there is no stated maximum, the container will be filled up to the maximum capacity.

Removable elements for cooling ice cream are pre-cooled for 24 h at –20 °C ± 5 °C.

For appliances cooled by ice, the cooling container is filled with ice in accordance with the instructions, 200 g of salt being added for each kg of ice.

Ice-cream machines for use in refrigerators and freezers are placed on thermal insulating material approximately 20 mm thick. They are operated without load at an ambient temperature of –4 °C ± 1 °C.

3.1.9.114 Knives are operated by slicing a length of hard sausage when measuring the power input. The sausage is approximately 55 mm in diameter and cut into slices approximately 5 mm thick, a force of approximately 10 N being applied to the knife. The sausage is stored for at least 4 h at a temperature of 23 °C ± 2 °C before slicing.

Note 1 to entry: Salami is a suitable hard sausage.

For the other tests, knives are operated with the cutting edge of the blade pressed against a length of soft wood having a cross-section approximately 50 mm × 100 mm. A force is

gradually applied to the knife until the power input measured when cutting the sausage is obtained.

3.1.9.115 Mincers are fed with sinewless, boneless and fatless beef that has been cut into pieces approximately 20 mm × 20 mm × 60 mm. Pushers are pressed with a force of 5 N against the meat.

Note 1 to entry: A brake may be used to apply the mean value of the load that is determined by mincing the meat for 2 min.

3.1.9.116 Noodle makers without a mixing function are fed with dough prepared from 225 g wheat flour, 1 egg (approximately 55 g), 15 ml cooking oil and 45 ml water. Pushers are pressed with a force of 5 N against the dough.

Noodle makers with a mixing function are fed with wheat flour and water in turn, 32 g water being used for each 100 g of wheat flour unless the instructions specify a more severe mixture. The quantity of the mixture is the maximum stated in the instructions.

3.1.9.117 Potato peelers of the container type are operated filled with water and potatoes. 5 kg of approximately spherical potatoes are used, each kilogram containing 12 to 15 potatoes.

Hand-held potato peelers are operated by peeling potatoes.

3.1.9.118 Vegetable graters and shredders are operated with carrots that have been soaked in water for approximately 24 h and cut into suitable pieces. Five batches, each containing 0,5 kg of soaked carrots, are used. Pushers are pressed with a force of 5 N against the carrots.

3.1.9.119 Bean slicers, knife sharpeners, sieving machines and slicing machines are operated without load.

3.101
food mixer
appliance intended for mixing food ingredients

3.102
food processor
appliance intended to finely chop batches of meat, cheese, vegetables and other foods by means of cutting blades rotating in a container

Note 1 to entry: Other functions may be performed by rotating blades, disks, paddles, or similar means used in place of the cutting blades.

Note 2 to entry: Choppers are considered to be **food processors**.

3.103
mincer
appliance intended to finely cut meat and other foods by the action of a feed screw, knives and perforated screens

3.104
biased-off switch
switch that automatically returns to the **off position** when its actuating member is released