

INTERNATIONAL STANDARD

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

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INTERNATIONAL STANDARD

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

INTERNATIONAL
ELECTROTECHNICAL
COMMISSION

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INTERNATIONAL ELECTROTECHNICAL COMMISSION

HOUSEHOLD AND SIMILAR ELECTRICAL APPLIANCES – SAFETY –

Part 2-14: Particular requirements for kitchen machines

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 commented version (CMV) of the official standard IEC 60335-2-14:2025 edition 7.0 allows the user to identify the changes made to the previous IEC 60335-2-14:2016+AMD1:2019 CSV edition 6.1. Furthermore, comments from IEC TC 61 experts are provided to explain the reasons of the most relevant changes, or to clarify any part of the content.

A vertical bar appears in the margin wherever a change has been made. Additions are in green text, deletions are in strikethrough red text. Experts' comments are identified by a blue-background number. Mouse over a number to display a pop-up note with the comment.

This publication contains the CMV and the official standard. The full list of comments is available at the end of the CMV.

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

This seventh edition cancels and replaces the sixth edition published in 2016 and Amendment 1:2019. This edition constitutes a technical revision.

This edition includes the following significant technical changes with respect to the previous edition:

- a) alignment with IEC 60335-1:2020;
- b) conversion of some notes to normative text (Clause 1, 3.1.9.111, 3.1.9.112, 3.1.9.114, 3.1.9.115, 11.7.3, 20.2, 20.107, 20.108);
- c) modification to replace berry juice extractor with auger juicer and addition of a defined term (Clause 1, 3.1.9.101, 3.5.107, 11.7.102, 19.1, 19.7);
- d) addition of requirements for appliances not intended for use by children (Clause 1, 7.12, 20.2, 20.106, 20.117);
- e) modifications to clarify the testing under normal operating conditions (3.1.9, 3.1.9.111, 5.9, 7.12, 10.1, 11.5, 11.6, 11.7, 11.7.1 to 11.7.3, 11.7.101 to 11.7.118);
- f) addition of surface temperatures for external accessible surfaces (11.3, 11.8);
- g) modification of the spillage test of 15.2 to address leakage from the liquid container;
- h) clarification of requirements for remote operation of kitchen machines (11.7, 19.7, 22.40, 22.49, 22.51);
- i) modification of the operating period for juicers with respect to the 0,5 kg carrot load and the operating time (11.7.105);
- j) clarification of overfill testing with detachable gaskets and addition of gasket leakage test (15.2, 15.102);
- k) clarification of the feed opening dimension limits in 20.2;
- l) addition of requirements when compliance with the standard relies on an electronic circuit for the interlock function (20.2, 20.104, 20.108, 20.113);
- m) addition of test probe 18 where test probe B is applied and clarification of forces applied to test probes (20.2, 20.104, 20.106, 20.108, 20.113, 20.114, 20.117);
- n) update and combine requirements for inadvertent operation of hand-held blenders and knives to cover alternative switch constructions on the market (20.103 and deletion of previous 20.115);
- o) clarification of the test of 20.104;
- p) update of interlock requirements to be applicable for all appliances where the interlock is required for compliance with the standard (20.113, 20.114);
- q) update of the detergent used for centrifugal juicer conditioning (Annex AA).

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

Draft	Report on voting
61/7347/FDIS	61/7384/RVD

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

The language used for the development of this International Standard is English.

This document was drafted in accordance with ISO/IEC Directives, Part 2, and developed in accordance with ISO/IEC Directives, Part 1 and ISO/IEC Directives, IEC Supplement, available

at www.iec.ch/members_experts/refdocs. The main document types developed by IEC are described in greater detail at www.iec.ch/publications.

A list of all parts of the IEC 60335 series, under the general title: *Household and similar electrical appliances – Safety*, can be found on the IEC website.

This part 2 is to be used in conjunction with the latest edition of IEC 60335-1 and its amendments unless that edition precludes it; in that case, the latest edition that does not preclude it is used. It was established on the basis of the sixth edition (2020) of that standard.

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

This part 2 supplements or modifies the corresponding clauses in IEC 60335-1, so as to convert that publication into the IEC standard: Safety requirements for 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 document will remain unchanged until the stability date indicated on the IEC website under webstore.iec.ch in the data related to the specific document. At this date, the document will be

- reconfirmed,
- withdrawn, or
- revised.

NOTE 4 The attention of National Committees is drawn to the fact that equipment manufacturers and testing organizations can 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.

INTRODUCTION

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

Guidance documents concerning the application of the safety requirements for appliances can be accessed via TC 61 supporting documents on the IEC website <https://www.iec.ch/tc61/supportingdocuments>.

This information is given for the convenience of users of this International Standard and does not constitute a replacement for the normative text in this standard.

This standard recognizes the internationally accepted level of protection against hazards such as electrical, mechanical, thermal, fire and radiation of appliances when operated as in normal use taking into account the manufacturer's instructions. It also covers abnormal situations that can be expected in practice and takes into account the way in which electromagnetic phenomena can affect the safe operation of appliances.

This standard takes into account the requirements of IEC 60364 as far as possible so that there is compatibility with the wiring rules when the appliance is connected to the supply mains. However, national wiring rules ~~may~~ can 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~~ Horizontal publications, basic safety publications and group safety publications covering a hazard are not applicable since they have been taken into consideration when developing the general and particular requirements for the IEC 60335 series of standards. ~~For example, in the case of temperature requirements for surfaces on many appliances, generic standards, such as ISO 13732-1 for hot surfaces, are not applicable in addition to Part 1 or part 2 standards.~~ **1**

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

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

NOTE 3 Standards dealing with non-safety aspects of household appliances are:

- IEC standards published by TC 59 concerning methods of measuring performance;
- CISPR 11, CISPR 14-1 and relevant IEC 61000-3 series standards concerning electromagnetic emissions;
- CISPR 14-2 concerning electromagnetic immunity;
- IEC standards published by TC 111 concerning environmental matters. **2**

HOUSEHOLD AND SIMILAR ELECTRICAL APPLIANCES – SAFETY –

Part 2-14: Particular requirements for kitchen machines

1 Scope

This clause of Part 1 is replaced with 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 including direct current (DC) supplied appliances and **battery-operated appliances**. **3**

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

- bean slicers;
- ~~– berry juice extractors;~~
- **auger juicers**; **4**
- **blenders**;
- can openers;
- centrifugal juicers;
- churns;
- citrus-fruit squeezers;
- coffee mills not exceeding a hopper **rated capacity** of 500 g;
- cream whippers;
- egg beaters;
- **food mixers**;
- **food processors**;
- grain grinders not exceeding a hopper **rated capacity** of 3 l;
- graters;
- ice-cream machines, including those for use in refrigerators and freezers;
- knife sharpeners;
- knives;
- **mincers**;
- **noodle makers**;
- ~~– potato peelers~~; **5**
- shredders;
- sieving machines;
- slicing machines.

Appliances intended for normal household and similar use and that ~~may~~ can also be used by ~~laymen~~ laypersons in shops, in light industry, ~~bed and breakfast~~ 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:

- persons (including children) whose
 - physical, sensory or mental capabilities; or
 - lack of experience and knowledgeprevents them from using the appliance safely without supervision or instruction;
- children playing with the appliance.

It does not take into account the use of the following appliances by children: **6**

- bean slicers;
- **blenders** including **hand-held blenders**;
- juicers other than citrus-fruit squeezers;
- **food mixers**;
- **food processors**;
- knives;
- **mincers**;
- **noodle makers**;
- lathe-type or **hand-held peelers**;
- vegetable graters/shredders;
- slicing machines.

~~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~~ can 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;
- breadmakers (IEC 60335-2-9); **7**
- soy milk makers (IEC 60335-2-15); **8**
- 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 60584-1, *Thermocouples – Part 1: EMF specifications and tolerances*

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 Definitions relating to physical characteristics

3.1.9 *Replacement:*

normal operation

~~operation of the appliance under the conditions specified in 3.1.9.101 to 3.1.9.119 followed by operation with the most unfavourable load indicated in the instructions. If the conditions are not specified, the appliance is operated with the most unfavourable load indicated in the instructions~~

Modification: **9**

Replace the first paragraph with the following:

operation of the appliance under the conditions specified in 3.1.9.101 to 3.1.9.119 and operation with the most unfavourable load indicated in the instructions **10**

Note 101 to entry: Operation per the instructions is not necessary for appliances operated without load in accordance with 3.1.9.119. **11**

Note 102 to entry: A guidance document (61/6234/INF) concerning the application of 3.1.9, Clause 10 and Clause 11 can be accessed via TC 61 supporting documents on the IEC website.

3.1.9.101 ~~Berry juice extractors~~ **Auger juicers** 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~~ the **rated capacity** with a mixture comprising two parts by mass of soaked carrots and three parts water. If ~~this level~~ the **rated capacity** is not ~~indicated~~ specified, 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 **total 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 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 $30\text{ °C} \pm 2\text{ °C}$ and a relative humidity of $60\% \pm 2\%$.

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 $10\% \pm 1\%$, 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 **total capacity** in cm^3 , 72 g of water at a temperature of $25\text{ °C} \pm 1\text{ °C}$ 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 $29\text{ °C} \pm 1\text{ °C}$, 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 **food mixer** is held so that the kneaders ~~are to~~ touch the wall of the bowl at opposite points and ~~be~~ are 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.~~

Food processors are operated using the load which results in the most unfavourable conditions as follows:

- If provided with grating, slicing or shredding blades, they are operated as specified for vegetable graters and shredders (3.1.9.118) and cheese graters (3.1.9.105);
- If provided with chopping blades, they are operated with each of the following loads filled to the **rated capacity** or the maximum quantity recommended in the instructions for the specified food load, whichever is less:
 - raw sinewless, boneless and fatless beef;
 - hard Parmesan cheese selected from a block of cheese about 16 months old;
- If provided with mixing blades, they are operated as specified for:
 - **food mixers** for mixing cake batter (3.1.9.110) when the **food processor** is not intended to mix yeast dough. However, the sand is filled to the **rated capacity** or the maximum quantity recommended in the instructions for the mixing blade, whichever is less;
 - **food mixers** with kneaders for mixing yeast dough when the **food processor** is intended to mix yeast dough. However, the setting of the control and 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. **12**

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 $29\text{ °C} \pm 1\text{ °C}$, 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.~~

Note 2 to entry: The maximum quantity of the mixture may be specified by the maximum amount of flour.

Food loads are prepared prior to processing as recommended in the instruction manual, including cutting to a specified size, peeling, and chilling in the refrigerator or freezer. If no preparation instructions are provided, the foods are cut into pieces as needed to fit within the bowl or feed opening. **13**

For a multispeed appliance, if the instructions recommend processing of certain food loads at other than the highest speed, they are processed at the recommended speed. **14**

3.1.9.112 Grain grinders are operated with the hopper filled with wheat, and controls being set to the position resulting in the smallest grain size. Corn is used instead of wheat when instructions state that it can be ground.

Note 1 to entry: If necessary, the wheat or corn is conditioned for 24 h at a temperature of $30\text{ °C} \pm 2\text{ °C}$ and a relative humidity of $60\% \pm 2\%$.

~~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.~~ The quantity of the mixture is the **rated capacity**. If the **rated capacity** is not specified, the container is filled up to the **total capacity**.

Removable elements for cooling ice cream are pre-cooled for 24 h at $-20\text{ °C} \pm 5\text{ °C}$.

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 $-4\text{ °C} \pm 1\text{ °C}$.

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 $23\text{ °C} \pm 2\text{ °C}$ before slicing.

Note 1 to entry: An example of a ~~suitable~~ hard sausage is salami.

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~~ and lathe-type peelers are operated by peeling potatoes. **15**

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.

3.1.101

rated capacity

capacity assigned to the appliance by the manufacturer **16**

3.1.102

total capacity

maximum capacity without overflowing **17**

3.5 Definitions relating to types of appliances

3.5.101

food mixer

appliance intended for mixing food ingredients

3.5.102

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~~ can 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**.

3.5.103

mincer

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

3.5.104

blender

appliance intended to pulverise solids, such as ice, vegetables or fruit, and to combine them into a blend, or to merge liquids and solids into a blend (**food blenders**) or to combine liquids only (**liquid blenders**)

3.5.105

cordless blender

blender incorporating a motor and which is connected to the supply and operated only when placed on its associated stand

3.5.106

noodle maker

appliance without a mixing function intended to make noodles by extrusion or other means or an appliance with a mixing function intended to make noodles by extrusion only

3.5.107

auger juicer

appliance intended to juice various fruits and vegetables by use of an auger to crush the food load and a strainer to separate the juice from the pulp **18**

Note 1 to entry: An auger is a screw, transporting food load, where the volume decreases and thus crushes the food load.

3.7 Definitions relating to safety of components

3.7.101

biased-off switch

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

4 General requirement

This clause of Part 1 is applicable.

5 General conditions for the tests

This clause of Part 1 is applicable except as follows.

5.2 Addition:

*The test of 15.2 may be carried out on a separate appliance. **19***

Three additional coffee mills and grain grinders are required for the test of 19.102.

The additional test of 25.14 is carried out on a separate appliance.

5.9 Addition:

For appliances intended to perform more than one of the functions specified in 3.1.9.101 to 3.1.9.119, the test is carried out with the functions which give the most unfavourable conditions. 20

6 Classification

This clause of Part 1 is applicable except as follows.

6.1 Addition:

Hand-held kitchen machines shall be **class II** or **class III**. However, they may be **class 0** or **class I** if their **rated voltage** does not exceed 150 V.

7 Marking and instructions

This clause of Part 1 is applicable except as follows.

7.1 Modification:

Appliances shall be marked with their **rated power input**.

Addition:

Stands provided with **cordless blenders** shall be marked with:

- the name, trademark or identification mark of the manufacturer or responsible vendor;
- the model or type reference.

7.12 Addition:

~~The instructions shall include the operating times for accessories.~~ 21

Modification:

Add the following before the fourth paragraph and add "For other appliances," at the beginning of the fourth paragraph:

For knives **blenders** including **hand-held blenders**, juicers other than citrus-fruit squeezers, **food mixers**, **food processors**, **mincers**, **noodle makers**, lathe-type or **hand-held peelers**, vegetable graters/shredders, bean slicers and slicing machines, the instructions shall include the substance of the following:

This appliance is not intended for use by children. Keep the appliance and its supply cord out of reach of children.

This appliance is not intended for use by persons with reduced physical, sensory or mental capabilities, or lack of experience and knowledge, unless they have been given supervision or instruction concerning use of the appliance by a person responsible for their safety.

Children should be supervised to ensure that they do not play with the appliance. 22

Addition:

For appliances with a **rated capacity**, the **rated capacity** shall be described in the instructions unless it is marked on the appliance. 23

Accessories, other than those supplied with the appliance, shall include instructions for their safe use.

The instructions for appliances intended to perform more than one of the functions specified in 3.1.9.101 to 3.1.9.119 shall identify the appliance function upon which the **rated power input** or **rated power input range** is based, unless the **rated power input** or **rated power input range** is based on the appliance function resulting in the greatest power input during the test of Clause 10. **24**

The instructions for slicing machines with a base having a plane surface underneath the sliding feed table shall include the substance of the following:

This appliance must be used with the sliding feed table and the piece holder in position unless this is not possible due to the size or shape of the food.

The instructions shall warn of potential injury from unintended use. They shall state that care shall be taken when handling the sharp cutting blades, emptying the container and during cleaning. **25**

The instructions for **food processors** and **blenders** shall ~~warn of potential injury from misuse. They shall state that care shall be taken when handling the sharp cutting blades, emptying the bowl and during cleaning and they shall~~ include the substance of the following:

Be careful if hot liquid is poured into the food processor or blender as it can be ejected out of the appliance due to a sudden steaming.

The instructions shall include the substance of the following:

Always disconnect the appliance from the supply before assembling, disassembling or cleaning. **26**

The instructions for **hand-held blenders** shall include the substance of the following:

~~— always disconnect the blender from the supply if it is left unattended and before assembling, disassembling or cleaning;~~

~~— do not allow children to use the blender without supervision.~~

Always disconnect the blender from the supply if it is left unattended.

The instructions for centrifugal juicers shall include the substance of the following:

Do not use the appliance if the rotating sieve or the protecting cover is damaged or has visible cracks.

The instructions for **cordless blenders** shall state that the **blender** is only to be used with the stand provided.

If the **blender** and stand of the **cordless blender** can be lifted together by gripping the handle of the **blender**, the instructions shall include the substance of the following:

CAUTION Ensure that the blender is switched off before removing it from the stand.

The instructions shall include details on how to clean surfaces in contact with food.

The instructions for appliances incorporating a switch necessary for compliance with 22.40 shall include the substance of the following:

Switch off the appliance and disconnect from supply before changing accessories or approaching parts that move in use.

The instructions for **noodle makers** with a mixing function shall state the maximum quantity of ingredients that ~~may~~ should be used.

The instructions shall include the substance of the following:

This appliance is intended to be used in household and similar applications such as:

- staff kitchen areas in shops, offices and other working environments;
- farm houses;
- by clients in hotels, motels and other residential type environments;
- bed and breakfast type environments.

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.

8 Protection against access to live parts

This clause of Part 1 is applicable except as follows.

8.1.1 Addition:

Test probe 18 is not applied for those appliances identified in 7.12 as not intended for use by children. 27

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 except as follows.

10.1 Addition:

~~Except for **noodle makers** with a mixing function, a representative period is 2 min or the time specified in 11.7 for one cycle of operation, whichever is shorter.~~

*Except for **noodle makers** with a mixing function, a representative period is the shortest of:*

- *2 min or the operating period specified in 11.7.1 for one cycle of operation, when the conditions specified in 3.1.9.101 to 3.1.9.119 are used,*
- *2 min or the operating period specified in the instructions for one cycle of operation, when the most unfavourable load indicated in the instructions is used. 28*

11 Heating

This clause of Part 1 is applicable except as follows.

11.3 Addition:

*Where the external **accessible surfaces** are suitably flat and access permits, then the test probe of Figure 101 is used to measure the temperature rises of external **accessible surfaces** specified in Table 101. The probe is applied with a force of $4\text{ N} \pm 1\text{ N}$ to the surface in such a way that the best possible contact between the probe and the surface is ensured. The measurement is performed after a contact period of 30 s.*

The probe may be held in place using a laboratory stand clamp or similar device. Any measuring instrument giving the same results as the probe may be used. **29**

11.5 Replacement:

Motor-operated appliances are supplied with the most unfavourable voltage between 0,94 times and 1,06 times the **rated voltage**. **30**

11.6 Replacement:

Combined appliances are supplied with the most unfavourable voltage between 0,94 times and 1,06 times the **rated voltage**. **31**

11.7 Replacement:

~~The appliance is subjected to the tests of 11.7.1 and 11.7.2 and if necessary the test of 11.7.3.~~

Modification: **32**

Replace the first paragraph with the following:

The appliance is subjected to the test of 11.7.1 and if necessary the tests of 11.7.2 and 11.7.3. **33**

Appliances incorporating a programmer or timer are operated for the maximum period allowed by the programmer or timer or until steady conditions are established, whichever occurs first. If the appliance is also operable without the programmer or timer, the appliance is operated for the maximum period allowed by the programmer or timer or the operating period specified in 11.7.1, 11.7.2 or 11.7.3, as applicable, whichever is most unfavourable **34**. An appliance incorporating a time limiting function that:

- operates at a time greater than the operating period specified in 11.7.1, 11.7.2 and 11.7.3, and
- is not identified on the control or in the user instructions

is not considered to be a timer during the heating test and the operating period specified in 11.7.1, 11.7.2 and 11.7.3 are applicable. **35**

Appliances for **remote operation** are also operated for the maximum operating time that can be set for **remote operation**, or the maximum time until the appliance automatically switches off. **36**

Replace the first dashed item in the third paragraph item with the following:

- the **battery** that has been **fully discharged** is charged while the appliance is operated as specified in 11.7.1, 11.7.2 and 11.7.3, as applicable, performing its intended function, if allowed by the construction of the appliance; **37**

~~**11.7.1** The appliance is operated for the period specified and where relevant the number of cycles as specified in 11.7.101 to 11.7.118.~~

The appliance is operated with

- the load conditions as specified in 3.1.9.101 to 3.1.9.119,
- the operating period as specified in 11.7.101 to 11.7.118, and
- the number of cycles and rest periods as specified in 11.7.101 to 11.7.118 (where relevant). **38**

~~11.7.2 The appliance is operated for the number of cycles specified in 11.7.101 to 11.7.118 and using the maximum quantity of the load to be processed stated in the instructions, with operating periods as follows:~~

- ~~— for operating periods specified in the instructions not exceeding 7 min, the maximum period stated in the instructions plus 1 min or 7 min whichever is less;~~
- ~~— for operating periods specified in the instructions exceeding 7 min, the maximum period stated in the instructions.~~

~~If it is necessary to perform a number of operations to obtain these periods, the rest periods are equal to, where relevant, the time taken to empty and refill the container with the maximum quantity of ingredients stated in the instructions.~~

~~Appliances incorporating a timer are operated for the maximum period allowed by the timer.~~

If the power input, measured in accordance with Clause 10, of any load stated in the instructions exceeds the power input of the load used for the test in 11.7.1, the appliance is operated as specified in a). If the operating period specified in the instructions exceeds the operating period used for the test of 11.7.1, the appliance is operated as specified in b) **39**. However, operation per the instructions is not necessary for appliances operated without load in accordance with 3.1.9.119 **40**.

a) The appliance is operated with

- the maximum load conditions as specified in the instructions,
- the operating period as specified in the instructions, and
- the number of cycles and rest periods as specified in 11.7.101 to 11.7.118 (where relevant). **41**

However, if the operating period specified in the instructions is less than that specified in 11.7.1 and does not exceed 7 min, the operating period shall be:

- the maximum period stated in the instructions plus 1 min,
- the operating period specified in 11.7.1, or
- 7 min,

whichever is less. **42**

b) The appliance is operated with

- the load conditions as specified in the instructions,
- the maximum operating period as specified in the instructions, and
- the number of cycles and rest periods as specified in 11.7.101 to 11.7.118 (where relevant). **43**

~~11.7.3 If none of the power inputs used for the tests in 11.7.1 or 11.7.2 are~~

- ~~— more than 80 % of rated power input for a rated power input not exceeding 300 W;~~
- ~~— more than rated power input minus 60 W for a rated power input between 300 W and 400 W;~~
- ~~— more than 85 % of rated power input for a rated power input exceeding 400 W,~~

~~then the following test is carried out.~~

~~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. The appliance is run with the relevant time period specified in 11.7.101 to 11.7.118.~~

NOTE 101—For some functions of kitchen machines, the period for which rated power input is applied can be determined by first applying the load detailed in 3.1.9. For example

- ~~the period in 11.7.104 is obtained using the load in 3.1.9.103;~~
- ~~the period in 11.7.106 is obtained using the load in 3.1.9.105;~~
- ~~the period in 11.7.108 is obtained using the load in 3.1.9.108;~~
- ~~the period in 11.7.111 is obtained using the load in 3.1.9.111 (for **food processors** when instructions for mixing yeast dough are not provided);~~
- ~~the period in 11.7.112 is obtained using the load in 3.1.9.112;~~
- ~~the period in 11.7.116 is obtained using the load in 3.1.9.117 (for other than hand held potato peelers);~~
- ~~the period in 11.7.117 is obtained using the load in 3.1.9.118.~~

~~NOTE 102 When using **rated power input** as the load and if instructions for mixing yeast dough are provided, the number of cycles to be applied in 11.7.111 is found by first ascertaining the number of cycles necessary to process at least 1 kg of flour using the load in 3.1.9.111.~~

If none of the power inputs measured in accordance with Clause 10 are:

- more than 80 % of **rated power input** for a **rated power input** not exceeding 300 W;
- more than **rated power input** minus 60 W for a **rated power input** between 300 W and 400 W;
- more than 85 % of **rated power input** for a **rated power input** exceeding 400 W,

then the following test is carried out. For appliances intended to perform more than one of the functions specified in 3.1.9.101 to 3.1.9.119, if the power input for any of these functions meets the criteria above, this test is not carried out. **44**

The appliance is operated with

- the load to obtain **rated power input** when supplied at **rated voltage** or the upper limit of the **rated voltage range** by applying a 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;
- the operating period as specified in 11.7.101 to 11.7.118, and
- the number of cycles and rest periods as specified in 11.7.101 to 11.7.118 (where relevant).

The applied torque is maintained when the test voltage is adjusted to 0,94 and 1,06 times the **rated voltage**. **45**

However, for appliances intended to perform more than one of the functions specified in 3.1.9.101 to 3.1.9.119, the relevant operating period, number of cycles and rest period specified in 11.7.101 through 11.7.118 for the function upon which the **rated power input** is based, as specified in the instructions, is used. If the instructions do not identify the function upon which the **rated power input** is based, the relevant operating period for the function that provides the greatest power input during Clause 10 is used. **46**

~~**11.7.101** **Bean slicers, churns, sieving machines and slicing machines are operated for 30 min.**~~

For bean slicers, churns, sieving machines and slicing machines,

- the operating period is 30 min;
- the number of cycles is one. **47**

~~**11.7.102** **Berry juice extractors and mincers are operated for 15 min.**~~

For auger juicers and mincers,

- the operating period is 15 min;
- the number of cycles is one.

~~11.7.103 Blenders that have to be kept switched on by hand and hand-held blenders are operated for 1 min with the control adjusted to the highest setting. The operation is carried out five times with rest periods of 1 min during which the mixture is replaced.~~

~~For other blenders, the period of operation is 3 min, the operation being carried out 10 times.~~

For blenders that have to be kept switched on by hand and hand-held blenders,

- the operating period is 1 min with the control adjusted to the highest setting;
- the number of cycles is five with rest periods of 1 min during which the mixture is replaced.

For other blenders,

- the operating period is 3 min with the control adjusted to the highest setting;
- the number of cycles is 10 with rest periods of 1 min during which the mixture is replaced.

~~11.7.104 Can openers are operated until the can is fully open. This operation is carried out five times with rest periods of 15 s.~~

For can openers,

- the operating period is the time needed to fully open the can;
- the number of cycles is five with rest periods of 15 s.

~~11.7.105 Juicers having separate outlets for the juice and residue are operated for 15 min.~~

~~Other juicers are operated for 2 min. The operation is carried out 10 times with rest periods of 2 min.~~

For juicers having separate outlets for the juice and residue,

- the operating period is 15 min or the time to process 5 kg of carrots, whichever is less;
- the number of cycles is one.

For other juicers,

- the operating period is 2 min or the time to process 0,5 kg of carrots, whichever is less;
- the number of cycles is 10 with rest periods of 2 min during which any container is emptied. **48**

~~11.7.106 Cheese graters are operated until the cheese is grated.~~

For cheese graters,

- the operating period is the time needed until the cheese is grated;
- the number of cycles is one.

~~11.7.107 Citrus-fruit squeezers are operated for 15 s during which two halves of fruit are squeezed. The operation is carried out 10 times with rest periods of 15 s. The appliance is left idling during the rest periods unless it switches off automatically.~~

~~NOTE—If necessary, fruit residue is removed during the rest periods.~~

For citrus-fruit squeezers,

- the operating period is 15 s during which two halves of fruit are squeezed;
- the number of cycles is 10 with rest periods of 15 s during which the appliance is left idling unless it switches off automatically.

If necessary, fruit residue may be removed during the rest periods.

~~11.7.108 Coffee mills having a separate container for collecting the ground coffee are operated until the container is full, unless the hopper is emptied first. This operation is carried out twice with a rest period of 1 min.~~

~~Other coffee mills are operated until the coffee beans are completely ground or for 30 s if this is longer. The operation is carried out three times with rest periods of 1 min.~~

For coffee mills having a separate container for collecting the ground coffee,

- the operating period is the time needed until the container is full or the hopper is emptied, whichever occurs first;
- the number of cycles is two with a rest period of 1 min.

For other coffee mills,

- the operating period is the time needed until the coffee beans are completely ground or for 30 s, whichever is longer;
- the number of cycles is three with rest periods of 1 min.

~~11.7.109 Cream whippers and egg beaters are operated for 10 min with the control adjusted to the highest setting.~~

For cream whippers and egg beaters,

- the operating period is 10 min with the control adjusted to the highest setting;
- the number of cycles is one.

~~11.7.110 Food mixers with beaters for mixing cake batter are operated for 15 min unless they incorporate a biased-off switch, in which case they are operated for 5 min.~~

~~Food mixers with kneaders for mixing yeast dough are operated for~~

- ~~— 5 min for hand-held food mixers;~~
- ~~— 10 min for other food mixers.~~

For food mixers with beaters for mixing cake batter,

- the operating period is 15 min unless they have to be kept switched on by hand, in which case the operating period is 5 min;
- the number of cycles is one.

For food mixers with kneaders for mixing yeast dough,

- the operating period is:
 - 5 min for hand-held food mixers;
 - 10 min for other food mixers;
- the number of cycles is one.

For the first 30 s, the control is adjusted to the lowest setting, after which the control is adjusted to the position for mixing yeast dough stated in the instructions. If the mixing action automatically stops when the dough is ready, the test is terminated.

~~11.7.111 Food processors are operated with the setting of the control and for the period stated in the instructions for mixing yeast dough. This operation is carried out five times with a rest period of 2 min between each operation or for a sufficient number of times to process at least 1 kg of flour, whichever is less. However, at least two operations are performed, with a rest period of 2 min between each operation.~~

~~If instructions for mixing yeast dough are not provided, the food processor is operated under the most unfavourable conditions stated in the instructions. The operation is carried out three times with a rest period of 2 min between each operation.~~

Food processors are operated under the most unfavourable of the following conditions, as applicable:

- grating, slicing or shredding vegetables where the operating period, number of cycles and rest periods are as specified for vegetable graters and shredders;
- grating cheese where the operating period and number of cycles are as specified for cheese graters. If necessary, the bowl is filled to **rated capacity** and emptied as quickly as possible;
- chopping, where the
 - operating period is the time stated in the instructions or 10 s, whichever is greater;
 - number of cycles is 3 with rest periods of 2 min;
- mixing, for **food processors** with instructions for mixing yeast dough, where the
 - operating period and setting of the control is as stated in the instructions for mixing yeast dough;
 - number of cycles is five, with rest periods of 2 min between each operation, or for the number of cycles needed to process at least 1 kg of flour, whichever is less. However, at least two cycles are performed.
- mixing, for other than yeast dough, where the
 - operating period is the time stated in the instructions for mixing or 10 s, whichever is greater;
 - number of cycles is three with rest periods of 2 min. **49**

~~11.7.112 Grain grinders are operated until 1 kg of wheat has been ground. The hopper of batch-fed grinders is refilled if necessary, with rest periods of 30 s.~~

For batch-fed grain grinders needing to be refilled to process 1 kg of wheat or corn,

- the operating period is the time needed until a full hopper of wheat or corn has been ground;
- the number of cycles is that necessary to grind at least 1 kg of wheat or corn with rest periods of 30 s.

For other grain grinders,

- the operating period is the time needed until 1 kg of wheat or corn has been ground;
- the number of cycles is one.

~~11.7.113 Ice-cream machines for use in refrigerators and freezers are operated for 5 min, after which the stirrer is stalled for 25 min.~~

~~Other ice-cream machines are operated for 30 min.~~

For Ice-cream machines for use in refrigerators and freezers,

- the operating period is 5 min, after which the stirrer is stalled for 25 min;
- the number of cycles is one.

For other ice-cream machines,

- the operating period is 30 min;
- the number of cycles is one.

~~11.7.114 Knife sharpeners are operated for 10 min.~~

For knife sharpeners,

- the operating period is 10 min;
- the number of cycles is one.

~~11.7.115 Knives are operated for 15 min. The slicing operation is simulated at a rate of 10 slices per minute, the blades being unloaded for 2 s each time.~~

For knives,

- the operating period is 4 s while simulating the slicing operation;
- the number of cycles is 150 with rest periods of 2 s while the blades are operating without load. **50**

~~11.7.116 Potato peelers of the container type are operated until the potatoes are adequately peeled. Potatoes may be peeled in more than one batch. Peeling periods are separated by rest periods of 2 min. When checking that the potatoes are adequately peeled, eyes are ignored. Timers are reset if necessary.~~

~~Hand-held potato peelers are operated for 10 min.~~

For potato peelers of the container type,

- the operating period is the time needed until the potatoes are adequately peeled;
- the number of cycles is that needed to peel 5 kg of potatoes with rest periods of 2 min.

When checking that the potatoes are adequately peeled, eyes are ignored. Timers are reset if necessary.

For hand-held peelers,

- the operating period is the time needed to peel a potato;
- the number of cycles is that needed to peel potatoes for 10 min with no rest period. **51**

For lathe-type peelers,

- the operating period is the time needed to peel a potato;
- the number of cycles is that needed to peel potatoes for 10 min with rest periods equal to the time needed to replace the potato. **52**

~~11.7.117 Shredders and vegetable graters are operated until a batch of carrots is shredded. The operation is carried out five times with rest periods of 2 min.~~

For shredders and vegetable graters,

- the operating period is the time needed until a batch of carrots is shredded;
- the number of cycles is five with rest periods of 2 min.

~~11.7.118 Noodle makers without a mixing function are operated for 15 min.~~

~~Noodle makers with a mixing function are operated two times or a sufficient number of times to process 1 kg of flour, whichever is greater. There shall be a 2 min rest period between each operation.~~

For noodle makers without a mixing function,

- the operating period is 15 min;
- the number of cycles is one.

For **noodle makers** with a mixing function,

- the operating period is the time needed until a batch of dough is mixed and extruded;
- the number of cycles is two or that needed to process 1 kg of flour, whichever is greater, with rest periods of 2 min.

11.8 Modification:

Replace the first paragraph with the following:

During the test, the temperature rises are monitored continuously and shall not exceed the values shown in Table 3 and Table 101. **53**

Addition:

For ice-cream machines for use in refrigerators and freezers, the temperature rise values are increased by 30 K. **54**

Table 101 – Maximum temperature rises for specified external accessible surfaces under normal operating conditions

Surface	Temperature rise of external accessible surfaces K
Bare metal	42
Coated metal ^a	49
Glass and ceramic	56
Plastic and plastic coating > 0,4 mm ^{b, c}	62
NOTE The temperature rise limits of handles, knobs, grips, keyboards, keypads and similar parts are specified in Table 3.	
^a Metal is considered coated when a coating having a minimum thickness of 90 µm made of enamel, powder or non-substantially plastic coating is used.	
^b The temperature rise limit of plastic also applies for plastic material having a metal finish of thickness less than 0,1 mm.	
^c When the thickness of the plastic coating does not exceed 0,4 mm, the temperature rise limits of coated metal for underlying metal apply or the temperature rise limits for glass or ceramic material for underlying glass or ceramic material apply.	

12 ~~Void~~ Charging of metal-ion batteries

This clause of Part 1 is applicable. **55**

13 Leakage current and electric strength at operating temperature

This clause of Part 1 is applicable.

14 Transient overvoltages

This clause of Part 1 is applicable.

15 Moisture resistance

This clause of Part 1 is applicable except as follows.

15.2 Modification:

~~Instead of overfilling the liquid container, the test is carried out as follows.~~

~~The liquid container of the appliance is completely filled with water containing approximately 1 % NaCl. The appliance is then supplied at **rated voltage** and operated for 15 s. Lids are in position or removed, whichever is more unfavourable. During the test, the leakage current shall not exceed the values specified in Clause 13.~~

~~Saline solution is then added to the liquid container until it is completely full again. A further quantity equal to 15 % of the capacity of the container or 0,25 l, whichever is greater, is poured in steadily over a period of 1 min.~~

Replace the second paragraph with the following:

Compliance is checked by:

- the test of 15.101, and
- the following test using a spillage solution comprising water containing approximately 1 % NaCl and 0,6 % rinsing agent. **56**

Addition:

Water outlets for ~~potato~~ peelers are blocked

For **cordless blenders**, the test is carried out on a horizontal surface with the **blender** both on and off its stand.

Liquid containers, gaskets and blades are not removed, even if they are **detachable parts**. **57**

15.101 Appliances with **type X attachment**, except those having a specially prepared cord, are fitted with the lightest permissible type of flexible cord of the smallest cross-sectional area specified in Table 13.

Appliances incorporating an appliance inlet are tested with or without an appropriate connector in position, whichever is most unfavourable.

Detachable parts are removed. However, liquid containers, gaskets and blades are not removed, even if they are **detachable parts**.

The liquid container of the appliance is completely filled with water containing approximately 1 % NaCl. If it is not possible to completely fill the liquid container due to leakage of the solution through openings in the container, the container is filled to the maximum level possible without leakage.

The appliance is then supplied at **rated voltage** and operated for 15 s. During operation, lids are in position or removed, whichever is more unfavourable.

During the test, the leakage current shall not exceed the values specified in 13.2. After the test, the appliance shall then withstand the electric strength test of 16.3 and inspection shall show that there is no trace of water on insulation that could result in a reduction of **clearances** or **creepage distances** below the values specified in Clause 29. **58**

15.101 ~~102~~ The connecting devices of stands for **cordless blenders** shall not be affected by water.

Compliance is checked by the following test.

*The stand is placed on a horizontal surface and 30 ml of ~~water containing approximately 1 % NaCl~~ the spillage solution specified in 15.2 **59** is poured onto each connecting device. The solution is poured steadily through a tube having an inner diameter of 8 mm over a period of 2 s, the lower end of the tube being 200 mm above the connecting device.*

NOTE A schematic representation of the test arrangement is shown in Figure ~~103~~ 102.

The stand shall then withstand the dielectric strength test of 16.3.

15.103 *Appliances having a liquid container with a gasket that is a **detachable part** shall be constructed so that leakage from a liquid container does not affect their electrical insulation.*

Compliance is checked by the following test using water containing approximately 1 % NaCl.

*Appliances with **type X attachment**, except those having a specially prepared cord, are fitted with the lightest permissible type of flexible cord of the smallest cross-sectional area specified in Table 13.*

Appliances incorporating an appliance inlet are tested with or without an appropriate connector in position, whichever is most unfavourable.

*The appliance shall be assembled for normal use, but gaskets that are **detachable parts** are removed.*

*The appliance is operated at **rated voltage**. A quantity of the saline solution is added to the liquid container equal to **total capacity**. For appliances where it is not possible to add liquid to the container while the appliance is operating, the saline solution is added to the container before starting the operation.*

The duration of the test shall be the shortest of the following:

- until the container is empty;*
- until no additional leakage from the container is possible independent of the tightening torque during assembly; or*
- until the operating period has reached the duration specified for one cycle in 11.7.1 or 3 min, whichever is longer.*

*After the test, the appliance shall then withstand the electric strength test of 16.3 and inspection shall show that there is no trace of water on insulation that could result in a reduction of **clearances or creepage distances** below the values specified in Clause 29. **60***

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:

The test of 19.7 is only applicable to coffee mills and grain grinders that have to be kept switched on by hand, ~~berry juice extractors~~ **auger juicers**, **food blenders**, centrifugal juicers, churns, **food mixers**, **food processors**, ice-cream machines, **mincers**, and **noodle makers**.

Coffee mills and grain grinders are also subjected to the test of 19.101. They are also subject to the test of 19.102 unless they have to be kept switched on by hand.

Noodle makers with a mixing function are also subjected to the test of 19.103.

19.7 Addition:

Coffee mills and grain grinders that have to be kept switched on by hand, ~~berry juice extractors~~ **auger juicers**, **food blenders**, centrifugal juicers for fruit and vegetables, **food mixers**, **food processors** and **mincers** are operated for 30 s.

Noodle makers without a mixing function that are fed by hand are tested for 30 s **61**. Other **noodle makers** are tested for 5 min.

Churns and ice-cream machines are operated until steady conditions are established.

Appliances that can be controlled by **remote operation** are also tested for the maximum operating time that can be set for **remote operation**, or the maximum time until the appliance automatically switches off. **62**

19.10 Addition:

The test is repeated with accessories in position but without additional load.

Coffee mills and grain grinders are only tested for 30 s.

19.11.2 Addition:

Appliances having a device with an **off position** obtained by electronic disconnection, or a device that can place the appliance in a stand-by mode, are turned off or placed in the stand-by mode and supplied at **rated voltage**.

19.13 Addition:

Appliances tested with an electronic switch in the **off position**, or in the stand-by mode, shall

- not become operational, or
- if they become operational, not result in a **dangerous malfunction** during or after the tests of 19.11.2.

19.101 Coffee mills and grain grinders are supplied at **rated voltage** and operated under **normal operation** five times with rest periods.

The duration of the operating period is

- for appliances incorporating a timer, the longest period allowed by the timer;
- for other appliances, as follows:
 - for coffee mills of the grinding type and grain grinders, 30 s longer than the time needed to fill the collecting container or the time required to empty the hopper, whichever is shorter;
 - for other coffee mills, 1 min.

The duration of the rest period is

- 10 s, for appliances provided with a collecting container;
- 60 s, for other appliances.

The temperature of the windings shall not exceed the values shown in Table 8.

19.102 Coffee mills and grain grinders are subjected to the following test that is carried out on three additional appliances.

Coffee mills are filled with 40 g of coffee beans to which are added two granite chips that pass through an 8 mm screen but not a 7 mm screen. Grain grinders are operated under **normal operation** but with two granite chips that pass through a 4 mm screen but not a 3 mm screen. The appliance is supplied at **rated voltage** and operated until grinding has been completed.

If any of the motors stall, the original appliance is subjected to the test of 19.7 for a test period of 5 min.

19.103 **Noodle makers** with a mixing function are fed with the maximum quantity of flour stated in the instruction and no water, and then operated for one operating cycle. During the test, 19.13 is applicable and the winding temperatures shall not exceed the values specified in 19.9.

20 Stability and mechanical hazards

This clause of Part 1 is applicable except as follows.

20.2 Modification:

Replace the last sentence of the second paragraph with the following:

However, enclosures that can be opened by overriding an interlock by applying the test probe B with a force not exceeding 5 N or test probe 18 with a force not exceeding 2,5 N are considered to be **detachable parts**. Test probe 18 is not applied for those appliances identified in 7.12 as not intended for use by children. **63**

Addition:

Detachable accessories, such as feed pushers, are removed and covers are opened except that:

- for centrifugal juicers, the cover and the container for collecting the residue are in position;
- for graters and shredders, this is only applicable to accessories that are removed while the appliance is in operation.

~~NOTE 101 A feed pusher is an example of an accessory that is removed.~~

The test probes are not applied to:

- bean slicers;
- can openers;
- citrus juice squeezers;
- **food mixers**;
- **hand-held blenders**;
- ice-cream machines, including those for use in refrigerators and freezers;
- knife sharpeners;
- knives;
- ~~potato~~ peelers;
- sieving machines;
- slicing machines;
- the following parts of other appliances:
 - smooth shafts having a diameter not exceeding 8 mm, rotating at a speed not exceeding 1 500 r/min and driven by motors having an input not exceeding 200 W;
 - outlet sides of grating and shredding disks rotating at a speed not exceeding 1 500 r/min;
 - projections from the surface of grinding disks, cones and similar parts having a height less than 4 mm;
 - grinding screws with a projection having a height less than 4 mm and complying with all of the following:
 - the distance (shown as "S" in ~~Figure 104~~ Figure 103) between the grinding screw outer circumference (top of projection, shown as "B" in ~~Figure 104~~ Figure 103) and the inner wall of the feed screw housing (shown as "C" in ~~Figure 104~~ Figure 103) shall be maximum 1 mm;
 - the radius corner of the inner wall of the feed opening to the screw housing is less than 2 mm (shown as "R2" in ~~Figure 104~~ Figure 103);
 - the grinding screw profile shall not have sharp edges;
 - the position of the inner wall of the feed opening in the direction of rotation (shown as "W" in ~~Figure 104~~ Figure 103) shall be located at a distance equal to or smaller than 0,75 times the grinding screw radius including its threads (shown as "R1" in ~~Figure 104~~ Figure 103) measured from the grinding screw middle point.

NOTE 402101 Accessible drive shafts that may are not be always in use when the appliance is in operation can be protected by means of a collar or by being positioned in a recess.

~~The test probe is not applied to feed openings having a throat with the following dimensions:~~

- ~~— a height of at least 100 mm, measured from the upper edge of the cutting blade;~~
- ~~— an average of the maximum and minimum cross-sectional dimensions of the feed opening that does not exceed 65,5 mm;~~
- ~~— a maximum cross-sectional dimension of the feed opening that does not exceed 76 mm.~~

The test probes are not applied to feed openings with the following dimensions:

- located at a height of at least 100 mm, measured from the upper edge of the cutting blade;
- an average of the maximum (D_{\max}) and minimum (D_{\min}) cross-sectional dimensions of the feed opening that does not exceed 65,5 mm, where the minimum cross-sectional dimension is the diameter of the largest cylindrical rod that can be inserted into the opening;

- a length of the longest continuous straight line intersecting the feed opening (L) that does not exceed 76 mm. **64**

NOTE 102 See Figure 104 for examples of D_{\max} , D_{\min} and L .

For other feed openings, only the test probe similar to test probe B of IEC 61032 but having a circular stop face with a diameter of 50 mm, instead of the non-circular face, is applied. **65**

For **blenders, detachable parts**, except lids, are not removed. The test is carried out only **66** with a test probe similar to that of test probe B of IEC 61032 but having a circular stop face with a diameter of 125 mm instead of the non-circular face, the distance between the tip of the test finger and the stop face being 100 mm.

If compliance relies on an interlocked guard and the operation of an **electronic circuit** for the interlock function, the moving parts shall not operate with the guard removed under the following conditions applied separately:

- The fault conditions in a) to g) of 19.11.2 are applied one at a time to the **electronic circuit**.
- The electromagnetic phenomena tests of 19.11.4.2 and 19.11.4.5 are applied. The tests are carried out with surge protective devices disconnected, unless they incorporate spark gaps.

If the **electronic circuit** is programmable, the software shall contain measures to control the fault/error conditions specified in Table R.1 and is evaluated in accordance with the relevant requirements of normative Annex R. **67**

20.101 Accessories for cream whippers, egg beaters and **hand-held food mixers** shall not have knife edges, unless a suitable guard prevents accidental contact with their rotating parts.

It shall not be possible to release beaters, kneaders and similar accessories of **hand-held food mixers** by pressing a button or a similar action while the accessory is rotating at a speed exceeding 1 500 r/min.

Compliance is checked by inspection, by measurement and by manual test.

If compliance relies on the operation of an **electronic circuit**, the appliance is further tested as follows:

- The appliance is supplied at **rated voltage** and operated under **normal operation**.
The electromagnetic phenomena tests of 19.11.4.2 and 19.11.4.5 are then applied. The tests are carried out with surge protective devices disconnected, unless they incorporate spark gaps. **68**

Beaters, kneaders and similar accessories of **hand-held food mixers** shall not be released or be capable of being released by a single action during or after, as appropriate, the electromagnetic phenomena application.

- The appliance is supplied at **rated voltage** and operated under **normal operation**.
The fault conditions in a) to g) of 19.11.2 are then applied one at a time to the **electronic circuit** monitoring the release mechanism.

Beaters, kneaders and similar accessories of **hand-held food mixers** shall not be released or be capable of being released by a single action during the test.

If the **electronic circuit** is programmable, the software shall contain measures to control the fault/error conditions specified in Table R.1 and is evaluated in accordance with the relevant requirements of Annex R.

20.102 Blades of **hand-held blenders** shall be completely screened from above and shall not be able to touch a flat surface while rotating.

Compliance is checked by inspection and by applying a cylindrical rod from any position between the vertical and an angle of 45° to the upperside of the blending blade. The rod has a diameter of 8,0 mm ± 0,1 mm and unlimited length.

It shall not be possible to touch the blades with the end of the test rod.

20.103 Knives and **hand-held blenders**, other than **hand-held food mixers** provided with a **blender** attachment, shall incorporate a **biased-off switch**, its actuating member being ~~positioned in a recess or otherwise guarded to prevent accidental operation~~ recessed, guarded or otherwise constructed to prevent inadvertent operation.

Compliance is checked by applying a cylindrical rod, having a diameter of 40 mm and a hemispherical end, to the actuating member of the switch. The test rod is applied with a force not exceeding 5 N. The appliance shall not operate.

When an appliance incorporates a separate locking device that has to be actuated and held so the **biased-off switch** can be operated and that returns to the locked condition when the **biased-off switch** actuator is released, compliance is checked by applying two cylindrical rods simultaneously, one being applied to the separate locking device and one to the actuating member of the **biased-off switch**. The appliance shall not operate unless two separate and dissimilar actions are required to operate the appliance, such that the appliance cannot be operated with a single grasping motion or a straight-line motion.

NOTE Example of such construction are:

- a **biased-off switch** that has to be pushed in before it can be moved laterally to operate the appliance;
- a separate locking device located so that a single grasping motion will not actuate both the locking device and the **biased-off switch**. **69**

20.104 It shall not be possible to ~~inadvertently~~ operate the cutting blades of **blenders**, other than **hand-held blenders**, when they are accessible.

Compliance is checked by the following test applied to **blenders** other than **hand-held blenders**.

The test shall be carried out with **detachable parts** removed or with any combination of assembly of **detachable parts**, whichever is most unfavourable, but with the cutting blades in place. If the cutting blades of the **blender** can be touched with the test probe specified for **blenders** in 20.2, it shall not be possible to operate the ~~appliance~~ cutting blades of the **blender**.

Controls and switches, other than **biased-off switches**, are placed in the ~~on~~ most unfavourable position and two simultaneous or sequential applications of test probe B of IEC 61032 are applied to controls, **detachable parts** and **biased-off switches**, including interlock switches, with a force not exceeding 20 N, in an attempt to operate the cutting blades.

During the test, it shall not be possible to operate ~~the appliance~~ the cutting blades of the **blender**. **70**

If compliance relies on an interlocked guard and the operation of an **electronic circuit** for the interlock function, the cutting blades shall not operate with the guard removed under the following conditions applied separately:

- a) The fault conditions in a) to g) of 19.11.2 are applied one at a time to the **electronic circuit**.
- b) The electromagnetic phenomena tests of 19.11.4.2 and 19.11.4.5 are applied. The tests are carried out with surge protective devices disconnected, unless they incorporate spark gaps.

If the **electronic circuit** is programmable, the software shall contain measures to control the fault/error conditions specified in Table R.1 and is evaluated in accordance with the relevant requirements of normative Annex R. **71**

20.105 Centrifugal juicers shall be constructed so that covers do not open due to vibration.

Rotating parts shall be secured so that they are not liable to become loose during operation.

NOTE Fastening of screws and nuts in a direction opposite to the direction of rotation of the rotating parts is considered to be sufficient.

If parts rotate faster than 5 000 r/min, **tools** for fastening them shall be such that covers can only be closed after the **tool** has been removed.

Teeth of grating disks shall have a height not exceeding 1,5 mm. Ejectors on filter drums shall not project by more than 4 mm.

A feed pusher that fills the throat of the hopper shall be provided.

Compliance is checked by inspection, by measurement and by manual test. A force of 5 N is applied to covers in the most unfavourable direction. They shall not open.

20.106 Appliances having a feed screw or an auger shall, as far as is compatible with the use and working of the appliance, provide adequate protection against personal injury in normal use. They shall be provided with a feed pusher. These requirements are not applicable to grinding screws for which the test probes are not applied in 20.2.

Compliance is checked by inspection, by measurement and by the following test.

For appliances having only one opening for inserting food and applying the feed pusher, the maximum cross-sectional dimension of the opening, measured at least 100 mm from the upper edge of the feed screw or the auger shall not exceed 45 mm, or the feed screw or the auger of the appliance shall not be accessible to test probe B of IEC 61032 applied with a force not exceeding 5 N with the feed pusher not in position.

For appliances having different openings for inserting food and applying the feed pusher:

- *The maximum cross-sectional dimension of the opening for the feed pusher, measured at least 100 mm from the upper edge of the feed screw or the auger, shall not exceed 45 mm. The feed screw or the auger of the appliance shall not be accessible to test probe B of IEC 61032 applied with a force not exceeding 5 N with the pusher in position and not in position.*
- *The opening for inserting food shall have a construction such that direct access to the feed screw or the auger is prevented. It shall not be possible to touch the feed screw or auger with the test probe B of IEC 61032 applied with a force not exceeding 5 N with the pusher in position and not in position. 72*

The test shall be repeated with test probe 18 of IEC 61032 applied with a force not exceeding 2,5 N except for those appliances identified in 7.12 as not intended for use by children. 73

20.107 Slicing machines, other than **fixed appliances** and those having a **biased-off switch**, shall incorporate means to hold the appliance in place, such as suction cups, and allow it to be released after use.

~~NOTE Suction cups are suitable means to hold the appliance in place.~~

Compliance is checked by the following test.

The slicing machine is fixed to a plain glass plate placed on a horizontal surface. The glass is prevented from sliding by a stop.

A force of 30 N is applied horizontally to the appliance along the plane of the knife at a point 10 mm below the upper surface of the base carrying the sliding feed table.

The machine shall not move on the glass plate.

20.108 Slicing machines shall incorporate a guard surrounding the circular knife, its open sector being no larger than required for using the appliance, as shown in Figure 105.

Knife guards shall be **non-detachable parts** unless the motor cannot be switched on after their removal. It shall not be possible to operate interlocks by means of test probe B of IEC 61032 applied with a force not exceeding 5 N. **74**

If compliance relies on an interlocked guard and the operation of an **electronic circuit** for the interlock function, the circular knife shall not operate with the guard removed under the following conditions applied separately:

- a) The fault conditions in a) to g) of 19.11.2 are applied one at a time to the **electronic circuit**.
- b) The electromagnetic phenomena tests of 19.11.4.2 and 19.11.4.5 are applied. The tests are carried out with surge protective devices disconnected, unless they incorporate spark gaps.

If the **electronic circuit** is programmable, the software shall contain measures to control the fault/error conditions specified in Table R.1 and is evaluated in accordance with the relevant requirements of normative Annex R. **75**

The angle of the upper part of the open sector (θ in Figure 106) shall not exceed 75°. However, the angle may be increased to 90° if the exposed part of the knife exceeding 75° is screened from above.

The radial distance between the outer circumference of the knife and the knife guard (a in Figure 106) shall not exceed:

- 2 mm, if the guard is flush with the plane of the knife;
- 3 mm, if the guard projects at least 0,2 mm beyond the plane of the knife (b in Figure 106).

~~NOTE 1 – The distance between the plane of the knife and the projection of the guard is shown as b in Figure 102.~~

When the thickness of the slices is set to zero, the distance between the outer circumference of the knife and the plate that sets the thickness of the slices (c in Figure 106) shall not exceed 6 mm. At the upper and lower points of the open sector, the distance between the plate that sets the thickness of the slices and any other protecting part (e in Figure 106) shall not exceed 5 mm. If the distance "e" is shielded, the limit does not apply.

~~Additional guarding shall be provided if slices thicker than 15 mm can be cut.~~

~~NOTE 2 – an extension of the upper end of the plate that sets the thickness of the slices or an extension of the knife guard are examples of additional guarding.~~

Additional guarding, such as an extension of the upper end or the plate that sets the thickness or an extension of the knife guard, shall be provided if slices thicker than 15 mm can be cut.

Slicing machines shall incorporate a sliding feed table with a hand rest, a thumb guard and a piece holder. The thumb guard shall screen the full height of the open sector and be constructed so that the other fingers remain at least 30 mm away from the knife (f in Figure 106). The distance between the plane of the thumb guard and the knife (d in Figure 106) shall not exceed 5 mm. At the end of the forward movement of the sliding feed table, the thumb guard shall project at least 8 mm beyond the outer circumference of the knife.

The piece holder shall allow small pieces of food to be sliced and shall be capable of holding food, for example by spikes having a height of approximately 1,5 mm. It shall have a length of at least 120 mm and a height of at least 70 mm and shall project at least 20 mm beyond the hand rest.

The support for the sliding feed table shall not be usable for supporting food if:

- the knife has a diameter exceeding 170 mm, or
- the no-load speed of the knife exceeds 200 r/min, or
- the **rated power input** exceeds 200 W.

Compliance is checked by inspection, by measurement and by manual test.

20.109 Slicing machines shall be constructed so that accidental operation of the appliance is prevented.

NOTE The requirement ~~may~~ can be met by using a pull-on switch.

If a push-button, toggle, rocker or slide switch is used, the force necessary to actuate it shall be at least 2 N and the actuating member shall be recessed. However, the actuating member of a slide switch need not be recessed if the force is at least 5 N and is located so that unintentional actuation of the switch is unlikely.

Compliance is checked by inspection and measurement and by applying a cylindrical rod, having a diameter of 40 mm and a hemispherical end, to the actuating member of the switch. The test rod is applied with a force not exceeding 5 N. The appliance shall not operate.

20.110 The cutting blades of bean slicers shall be at least 30 mm from the plane of the inlet opening. The length of the major and minor axis of the inlet and outlet openings shall not exceed 30 mm and 15 mm. However, the dimensions of the outlet openings are not limited if a finger cannot be drawn in and a piece of stiff paper is not cut when inserted into the outlet opening.

Compliance is checked by measurement and by manual test.

20.111 The rotating parts of **blenders**, graters and shredders shall be secured so that they are not liable to become loose during operation.

NOTE Fastening of screws and nuts in a direction opposite to the direction of rotation of the rotating parts is considered to be sufficient.

A feed pusher that fills the throat of the hopper shall be provided.

Compliance is checked by inspection and by manual test.

20.112 The cutting blade of **food processors** shall stop within 1,5 s after the lid has been opened or removed.

Compliance is checked by operating the appliance without load and at the highest speed.

~~**20.113** The lid interlock of **food processors** shall be constructed so that accidental operation of the appliance is prevented. Lid Interlock switches shall be **biased off switches**.~~

~~If there is an interlock between the lid and the main switch, the lid shall be locked when the switch is in the on position. When the lid is not correctly closed, the switch shall be locked in the off position.~~

~~*Compliance is checked by inspection, by manual test and by applying test probe B of IEC 61032.*~~

An interlock necessary for compliance with this standard shall be constructed so that accidental operation of the dangerous moving parts of the appliance is prevented when the lid or guard is not in place.

Interlock switches necessary for compliance with this standard shall be **biased-off switches**. **76**

If there is a mechanical interlock between the lid or guard and the switch to control the motor, the lid or guard shall be locked when the switch is in the on position. When the lid or guard is not correctly closed, the switch shall be locked in the **off position**. **77**

Compliance is checked by inspection, by manual test and by applying test probe B of IEC 61032 applied with a force not exceeding 5 N and test probe 18 with a force not exceeding 2,5 N to the interlock actuator for the lid or guard. **78**

*If compliance relies on the operation of an **electronic circuit** for the interlock function, the moving parts shall not operate with the lid removed under the following conditions applied separately:*

- a) *The fault conditions in a) to g) of 19.11.2 are applied one at a time to the **electronic circuit**.*
- b) *The electromagnetic phenomena tests of 19.11.4.2 and 19.11.4.5 are applied. The tests are carried out with surge protective devices disconnected, unless they incorporate spark gaps.*

*If the **electronic circuit** is programmable, the software shall contain measures to control the fault/error conditions specified in Table R.1 and is evaluated in accordance with the relevant requirements of normative Annex R.* **79**

20.114 Access to dangerous moving parts of ~~food processors~~ appliances, where an interlock is necessary for compliance with this standard, shall be prevented for all combinations of assembly of **detachable parts** that ~~may~~ can occur in use. **80**

Compliance is checked by the following test.

Detachable parts are removed or assembled incorrectly in a manner that ~~may~~ can occur in use, such as the incorrect location or misalignment of the parts.

*A force not exceeding 5 N is applied to the parts in any direction and it shall not be possible to touch dangerous moving parts through openings, other than feed openings **81**, with test probe B of IEC 61032 applied with a force not exceeding 5 N.* **82**

~~**20.115** Knives shall incorporate a **biased-off switch** that is recessed or guarded to prevent accidental operation.~~

~~*Compliance is checked by applying a cylindrical rod, having a diameter of 40 mm and a hemispherical end, to the actuating member of the switch. The test rod is applied with a force not exceeding 5 N. The appliance shall not operate.*~~ **83**

~~**20.116**~~**115** Centrifugal juicers for fruit and vegetables shall be constructed so that parts cannot become disengaged when the appliance is operated at high speed.

Compliance is checked by the following test that is carried out without load.

*The appliance with the lid removed is supplied at **rated voltage** with the control adjusted to give the highest speed. The appliance is operated 10 times.*

No part of the appliance shall become disengaged.

The appliance is operated again but with the lid in position. When the speed reaches its maximum value, an attempt is made to remove the lid. The test is carried out 10 times.

No part of the appliance shall become disengaged.

20.116 Centrifugal juicers having a rotating sieve retained by a rim of plastic material shall withstand the stresses resulting from parts rotating at high speed.

Compliance is checked by the following test that is carried out on three new appliances and by testing the sieve in accordance with Annex AA.

The rim of plastic material retaining the rotating sieve is cut. The appliance is supplied at **rated voltage** and operated with the sieve and lid placed as in normal use. Speed controls are set to the highest position.

If the sieve retains its structure, the rim is cut further and the test repeated until disintegration takes place. The damage to the rim and if necessary the mesh is increased gradually so that disintegration of the sieve takes place at high velocity.

During the test, parts shall not be ejected from the appliance.

20.117 The bowl and cutting blades of **food blenders** and **hand-held blenders** shall have adequate mechanical strength.

Compliance is checked by the following test.

Ice cubes with sides of about 20 mm and at a temperature of about $-18\text{ }^{\circ}\text{C}$ are placed in the bowl. The number of cubes is equal to 0,025 times the capacity of the bowl, in cm^3 , rounded up to a whole number.

The capacity of the bowl, without any **detachable blade**, is determined by the maximum quantity of water that it can contain without overflowing. Any hole provided for the driving spindle is blocked. For **hand-held blenders** delivered without a bowl, the bowl defined in 3.1.9.110 is used.

The appliance is supplied at **rated voltage** and is operated continuously or intermittently in order to obtain the best crushing results. ~~Care is taken to ensure~~ while ensuring that the blade is not jammed by the ice cubes.

For **blenders** incorporating a timer, the test is carried out for the maximum period provided by the timer. For other **blenders**, the test is carried out for a period related to the maximum operating period specified in the instructions as follows:

- for durations not exceeding 7 min, the maximum period specified plus 1 min;
- for durations exceeding 7 min, the maximum period specified.

After the test, the bowl and cutting blades shall not be broken, distorted or blunt edges being ignored.

~~**20.118** The operation of cordless appliances incorporating cutting blades that are accessible to test probe B of IEC 61032 shall require two separate movements unless the control device is not directly accessible to the probe.~~

~~NOTE A movement of two control devices or the movement of the same device in two different directions are examples of two separate movements.~~

~~Compliance is checked by inspection and by manual test.~~

Cordless appliances incorporating cutting blades that are accessible to test probe B of IEC 61032 applied with a force not exceeding 5 N or, for appliances other than those identified in 7.12 as not intended for use by children, to test probe 18 with a force of 2,5 N, shall incorporate a **biased-off switch**, its actuating member being recessed, guarded or otherwise constructed to prevent inadvertent operation.

*Compliance is checked by applying a cylindrical rod, having a diameter of 40 mm and a hemispherical end, to the actuating member of the **biased-off switch**. The test rod is applied with a force not exceeding 5 N. The appliance shall not operate.*

*When an appliance incorporates a separate locking device that has to be actuated and held so the **biased-off switch** can be operated and that returns to the locked condition when the **biased-off switch** actuator is released, compliance is checked by applying two cylindrical rods simultaneously, one being applied to the separate locking device and one to the actuating member of **biased-off switch**. The appliance shall not operate unless two separate and dissimilar actions are required to operate the appliance, such that the appliance cannot be operated with a single grasping motion or a straight-line motion.*

NOTE Example of such construction are:

- a **biased-off switch** that shall be pushed in before it can be moved laterally to operate the appliance;
- a separate locking device located so that a single grasping motion will not actuate both the locking device and the **biased-off switch**. 84

21 Mechanical strength

This clause of Part 1 is applicable except as follows.

21.1 Addition:

*This test is also carried out on **detachable parts** that are necessary for protection against mechanical hazards.*

22 Construction

This clause of Part 1 is applicable except as follows.

22.40 Modification:

Replace the second paragraph and the NOTE with the following:

Appliances for **remote operation** shall be fitted with a switch for stopping the operation of the appliance. The actuating member of this switch shall be easily visible and accessible. 85

Addition:

Remote operation or a delayed start timer shall not enable the operation of:

- functions that include accessible dangerous moving parts, such as those without an interlocked cover or lid;
- **hand-held appliances**; and
- functions that require further interaction with the user (example: adding ingredients).

*Compliance is checked by inspection and, to determine if dangerous moving parts are accessible, by applying test probe B of IEC 61032 with a force not exceeding 5 N and test probe 18 of IEC 61032 with a force not exceeding 2,5 N. During the test, the **detachable parts** are in*

*place or removed, whichever is more unfavourable. The test probes are applied also for all combinations of assembly of **detachable parts** that can occur in use. 86*

22.49 Replacement:

For **remote operation**, the duration of operation shall be set before the appliance can be started unless the appliance switches off automatically at the end of a cycle.

Compliance is checked by inspection. 87

22.51 Replacement:

A control on the appliance shall be manually adjusted to the setting for **remote operation** before the appliance can be operated in this mode. There shall be a visual indication on the appliance showing that the appliance is adjusted for **remote operation**.

Compliance is checked by inspection. 88

22.101 Appliances shall be constructed so that lubricants are prevented from polluting food compartments.

Compliance is checked by inspection.

22.102 Appliances shall be constructed so that food or liquids are prevented from penetrating into places that could cause electrical or mechanical faults.

Compliance is checked by inspection.

22.103 The appliance coupler of **cordless blenders** shall be constructed to withstand the stresses occurring during normal use.

Compliance is checked by the following test.

*The two **live pins** of the **blender** are connected together and an external resistive load is connected in series with the supply. The external load is such that the current is 1,1 times **rated current**.*

*The **blender** is placed on its stand and withdrawn 10 000 times at a rate of approximately 10 times per minute. The test is continued for a further 10 000 times without current flowing.*

If the connection contacts cannot be energized when making or breaking the connection, instead of the above sequence, the test is carried out 20 000 times without current.

*After the test, the **blender** shall be suitable for further use and compliance with 8.1, 16.3, 27.5 and Clause 29 shall not be impaired.*

22.104 Knife sharpeners shall be constructed so that knife blades are prevented from penetrating into areas that could cause an electrical or mechanical hazard.

Compliance is checked by the following test.

Test probe D of IEC 61032 is inserted in any position through openings intended for sharpening. It shall not be possible to touch live parts, electrical insulation or moving parts, other than a grinding wheel.

23 Internal wiring

This clause of Part 1 is applicable.

24 Components

This clause of Part 1 is applicable except as follows.

24.1.3 Modification:

Add the following after the second sentence of the first paragraph:

~~Switches incorporated in the following appliances are tested for 3 000 cycles of operation:~~

However, for the following appliances, the number of cycles of operation shall be at least 3 000: **89**

- bean slicers;
- **liquid blenders**;
- cheese graters;
- graters;
- ice-cream machines for use in refrigerators and freezers;
- sieving machines;
- shredders.

25 Supply connection and external flexible cords

This clause of Part 1 is applicable except as follows.

25.1 Addition:

Ice-cream machines for use in refrigerators and freezers and **hand-held appliances** shall not incorporate an appliance inlet.

25.5 Addition:

Type Z attachment is allowed for

- can openers;
- coffee mills and grain grinders having a mass not exceeding 1,5 kg;
- cream whippers;
- egg beaters;
- ice-cream machines including those for use in refrigerators and freezers;
- knife sharpeners.

Type X attachments, other than those with a specially prepared cord, shall not be used for ice-cream machines for use in refrigerators and freezers.

25.7 Addition:

Polyvinyl chloride sheathed **supply cords** of ice-cream machines for use in refrigerators and freezers shall be resistant to low temperatures.

Compliance is checked by the tests of IEC 60811-504:2012, 4.2 and 4.3, and IEC 60811-505:2012, 4.2, these tests being carried out at a temperature of $-25\text{ °C} \pm 2\text{ °C}$.

25.14 Addition:

Hand-held blenders and hand-held food mixers are also subjected to the following test while mounted on an apparatus similar to that of Figure 8. The appliance is mounted so that the direction of flexing corresponds to that most likely to occur when the **supply cord** is wound around it for storage.

The **supply cord** is suspended vertically from the appliance and loaded so that a force of 10 N is applied. The oscillating part is moved through an angle of 180° and back to the initial position. The number of flexings is 2 000, the rate of flexing being six per minute.

25.22 Addition:

Appliance inlets shall be located so that pollution by food or liquid is unlikely to occur during normal use.

26 Terminals for external conductors

This clause of Part 1 is applicable.

27 Provision for earthing

This clause of Part 1 is applicable.

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 Modification:

~~For ice cream machines for use in refrigerators and freezers, the temperature of 40 °C is replaced by 10 °C.~~

Addition:

For ice-cream machines for use in refrigerators and freezers, the test is carried out at a temperature of $10\text{ °C} \pm 2\text{ °C}$ plus the maximum temperature rise determined during the test of Clause 11, but it shall be at least:

- $75\text{ °C} \pm 2\text{ °C}$, for external parts;
- $125\text{ °C} \pm 2\text{ °C}$, for parts supporting **live parts**. **90**

30.2 Addition:

~~For churns and ice-cream machines, 30.2.3 is applicable. For other appliances, 30.2.2 is applicable.~~

Modification:

Replace the two dashed items in the compliance criteria with the following:

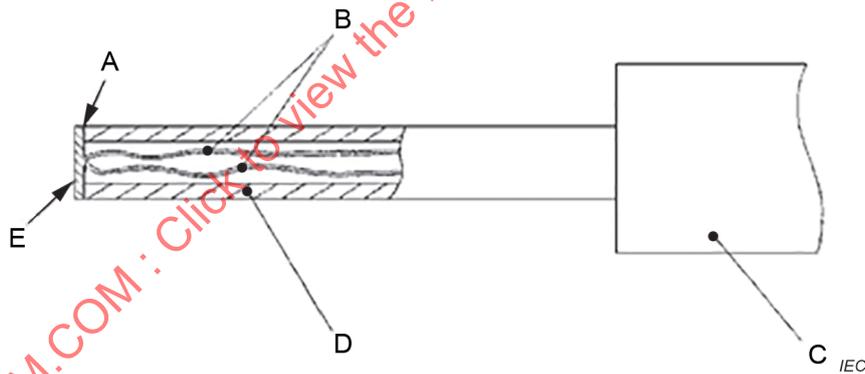
- for churns and ice-cream machines, 30.2.3 is applicable;
- for other appliances, 30.2.2 is applicable. **91**

31 Resistance to rusting

This clause of Part 1 is applicable.

32 Radiation, toxicity and similar hazards

This clause of Part 1 is applicable.

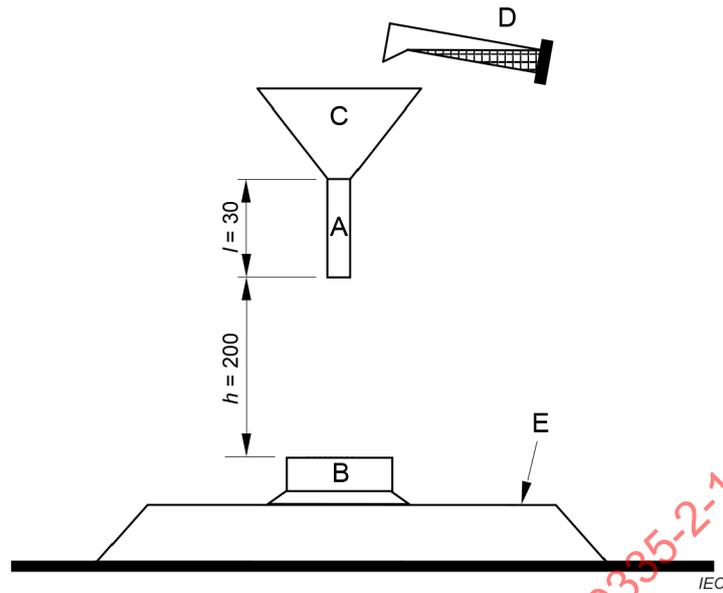


Key

- A adhesive
- B thermocouple wires 0,3 mm diameter to IEC 60584-1 Type K
- C handle arrangement permitting a contact force of $4\text{ N} \pm 1\text{ N}$
- D polycarbonate tube: inside diameter 3 mm, outside diameter 5 mm
- E tinned copper disc: 5 mm diameter, 0,5 mm thick with a flat contact face

Figure 101 – Probe for measuring surface temperatures

Dimensions in millimetres



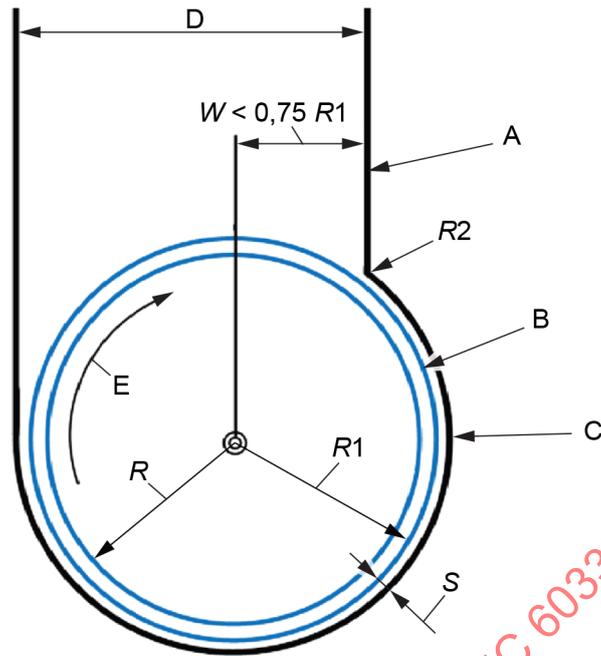
Key

- A funnel tube with inner diameter of 8 mm
- B item under test
- C funnel
- D container with 30 ml of ~~saline~~ spillage 92 solution
- E horizontal surface

Figure 103 102 – Schematic representation of the 30 ml spillage test

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Dimensions in millimetres

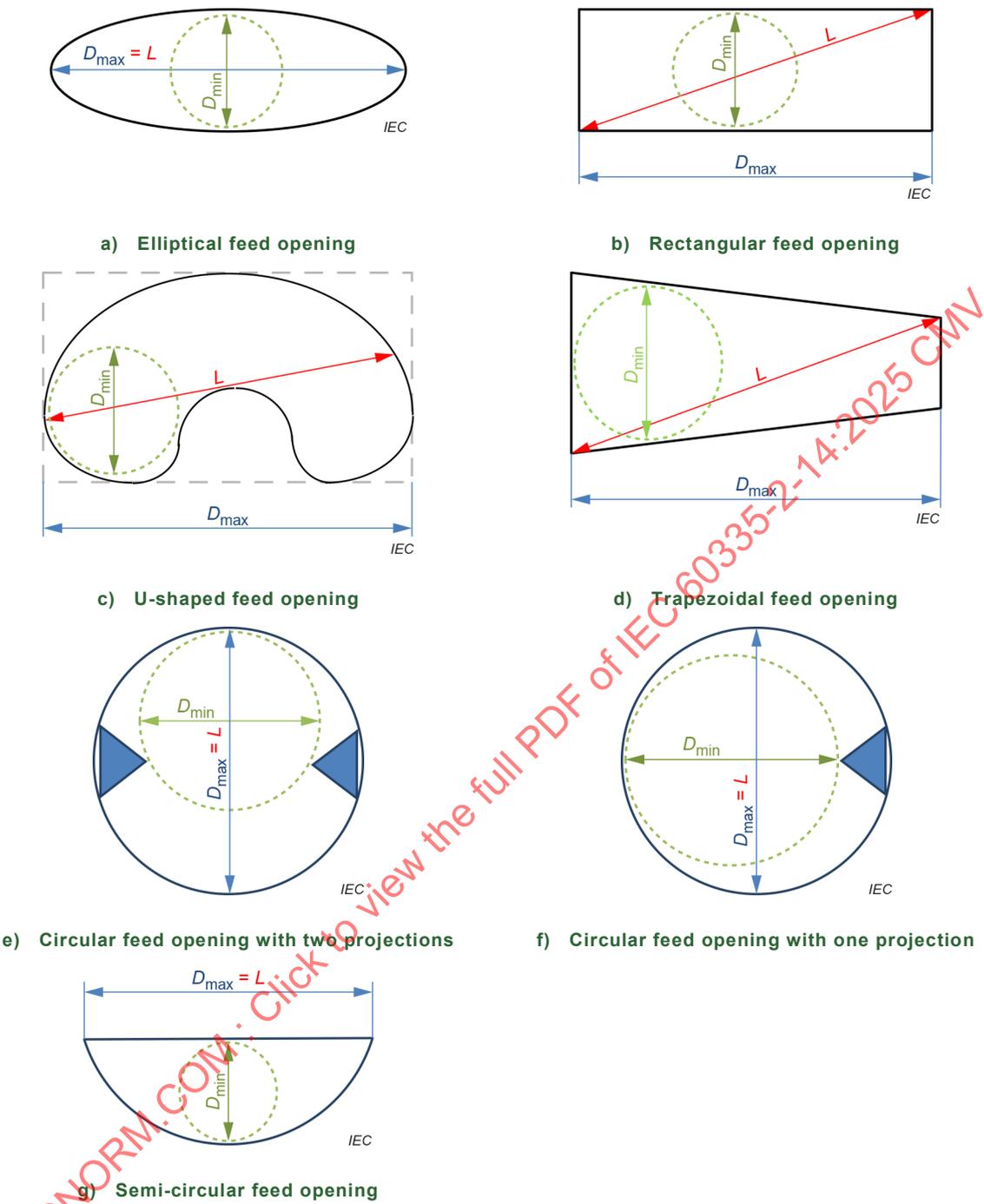


IEC

Key

- A wall of feed opening in the direction of rotation
- B grinding screw outer circumference
- C grinding screw housing
- D feed screw opening
- E direction of rotation
- W distance from the grinding screw centre point to the inner wall of the feed opening at the direction of rotation
- R radius of the grinding screw excluding its threads
- R1 radius of grinding screw outer circumference
- S distance between the grinding screw outer circumference (top of projection) and the inner wall of the grinding screw housing
- R2 radius corner between the wall of the feed opening and the screw housing

Figure 103 – Grinding screw with projections



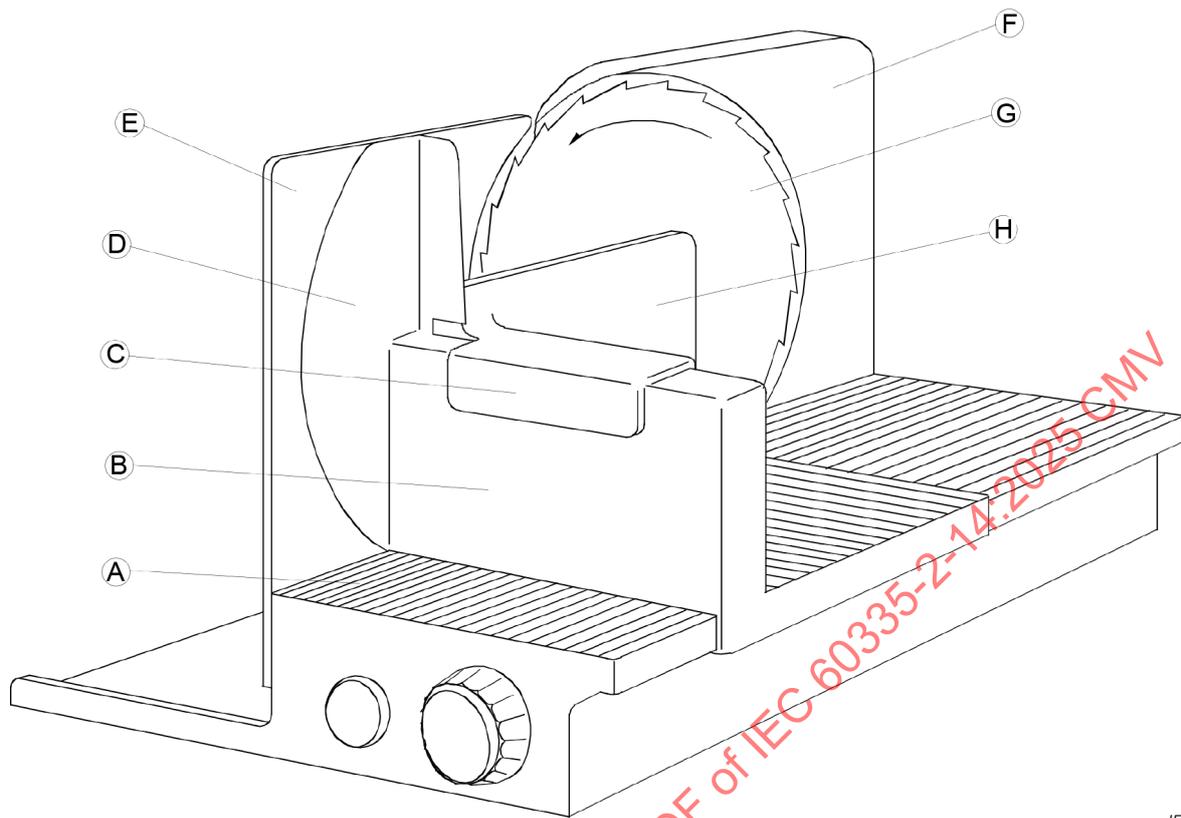
Key

D_{max} maximum cross-sectional dimension of the opening

D_{min} minimum cross-sectional dimension of the opening

L length of the longest continuous straight line intersecting the feed opening

Figure 104 – Examples of feed opening dimensions 93

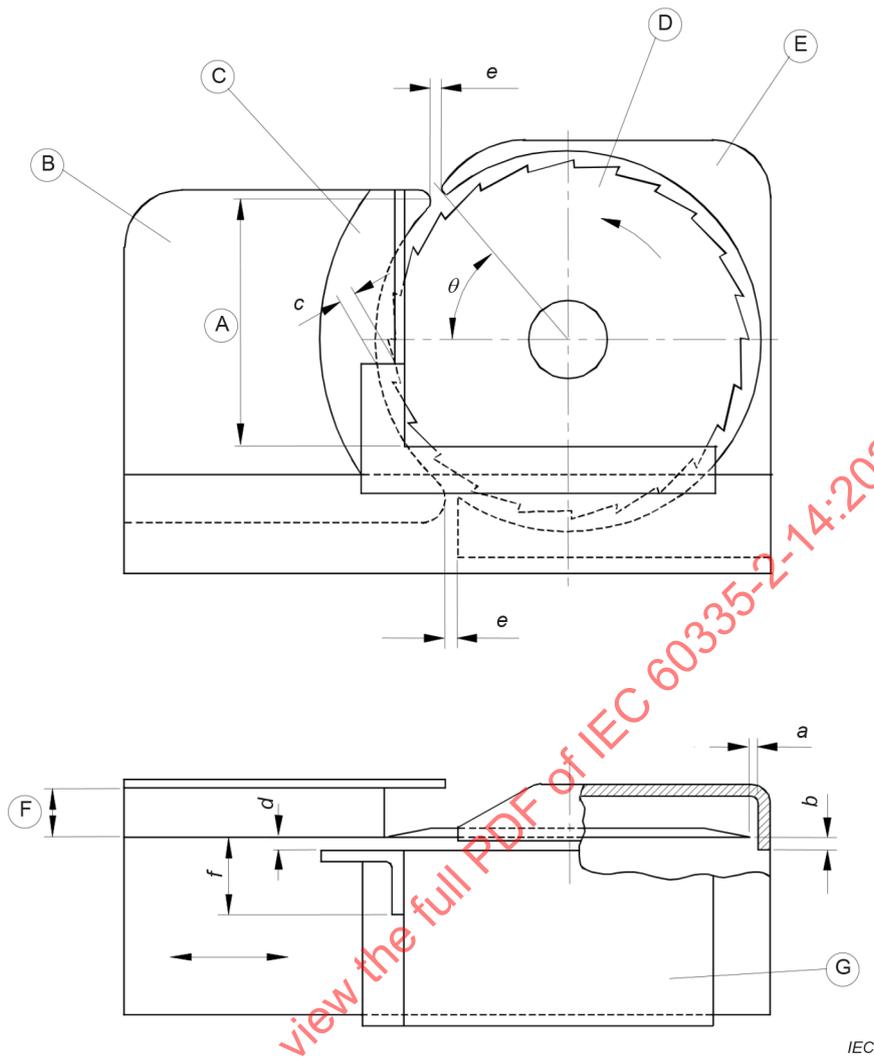


IEC

Key

- A support
- B sliding feed table
- C hand rest
- D thumb guard
- E plate that sets the thickness of the slices
- F blade guard
- G rotating blade
- H piece holder

Figure 105 – Slicing machine



Key

- A full height of the open section
- B plate that sets the thickness of the slices
- C thumb guard
- D rotating blade
- E blade guard
- F thickness of slices
- G sliding feed table

NOTE The dimensions are explained in 20.108.

Figure 106 – Protecting devices for slicing machines

Annexes

The annexes of Part 1 are applicable except as follows.

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Annex B (normative)

Battery-operated appliances, separable batteries and detachable batteries for battery-operated appliances

This annex of Part 1 is applicable except as follows.

B.11.1 Modification:

Replace the second, third and fourth paragraphs with the following:

*For appliances operated with **detachable batteries** or **separable batteries** that are disconnected from the appliance for charging purposes, the appliance is operated as specified in 11.7.101 to 11.7.118 until it completes the duration of the test as specified or it no longer operates due to depletion of the **battery**, whichever occurs first. If the **battery** is depleted before the appliance completes the duration of the test, the depleted **battery** is immediately replaced with another **battery** that is **fully charged**, the **battery** being the model or type reference of the **battery** provided or indicated in the instructions. The test is continued until the appliance completes the duration of the test as specified or it no longer operates due to depletion of the **battery**, whichever occurs first.*

*For appliances incorporating **integral batteries** or **separable batteries** not disconnected from the appliance for charging purposes, and that cannot perform their intended function while the **batteries** are being charged, the appliance is operated as specified in 11.7.101 to 11.7.118 until it completes the duration of the test or it cannot perform its intended function due to the depletion of the **battery**, whichever occurs first.*

*For appliances operated with **batteries** that are replaceable, including **integral batteries** that are replaceable, or **non-rechargeable batteries**, the appliance is operated until the minimum capacity of the **battery** as specified in Table B.1 has been delivered or the appliance completes the duration of the test as specified in 11.7.101 to 11.7.118, whichever occurs first. 94*

19.7 Addition:

Battery-operated appliances that have to be kept switched on by hand are operated for 30 s. 95

B.20.101 Battery-operated appliances incorporating cutting blades that are accessible to test probe B of IEC 61032 applied with a force not exceeding 5 N or, for appliances other than those identified in 7.12 as not intended for use by children, to test probe 18 with a force of 2,5 N shall incorporate a **biased-off switch**, its actuating member being recessed, guarded or otherwise constructed to prevent inadvertent operation.

*Compliance is checked by applying a cylindrical rod, having a diameter of 40 mm and a hemispherical end, to the actuating member of the **biased-off switch**. The test rod is applied with a force not exceeding 5 N. The appliance shall not operate.*

*When an appliance incorporates a separate locking device that has to be actuated and held so the **biased-off switch** can be operated and that returns to the locked condition when the **biased-off switch** actuator is released, compliance is checked by applying two cylindrical rods simultaneously, one being applied to the separate locking device and one to the actuating member of **biased-off switch**. The appliance shall not operate unless two separate and dissimilar actions are required to operate the appliance, such that the appliance cannot be operated with a single grasping motion or a straight-line motion.*

NOTE Examples of such construction are:

- a **biased-off switch** that has to be pushed in before it can be moved laterally to operate the appliance;
- a separate locking device located so that a single grasping motion will not actuate both the locking device and the **biased-off switch**. **96**

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Annex C
(normative)

Ageing test on motors

Modification:

The value of p in Table C.1 is 2 000, except for the following appliances for which it is 500:

- bean slicers;
- **blenders**;
- can openers;
- cheese graters;
- citrus-fruit squeezers;
- graters;
- ice-cream machines for use in refrigerators and freezers;
- knife sharpeners;
- knives;
- sieving machines;
- shredders.

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Annex R
(normative)

Software evaluation

R.2.2.5 *Modification:*

Replace the first paragraph with the following:

For programmable **electronic circuits** with functions requiring software incorporating measures to control the fault/error conditions specified in Table R.1 or Table R.2, detection of a fault/error shall occur before compliance with Clause 19, 20.2, 20.101, 20.104, 20.108 or 20.113 is impaired.

R.2.2.9 *Modification:*

Replace the first sentence of the first paragraph with the following:

The software and safety-related hardware under its control shall be initialized and shall terminate before compliance with Clause 19, 20.2, 20.101, 20.104, 20.108 or 20.113 is impaired.

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Annex AA (normative)

Tests on sieves of centrifugal juicers

The purpose of these tests is to ensure that rotating sieves of centrifugal juicers are able to withstand the stresses to which they are subjected during the lifetime of the appliance.

The tests are carried out in the order specified.

1) Chemical stress test

The sieves are placed in a solution of detergent having a concentration of 3 g/l and a temperature of $65\text{ °C} \pm 1\text{ °C}$. The detergent to be used consists of the chemical substances as specified in Table AA.1 **97**.

Table AA.1 – Detergent composition

Chemical substance	Specification ¹	Weight in %
Sodium citrate dihydrate	N 1560/Jungbunzlauer	30,0
Maleic acid/acrylic acid copolymer Na salt	Alternative 1: Sokalan CP 5 Compound/Henkel 50 % active on sodium carbonate	12,0
	Alternative 2: Norasol WL 4/Norsekhaas 30 % active on sodium carbonate	20,0
Sodium perborate monohydrate	–	5,0
Sodium percarbonate		7,0
Tetraacetyl ethylenediamine	TAED/Warwick	2,0
Sodium disilicate (noncrystalline)	Portil A/Cognis	25,0 10
Linear fatty alcohol ethoxylate (Nonionic surfactant, low foaming)	Plurafac LF403/BASF	2,0
Protease	Savinase X.0T/NOVO	40 KNPU/kg ‡ e.g. Savinase 8.0T: 0,5 1,0 %
Amylase	Termamyl xxT/NOVO	300 KNU/kg ‡ e.g. Termamyl 60T: 0,5 %
Sodium carbonate, anhydrous	Soda, leicht/Mathes & Weber	Add to 100
‡ = Activity units		

The sieves are kept in the solution for 48 h after which they are removed and rinsed with water.

The sieves are stored at **room temperature** for 14 days.

2) Thermal stress test

1 "Jungbunzlauer", "Sokalan", "Henkel", "~~Norasol~~", "~~Norsekhaas~~", "Warwick", "Portil", "Cognis", "Plurafac", "BASF", "Savinase", "Termamyl", "Novo"Mathes & Weber" are trademarks. This information is given for the convenience of users of this document and does not constitute an endorsement by the IEC of these trademarks. Items of the similar specification ~~may~~ can be used if they can be shown to lead to the same results.

The sieves are placed in a dry atmosphere at a temperature of $83\text{ °C} \pm 2\text{ °C}$ for 1 h. They are then placed into water having a temperature of $20\text{ °C} \pm 2\text{ °C}$.

This test is carried out three times.

3) *Impact test*

The sieves are dropped from a height of 1 m onto a wooden floor in such a way that at the moment of impact the axis of rotation is horizontal.

This test is carried out 12 times, the sieves being rotated by 30° each time to obtain 12 different points of impact.

4) *Starting test*

*A sieve is placed in the appliance that is supplied at 1,06 times **rated voltage**, speed controls being set at the highest position. The appliance is operated for 15 s followed by a rest period of 45 s.*

This test is carried out 25 times on each sieve.

After the tests, there shall be no crack or other damage visible to the naked eye, dents being disregarded.

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Bibliography

The Bibliography of Part 1 is applicable except as follows.

Addition:

IEC 60335-2-9, *Household and similar electrical appliances – Safety – Part 2-9: Particular requirements for grills, toasters and similar portable cooking appliances*

IEC 60335-2-15, *Household and similar electrical appliances – Safety – Part 2-15: Particular requirements for appliances for heating liquids*

IEC 60335-2-16, *Household and similar electrical appliances – Safety – Part 2-16: Particular requirements for food waste disposers*

IEC 60335-2-24, *Household and similar electrical appliances – Safety – Part 2-24: Particular requirements for refrigerating appliances, ice-cream appliances and ice makers*

IEC 60335-2-64, *Household and similar electrical appliances – Safety – Part 2-64: Particular requirements for commercial electric kitchen machines*

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List of comments

- 1 This revision is for alignment with IEC 60335-1:2020.
- 2 This revision is for alignment with IEC 60335-1:2020.
- 3 This revision is for alignment with IEC 60335-1:2020.
- 4 The term auger juicer is now defined in Clause 3 and takes the place of berry juice extractors throughout the standard.
- 5 Because peelers are also used to peel other fruits and vegetables besides potatoes, they are referred to as peelers instead of potato peelers throughout the standard.
- 6 Some appliances covered by this standard have hazardous moving parts that are necessarily exposed to perform their intended function. These appliances are not suitable for use by children. The Scope and requirements are updated to reflect this.
- 7 Breadmakers consist of a mixing and a baking function. In order to clarify the applicable standard for these appliances, breadmakers are added to the list of appliances that are not covered in the Scope of this standard.
- 8 Soy milk makers consist of a chopping and a heating function. In order to clarify the applicable standard for these appliances, soy milk makers are added to the list of appliances that are not covered in the Scope of this standard.
- 9 Changing Subclause 3.1.9 to a Modification maintains the normal operation while charging as specified in IEC 60335-1:2020.
- 10 This is updated to reflect that testing with the load conditions specified in the standard and testing with the load conditions specified in the instructions do not necessarily need to be done in that order. In addition, the last sentence is deleted because it is not necessary.
- 11 For these appliances, the no load operation is considered suitable to represent normal operation and there is no need to also test with the load recommended in the instructions.
- 12 Because food processors typically consist of multiple attachments in order to perform different functions, they are tested under the most unfavourable conditions when considering all relevant functions. Where those functions are similar to other types of appliances, the loads are aligned. For food choppers, the meat and cheese loads are common loads and are often the most unfavourable loads, so the appliance is tested with these loads.

In addition, the quantity of the load is clarified because food processors can have different recommended maximum capacities marked on the appliance or specified in the instructions for different functions or loads.
- 13 The preparation of the food load can have a significant impact on the operation of the appliance, so it is now specified.
- 14 At times, certain functions or food loads are not recommended when the appliance is operating at its highest speed.
- 15 There are lathe-type peelers on the market, where the potato or other load to be peeled is rotated past a stationary peeling blade in order to remove the peelings. Both hand-held and lathe-type peelers are operated peeling one potato at a time.
- 16 A definition is added for rated capacity based on IEC 60335-2-15 and the standard is updated to utilize this term where applicable.
- 17 A definition is added for total capacity based on Subclause 20.117 and the standard is updated to utilize this term where applicable.
- 18 A definition for auger juicer is added to the standard and this term replaces berry juice extractor throughout the standard.
- 19 The residual rinse agent on the enclosure of the appliance after the test of Subclause 15.2 can affect the test results of the test of Subclause 15.101.

- 20 This is added to clarify that multifunction appliances are tested under the most unfavourable conditions considering all intended functions.
- 21 This is not deemed necessary. The operating times for each function is specified in Subclauses 11.7.101 to 11.7.118. If the appliance has functions not anticipated by these subclauses, operation in accordance with the instructions is required per Subclauses 3.1.9 and 11.7.2 and adequate instructions for the load and operating period must then be specified in the instructions.
- 22 Some appliances covered by this standard have hazardous moving parts that are necessarily exposed to perform their intended function. These appliances are not suitable for use by children. The instructions for these appliances must state this to inform the user of their intended use.
- 23 Since the rated capacity is defined by the appliance manufacturer, the instructions for the appliance must specify the rated capacity unless it is marked on the appliance.
- 24 This is necessary when testing a multifunction appliance in accordance with Subclause 11.7.3. The appliance will be loaded to the rated power input, but the operating period, number of cycles and rest periods, as applicable, are based on the appliance function stated in the instructions or the function resulting in the highest power input during the test of Clause 10.
- 25 This instruction is now applicable for all appliances instead of just for food processors and blenders because other appliances covered by this standard can present a risk of injury due to unintended use or include sharp blades. If the appliance does not have sharp cutting blades or containers that are emptied in normal use, then the irrelevant content can be removed from the instructions.
- 26 This instruction is a good practice for all kitchen machines to reduce the risk of injury due to unexpected or unintentional operation of an appliance while the user is assembling or disassembling parts or during cleaning of the appliance. Therefore, it is changed from instructions for hand-held blenders to instructions for all kitchen machines.
- 27 Some appliances covered by this standard have hazardous moving parts that are necessarily exposed to perform their intended function. These appliances are not suitable for use by children. Therefore, test probe 18, which represents children from 3 to 14 years of age, is not applied to these appliances.
- 28 The representative period is clarified to specify the duration of one cycle of operation depending upon whether the appliance is being operated with the load specified in Subclauses 3.1.9.101 to 3.1.9.119 or with the load specified in the instructions.
- 29 Limits on the temperature rise of external accessible surfaces are introduced to address the risk of thermal injury from contact with external accessible surfaces based on IEC Guide 117 for Temperatures of touchable hot surfaces.
- 30 Because normal operation in Subclause 3.1.9 consist of operation under the load conditions specified in Subclauses 3.1.9.101 to 3.1.9.119 and the load conditions specified in the instructions, the reference to normal operation is removed from Subclauses 11.5 and 11.6. Instead Subclause 11.7.1 specifies operation with the load specified in Subclauses 3.1.9.101 to 3.1.9.119 and Subclause 11.7.2 specifies operation with the load specified in the instructions.
- 31 Because normal operation in Subclause 3.1.9 consist of operation under the load conditions specified in Subclauses 3.1.9.101 to 3.1.9.119 and the load conditions specified in the instructions, the reference to normal operation is removed from Subclauses 11.5 and 11.6. Instead Subclause 11.7.1 specifies operation with the load specified in Subclauses 3.1.9.101 to 3.1.9.119 and Subclause 11.7.2 specifies operation with the load specified in the instructions.
- 32 Changing Subclause 11.7 to a Modification instead of a Replacement maintains the requirements for appliance outlets and socket outlets and the test duration for charging of battery-operated appliances as specified in IEC 60335-1:2020.
- 33 Subclause 11.7.2 is updated to indicate when it is necessary to test under the conditions specified in the instructions, so Subclause 11.7.2 is not always necessary.

- 34 This statement is relocated from Subclause 11.7.2 to Subclause 11.7 because appliances with a timer or programmer should be operated for the maximum period allowed by the timer or programmer in Subclauses 11.7.1 and 11.7.3 also. The requirement is updated to require operation for the operating periods specified in Subclauses 11.7.1, 11.7.2 and 11.7.3 when the appliance is also able to be operated without the programmer or timer.
- 35 Some appliances incorporate a time limiting function that is not intended to operate under normal use, but is intended to prevent an overload of the appliance. If this function does not operate during the heating test and is not identified on the appliance or in the instructions, then it is not considered to be a timer or programmer for the heating test.
- 36 According to Subclause 22.49, the duration of operation for kitchen appliances for remote operation must be set before the appliance is started unless it automatically switches off at the end of a cycle. This operating period is also considered during normal use of the appliance.
- 37 This modification is for alignment with IEC 60335-1:2020 and aligns the test duration for operation of battery-operated appliances with that of mains operated appliances.
- 38 The format of Subclauses 11.7.1, 11.7.2 and 11.7.3 are more closely aligned using dashed items for the load condition, operating period, number of cycles and rest period, so that the differences are clear between these three heating test methods.
- 39 The conditions under which the test of Subclause 11.7.2 are specified and the test conditions are outlined in (a) or (b) below as applicable.
- 40 For the appliances specified in Subclause 3.1.9.119, the no load operation is considered suitable to represent normal operation and there is no need to also test with any load recommended in the instructions.
- 41 When a load is recommended in the instructions that exceeds the power input of the load used for the test of Subclause 11.7.1, then the appliance is operated as specified in (a).
- 42 Specifying an unrealistically short operating period in the instructions for a load with a high power input is not acceptable to waive the rated power input test method of Subclause 11.7.3. Therefore, the operating period is increased if it is less than specified in Subclause 11.7.1 and does not exceed 7 minutes.
- 43 When the operating period specified in the instructions exceeds the operating period used in Subclause 11.7.1, then the appliance is operated as specified in (b).
- 44 This is updated to address multifunction appliances, in which case the power input of only one function needs to be more than that specified to waive the test of Subclause 11.7.3.
- 45 This is updated to indicate that the appliance is loaded to obtain the rated power input while operating at rated voltage and then the voltage is adjusted to 0,94 and 1,06 time rated voltage for the test as specified in Subclauses 11.5 and 11.6.
- 46 When testing a multifunction appliance in accordance with Subclause 11.7.3, the appliance will be loaded to the rated power input and the operating period, number of cycles and rest periods, as applicable, are based on the appliance function stated in the instructions or the function resulting in the highest power input during the test of Clause 10.
- 47 Similar to the format of Subclauses 11.7.1, 11.7.2 and 11.7.3, the format of Subclauses 11.7.101 to 11.7.118 are more closely aligned using dashed items for the operating period, number of cycles and rest period as applicable. This is an editorial change for most of these subclauses. Any additional changes are noted within the comments.
- 48 The operating duration for juicers is updated to clarify that the operating time is limited by the amount of carrots specified for normal load in Subclause 3.1.9.104.
- 49 Because food processors typically consist of multiple attachments in order to perform different functions, they are tested under the most unfavourable conditions when considering all relevant functions. Where those functions are similar to other types of appliances, the operating period, number of cycles and rest periods are aligned. For food choppers, a minimum operating period is specified instead of only relying upon the time specified in the instructions.

- 50 Although this looks quite different, it is not a change in the requirement. It is only reformatted to match the format of the other 11.7.1XX subclauses.
- 51 The number of cycles and rest period are defined for hand-held peelers.
- 52 The operating period, number of cycles and rest period are defined for lathe-type peelers.
- 53 Limits on the temperature rise of external accessible surfaces are introduced to address the risk of thermal injury from contact with external accessible surfaces based on IEC Guide 117 for Temperatures of touchable hot surfaces.
- 54 This is changed from a Modification to an Addition, since it is a change only for ice cream machines for use in refrigerators and freezers.
- 55 This revision is for alignment with IEC 60335-1:2020.
- 56 The part of the overflow test that consists of operating the appliance is relocated to Subclause 15.101. If testing is conducted on the same sample, the test of Subclause 15.101 is conducted before the test of Subclause 15.2.
- 57 These parts must be in position for normal use of the appliance. Additional testing is added in Subclause 15.103 to evaluate the effects of leakage due to a gasket failure or accidental assembly without the gasket.
- 58 The part of the overflow test that consists of operating the appliance is relocated to Subclause 15.101. During operation, the rinse agent causes excessive foaming which is not representative of normal use or expected misuse. Therefore the test of Subclause 15.101 is done without the rinse agent.
- 59 This revision is for alignment with Subclause 15.2 of IEC 60335-1:2020.
- 60 This test is added to represent failure of a gasket or accidental assembly without the gasket in place. This can result in leakage of liquid from the container on the outside of the appliance that may enter the appliance through openings or seams in the enclosure. This is not covered by the test of Subclause 22.6, which considers only leakage on the inside of the appliance.
- 61 Those noodle makers that are fed by hand are tested for 30 seconds because they are considered to be appliances that are continuously loaded by hand as specified in Subclause 19.7 of IEC 60335-1:2020.
- 62 According to Subclause 22.49, the duration of operation for kitchen appliances for remote operation must be set before the appliance is started unless it automatically switches off at the end of a cycle. This operating period is also considered during abnormal operation of the appliance.
- 63 Unintentional operation of an interlock actuator is evaluated with both test probe B and test probe 18. However, some appliances covered by this standard have hazardous moving parts that are necessarily exposed to perform their intended function. These appliances are not suitable for use by children. Therefore, test probe 18, which represents children from 3 to 14 years of age, is not applied to these appliances.
- 64 This requirement is updated to reference both test probes and to better define the dimensions of the feed opening. Figure 104 is also added to show examples of these dimensions on various feed opening shapes.
- 65 When a feed opening does not meet the dimensions specified in the paragraph above, accessibility of the moving parts is evaluated using test probe B with the 50 mm circular stop face as specified in Subclause 20.2 of IEC 60335-1:2020.
- 66 Test probes 18 and the modified test probe B specified in Subclause 20.2 of IEC 60335-1:2020 are not applied to blenders.
- 67 For an interlocked cover or guard that is relied upon to prevent access to hazardous moving parts and that relies on the operation of an electronic circuit, the interlock function shall not be defeated by a component fault, electromagnetic phenomena or software faults.
- 68 Where the tests of Subclauses 19.11.4.1 to 19.11.4.7 are referenced for evaluation of electronic circuits relied upon for compliance with requirements typically in Clauses 20, 22 and 24 this requirement is added to align with Subclause 19.11.4 of IEC 60335-1:2020.

- 69 The requirement for knives and hand-held blenders are now aligned, so knives are included in Subclauses 20.103 and 20.115 of the previous edition is deleted. In addition, requirements are added to address appliances with a separate locking device that has to be actuated and held so the biased off switch can be operated.
- 70 Subclause 20.104 is updated to allow the appliance to be set up in the most unfavourable condition, including detachable parts being removed or attached and switches and controls being in the most unfavourable position. The test probes are applied to controls, detachable parts and biased-off switches in an attempt to operate the blades of the blender.
- 71 When an interlock function relies upon the operation of an electronic circuit, additional testing is specified to verify that the interlock function is maintained under a component fault condition, when subjected to electromagnetic phenomena or due to a fault in the software.
- 72 Due to the addition of Subclause 5.21 in IEC 60335-1:2020, the force applied to test probe B is specified to align with that specified in Subclause 20.2 of Part 1.
- 73 The test is repeated using test probe 18. However, some appliances covered by this standard have hazardous moving parts that are necessarily exposed to perform their intended function. These appliances are not suitable for use by children. Therefore, test probe 18, which represents children from 3 to 14 years of age, is not applied to these appliances.
- 74 Due to the addition of Subclause 5.21 in IEC 60335-1:2020, the force applied to test probe B is specified to align with that specified in Subclause 20.2 of Part 1.
- 75 When the interlock function relies upon the operation of an electronic circuit, additional testing is specified to verify that the interlock function is maintained under a component fault condition, when subjected to electromagnetic phenomena or due to a fault in the software.
- 76 This requirement is expanded to include all interlocks that are relied upon for compliance with this standard.
- An appliance may be provided with an interlock switch that is not required for compliance with this standard. In that case, this requirement is not applicable.
- 77 This requirement is clarified. The mechanical interlock prevents actuation of the switch controlling the motor unless the lid or guard is in place.
- 78 Due to the addition of Subclause 5.21 in IEC 60335-1:2020, the force applied to test probe B is specified to align with that specified in Subclause 20.2 of Part 1. In addition, test probe 18 is added to represent children from 3 to 14 years of age.
- 79 When the interlock function relies upon the operation of an electronic circuit, additional testing is specified to verify that the interlock function is maintained under a component fault condition, when subjected to electromagnetic phenomena or due to a fault in the software.
- 80 This requirement is expanded to include all interlocks that are relied upon for compliance with this standard.
- An appliance may be provided with an interlock switch that is not required for compliance with this standard. In that case, this requirement is not applicable.
- 81 Accessibility of moving parts via feed openings is addressed in Subclause 20.2. This requirement is intended to address accessibility of moving parts through openings that can be created by incorrect assembly of parts that can occur in use.
- 82 Due to the addition of Subclause 5.21 in IEC 60335-1:2020, the force applied to test probe B is specified to align with that specified in Subclause 20.2 of Part 1.
- 83 The requirement for knives and hand-held blenders are now aligned, so knives are included in Subclause 20.103 and Subclause 20.115 of the previous edition is deleted.

- 84 The requirement for cordless appliance is updated to align with Subclause 20.103, adding the force for test probe B to align with Subclause 20.2 and adding test probe 18. However, some appliances covered by this standard have hazardous moving parts that are necessarily exposed to perform their intended function. These appliances are not suitable for use by children. Therefore, test probe 18, which represents children from 3 to 14 years of age, is not applied to these appliances.
- 85 Additional requirements for remote operation were added to IEC 60335-1:2020. These appliances are not considered to be appliances that can operate continuously without giving rise to a hazard, so the remote operation requirement is replaced to remove this alternative.
- 86 Additional requirements for remote operation were added to IEC 60335-1:2020. However, some appliances covered by this Part 2 Standard are not considered suitable for remote operation.
- 87 Additional requirements for remote operation were added to IEC 60335-1:2020. These appliances are not considered to be appliances that can operate continuously without giving rise to a hazard, so the remote operation requirement is replaced to remove this alternative.
- 88 Additional requirements for remote operation were added to IEC 60335-1:2020. These appliances are not considered to be appliances that can operate continuously without giving rise to a hazard, so the remote operation requirement is replaced to remove this alternative.
- 89 This is a clarification of what is being modified from the Part 1 standard.
- 90 This is changed from a Modification to an Addition because the changes are only applicable for ice cream machines for use in refrigerators and freezers. The Part 1 remains applicable for all other appliances covered by this standard.
- 91 This is aligned with other Part 2 standards as a modification to replace the dashed items. For other appliances, if they are controlled via remote operation or batteries are recharged in the appliance, then Subclause 30.2.3 is applicable as specified in Subclause 30.2 of Part 1.
- 92 The figure is updated to reflect the changes in Subclause 15.102.
- 93 Figure 104 is added to show examples of the dimensions specified in Subclause 20.2 on various feed opening shapes.
- 94 The test duration of operation for battery-operated appliances is modified to align with that of mains operated appliances.
- 95 Subclause 19.7 of Annex B in IEC 60335-1:2020 specifies operation until steady conditions or a minimum of 3 hours. Since these appliances are kept switched on by hand, the test duration is aligned with Subclause 19.7 in the main body of IEC 60335-1:2020.
- 96 This requirement is added for battery operated appliances to align with the requirements for knives, hand-held blenders and cordless appliances in Subclauses 20.103 and 20.118.
- 97 The detergent composition is updated to align with the detergent type D specified in Annex E of IEC 60436:2015+AMD1:2020 CSV.
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INTERNATIONAL STANDARD

NORME INTERNATIONALE

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

**Appareils électrodomestiques et analogues – Sécurité –
Partie 2-14: Exigences particulières pour les machines de cuisine**

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INTERNATIONAL ELECTROTECHNICAL COMMISSION

HOUSEHOLD AND SIMILAR ELECTRICAL APPLIANCES – SAFETY –**Part 2-14: Particular requirements for kitchen machines**

FOREWORD

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

This seventh edition cancels and replaces the sixth edition published in 2016 and Amendment 1:2019. This edition constitutes a technical revision.

This edition includes the following significant technical changes with respect to the previous edition:

- a) alignment with IEC 60335-1:2020;
- b) conversion of some notes to normative text (Clause 1, 3.1.9.111, 3.1.9.112, 3.1.9.114, 3.1.9.115, 11.7.3, 20.2, 20.107, 20.108);
- c) modification to replace berry juice extractor with auger juicer and addition of a defined term (Clause 1, 3.1.9.101, 3.5.107, 11.7.102, 19.1, 19.7);

- d) addition of requirements for appliances not intended for use by children (Clause 1, 7.12, 20.2, 20.106, 20.117);
- e) modifications to clarify the testing under normal operating conditions (3.1.9, 3.1.9.111, 5.9, 7.12, 10.1, 11.5, 11.6, 11.7, 11.7.1 to 11.7.3, 11.7.101 to 11.7.118);
- f) addition of surface temperatures for external accessible surfaces (11.3, 11.8);
- g) modification of the spillage test of 15.2 to address leakage from the liquid container;
- h) clarification of requirements for remote operation of kitchen machines (11.7, 19.7, 22.40, 22.49, 22.51);
- i) modification of the operating period for juicers with respect to the 0,5 kg carrot load and the operating time (11.7.105);
- j) clarification of overflow testing with detachable gaskets and addition of gasket leakage test (15.2, 15.102);
- k) clarification of the feed opening dimension limits in 20.2;
- l) addition of requirements when compliance with the standard relies on an electronic circuit for the interlock function (20.2, 20.104, 20.108, 20.113);
- m) addition of test probe 18 where test probe B is applied and clarification of forces applied to test probes (20.2, 20.104, 20.106, 20.108, 20.113, 20.114, 20.117);
- n) update and combine requirements for inadvertent operation of hand-held blenders and knives to cover alternative switch constructions on the market (20.103 and deletion of previous 20.115);
- o) clarification of the test of 20.104;
- p) update of interlock requirements to be applicable for all appliances where the interlock is required for compliance with the standard (20.113, 20.114);
- q) update of the detergent used for centrifugal juicer conditioning (Annex AA).

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

Draft	Report on voting
61/7347/FDIS	61/7384/RVD

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

The language used for the development of this International Standard is English.

This document was drafted in accordance with ISO/IEC Directives, Part 2, and developed in accordance with ISO/IEC Directives, Part 1 and ISO/IEC Directives, IEC Supplement, available at www.iec.ch/members_experts/refdocs. The main document types developed by IEC are described in greater detail at www.iec.ch/publications.

A list of all parts of the IEC 60335 series, under the general title: *Household and similar electrical appliances – Safety*, can be found on the IEC website.

This part 2 is to be used in conjunction with the latest edition of IEC 60335-1 and its amendments unless that edition precludes it; in that case, the latest edition that does not preclude it is used. It was established on the basis of the sixth edition (2020) of that standard.

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

This part 2 supplements or modifies the corresponding clauses in IEC 60335-1, so as to convert that publication into the IEC standard: Safety requirements for 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 document will remain unchanged until the stability date indicated on the IEC website under webstore.iec.ch in the data related to the specific document. At this date, the document will be

- reconfirmed,
- withdrawn, or
- revised.

NOTE 4 The attention of National Committees is drawn to the fact that equipment manufacturers and testing organizations can 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.

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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.

Guidance documents concerning the application of the safety requirements for appliances can be accessed via TC 61 supporting documents on the IEC website <https://www.iec.ch/tc61/supportingdocuments>.

This information is given for the convenience of users of this International Standard and does not constitute a replacement for the normative text in this standard.

This standard recognizes the internationally accepted level of protection against hazards such as electrical, mechanical, thermal, fire and radiation of appliances when operated as in normal use taking into account the manufacturer's instructions. It also covers abnormal situations that can be expected in practice and takes into account the way in which electromagnetic phenomena can affect the safe operation of appliances.

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

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

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

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

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

NOTE 2 Horizontal publications, basic safety publications and group safety publications covering a hazard are not applicable since they have been taken into consideration when developing the general and particular requirements for the IEC 60335 series of standards.

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

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

NOTE 3 Standards dealing with non-safety aspects of household appliances are:

- IEC standards published by TC 59 concerning methods of measuring performance;
- CISPR 11, CISPR 14-1 and relevant IEC 61000-3 series standards concerning electromagnetic emissions;
- CISPR 14-2 concerning electromagnetic immunity;
- IEC standards published by TC 111 concerning environmental matters.

HOUSEHOLD AND SIMILAR ELECTRICAL APPLIANCES – SAFETY –

Part 2-14: Particular requirements for kitchen machines

1 Scope

This clause of Part 1 is replaced with 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 including direct current (DC) supplied appliances and **battery-operated appliances**.

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

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

Appliances intended for normal household and similar use and that can also be used by laypersons in shops, in light industry, bed and breakfast 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.

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:

- persons (including children) whose
 - physical, sensory or mental capabilities; or
 - lack of experience and knowledgeprevents them from using the appliance safely without supervision or instruction;
- children playing with the appliance.

It does not take into account the use of the following appliances by children:

- bean slicers;
- **blenders** including **hand-held blenders**;
- juicers other than citrus-fruit squeezers;
- **food mixers**;
- **food processors**;
- knives;
- **mincers**;
- **noodle makers**;
- lathe-type or **hand-held peelers**;
- vegetable graters/shredders;
- slicing machines.

Attention is drawn to the fact that

- for appliances intended to be used in vehicles or on board ships or aircraft, additional requirements can 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.

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;
- breadmakers (IEC 60335-2-9);
- soy milk makers (IEC 60335-2-15);
- 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 60584-1, *Thermocouples – Part 1: EMF specifications and tolerances*

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 Definitions relating to physical characteristics

3.1.9 *Modification:*

Replace the first paragraph with the following:

operation of the appliance under the conditions specified in 3.1.9.101 to 3.1.9.119 and operation with the most unfavourable load indicated in the instructions

Note 101 to entry: Operation per the instructions is not necessary for appliances operated without load in accordance with 3.1.9.119.

Note 102 to entry: A guidance document (61/6234/INF) concerning the application of 3.1.9, Clause 10 and Clause 11 can be accessed via TC 61 supporting documents on the IEC website.

3.1.9.101 Auger juicers 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 the **rated capacity** with a mixture comprising two parts by mass of soaked carrots and three parts water. If the **rated capacity** is not specified, 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 **total 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 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 $30\text{ °C} \pm 2\text{ °C}$ and a relative humidity of $60\% \pm 2\%$.

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 $10\% \pm 1\%$, 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 **total capacity** in cm^3 , 72 g of water at a temperature of $25\text{ °C} \pm 1\text{ °C}$ 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 $29\text{ °C} \pm 1\text{ °C}$, 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 **food mixer** is held so that the kneaders touch the wall of the bowl at opposite points and are 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 using the load which results in the most unfavourable conditions as follows:

- If provided with grating, slicing or shredding blades, they are operated as specified for vegetable graters and shredders (3.1.9.118) and cheese graters (3.1.9.105);
- If provided with chopping blades, they are operated with each of the following loads filled to the **rated capacity** or the maximum quantity recommended in the instructions for the specified food load, whichever is less:
 - raw sinewless, boneless and fatless beef;
 - hard Parmesan cheese selected from a block of cheese about 16 months old;

- If provided with mixing blades, they are operated as specified for:
 - **food mixers** for mixing cake batter (3.1.9.110) when the **food processor** is not intended to mix yeast dough. However, the sand is filled to the **rated capacity** or the maximum quantity recommended in the instructions for the mixing blade, whichever is less;
 - **food mixers** with kneaders for mixing yeast dough when the **food processor** is intended to mix yeast dough. However, the setting of the control and 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 $29\text{ °C} \pm 1\text{ °C}$, measured using a farinograph.

Note 2 to entry: The maximum quantity of the mixture may be specified by the maximum amount of flour.

Food loads are prepared prior to processing as recommended in the instruction manual, including cutting to a specified size, peeling, and chilling in the refrigerator or freezer. If no preparation instructions are provided, the foods are cut into pieces as needed to fit within the bowl or feed opening.

For a multispeed appliance, if the instructions recommend processing of certain food loads at other than the highest speed, they are processed at the recommended speed.

3.1.9.112 Grain grinders are operated with the hopper filled with wheat and controls being set to the position resulting in the smallest grain size. Corn is used instead of wheat when instructions state that it can be ground.

Note 1 to entry: If necessary, the wheat or corn is conditioned for 24 h at a temperature of $30\text{ °C} \pm 2\text{ °C}$ and a relative humidity of $60\% \pm 2\%$.

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 **rated capacity**. If the **rated capacity** is not specified, the container is filled up to the **total capacity**.

Removable elements for cooling ice cream are pre-cooled for 24 h at $-20\text{ °C} \pm 5\text{ °C}$.

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 $-4\text{ °C} \pm 1\text{ °C}$.

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 $23\text{ °C} \pm 2\text{ °C}$ before slicing.

Note 1 to entry: An example of a hard sausage is salami.

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.

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 peelers and lathe-type 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.

3.1.101

rated capacity

capacity assigned to the appliance by the manufacturer

3.1.102

total capacity

maximum capacity without overflowing

3.5 Definitions relating to types of appliances

3.5.101

food mixer

appliance intended for mixing food ingredients

3.5.102

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 can 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**.

3.5.103

mincer

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

3.5.104

blender

appliance intended to pulverise solids, such as ice, vegetables or fruit, and to combine them into a blend, or to merge liquids and solids into a blend (**food blenders**) or to combine liquids only (**liquid blenders**)

3.5.105

cordless blender

blender incorporating a motor and which is connected to the supply and operated only when placed on its associated stand

3.5.106

noodle maker

appliance without a mixing function intended to make noodles by extrusion or other means or an appliance with a mixing function intended to make noodles by extrusion only

3.5.107

auger juicer

appliance intended to juice various fruits and vegetables by use of an auger to crush the food load and a strainer to separate the juice from the pulp

Note 1 to entry: An auger is a screw, transporting food load, where the volume decreases and thus crushes the food load.

3.7 Definitions relating to safety of components

3.7.101

biased-off switch

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

4 General requirement

This clause of Part 1 is applicable.

5 General conditions for the tests

This clause of Part 1 is applicable except as follows.

5.2 Addition:

The test of 15.2 may be carried out on a separate appliance.

Three additional coffee mills and grain grinders are required for the test of 19.102.

The additional test of 25.14 is carried out on a separate appliance.

5.9 Addition:

For appliances intended to perform more than one of the functions specified in 3.1.9.101 to 3.1.9.119, the test is carried out with the functions which give the most unfavourable conditions.

6 Classification

This clause of Part 1 is applicable except as follows.

6.1 Addition:

Hand-held kitchen machines shall be **class II** or **class III**. However, they may be **class 0** or **class I** if their **rated voltage** does not exceed 150 V.

7 Marking and instructions

This clause of Part 1 is applicable except as follows.

7.1 Modification:

Appliances shall be marked with their **rated power input**.

Addition:

Stands provided with **cordless blenders** shall be marked with:

- the name, trademark or identification mark of the manufacturer or responsible vendor;
- the model or type reference.

7.12 Modification:

Add the following before the fourth paragraph and add "For other appliances," at the beginning of the fourth paragraph:

For knives, **blenders** including **hand-held blenders**, juicers other than citrus-fruit squeezers, **food mixers**, **food processors**, **mincers**, **noodle makers**, lathe-type or **hand-held peelers**, vegetable graters/shredders, bean slicers and slicing machines, the instructions shall include the substance of the following:

This appliance is not intended for use by children. Keep the appliance and its supply cord out of reach of children.

This appliance is not intended for use by persons with reduced physical, sensory or mental capabilities, or lack of experience and knowledge, unless they have been given supervision or instruction concerning use of the appliance by a person responsible for their safety.

Children should be supervised to ensure that they do not play with the appliance.

Addition:

For appliances with a **rated capacity**, the **rated capacity** shall be described in the instructions unless it is marked on the appliance.

Accessories, other than those supplied with the appliance, shall include instructions for their safe use.

The instructions for appliances intended to perform more than one of the functions specified in 3.1.9.101 to 3.1.9.119 shall identify the appliance function upon which the **rated power input** or **rated power input range** is based, unless the **rated power input** or **rated power input range** is based on the appliance function resulting in the greatest power input during the test of Clause 10.

The instructions for slicing machines with a base having a plane surface underneath the sliding feed table shall include the substance of the following:

This appliance must be used with the sliding feed table and the piece holder in position unless this is not possible due to the size or shape of the food.

The instructions shall warn of potential injury from unintended use. They shall state that care shall be taken when handling the sharp cutting blades, emptying the container and during cleaning.

The instructions for **food processors** and **blenders** shall include the substance of the following:

Be careful if hot liquid is poured into the food processor or blender as it can be ejected out of the appliance due to a sudden steaming.

The instructions shall include the substance of the following:

Always disconnect the appliance from the supply before assembling, disassembling or cleaning.

The instructions for **hand-held blenders** shall include the substance of the following:

Always disconnect the blender from the supply if it is left unattended.

The instructions for centrifugal juicers shall include the substance of the following:

Do not use the appliance if the rotating sieve or the protecting cover is damaged or has visible cracks.

The instructions for **cordless blenders** shall state that the **blender** is only to be used with the stand provided.

If the **blender** and stand of the **cordless blender** can be lifted together by gripping the handle of the **blender**, the instructions shall include the substance of the following:

CAUTION Ensure that the blender is switched off before removing it from the stand.

The instructions shall include details on how to clean surfaces in contact with food.

The instructions for appliances incorporating a switch necessary for compliance with 22.40 shall include the substance of the following:

Switch off the appliance and disconnect from supply before changing accessories or approaching parts that move in use.

The instructions for **noodle makers** with a mixing function shall state the maximum quantity of ingredients that should be used.

The instructions shall include the substance of the following:

This appliance is intended to be used in household and similar applications such as:

- staff kitchen areas in shops, offices and other working environments;
- farm houses;
- by clients in hotels, motels and other residential type environments;
- bed and breakfast type environments.

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.

8 Protection against access to live parts

This clause of Part 1 is applicable except as follows.

8.1.1 Addition:

Test probe 18 is not applied for those appliances identified in 7.12 as not intended for use by children.

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 except as follows.

10.1 Addition:

Except for **noodle makers** with a mixing function, a representative period is the shortest of:

- 2 min or the operating period specified in 11.7.1 for one cycle of operation, when the conditions specified in 3.1.9.101 to 3.1.9.119 are used,
- 2 min or the operating period specified in the instructions for one cycle of operation, when the most unfavourable load indicated in the instructions is used.

11 Heating

This clause of Part 1 is applicable except as follows.

11.3 Addition:

Where the external **accessible surfaces** are suitably flat and access permits, then the test probe of Figure 101 is used to measure the temperature rises of external **accessible surfaces** specified in Table 101. The probe is applied with a force of $4\text{ N} \pm 1\text{ N}$ to the surface in such a way that the best possible contact between the probe and the surface is ensured. The measurement is performed after a contact period of 30 s.

The probe may be held in place using a laboratory stand clamp or similar device. Any measuring instrument giving the same results as the probe may be used.

11.5 Replacement:

Motor-operated appliances are supplied with the most unfavourable voltage between 0,94 times and 1,06 times the **rated voltage**.

11.6 Replacement:

Combined appliances are supplied with the most unfavourable voltage between 0,94 times and 1,06 times the **rated voltage**.

11.7 Modification:

Replace the first paragraph with the following:

The appliance is subjected to the test of 11.7.1 and if necessary the tests of 11.7.2 and 11.7.3.

Appliances incorporating a programmer or timer are operated for the maximum period allowed by the programmer or timer or until steady conditions are established, whichever occurs first. If the appliance is also operable without the programmer or timer, the appliance is operated for the maximum period allowed by the programmer or timer or the operating period specified in 11.7.1, 11.7.2 or 11.7.3, as applicable, whichever is most unfavourable. An appliance incorporating a time limiting function that:

- *operates at a time greater than the operating period specified in 11.7.1, 11.7.2 and 11.7.3, and*
- *is not identified on the control or in the user instructions*

is not considered to be a timer during the heating test and the operating period specified in 11.7.1, 11.7.2 and 11.7.3 are applicable.

*Appliances for **remote operation** are also operated for the maximum operating time that can be set for **remote operation**, or the maximum time until the appliance automatically switches off.*

Replace the first dashed item in the third paragraph item with the following:

- *the **battery** that has been **fully discharged** is charged while the appliance is operated as specified in 11.7.1, 11.7.2 and 11.7.3, as applicable, performing its intended function, if allowed by the construction of the appliance;*

11.7.1 *The appliance is operated with*

- *the load conditions as specified in 3.1.9.101 to 3.1.9.119,*
- *the operating period as specified in 11.7.101 to 11.7.118, and*
- *the number of cycles and rest periods as specified in 11.7.101 to 11.7.118 (where relevant).*

11.7.2 *If the power input, measured in accordance with Clause 10, of any load stated in the instructions exceeds the power input of the load used for the test in 11.7.1, the appliance is operated as specified in a). If the operating period specified in the instructions exceeds the operating period used for the test of 11.7.1, the appliance is operated as specified in b). However, operation per the instructions is not necessary for appliances operated without load in accordance with 3.1.9.119.*

a) *The appliance is operated with*

- *the maximum load conditions as specified in the instructions,*
- *the operating period as specified in the instructions, and*
- *the number of cycles and rest periods as specified in 11.7.101 to 11.7.118 (where relevant).*

However, if the operating period specified in the instructions is less than that specified in 11.7.1 and does not exceed 7 min, the operating period shall be:

- *the maximum period stated in the instructions plus 1 min,*
- *the operating period specified in 11.7.1, or*
- *7 min,*

whichever is less.

b) *The appliance is operated with*

- *the load conditions as specified in the instructions,*
- *the maximum operating period as specified in the instructions, and*
- *the number of cycles and rest periods as specified in 11.7.101 to 11.7.118 (where relevant).*

11.7.3 If none of the power inputs measured in accordance with Clause 10 are:

- more than 80 % of **rated power input** for a **rated power input** not exceeding 300 W;
- more than **rated power input** minus 60 W for a **rated power input** between 300 W and 400 W;
- more than 85 % of **rated power input** for a **rated power input** exceeding 400 W,

then the following test is carried out. For appliances intended to perform more than one of the functions specified in 3.1.9.101 to 3.1.9.119, if the power input for any of these functions meets the criteria above, this test is not carried out.

The appliance is operated with

- the load to obtain **rated power input** when supplied at **rated voltage** or the upper limit of the **rated voltage range** by applying a 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;
- the operating period as specified in 11.7.101 to 11.7.118, and
- the number of cycles and rest periods as specified in 11.7.101 to 11.7.118 (where relevant).

The applied torque is maintained when the test voltage is adjusted to 0,94 and 1,06 times the **rated voltage**.

However, for appliances intended to perform more than one of the functions specified in 3.1.9.101 to 3.1.9.119, the relevant operating period, number of cycles and rest period specified in 11.7.101 through 11.7.118 for the function upon which the **rated power input** is based, as specified in the instructions, is used. If the instructions do not identify the function upon which the **rated power input** is based, the relevant operating period for the function that provides the greatest power input during Clause 10 is used.

11.7.101 For bean slicers, churns, sieving machines and slicing machines,

- the operating period is 30 min;
- the number of cycles is one.

11.7.102 For **auger juicers** and **mincers**,

- the operating period is 15 min;
- the number of cycles is one.

11.7.103 For **blenders** that have to be kept switched on by hand and **hand-held blenders**,

- the operating period is 1 min with the control adjusted to the highest setting;
- the number of cycles is five with rest periods of 1 min during which the mixture is replaced.

For other **blenders**,

- the operating period is 3 min with the control adjusted to the highest setting;
- the number of cycles is 10 with rest periods of 1 min during which the mixture is replaced.

11.7.104 For can openers,

- the operating period is the time needed to fully open the can;
- the number of cycles is five with rest periods of 15 s.

11.7.105 For juicers having separate outlets for the juice and residue,

- the operating period is 15 min or the time to process 5 kg of carrots, whichever is less;
- the number of cycles is one.

For other juicers,

- the operating period is 2 min or the time to process 0,5 kg of carrots, whichever is less;
- the number of cycles is 10 with rest periods of 2 min during which any container is emptied.

11.7.106 For cheese graters,

- the operating period is the time needed until the cheese is grated;
- the number of cycles is one.

11.7.107 For citrus-fruit squeezers,

- the operating period is 15 s during which two halves of fruit are squeezed;
- the number of cycles is 10 with rest periods of 15 s during which the appliance is left idling unless it switches off automatically.

If necessary, fruit residue may be removed during the rest periods.

11.7.108 For coffee mills having a separate container for collecting the ground coffee,

- the operating period is the time needed until the container is full or the hopper is emptied, whichever occurs first;
- the number of cycles is two with a rest period of 1 min.

For other coffee mills,

- the operating period is the time needed until the coffee beans are completely ground or for 30 s, whichever is longer;
- the number of cycles is three with rest periods of 1 min.

11.7.109 For cream whippers and egg beaters,

- the operating period is 10 min with the control adjusted to the highest setting;
- the number of cycles is one.

11.7.110 For **food mixers** with beaters for mixing cake batter,

- the operating period is 15 min unless they have to be kept switched on by hand, in which case the operating period is 5 min;
- the number of cycles is one.

For **food mixers** with kneaders for mixing yeast dough,

- the operating period is:
 - 5 min for **hand-held food mixers**;
 - 10 min for other **food mixers**;
- the number of cycles is one.

For the first 30 s, the control is adjusted to the lowest setting, after which the control is adjusted to the position for mixing yeast dough stated in the instructions. If the mixing action automatically stops when the dough is ready, the test is terminated.

11.7.111 Food processors are operated under the most unfavourable of the following conditions, as applicable:

- grating, slicing or shredding vegetables where the operating period, number of cycles and rest periods are as specified for vegetable graters and shredders;
- grating cheese where the operating period and number of cycles are as specified for cheese graters. If necessary, the bowl is filled to **rated capacity** and emptied as quickly as possible;
- chopping, where the
 - operating period is the time stated in the instructions or 10 s, whichever is greater;
 - number of cycles is 3 with rest periods of 2 min;
- mixing, for **food processors** with instructions for mixing yeast dough, where the
 - operating period and setting of the control is as stated in the instructions for mixing yeast dough;
 - number of cycles is five, with rest periods of 2 min between each operation, or for the number of cycles needed to process at least 1 kg of flour, whichever is less. However, at least two cycles are performed.
- mixing, for other than yeast dough, where the
 - operating period is the time stated in the instructions for mixing or 10 s, whichever is greater;
 - number of cycles is three with rest periods of 2 min.

11.7.112 For batch-fed grain grinders needing to be refilled to process 1 kg of wheat or corn,

- the operating period is the time needed until a full hopper of wheat or corn has been ground;
- the number of cycles is that necessary to grind at least 1 kg of wheat or corn with rest periods of 30 s.

For other grain grinders,

- the operating period is the time needed until 1 kg of wheat or corn has been ground;
- the number of cycles is one.

11.7.113 For ice-cream machines for use in refrigerators and freezers,

- the operating period is 5 min, after which the stirrer is stalled for 25 min;
- the number of cycles is one.

For other ice-cream machines,

- the operating period is 30 min;
- the number of cycles is one.

11.7.114 For knife sharpeners,

- the operating period is 10 min;
- the number of cycles is one.

11.7.115 For knives,

- the operating period is 4 s while simulating the slicing operation;
- the number of cycles is 150 with rest periods of 2 s while the blades are operating without load.

11.7.116 For potato peelers of the container type,

- the operating period is the time needed until the potatoes are adequately peeled;
- the number of cycles is that needed to peel 5 kg of potatoes with rest periods of 2 min.

When checking that the potatoes are adequately peeled, eyes are ignored. Timers are reset if necessary.

For hand-held peelers,

- the operating period is the time needed to peel a potato;
- the number of cycles is that needed to peel potatoes for 10 min with no rest period.

For lathe-type peelers,

- the operating period is the time needed to peel a potato;
- the number of cycles is that needed to peel potatoes for 10 min with rest periods equal to the time needed to replace the potato.

11.7.117 For shredders and vegetable graters,

- the operating period is the time needed until a batch of carrots is shredded;
- the number of cycles is five with rest periods of 2 min.

11.7.118 For **noodle makers** without a mixing function,

- the operating period is 15 min;
- the number of cycles is one.

For noodle makers with a mixing function,

- the operating period is the time needed until a batch of dough is mixed and extruded;
- the number of cycles is two or that needed to process 1 kg of flour, whichever is greater, with rest periods of 2 min.

11.8 Modification:

Replace the first paragraph with the following:

During the test, the temperature rises are monitored continuously and shall not exceed the values shown in Table 3 and Table 101.

Addition:

For ice-cream machines for use in refrigerators and freezers, the temperature rise values are increased by 30 K.

Table 101 – Maximum temperature rises for specified external accessible surfaces under normal operating conditions

Surface	Temperature rise of external accessible surfaces K
Bare metal	42
Coated metal ^a	49
Glass and ceramic	56
Plastic and plastic coating > 0,4 mm ^{b, c}	62
NOTE The temperature rise limits of handles, knobs, grips, keyboards, keypads and similar parts are specified in Table 3.	
^a Metal is considered coated when a coating having a minimum thickness of 90 µm made of enamel, powder or non-substantially plastic coating is used.	
^b The temperature rise limit of plastic also applies for plastic material having a metal finish of thickness less than 0,1 mm.	
^c When the thickness of the plastic coating does not exceed 0,4 mm, the temperature rise limits of coated metal for underlying metal apply or the temperature rise limits for glass or ceramic material for underlying glass or ceramic material apply.	

12 Charging of metal-ion batteries

This clause of Part 1 is applicable.

13 Leakage current and electric strength at operating temperature

This clause of Part 1 is applicable.

14 Transient overvoltages

This clause of Part 1 is applicable.

15 Moisture resistance

This clause of Part 1 is applicable except as follows.

15.2 Modification:

Replace the second paragraph with the following:

Compliance is checked by:

- the test of 15.101, and
- the following test using a spillage solution comprising water containing approximately 1 % NaCl and 0,6 % rinsing agent.

Addition:

Water outlets for peelers are blocked.

For cordless blenders, the test is carried out on a horizontal surface with the blender both on and off its stand.

Liquid containers, gaskets and blades are not removed, even if they are **detachable parts**.

15.101 Appliances with **type X attachment**, except those having a specially prepared cord, are fitted with the lightest permissible type of flexible cord of the smallest cross-sectional area specified in Table 13.

Appliances incorporating an appliance inlet are tested with or without an appropriate connector in position, whichever is most unfavourable.

Detachable parts are removed. However, liquid containers, gaskets and blades are not removed, even if they are **detachable parts**.

The liquid container of the appliance is completely filled with water containing approximately 1 % NaCl. If it is not possible to completely fill the liquid container due to leakage of the solution through openings in the container, the container is filled to the maximum level possible without leakage.

The appliance is then supplied at **rated voltage** and operated for 15 s. During operation, lids are in position or removed, whichever is more unfavourable.

During the test, the leakage current shall not exceed the values specified in 13.2. After the test, the appliance shall then withstand the electric strength test of 16.3 and inspection shall show that there is no trace of water on insulation that could result in a reduction of **clearances** or **creepage distances** below the values specified in Clause 29.

15.102 The connecting devices of stands for **cordless blenders** shall not be affected by water.

Compliance is checked by the following test.

The stand is placed on a horizontal surface and 30 ml of the spillage solution specified in 15.2 is poured onto each connecting device. The solution is poured steadily through a tube having an inner diameter of 8 mm over a period of 2 s, the lower end of the tube being 200 mm above the connecting device.

NOTE A schematic representation of the test arrangement is shown in Figure 102.

The stand shall then withstand the dielectric strength test of 16.3.

15.103 Appliances having a liquid container with a gasket that is a **detachable part** shall be constructed so that leakage from a liquid container does not affect their electrical insulation.

Compliance is checked by the following test using water containing approximately 1 % NaCl.

Appliances with **type X attachment**, except those having a specially prepared cord, are fitted with the lightest permissible type of flexible cord of the smallest cross-sectional area specified in Table 13.

Appliances incorporating an appliance inlet are tested with or without an appropriate connector in position, whichever is most unfavourable.

The appliance shall be assembled for normal use, but gaskets that are **detachable parts** are removed.

The appliance is operated at **rated voltage**. A quantity of the saline solution is added to the liquid container equal to **total capacity**. For appliances where it is not possible to add liquid to the container while the appliance is operating, the saline solution is added to the container before starting the operation.

The duration of the test shall be the shortest of the following:

- until the container is empty;
- until no additional leakage from the container is possible independent of the tightening torque during assembly; or
- until the operating period has reached the duration specified for one cycle in 11.7.1 or 3 min, whichever is longer.

After the test, the appliance shall then withstand the electric strength test of 16.3 and inspection shall show that there is no trace of water on insulation that could result in a reduction of **clearances** or **creepage distances** below the values specified in Clause 29.

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:

The test of 19.7 is only applicable to coffee mills and grain grinders that have to be kept switched on by hand, **auger juicers**, **food blenders**, centrifugal juicers, churns, **food mixers**, **food processors**, ice-cream machines, **mincers**, and **noodle makers**.

Coffee mills and grain grinders are also subjected to the test of 19.101. They are also subject to the test of 19.102 unless they have to be kept switched on by hand.

Noodle makers with a mixing function are also subjected to the test of 19.103.

19.7 Addition:

Coffee mills and grain grinders that have to be kept switched on by hand, **auger juicers**, **food blenders**, centrifugal juicers for fruit and vegetables, **food mixers**, **food processors** and **mincers** are operated for 30 s.

Noodle makers without a mixing function that are fed by hand are tested for 30 s. Other **noodle makers** are tested for 5 min.

Churns and ice-cream machines are operated until steady conditions are established.

Appliances that can be controlled by **remote operation** are also tested for the maximum operating time that can be set for **remote operation**, or the maximum time until the appliance automatically switches off.

19.10 Addition:

The test is repeated with accessories in position but without additional load.

Coffee mills and grain grinders are only tested for 30 s.

19.11.2 Addition:

Appliances having a device with an **off position** obtained by electronic disconnection, or a device that can place the appliance in a stand-by mode, are turned off or placed in the stand-by mode and supplied at **rated voltage**.

19.13 Addition:

Appliances tested with an electronic switch in the **off position**, or in the stand-by mode, shall

- not become operational, or
- if they become operational, not result in a **dangerous malfunction** during or after the tests of 19.11.2.

19.101 Coffee mills and grain grinders are supplied at **rated voltage** and operated under **normal operation** five times with rest periods.

The duration of the operating period is

- for appliances incorporating a timer, the longest period allowed by the timer;
- for other appliances, as follows:
 - for coffee mills of the grinding type and grain grinders, 30 s longer than the time needed to fill the collecting container or the time required to empty the hopper, whichever is shorter;
 - for other coffee mills, 1 min.

The duration of the rest period is

- 10 s, for appliances provided with a collecting container;
- 60 s, for other appliances.

The temperature of the windings shall not exceed the values shown in Table 8.

19.102 Coffee mills and grain grinders are subjected to the following test that is carried out on three additional appliances.

Coffee mills are filled with 40 g of coffee beans to which are added two granite chips that pass through an 8 mm screen but not a 7 mm screen. Grain grinders are operated under **normal operation** but with two granite chips that pass through a 4 mm screen but not a 3 mm screen. The appliance is supplied at **rated voltage** and operated until grinding has been completed.

If any of the motors stall, the original appliance is subjected to the test of 19.7 for a test period of 5 min.

19.103 Noodle makers with a mixing function are fed with the maximum quantity of flour stated in the instruction and no water, and then operated for one operating cycle. During the test, 19.13 is applicable and the winding temperatures shall not exceed the values specified in 19.9.

20 Stability and mechanical hazards

This clause of Part 1 is applicable except as follows.

20.2 Modification:

Replace the last sentence of the second paragraph with the following:

However, enclosures that can be opened by overriding an interlock by applying the test probe B with a force not exceeding 5 N or test probe 18 with a force not exceeding 2,5 N are considered to be **detachable parts**. Test probe 18 is not applied for those appliances identified in 7.12 as not intended for use by children.

Addition:

Detachable accessories, such as feed pushers, are removed and covers are opened except that:

- for centrifugal juicers, the cover and the container for collecting the residue are in position;
- for graters and shredders, this is only applicable to accessories that are removed while the appliance is in operation.

The test probes are not applied to:

- bean slicers;
- can openers;
- citrus juice squeezers;
- **food mixers**;
- **hand-held blenders**;
- ice-cream machines, including those for use in refrigerators and freezers;
- knife sharpeners;
- knives;
- peelers;
- sieving machines;
- slicing machines;
- the following parts of other appliances:
 - smooth shafts having a diameter not exceeding 8 mm, rotating at a speed not exceeding 1 500 r/min and driven by motors having an input not exceeding 200 W;
 - outlet sides of grating and shredding disks rotating at a speed not exceeding 1 500 r/min;
 - projections from the surface of grinding disks, cones and similar parts having a height less than 4 mm;

- *grinding screws with a projection having a height less than 4 mm and complying with all of the following:*
 - *the distance (shown as "S" in Figure 103) between the grinding screw outer circumference (top of projection, shown as "B" in Figure 103) and the inner wall of the feed screw housing (shown as "C" in Figure 103) shall be maximum 1 mm;*
 - *the radius corner of the inner wall of the feed opening to the screw housing is less than 2 mm (shown as "R2" in Figure 103);*
 - *the grinding screw profile shall not have sharp edges;*
 - *the position of the inner wall of the feed opening in the direction of rotation (shown as "W" in Figure 103) shall be located at a distance equal to or smaller than 0,75 times the grinding screw radius including its threads (shown as "R1" in Figure 103) measured from the grinding screw middle point.*

NOTE 101 **Accessible drive shafts** that are not always in use when the appliance is in operation can be protected by means of a collar or by being positioned in a recess.

The test probes are not applied to feed openings with the following dimensions:

- *located at a height of at least 100 mm, measured from the upper edge of the cutting blade;*
- *an average of the maximum (D_{\max}) and minimum (D_{\min}) cross-sectional dimensions of the feed opening that does not exceed 65,5 mm, where the minimum cross-sectional dimension is the diameter of the largest cylindrical rod that can be inserted into the opening;*
- *a length of the longest continuous straight line intersecting the feed opening (L) that does not exceed 76 mm.*

NOTE 102 See Figure 104 for examples of D_{\max} , D_{\min} and L .

For other feed openings, only the test probe similar to test probe B of IEC 61032 but having a circular stop face with a diameter of 50 mm, instead of the non-circular face, is applied.

For blenders, detachable parts, except lids, are not removed. The test is carried out only with a test probe similar to that of test probe B of IEC 61032 but having a circular stop face with a diameter of 125 mm instead of the non-circular face, the distance between the tip of the test finger and the stop face being 100 mm.

*If compliance relies on an interlocked guard and the operation of an **electronic circuit** for the interlock function, the moving parts shall not operate with the guard removed under the following conditions applied separately:*

- a) *The fault conditions in a) to g) of 19.11.2 are applied one at a time to the **electronic circuit**.*
- b) *The electromagnetic phenomena tests of 19.11.4.2 and 19.11.4.5 are applied. The tests are carried out with surge protective devices disconnected, unless they incorporate spark gaps.*

*If the **electronic circuit** is programmable, the software shall contain measures to control the fault/error conditions specified in Table R.1 and is evaluated in accordance with the relevant requirements of normative Annex R.*

20.101 Accessories for cream whippers, egg beaters and **hand-held food mixers** shall not have knife edges, unless a suitable guard prevents accidental contact with their rotating parts.

It shall not be possible to release beaters, kneaders and similar accessories of **hand-held food mixers** by pressing a button or a similar action while the accessory is rotating at a speed exceeding 1 500 r/min.

Compliance is checked by inspection, by measurement and by manual test.

If compliance relies on the operation of an **electronic circuit**, the appliance is further tested as follows:

a) The appliance is supplied at **rated voltage** and operated under **normal operation**.

The electromagnetic phenomena tests of 19.11.4.2 and 19.11.4.5 are then applied. The tests are carried out with surge protective devices disconnected, unless they incorporate spark gaps.

Beaters, kneaders and similar accessories of **hand-held food mixers** shall not be released or be capable of being released by a single action during or after, as appropriate, the electromagnetic phenomena application.

b) The appliance is supplied at **rated voltage** and operated under **normal operation**.

The fault conditions in a) to g) of 19.11.2 are then applied one at a time to the **electronic circuit** monitoring the release mechanism.

Beaters, kneaders and similar accessories of **hand-held food mixers** shall not be released or be capable of being released by a single action during the test.

If the **electronic circuit** is programmable, the software shall contain measures to control the fault/error conditions specified in Table R.1 and is evaluated in accordance with the relevant requirements of Annex R.

20.102 Blades of **hand-held blenders** shall be completely screened from above and shall not be able to touch a flat surface while rotating.

Compliance is checked by inspection and by applying a cylindrical rod from any position between the vertical and an angle of 45° to the upper side of the blending blade. The rod has a diameter of 8,0 mm ± 0,1 mm and unlimited length.

It shall not be possible to touch the blades with the end of the test rod.

20.103 Knives and **hand-held blenders**, other than **hand-held food mixers** provided with a **blender** attachment, shall incorporate a **biased-off switch**, its actuating member being recessed, guarded or otherwise constructed to prevent inadvertent operation.

Compliance is checked by applying a cylindrical rod, having a diameter of 40 mm and a hemispherical end, to the actuating member of the switch. The test rod is applied with a force not exceeding 5 N. The appliance shall not operate.

When an appliance incorporates a separate locking device that has to be actuated and held so the **biased-off switch** can be operated and that returns to the locked condition when the **biased-off switch** actuator is released, compliance is checked by applying two cylindrical rods simultaneously, one being applied to the separate locking device and one to the actuating member of the **biased-off switch**. The appliance shall not operate unless two separate and dissimilar actions are required to operate the appliance, such that the appliance cannot be operated with a single grasping motion or a straight-line motion.

NOTE Example of such construction are:

- a **biased-off switch** that has to be pushed in before it can be moved laterally to operate the appliance;
- a separate locking device located so that a single grasping motion will not actuate both the locking device and the **biased-off switch**.

20.104 It shall not be possible to operate the cutting blades of **blenders**, other than **hand-held blenders**, when they are accessible.

Compliance is checked by the following test applied to **blenders** other than **hand-held blenders**.

The test shall be carried out with **detachable parts** removed or with any combination of assembly of **detachable parts**, whichever is most unfavourable, but with the cutting blades in place. If the cutting blades of the **blender** can be touched with the test probe specified for **blenders** in 20.2, it shall not be possible to operate the cutting blades of the **blender**.

Controls and switches, other than **biased-off switches**, are placed in the most unfavourable position and two simultaneous or sequential applications of test probe B of IEC 61032 are applied to controls, **detachable parts** and **biased-off switches**, including interlock switches, with a force not exceeding 20 N, in an attempt to operate the cutting blades.

During the test, it shall not be possible to operate the cutting blades of the **blender**.

If compliance relies on an interlocked guard and the operation of an **electronic circuit** for the interlock function, the cutting blades shall not operate with the guard removed under the following conditions applied separately:

- a) The fault conditions in a) to g) of 19.11.2 are applied one at a time to the **electronic circuit**.
- b) The electromagnetic phenomena tests of 19.11.4.2 and 19.11.4.5 are applied. The tests are carried out with surge protective devices disconnected, unless they incorporate spark gaps.

If the **electronic circuit** is programmable, the software shall contain measures to control the fault/error conditions specified in Table R.1 and is evaluated in accordance with the relevant requirements of normative Annex R.

20.105 Centrifugal juicers shall be constructed so that covers do not open due to vibration.

Rotating parts shall be secured so that they are not liable to become loose during operation.

NOTE Fastening of screws and nuts in a direction opposite to the direction of rotation of the rotating parts is considered to be sufficient.

If parts rotate faster than 5 000 r/min, **tools** for fastening them shall be such that covers can only be closed after the **tool** has been removed.

Teeth of grating disks shall have a height not exceeding 1,5 mm. Ejectors on filter drums shall not project by more than 4 mm.

A feed pusher that fills the throat of the hopper shall be provided.

Compliance is checked by inspection, by measurement and by manual test. A force of 5 N is applied to covers in the most unfavourable direction. They shall not open.

20.106 Appliances having a feed screw or an auger shall, as far as is compatible with the use and working of the appliance, provide adequate protection against personal injury in normal use. They shall be provided with a feed pusher. These requirements are not applicable to grinding screws for which the test probes are not applied in 20.2.

Compliance is checked by inspection, by measurement and by the following test.

For appliances having only one opening for inserting food and applying the feed pusher, the maximum cross-sectional dimension of the opening, measured at least 100 mm from the upper edge of the feed screw or the auger shall not exceed 45 mm, or the feed screw or the auger of the appliance shall not be accessible to test probe B of IEC 61032 applied with a force not exceeding 5 N with the feed pusher not in position.

For appliances having different openings for inserting food and applying the feed pusher:

- The maximum cross-sectional dimension of the opening for the feed pusher, measured at least 100 mm from the upper edge of the feed screw or the auger, shall not exceed 45 mm. The feed screw or the auger of the appliance shall not be accessible to test probe B of IEC 61032 applied with a force not exceeding 5 N with the pusher in position and not in position.
- The opening for inserting food shall have a construction such that direct access to the feed screw or the auger is prevented. It shall not be possible to touch the feed screw or auger with the test probe B of IEC 61032 applied with a force not exceeding 5 N with the pusher in position and not in position.

The test shall be repeated with test probe 18 of IEC 61032 applied with a force not exceeding 2,5 N except for those appliances identified in 7.12 as not intended for use by children.

20.107 Slicing machines, other than **fixed appliances** and those having a **biased-off switch**, shall incorporate means to hold the appliance in place, such as suction cups, and allow it to be released after use.

Compliance is checked by the following test.

The slicing machine is fixed to a plain glass plate placed on a horizontal surface. The glass is prevented from sliding by a stop.

A force of 30 N is applied horizontally to the appliance along the plane of the knife at a point 10 mm below the upper surface of the base carrying the sliding feed table.

The machine shall not move on the glass plate.

20.108 Slicing machines shall incorporate a guard surrounding the circular knife, its open sector being no larger than required for using the appliance, as shown in Figure 105.

Knife guards shall be **non-detachable parts** unless the motor cannot be switched on after their removal. It shall not be possible to operate interlocks by means of test probe B of IEC 61032 applied with a force not exceeding 5 N.

If compliance relies on an interlocked guard and the operation of an **electronic circuit** for the interlock function, the circular knife shall not operate with the guard removed under the following conditions applied separately:

- a) The fault conditions in a) to g) of 19.11.2 are applied one at a time to the **electronic circuit**.
- b) The electromagnetic phenomena tests of 19.11.4.2 and 19.11.4.5 are applied. The tests are carried out with surge protective devices disconnected, unless they incorporate spark gaps.

If the **electronic circuit** is programmable, the software shall contain measures to control the fault/error conditions specified in Table R.1 and is evaluated in accordance with the relevant requirements of normative Annex R.

The angle of the upper part of the open sector (θ in Figure 106) shall not exceed 75°. However, the angle may be increased to 90° if the exposed part of the knife exceeding 75° is screened from above.

The radial distance between the outer circumference of the knife and the knife guard (a in Figure 106) shall not exceed:

- 2 mm, if the guard is flush with the plane of the knife;
- 3 mm, if the guard projects at least 0,2 mm beyond the plane of the knife (b in Figure 106).

When the thickness of the slices is set to zero, the distance between the outer circumference of the knife and the plate that sets the thickness of the slices (c in Figure 106) shall not exceed 6 mm. At the upper and lower points of the open sector, the distance between the plate that sets the thickness of the slices and any other protecting part (e in Figure 106) shall not exceed 5 mm. If the distance "e" is shielded, the limit does not apply.

Additional guarding, such as an extension of the upper end or the plate that sets the thickness or an extension of the knife guard, shall be provided if slices thicker than 15 mm can be cut.

Slicing machines shall incorporate a sliding feed table with a hand rest, a thumb guard and a piece holder. The thumb guard shall screen the full height of the open sector and be constructed so that the other fingers remain at least 30 mm away from the knife (f in Figure 106). The distance between the plane of the thumb guard and the knife (d in Figure 106) shall not exceed 5 mm. At the end of the forward movement of the sliding feed table, the thumb guard shall project at least 8 mm beyond the outer circumference of the knife.

The piece holder shall allow small pieces of food to be sliced and shall be capable of holding food, for example by spikes having a height of approximately 1,5 mm. It shall have a length of at least 120 mm and a height of at least 70 mm and shall project at least 20 mm beyond the hand rest.

The support for the sliding feed table shall not be usable for supporting food if:

- the knife has a diameter exceeding 170 mm, or
- the no-load speed of the knife exceeds 200 r/min, or
- the **rated power input** exceeds 200 W.

Compliance is checked by inspection, by measurement and by manual test.

20.109 Slicing machines shall be constructed so that accidental operation of the appliance is prevented.

NOTE The requirement can be met by using a pull-on switch.

If a push-button, toggle, rocker or slide switch is used, the force necessary to actuate it shall be at least 2 N and the actuating member shall be recessed. However, the actuating member of a slide switch need not be recessed if the force is at least 5 N and is located so that unintentional actuation of the switch is unlikely.

Compliance is checked by inspection and measurement and by applying a cylindrical rod, having a diameter of 40 mm and a hemispherical end, to the actuating member of the switch. The test rod is applied with a force not exceeding 5 N. The appliance shall not operate.

20.110 The cutting blades of bean slicers shall be at least 30 mm from the plane of the inlet opening. The length of the major and minor axis of the inlet and outlet openings shall not exceed 30 mm and 15 mm. However, the dimensions of the outlet openings are not limited if a finger cannot be drawn in and a piece of stiff paper is not cut when inserted into the outlet opening.

Compliance is checked by measurement and by manual test.

20.111 The rotating parts of **blenders**, graters and shredders shall be secured so that they are not liable to become loose during operation.

NOTE Fastening of screws and nuts in a direction opposite to the direction of rotation of the rotating parts is considered to be sufficient.

A feed pusher that fills the throat of the hopper shall be provided.

Compliance is checked by inspection and by manual test.

20.112 The cutting blade of **food processors** shall stop within 1,5 s after the lid has been opened or removed.

Compliance is checked by operating the appliance without load and at the highest speed.

20.113 An interlock necessary for compliance with this standard shall be constructed so that accidental operation of the dangerous moving parts of the appliance is prevented when the lid or guard is not in place.

Interlock switches necessary for compliance with this standard shall be **biased-off switches**.

If there is a mechanical interlock between the lid or guard and the switch to control the motor, the lid or guard shall be locked when the switch is in the on position. When the lid or guard is not correctly closed, the switch shall be locked in the **off position**.

Compliance is checked by inspection, by manual test and by applying test probe B of IEC 61032 applied with a force not exceeding 5 N and test probe 18 with a force not exceeding 2,5 N to the interlock actuator for the lid or guard.

*If compliance relies on the operation of an **electronic circuit** for the interlock function, the moving parts shall not operate with the lid removed under the following conditions applied separately:*

- a) *The fault conditions in a) to g) of 19.11.2 are applied one at a time to the **electronic circuit**.*
- b) *The electromagnetic phenomena tests of 19.11.4.2 and 19.11.4.5 are applied. The tests are carried out with surge protective devices disconnected, unless they incorporate spark gaps.*

*If the **electronic circuit** is programmable, the software shall contain measures to control the fault/error conditions specified in Table R.1 and is evaluated in accordance with the relevant requirements of normative Annex R.*

20.114 Access to dangerous moving parts of appliances, where an interlock is necessary for compliance with this standard, shall be prevented for all combinations of assembly of **detachable parts** that can occur in use.

Compliance is checked by the following test.

Detachable parts are removed or assembled incorrectly in a manner that can occur in use, such as the incorrect location or misalignment of the parts.

A force not exceeding 5 N is applied to the parts in any direction and it shall not be possible to touch dangerous moving parts through openings, other than feed openings, with test probe B of IEC 61032 applied with a force not exceeding 5 N.

20.115 Centrifugal juicers for fruit and vegetables shall be constructed so that parts cannot become disengaged when the appliance is operated at high speed.

Compliance is checked by the following test that is carried out without load.

*The appliance with the lid removed is supplied at **rated voltage** with the control adjusted to give the highest speed. The appliance is operated 10 times.*

No part of the appliance shall become disengaged.

The appliance is operated again but with the lid in position. When the speed reaches its maximum value, an attempt is made to remove the lid. The test is carried out 10 times.

No part of the appliance shall become disengaged.

20.116 Centrifugal juicers having a rotating sieve retained by a rim of plastic material shall withstand the stresses resulting from parts rotating at high speed.

Compliance is checked by the following test that is carried out on three new appliances and by testing the sieve in accordance with Annex AA.

*The rim of plastic material retaining the rotating sieve is cut. The appliance is supplied at **rated voltage** and operated with the sieve and lid placed as in normal use. Speed controls are set to the highest position.*

If the sieve retains its structure, the rim is cut further and the test repeated until disintegration takes place. The damage to the rim and if necessary the mesh is increased gradually so that disintegration of the sieve takes place at high velocity.

During the test, parts shall not be ejected from the appliance.

20.117 The bowl and cutting blades of **food blenders** and **hand-held blenders** shall have adequate mechanical strength.

Compliance is checked by the following test.

Ice cubes with sides of about 20 mm and at a temperature of about $-18\text{ }^{\circ}\text{C}$ are placed in the bowl. The number of cubes is equal to 0,025 times the capacity of the bowl, in cm^3 , rounded up to a whole number.

*The capacity of the bowl, without any **detachable blade**, is determined by the maximum quantity of water that it can contain without overflowing. Any hole provided for the driving spindle is blocked. For **hand-held blenders** delivered without a bowl, the bowl defined in 3.1.9.110 is used.*

*The appliance is supplied at **rated voltage** and is operated continuously or intermittently in order to obtain the best crushing results while ensuring that the blade is not jammed by the ice cubes.*

*For **blenders** incorporating a timer, the test is carried out for the maximum period provided by the timer. For other **blenders**, the test is carried out for a period related to the maximum operating period specified in the instructions as follows:*

- for durations not exceeding 7 min, the maximum period specified plus 1 min;*
- for durations exceeding 7 min, the maximum period specified.*

After the test, the bowl and cutting blades shall not be broken, distorted or blunt edges being ignored.

20.118 **Cordless appliances** incorporating cutting blades that are accessible to test probe B of IEC 61032 applied with a force not exceeding 5 N or, for appliances other than those identified in 7.12 as not intended for use by children, to test probe 18 with a force of 2,5 N, shall incorporate a **biased-off switch**, its actuating member being recessed, guarded or otherwise constructed to prevent inadvertent operation.

Compliance is checked by applying a cylindrical rod, having a diameter of 40 mm and a hemispherical end, to the actuating member of the **biased-off switch**. The test rod is applied with a force not exceeding 5 N. The appliance shall not operate.

When an appliance incorporates a separate locking device that has to be actuated and held so the **biased-off switch** can be operated and that returns to the locked condition when the **biased-off switch** actuator is released, compliance is checked by applying two cylindrical rods simultaneously, one being applied to the separate locking device and one to the actuating member of **biased-off switch**. The appliance shall not operate unless two separate and dissimilar actions are required to operate the appliance, such that the appliance cannot be operated with a single grasping motion or a straight-line motion.

NOTE Example of such construction are:

- a **biased-off switch** that shall be pushed in before it can be moved laterally to operate the appliance;
- a separate locking device located so that a single grasping motion will not actuate both the locking device and the **biased-off switch**.

21 Mechanical strength

This clause of Part 1 is applicable except as follows.

21.1 Addition:

This test is also carried out on **detachable parts** that are necessary for protection against mechanical hazards.

22 Construction

This clause of Part 1 is applicable except as follows.

22.40 Modification:

Replace the second paragraph and the NOTE with the following:

Appliances for **remote operation** shall be fitted with a switch for stopping the operation of the appliance. The actuating member of this switch shall be easily visible and accessible.

Addition:

Remote operation or a delayed start timer shall not enable the operation of:

- functions that include accessible dangerous moving parts, such as those without an interlocked cover or lid;
- **hand-held appliances**; and
- functions that require further interaction with the user (example: adding ingredients).

Compliance is checked by inspection and, to determine if dangerous moving parts are accessible, by applying test probe B of IEC 61032 with a force not exceeding 5 N and test probe 18 of IEC 61032 with a force not exceeding 2,5 N. During the test, the **detachable parts** are in place or removed, whichever is more unfavourable. The test probes are applied also for all combinations of assembly of **detachable parts** that can occur in use.

22.49 Replacement:

For **remote operation**, the duration of operation shall be set before the appliance can be started unless the appliance switches off automatically at the end of a cycle.

Compliance is checked by inspection.

22.51 Replacement:

A control on the appliance shall be manually adjusted to the setting for **remote operation** before the appliance can be operated in this mode. There shall be a visual indication on the appliance showing that the appliance is adjusted for **remote operation**.

Compliance is checked by inspection.

22.101 Appliances shall be constructed so that lubricants are prevented from polluting food compartments.

Compliance is checked by inspection.

22.102 Appliances shall be constructed so that food or liquids are prevented from penetrating into places that could cause electrical or mechanical faults.

Compliance is checked by inspection.

22.103 The appliance coupler of **cordless blenders** shall be constructed to withstand the stresses occurring during normal use.

Compliance is checked by the following test.

*The two **live pins** of the **blender** are connected together and an external resistive load is connected in series with the supply. The external load is such that the current is 1,1 times **rated current**.*

*The **blender** is placed on its stand and withdrawn 10 000 times at a rate of approximately 10 times per minute. The test is continued for a further 10 000 times without current flowing.*

If the connection contacts cannot be energized when making or breaking the connection, instead of the above sequence, the test is carried out 20 000 times without current.

*After the test, the **blender** shall be suitable for further use and compliance with 8.1, 16.3, 27.5 and Clause 29 shall not be impaired.*

22.104 Knife sharpeners shall be constructed so that knife blades are prevented from penetrating into areas that could cause an electrical or mechanical hazard.

Compliance is checked by the following test.

Test probe D of IEC 61032 is inserted in any position through openings intended for sharpening. It shall not be possible to touch live parts, electrical insulation or moving parts, other than a grinding wheel.

23 Internal wiring

This clause of Part 1 is applicable.

24 Components

This clause of Part 1 is applicable except as follows.

24.1.3 Modification:

Add the following after the second sentence of the first paragraph:

However, for the following appliances, the number of cycles of operation shall be at least 3 000:

- *bean slicers;*
- **liquid blenders;**
- *cheese graters;*
- *graters;*
- *ice-cream machines for use in refrigerators and freezers;*
- *sieving machines;*
- *shredders.*

25 Supply connection and external flexible cords

This clause of Part 1 is applicable except as follows.

25.1 Addition:

Ice-cream machines for use in refrigerators and freezers and **hand-held appliances** shall not incorporate an appliance inlet.

25.5 Addition:

Type Z attachment is allowed for

- can openers;
- coffee mills and grain grinders having a mass not exceeding 1,5 kg;
- cream whippers;
- egg beaters;
- ice-cream machines including those for use in refrigerators and freezers;
- knife sharpeners.

Type X attachments, other than those with a specially prepared cord, shall not be used for ice-cream machines for use in refrigerators and freezers.

25.7 Addition:

Polyvinyl chloride sheathed **supply cords** of ice-cream machines for use in refrigerators and freezers shall be resistant to low temperatures.

Compliance is checked by the tests of IEC 60811-504:2012, 4.2 and 4.3, and IEC 60811-505:2012, 4.2, these tests being carried out at a temperature of $-25\text{ °C} \pm 2\text{ °C}$.

25.14 Addition:

Hand-held blenders and hand-held food mixers are also subjected to the following test while mounted on an apparatus similar to that of Figure 8. The appliance is mounted so that the direction of flexing corresponds to that most likely to occur when the **supply cord** is wound around it for storage.

The **supply cord** is suspended vertically from the appliance and loaded so that a force of 10 N is applied. The oscillating part is moved through an angle of 180° and back to the initial position. The number of flexings is 2 000, the rate of flexing being six per minute.

25.22 Addition:

Appliance inlets shall be located so that pollution by food or liquid is unlikely to occur during normal use.

26 Terminals for external conductors

This clause of Part 1 is applicable.

27 Provision for earthing

This clause of Part 1 is applicable.

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:

For ice-cream machines for use in refrigerators and freezers, the test is carried out at a temperature of $10\text{ °C} \pm 2\text{ °C}$ plus the maximum temperature rise determined during the test of Clause 11, but it shall be at least:

- $75\text{ °C} \pm 2\text{ °C}$, for external parts;
- $125\text{ °C} \pm 2\text{ °C}$, for parts supporting **live parts**.

30.2 Modification:

Replace the two dashed items in the compliance criteria with the following:

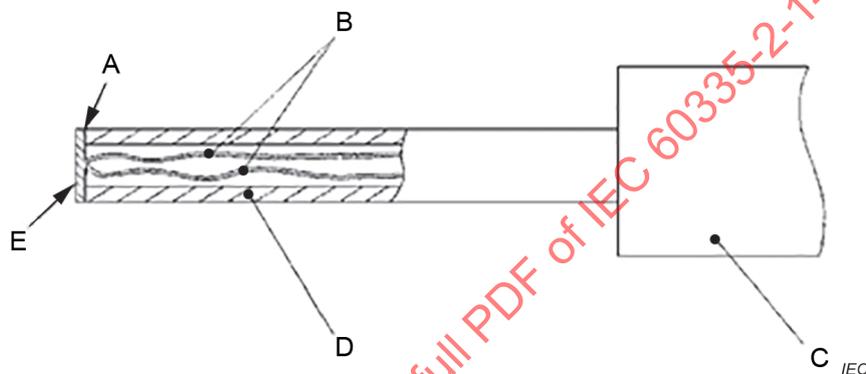
- for churns and ice-cream machines, 30.2.3 is applicable;
- for other appliances, 30.2.2 is applicable.

31 Resistance to rusting

This clause of Part 1 is applicable.

32 Radiation, toxicity and similar hazards

This clause of Part 1 is applicable.

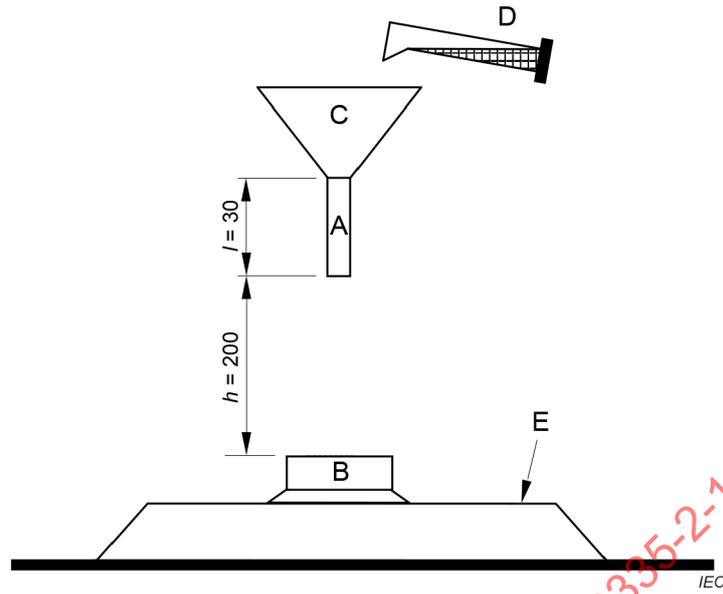


Key

- A adhesive
- B thermocouple wires 0,3 mm diameter to IEC 60584-1 Type K
- C handle arrangement permitting a contact force of $4\text{ N} \pm 1\text{ N}$
- D polycarbonate tube: inside diameter 3 mm, outside diameter 5 mm
- E tinned copper disc: 5 mm diameter, 0,5 mm thick with a flat contact face

Figure 101 – Probe for measuring surface temperatures

Dimensions in millimetres



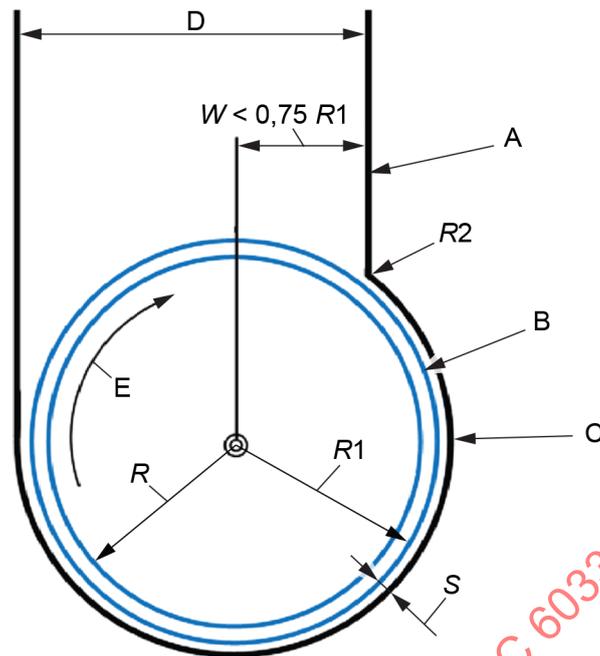
Key

- A funnel tube with inner diameter of 8 mm
- B item under test
- C funnel
- D container with 30 ml of spillage solution
- E horizontal surface

Figure 102 – Schematic representation of the 30 ml spillage test

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Dimensions in millimetres

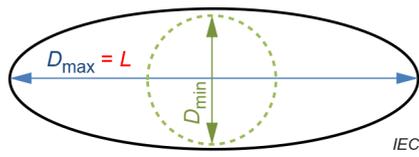


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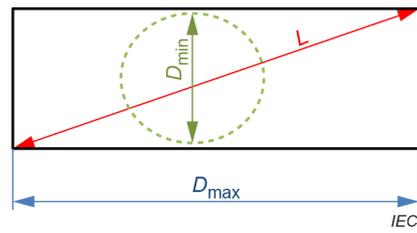
Key

- A wall of feed opening in the direction of rotation
- B grinding screw outer circumference
- C grinding screw housing
- D feed screw opening
- E direction of rotation
- W distance from the grinding screw centre point to the inner wall of the feed opening at the direction of rotation
- R radius of the grinding screw excluding its threads
- $R1$ radius of grinding screw outer circumference
- S distance between the grinding screw outer circumference (top of projection) and the inner wall of the grinding screw housing
- $R2$ radius corner between the wall of the feed opening and the screw housing

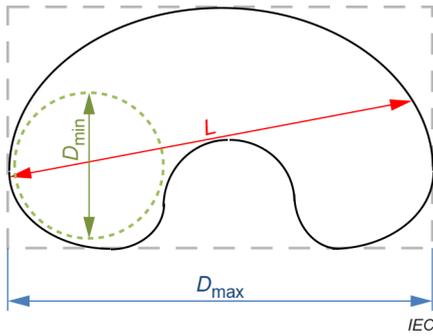
Figure 103 – Grinding screw with projections



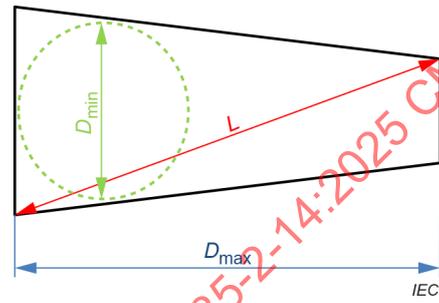
a) Elliptical feed opening



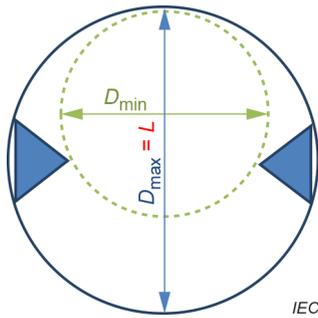
b) Rectangular feed opening



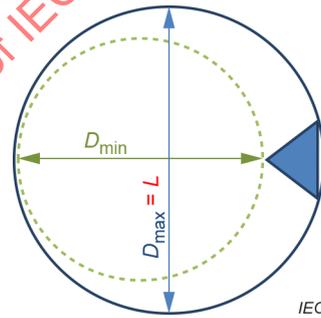
c) U-shaped feed opening



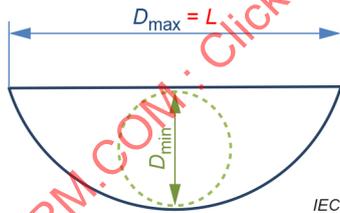
d) Trapezoidal feed opening



e) Circular feed opening with two projections



f) Circular feed opening with one projection



g) Semi-circular feed opening

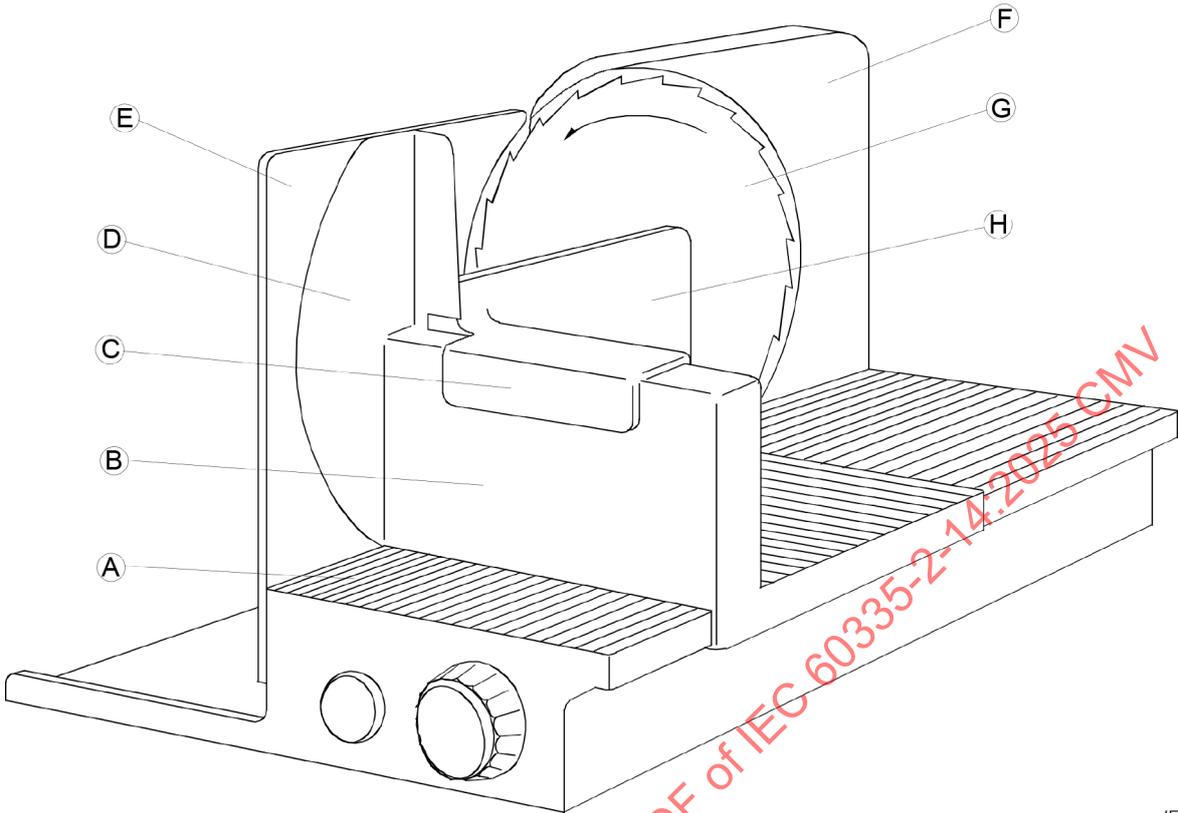
Key

D_{max} maximum cross-sectional dimension of the opening

D_{min} minimum cross-sectional dimension of the opening

L length of the longest continuous straight line intersecting the feed opening

Figure 104 – Examples of feed opening dimensions

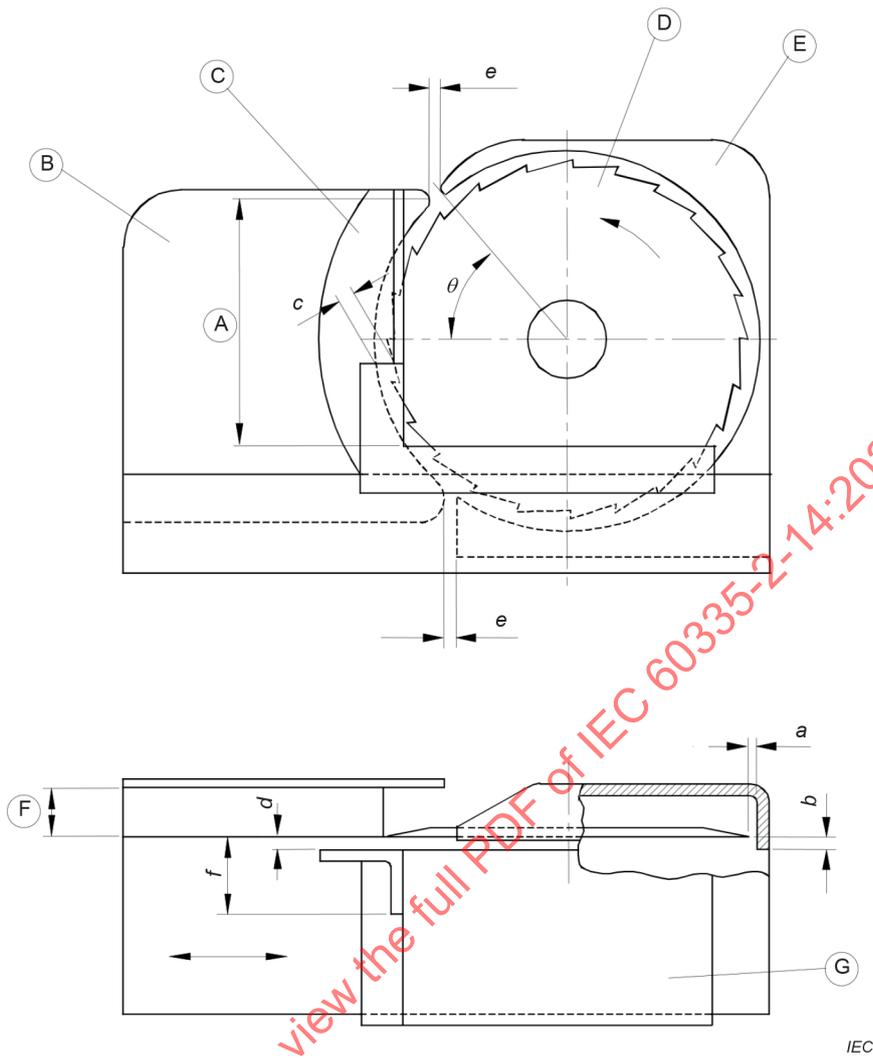


IEC

Key

- A support
- B sliding feed table
- C hand rest
- D thumb guard
- E plate that sets the thickness of the slices
- F blade guard
- G rotating blade
- H piece holder

Figure 105 – Slicing machine



Key

- A full height of the open section
- B plate that sets the thickness of the slices
- C thumb guard
- D rotating blade
- E blade guard
- F thickness of slices
- G sliding feed table

NOTE The dimensions are explained in 20.108.

Figure 106 – Protecting devices for slicing machines

Annexes

The annexes of Part 1 are applicable except as follows.

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Annex B (normative)

Battery-operated appliances, separable batteries and detachable batteries for battery-operated appliances

This annex of Part 1 is applicable except as follows.

B.11.1 Modification:

Replace the second, third and fourth paragraphs with the following:

*For appliances operated with **detachable batteries** or **separable batteries** that are disconnected from the appliance for charging purposes, the appliance is operated as specified in 11.7.101 to 11.7.118 until it completes the duration of the test as specified or it no longer operates due to depletion of the **battery**, whichever occurs first. If the **battery** is depleted before the appliance completes the duration of the test, the depleted **battery** is immediately replaced with another **battery** that is **fully charged**, the **battery** being the model or type reference of the **battery** provided or indicated in the instructions. The test is continued until the appliance completes the duration of the test as specified or it no longer operates due to depletion of the **battery**, whichever occurs first.*

*For appliances incorporating **integral batteries** or **separable batteries** not disconnected from the appliance for charging purposes, and that cannot perform their intended function while the **batteries** are being charged, the appliance is operated as specified in 11.7.101 to 11.7.118 until it completes the duration of the test or it cannot perform its intended function due to the depletion of the **battery**, whichever occurs first.*

*For appliances operated with **batteries** that are replaceable, including **integral batteries** that are replaceable, or **non-rechargeable batteries**, the appliance is operated until the minimum capacity of the **battery** as specified in Table B.1 has been delivered or the appliance completes the duration of the test as specified in 11.7.101 to 11.7.118, whichever occurs first.*

19.7 Addition:

Battery-operated appliances that have to be kept switched on by hand are operated for 30 s.

B.20.101 Battery-operated appliances incorporating cutting blades that are accessible to test probe B of IEC 61032 applied with a force not exceeding 5 N or, for appliances other than those identified in 7.12 as not intended for use by children, to test probe 18 with a force of 2,5 N shall incorporate a **biased-off switch**, its actuating member being recessed, guarded or otherwise constructed to prevent inadvertent operation.

*Compliance is checked by applying a cylindrical rod, having a diameter of 40 mm and a hemispherical end, to the actuating member of the **biased-off switch**. The test rod is applied with a force not exceeding 5 N. The appliance shall not operate.*

*When an appliance incorporates a separate locking device that has to be actuated and held so the **biased-off switch** can be operated and that returns to the locked condition when the **biased-off switch** actuator is released, compliance is checked by applying two cylindrical rods simultaneously, one being applied to the separate locking device and one to the actuating member of **biased-off switch**. The appliance shall not operate unless two separate and dissimilar actions are required to operate the appliance, such that the appliance cannot be operated with a single grasping motion or a straight-line motion.*

NOTE Examples of such construction are:

- a **biased-off switch** that has to be pushed in before it can be moved laterally to operate the appliance;
- a separate locking device located so that a single grasping motion will not actuate both the locking device and the **biased-off switch**.

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Annex C (normative)

Ageing test on motors

Modification:

The value of p in Table C.1 is 2 000, except for the following appliances for which it is 500:

- bean slicers;
- **blenders**;
- can openers;
- cheese graters;
- citrus-fruit squeezers;
- graters;
- ice-cream machines for use in refrigerators and freezers;
- knife sharpeners;
- knives;
- sieving machines;
- shredders.

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Annex R (normative)

Software evaluation

R.2.2.5 *Modification:*

Replace the first paragraph with the following:

For programmable **electronic circuits** with functions requiring software incorporating measures to control the fault/error conditions specified in Table R.1 or Table R.2, detection of a fault/error shall occur before compliance with Clause 19, 20.2, 20.101, 20.104, 20.108 or 20.113 is impaired.

R.2.2.9 *Modification:*

Replace the first sentence of the first paragraph with the following:

The software and safety-related hardware under its control shall be initialized and shall terminate before compliance with Clause 19, 20.2, 20.101, 20.104, 20.108 or 20.113 is impaired.

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Annex AA (normative)

Tests on sieves of centrifugal juicers

The purpose of these tests is to ensure that rotating sieves of centrifugal juicers are able to withstand the stresses to which they are subjected during the lifetime of the appliance.

The tests are carried out in the order specified.

1) Chemical stress test

The sieves are placed in a solution of detergent having a concentration of 3 g/l and a temperature of 65 °C ± 1 °C. The detergent to be used consists of the chemical substances as specified in Table AA.1.

Table AA.1 – Detergent composition

Chemical substance	Specification ¹	Weight in %
Sodium citrate dihydrate	N 1560/Jungbunzlauer	30,0
Maleic acid/acrylic acid copolymer Na salt	Alternative 1: Sokalan CP 5 Compound/Henkel 50 % active on sodium carbonate	12,0
Sodium percarbonate		7,0
Tetraacetyl ethylendiamine	TAED/Warwick	2,0
Sodium disilicate (noncrystalline)	Portil A/Cognis	10
Linear fatty alcohol ethoxylate (Nonionic surfactant, low foaming)	Plurafac LF403/BASF	2,0
Protease	Savinase X.0T/NOVO	40 KNPU/kg ‡ e.g. Savinase 8.0T: 1,0 %
Amylase	Termamyl xxT/NOVO	300 KNU/kg ‡ e.g. Termamyl 60T: 0,5 %
Sodium carbonate, anhydrous	Soda, leicht/Mathes & Weber	Add to 100
‡ = Activity units		

The sieves are kept in the solution for 48 h after which they are removed and rinsed with water.

*The sieves are stored at **room temperature** for 14 days.*

2) Thermal stress test

The sieves are placed in a dry atmosphere at a temperature of 83 °C ± 2 °C for 1 h. They are then placed into water having a temperature of 20 °C ± 2 °C.

This test is carried out three times.

1 "Jungbunzlauer", "Sokalan", "Henkel", "Warwick", "Portil", "Cognis", "Plurafac", "BASF", "Savinase", "Termamyl", "Novo", "Mathes & Weber" are trademarks. This information is given for the convenience of users of this document and does not constitute an endorsement by the IEC of these trademarks. Items of the similar specification can be used if they can be shown to lead to the same results.

3) *Impact test*

The sieves are dropped from a height of 1 m onto a wooden floor in such a way that at the moment of impact the axis of rotation is horizontal.

This test is carried out 12 times, the sieves being rotated by 30° each time to obtain 12 different points of impact.

4) *Starting test*

*A sieve is placed in the appliance that is supplied at 1,06 times **rated voltage**, speed controls being set at the highest position. The appliance is operated for 15 s followed by a rest period of 45 s.*

This test is carried out 25 times on each sieve.

After the tests, there shall be no crack or other damage visible to the naked eye, dents being disregarded.

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Bibliography

The Bibliography of Part 1 is applicable except as follows.

Addition:

IEC 60335-2-9, *Household and similar electrical appliances – Safety – Part 2-9: Particular requirements for grills, toasters and similar portable cooking appliances*

IEC 60335-2-15, *Household and similar electrical appliances – Safety – Part 2-15: Particular requirements for appliances for heating liquids*

IEC 60335-2-16, *Household and similar electrical appliances – Safety – Part 2-16: Particular requirements for food waste disposers*

IEC 60335-2-24, *Household and similar electrical appliances – Safety – Part 2-24: Particular requirements for refrigerating appliances, ice-cream appliances and ice makers*

IEC 60335-2-64, *Household and similar electrical appliances – Safety – Part 2-64: Particular requirements for commercial electric kitchen machines*

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COMMISSION ÉLECTROTECHNIQUE INTERNATIONALE

APPAREILS ÉLECTRODOMESTIQUES ET ANALOGUES – SÉCURITÉ –

Partie 2-14: Exigences particulières pour les machines de cuisine

AVANT-PROPOS

- 1) La Commission Électrotechnique Internationale (IEC) est une organisation mondiale de normalisation composée de l'ensemble des comités électrotechniques nationaux (Comités nationaux de l'IEC). L'IEC a pour objet de favoriser la coopération internationale pour toutes les questions de normalisation dans les domaines de l'électricité et de l'électronique. À cet effet, l'IEC – entre autres activités – publie des Normes internationales, des Spécifications techniques, des Rapports techniques, des Spécifications accessibles au public (PAS) et des Guides (ci-après dénommés "Publication(s) de l'IEC"). Leur élaboration est confiée à des comités d'études, aux travaux desquels tout Comité national intéressé par le sujet traité peut participer. Les organisations internationales, gouvernementales et non gouvernementales, en liaison avec l'IEC, participent également aux travaux. L'IEC collabore étroitement avec l'Organisation Internationale de Normalisation (ISO), selon des conditions fixées par accord entre les deux organisations.
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L'IEC 60335-2-14 a été établie par le comité d'études 61 de l'IEC: Sécurité des appareils électrodomestiques et analogues. Il s'agit d'une Norme internationale.

Cette septième édition annule et remplace la sixième édition parue en 2016 et l'Amendement 1:2019. Cette édition constitue une révision technique.

Cette édition inclut les modifications techniques majeures suivantes par rapport à l'édition précédente:

- a) le texte a été aligné sur l'IEC 60335-1:2020;
- b) certaines notes ont été converties en texte normatif (Article 1, 3.1.9.111, 3.1.9.112, 3.1.9.114, 3.1.9.115, 11.7.3, 20.2, 20.107, 20.108);
- c) l'extracteur de jus de baies a été remplacé par l'extracteur de jus à broyeur et un terme défini a été ajouté (Article 1, 3.1.9.101, 3.5.107, 11.7.102, 19.1, 19.7);
- d) des exigences ont été ajoutées pour les appareils qui ne sont pas destinés à être utilisés par des enfants (Article 1, 7.12, 20.2, 20.106, 20.117);
- e) les essais en conditions de fonctionnement normal ont été clarifiés (3.1.9, 3.1.9.111, 5.9, 7.12, 10.1, 11.5, 11.6, 11.7, 11.7.1 à 11.7.3, 11.7.101 à 11.7.118);
- f) des températures de surface ont été ajoutées pour les surfaces accessibles extérieures (11.3, 11.8);
- g) l'essai de débordement du 15.2 a été modifié pour couvrir les fuites du récipient de liquide;
- h) les exigences pour la commande à distance des machines de cuisine ont été clarifiées (11.7, 19.7, 22.40, 22.49, 22.51);
- i) la période de fonctionnement des extracteurs de jus a été modifiée en ce qui concerne la charge de 0,5 kg de carottes et la durée de fonctionnement (11.7.105);
- j) les essais de débordement avec des joints amovibles ont été clarifiés et l'essai d'étanchéité des joints a été ajouté (15.2, 15.102);
- k) les limites des dimensions des orifices d'approvisionnement ont été clarifiées au 20.2;
- l) des exigences ont été ajoutées pour la fonction de verrouillage lorsque la conformité à la norme repose sur un circuit électronique (20.2, 20.104, 20.108, 20.113);
- m) le calibre d'essai 18 a été ajouté lorsque le calibre d'essai B est appliqué et les forces appliquées aux calibres d'essai ont été clarifiées (20.2, 20.104, 20.106, 20.108, 20.113, 20.114, 20.117);
- n) les exigences relatives au fonctionnement intempestif des mélangeurs portatifs et des couteaux ont été mises à jour et combinées afin de couvrir les constructions alternatives d'interrupteurs disponibles sur le marché (20.103 et suppression de l'ancien 20.115);
- o) l'essai du 20.104 a été clarifié;
- p) les exigences de verrouillage ont été mises à jour de manière à s'appliquer à tous les appareils pour lesquels le verrouillage est exigé aux fins de la conformité à la norme (20.113, 20.114);
- q) le détergent utilisé pour le conditionnement des centrifugeuses a été mis à jour (Annexe AA).

Le texte de cette Norme internationale est issu des documents suivants:

Projet	Rapport de vote
61/7347/FDIS	61/7384/RVD

Le rapport de vote indiqué dans le tableau ci-dessus donne toute information sur le vote ayant abouti à son approbation.

La langue employée pour l'élaboration de cette Norme internationale est l'anglais.

Ce document a été rédigé selon les Directives ISO/IEC, Partie 2, il a été développé selon les Directives ISO/IEC, Partie 1 et les Directives ISO/IEC, Supplément IEC, disponibles sous www.iec.ch/members_experts/refdocs. Les principaux types de documents développés par l'IEC sont décrits plus en détail sous www.iec.ch/publications.

Une liste de toutes les parties de la série IEC 60335, publiées sous le titre général *Appareils électrodomestiques et analogues – Sécurité*, se trouve sur le site web de l'IEC.

La présente partie 2 doit être utilisée conjointement avec la dernière édition de l'IEC 60335-1 et ses amendements sauf si cette édition l'exclut. Dans ce cas, la dernière édition qui n'exclut pas la présente partie 2 est utilisée. Elle a été établie sur la base de la sixième édition (2020) de cette norme.

NOTE 1 L'expression "la Partie 1" utilisée dans la présente norme fait référence à l'IEC 60335-1.

La présente partie 2 complète ou modifie les articles correspondants de l'IEC 60335-1, de façon à transformer cette publication en norme IEC: Exigences de sécurité pour les machines de cuisine.

Lorsqu'un paragraphe particulier de la Partie 1 n'est pas mentionné dans cette partie 2, ce paragraphe s'applique pour autant que cela soit raisonnable. Lorsque la présente norme mentionne "addition", "modification" ou "remplacement", le texte correspondant de la Partie 1 doit être adapté en conséquence.

NOTE 2 Le système de numérotation suivant est utilisé:

- les paragraphes, tableaux et figures qui s'ajoutent à ceux de la Partie 1 sont numérotés à partir de 101;
- à l'exception de celles qui sont dans un nouveau paragraphe ou de celles qui concernent des notes de la Partie 1, les notes sont numérotées à partir de 101, y compris celles des articles ou paragraphes qui sont remplacés;
- les annexes qui sont ajoutées sont désignées AA, BB, etc.

NOTE 3 Les caractères d'imprimerie suivants sont utilisés:

- exigences: caractères romains;
- modalités d'essais: caractères italiques;
- notes: petits caractères romains.

Les termes en **gras** dans le texte sont définis à l'Article 3. Lorsqu'une définition concerne un adjectif, l'adjectif et le nom associé figurent également en gras.

Le comité a décidé que le contenu de ce document ne sera pas modifié avant la date de stabilité indiquée sur le site web de l'IEC sous webstore.iec.ch dans les données relatives au document recherché. À cette date, le document sera

- reconduit,
- supprimé, ou
- révisé.

NOTE 4 L'attention des Comités nationaux est attirée sur le fait que les fabricants d'appareils et les organismes d'essai peuvent avoir besoin d'une période transitoire après la publication d'une nouvelle publication IEC, ou d'une publication amendée ou révisée, pour fabriquer des produits conformes aux nouvelles exigences et pour adapter leurs équipements aux nouveaux essais ou aux essais révisés.

Le comité recommande que le contenu de cette publication soit adopté pour application nationale (obligatoire) au plus tôt 12 mois et au plus tard 36 mois après la date de publication.

INTRODUCTION

Il a été admis par hypothèse, en établissant la présente Norme internationale, que l'exécution de ses dispositions était confiée à des personnes expérimentées et ayant une qualification appropriée.

Les documents de recommandations concernant l'application des exigences de sécurité des appareils peuvent être obtenus par le biais des documents d'accompagnement du comité d'études 61 sur le site web de l'IEC à l'adresse: <https://www.iec.ch/tc61/supportingdocuments>.

Cette information est donnée à l'intention des utilisateurs de la présente Norme internationale et ne constitue nullement un remplacement du texte normatif de la présente norme.

La présente norme reconnaît le niveau de protection internationalement accepté contre les dangers électriques, mécaniques, thermiques, liés au feu et au rayonnement des appareils, lorsqu'ils fonctionnent comme en usage normal en tenant compte des instructions du fabricant. Elle couvre également les situations anormales auxquelles on peut s'attendre dans la pratique et elle tient compte de la façon dont les phénomènes électromagnétiques peuvent affecter le fonctionnement sûr des appareils.

La présente norme tient compte autant que possible des exigences de l'IEC 60364, de façon à rester compatible avec les règles d'installation quand l'appareil est raccordé au réseau d'alimentation. Cependant, des règles d'installation nationales peuvent être différentes.

Si un appareil relevant du domaine d'application de la présente norme comporte également des fonctions couvertes par une autre partie 2 de l'IEC 60335, la partie 2 correspondante est appliquée à chaque fonction séparément, dans la limite du raisonnable. Si cela s'applique, l'influence d'une fonction sur les autres fonctions est prise en compte.

Lorsqu'une partie 2 ne comporte pas d'exigences complémentaires pour couvrir les risques traités dans la Partie 1, la Partie 1 s'applique.

NOTE 1 Cela signifie que les comités d'études responsables pour les parties 2 ont déterminé qu'il n'était pas nécessaire de spécifier des exigences particulières pour l'appareil en question en plus des exigences générales.

La présente norme est une norme de famille de produits traitant de la sécurité d'appareils et a préséance sur les normes horizontales et génériques couvrant le même sujet.

NOTE 2 Les publications horizontales, les publications fondamentales de sécurité et les publications groupées de sécurité couvrant un danger ne s'appliquent pas, parce qu'elles ont été prises en considération lorsque les exigences générales et particulières ont été étudiées pour la série de normes IEC 60335.

Un appareil conforme au texte de la présente norme ne sera pas nécessairement jugé conforme aux principes de sécurité de la norme si, lorsqu'il est examiné et soumis aux essais, il apparaît qu'il présente d'autres caractéristiques qui compromettent le niveau de sécurité visé par ces exigences.

Un appareil utilisant des matériaux ou présentant des modes de construction différents de ceux décrits dans les exigences de la présente norme peut être examiné et soumis aux essais en fonction de l'objectif poursuivi par ces exigences et, s'il est jugé pratiquement équivalent, il peut être estimé conforme aux principes de sécurité de la présente norme.

NOTE 3 Les normes traitant des aspects non relatifs à la sécurité des appareils électrodomestiques sont:

- les normes IEC publiées par le comité d'études 59 concernant les méthodes de mesure de l'aptitude à la fonction;
- les normes CISPR 11 et CISPR 14-1, ainsi que les normes applicables de la série IEC 61000-3 concernant les émissions électromagnétiques;
- la norme CISPR 14-2 concernant l'immunité électromagnétique;
- les normes IEC publiées par le comité d'études 111 concernant l'environnement.

APPAREILS ÉLECTRODOMESTIQUES ET ANALOGUES – SÉCURITÉ –

Partie 2-14: Exigences particulières pour les machines de cuisine

1 Domaine d'application

L'article de la Partie 1 est remplacé par le texte suivant.

La présente partie de l'IEC 60335 traite de la sécurité des machines de cuisine électriques pour usages domestiques et analogues, dont la **tension assignée** est inférieure ou égale à 250 V, y compris les appareils alimentés en courant continu et les **appareils alimentés par batteries**.

La liste suivante répertorie les exemples d'appareils qui relèvent du domaine d'application de la présente norme:

- machines à couper les haricots;
- **extracteurs de jus à broyeur;**
- **mélangeurs;**
- ouvre-boîtes;
- centrifugeuses;
- barattes;
- presse-agrumes;
- moulins à café dont la **capacité assignée** de la trémie ne dépasse pas 500 g;
- fouets à crème;
- fouets à œufs;
- **batteurs;**
- **préparateurs culinaires;**
- moulins à grains dont la **capacité assignée** de la trémie ne dépasse pas 3 l;
- râpes;
- sorbetières, y compris celles utilisées dans les réfrigérateurs et les congélateurs;
- affûte-couteaux;
- couteaux;
- **hachoirs;**
- **appareils pour faire des nouilles;**
- éplucheuses;
- coupe-légumes;
- machines à tamiser;
- machines à trancher.

Les appareils destinés à un usage domestique normal et analogue et qui peuvent être également utilisés par des usagers non avertis dans des magasins, chez des artisans, dans des chambres d'hôtes et dans des fermes sont compris dans le domaine d'application de la présente norme. Toutefois, si un appareil est destiné à être utilisé par des professionnels pour la préparation d'aliments à des fins commerciales, cet appareil n'est pas considéré comme étant uniquement à usage domestique et analogue.

Dans la mesure du possible, la présente norme traite des dangers ordinaires présentés par les appareils, encourus par tous les individus à l'intérieur et autour de leur habitation. Cependant, elle ne tient en général pas compte :

- des personnes (y compris des enfants) dont
 - les capacités physiques, sensorielles ou mentales; ou
 - le manque d'expérience et de connaissanceles empêchent d'utiliser l'appareil en toute sécurité sans surveillance ou instruction;
- des enfants qui jouent avec l'appareil.

Elle ne tient pas compte de l'utilisation des appareils suivants par des enfants:

- machines à couper les haricots;
- **mélangeurs**, y compris les **mélangeurs portatifs**;
- extracteurs de jus autres que les presse-agrumes;
- **batteurs**;
- **préparateurs culinaires**;
- couteaux;
- **hachoirs**;
- **appareils pour faire des nouilles**;
- **éplucheuses de pommes de terre portatives** ou du type à tour;
- râpes à légumes/coupe-légumes;
- machines à trancher.

L'attention est attirée sur le fait que:

- pour les appareils destinés à être utilisés dans des véhicules ou à bord de navires ou d'avions, des exigences supplémentaires peuvent être nécessaires;
- dans de nombreux pays, des exigences supplémentaires sont spécifiées par les organismes nationaux de la santé, par les organismes nationaux responsables de la protection des travailleurs et par des organismes similaires.

La présente norme ne s'applique pas

- aux machines à trancher équipées d'un couteau circulaire dont la lame est inclinée à un angle supérieur à 45° par rapport à la verticale;
- aux machines à pain (IEC 60335-2-9);
- aux préparateurs de lait de soja (IEC 60335-2-15);
- aux broyeurs de déchets (IEC 60335-2-16);
- aux sorbetières avec motocompresseur incorporé (IEC 60335-2-24);
- aux machines de cuisine à usage commercial (IEC 60335-2-64);
- aux machines de cuisine à usage industriel;
- aux machines de cuisine destinées à être utilisées dans des locaux qui présentent des conditions particulières, comme la présence d'une atmosphère corrosive ou explosive (poussières, vapeurs ou gaz).

2 Références normatives

L'article de la Partie 1 s'applique, avec l'exception suivante.

Addition:

IEC 60584-1, *Couples thermoélectriques – Partie 1: Spécifications et tolérances en matière de FEM*

IEC 60811-504:2012, *Câbles électriques et à fibres optiques – Méthodes d'essai pour les matériaux non-métalliques – Partie 504: Essais mécaniques – Essai d'enroulement à basse température pour les enveloppes isolantes et les gaines*

IEC 60811-505:2012, *Câbles électriques et à fibres optiques – Méthodes d'essai pour les matériaux non-métalliques – Partie 505: Essais mécaniques – Essai d'allongement à basse température pour les enveloppes isolantes et les gaines*

3 Termes et définitions

L'article de la Partie 1 s'applique, avec les exceptions suivantes.

3.1 Définitions relatives aux caractéristiques physiques

3.1.9 *Modification:*

Remplacer le premier alinéa par ce qui suit:

fonctionnement de l'appareil dans les conditions spécifiées du 3.1.9.101 au 3.1.9.119 et fonctionnement avec la charge la plus défavorable indiquée dans les instructions

Note 101 à l'article: Le fonctionnement selon les instructions n'est pas nécessaire pour les appareils mis en fonctionnement sans charge conformément au 3.1.9.119.

Note 102 à l'article: Un document concernant l'application du 3.1.9, de l'Article 10 et de l'Article 11 peut être obtenu par le biais des documents d'accompagnement du comité d'études 61 sur le site web de l'IEC.

3.1.9.101 Les **extracteurs de jus à broyeur** sont alimentés avec 1 kg de baies telles que les groseilles, groseilles à maquereau ou raisins. Les pilons sont pressés avec une force de 5 N contre les baies.

3.1.9.102 Les **mélangeurs d'aliments** sont mis en fonctionnement avec le bol rempli jusqu'à la **capacité assignée** avec un mélange constitué de deux parts, en masse, de carottes préalablement mises à tremper et de trois parts d'eau. Si la **capacité assignée** n'est pas spécifiée, le bol est rempli aux deux tiers de sa **capacité totale**. Les carottes sont mises à tremper dans l'eau pendant 24 h et coupées de façon que les dimensions des morceaux ne dépassent pas 15 mm. Si le bol n'est pas fourni, un bol cylindrique d'une **capacité totale** d'environ 1 l et d'un diamètre intérieur d'environ 110 mm est utilisé.

Les **mélangeurs de liquides** sont mis en fonctionnement avec de l'eau à la place du mélange.

3.1.9.103 Les ouvre-boîtes sont mis en fonctionnement avec des boîtes en acier étamé d'un diamètre d'environ 100 mm.

3.1.9.104 Les extracteurs de jus sont mis en fonctionnement avec des carottes mises à tremper dans l'eau pendant 24 h environ. Une quantité de 5 kg de carottes préalablement mises à tremper est introduite graduellement dans les extracteurs de jus qui comportent des évacuations séparées pour le jus et la pulpe. Les autres extracteurs de jus sont alimentés avec des lots de 0,5 kg de carottes, sauf indication contraire dans les instructions. Les pilons sont pressés avec une force de 5 N contre les carottes.

3.1.9.105 Les râpes à fromage sont mises en fonctionnement avec un morceau de 250 g de parmesan dur choisi dans un bloc de fromage vieux d'environ 16 mois et dont l'une des faces au moins est plane. Une force de 10 N est appliquée au fromage à moins que la force ne soit appliquée automatiquement.

3.1.9.106 Les barattes sont remplies d'un mélange constitué de huit parts, en masse, de crème épaisse et d'une part de babeurre. La quantité de mélange est la quantité maximale qui permet un fonctionnement sans débordement de la baratte.

3.1.9.107 Les presse-agrumes sont mis en fonctionnement en pressant des moitiés d'orange sur le cône avec une force de 50 N.

3.1.9.108 Les moulins à café qui comportent un récipient séparé pour collecter la mouture sont mis en fonctionnement avec la trémie remplie de grains de café torréfiés.

Les autres moulins à café sont mis en fonctionnement avec la trémie remplie avec la quantité maximale de grains de café torréfiés indiquée dans les instructions.

Note 1 à l'article: Si nécessaire, les grains de café sont conditionnés pendant 24 h à une température de $30\text{ °C} \pm 2\text{ °C}$ et une humidité relative de $60\% \pm 2\%$.

Les dispositifs de commande sont réglés sur la position qui permet d'obtenir la mouture la plus fine.

3.1.9.109 Les fouets à crème et les fouets à œufs sont mis en fonctionnement dans l'eau en immergeant 80 % de la longueur de la partie active dans un bol d'eau.

3.1.9.110 Les **batteurs** équipés de fouets pour le mélange de la pâte à gâteau sont mis en fonctionnement avec les lames de fouet aussi près que possible du fond d'un bol qui contient du sable sec dont la grosseur de grain se situe entre $170\text{ }\mu\text{m}$ et $250\text{ }\mu\text{m}$. La hauteur du sable dans le bol est égale à environ 80 % de la longueur de la partie active des fouets.

Les **batteurs** avec fouets prévus pour pétrir la pâte à lever sont mis en fonctionnement en plaçant les fouets dans un bol rempli d'un mélange de farine et d'eau.

Note 1 à l'article: La farine contient $10\% \pm 1\%$ de protéine, lorsque la teneur en eau est négligeable et qu'elle ne contient pas d'additifs chimiques.

Note 2 à l'article: En cas de doute, une farine datant de plus de deux semaines et de moins de quatre mois est utilisée. La farine est entreposée dans des sacs en plastique avec une quantité d'air aussi faible que possible.

Le bol est rempli d'une masse de farine, en grammes, égale à 35 % de sa **capacité totale** en cm^3 , 72 g d'eau, à une température de $25\text{ °C} \pm 1\text{ °C}$, étant ajoutés pour chaque quantité de 100 g de farine.

Note 3 à l'article: En cas de doute, la quantité d'eau est de 1,2 fois la quantité nécessaire pour obtenir une consistance du mélange de 500 unités Brabender à $29\text{ °C} \pm 1\text{ °C}$, déterminée au moyen d'un farinographe.

Pour les **batteurs portatifs**, les fouets se déplacent de façon à décrire un mouvement en forme de huit à une cadence de 10 à 15 mouvements par minute. Le **batteur** est tenu de sorte que les fouets touchent la paroi du bol en des points opposés et soient en contact avec le fond du bol. Si un bol n'est pas fourni, un bol dont la hauteur est d'environ 130 mm et le diamètre interne d'environ 170 mm en haut, se réduisant à environ 150 mm au fond, est utilisé. Sa surface interne est lisse et la paroi est raccordée au fond par un arrondi.

3.1.9.111 Les **préparateurs culinaires** sont mis en fonctionnement avec la charge qui donne les conditions les plus défavorables, comme suit:

- s'ils sont équipés de lames pour râper, trancher ou hacher, ils sont mis en fonctionnement comme cela est spécifié pour les râpes à légumes et les coupe-légumes (3.1.9.118) et pour les râpes à fromage (3.1.9.105);
- s'ils sont équipés de lames pour couper, ils sont mis en fonctionnement avec chacune des charges suivantes, remplis jusqu'à la **capacité assignée** ou jusqu'à la quantité maximale recommandée dans les instructions pour la charge d'aliments spécifiée, si celle-ci est inférieure:
 - viande de bœuf crue tendre, sans os et sans gras;
 - morceau de parmesan dur choisi dans un bloc de fromage vieux d'environ 16 mois;
- s'ils sont équipés de lames de mélange, ils sont mis en fonctionnement comme cela est spécifié pour:
 - les **batteurs** pour le mélange de la pâte à gâteau (3.1.9.110) lorsque le **préparateur culinaire** n'est pas prévu pour pétrir la pâte à lever. Cependant, le sable est rempli jusqu'à la **capacité assignée** ou jusqu'à la quantité maximale recommandée dans les instructions pour la lame de mélange, si celle-ci est inférieure;
 - les **batteurs** avec fouets prévus pour pétrir la pâte à lever lorsque le **préparateur culinaire** est prévu pour pétrir la pâte à lever. Cependant, le réglage du dispositif de commande et la quantité de mélange correspondent à la valeur maximale indiquée dans les instructions. Si un accessoire qui tourne à grande vitesse est utilisé pour préparer la pâte, 60 g d'eau seulement sont ajoutés pour 100 g de farine.

Note 1 à l'article: En cas de doute, lorsqu'un accessoire qui tourne à grande vitesse est utilisé, la quantité d'eau est celle nécessaire pour obtenir une consistance du mélange de 500 unités Brabender à 29 °C ± 1 °C, déterminée au moyen d'un farinographe.

Note 2 à l'article: La quantité maximale de mélange peut être spécifiée par la quantité maximale de farine.

Les charges d'aliments sont préparées à l'avance, comme cela est recommandé dans le manuel d'instructions, notamment en coupant des morceaux d'une taille spécifiée, en épluchant les aliments et en les plaçant au réfrigérateur ou au congélateur. Si aucune instruction de préparation n'est fournie, les aliments sont coupés en morceaux de taille adaptée au bol ou à l'orifice d'approvisionnement.

Dans le cas d'un appareil à plusieurs vitesses, si les instructions recommandent des vitesses autres que la vitesse maximale pour certaines charges d'aliments, celles-ci sont traitées à la vitesse recommandée.

3.1.9.112 Les moulins à grains sont mis en fonctionnement avec la trémie remplie de blé et les dispositifs de commande réglés sur la position qui permet d'obtenir la mouture la plus fine. Le maïs est utilisé à la place du blé lorsque les instructions indiquent qu'il peut être moulu.

Note 1 à l'article: Si nécessaire, le blé ou le maïs est conditionné pendant 24 h à une température de 30 °C ± 2 °C et une humidité relative de 60 % ± 2 %.

3.1.9.113 Les sorbetières sont mises en fonctionnement avec un mélange constitué de 60 % d'eau, 30 % de sucre, 5 % de jus de citron et 5 % de blancs d'œufs battus par masse. La quantité de mélange est égale à la **capacité assignée**. Si la **capacité assignée** n'est pas spécifiée, le récipient est rempli à sa **capacité totale**.

Les éléments amovibles pour réfrigérer la crème glacée sont préalablement refroidis pendant 24 h à $-20\text{ °C} \pm 5\text{ °C}$.

Pour les appareils refroidis par de la glace, le récipient refroidissant est rempli de glace conformément aux instructions, en ajoutant 200 g de sel par kg de glace.

Les sorbetières utilisées dans les réfrigérateurs et les congélateurs sont placées sur un isolant thermique d'environ 20 mm d'épaisseur. Elles sont mises en fonctionnement sans charge à une température ambiante de $-4\text{ °C} \pm 1\text{ °C}$.

3.1.9.114 Les couteaux sont mis en fonctionnement en coupant une tranche de saucisson au moment du mesurage de la puissance. Le saucisson a un diamètre d'environ 55 mm et est découpé en tranches d'environ 5 mm d'épaisseur, en appliquant une force d'environ 10 N au couteau. Le saucisson est entreposé pendant au moins 4 h à une température de $23\text{ °C} \pm 2\text{ °C}$ avant d'être coupé.

Note 1 à l'article: Le salami est un exemple de saucisson.

Pour les autres essais, les couteaux sont mis en fonctionnement en pressant le bord coupant de la lame contre un bloc de bois tendre dont la section est d'environ 50 mm × 100 mm. Une force est appliquée progressivement au couteau jusqu'à ce que la puissance déterminée en coupant le saucisson soit atteinte.

3.1.9.115 Les **hachoirs** sont alimentés avec de la viande de bœuf tendre, sans os et sans gras, coupée en morceaux d'environ 20 mm × 20 mm × 60 mm. Les pilons sont pressés avec une force de 5 N contre la viande.

Un frein peut être utilisé pour appliquer la valeur moyenne de la charge déterminée en hachant la viande pendant 2 min.

3.1.9.116 Les **appareils pour faire des nouilles** sans fonction de mélange sont remplis d'une pâte composée de 225 g de farine de blé, 1 œuf (environ 55 g), 15 ml d'huile de cuisine et 45 ml d'eau. Les pilons sont pressés avec une force de 5 N contre la pâte.

Les **appareils pour faire des nouilles** qui possèdent une fonction de mélange sont remplis successivement de farine de blé et d'eau, 32 g d'eau étant utilisés pour 100 g de farine de blé, sauf si les instructions spécifient un mélange plus lourd. La quantité de mélange est égale à la valeur maximale indiquée dans les instructions.

3.1.9.117 Les éplucheuses de pommes de terre du type à cuve sont mises en fonctionnement remplies d'eau et de pommes de terre. Une quantité de 5 kg de pommes de terre plus ou moins sphériques est utilisée, chaque kilogramme comprenant 12 à 15 pommes de terre.

Les **éplucheuses de pommes de terre portatives** et du type à tour sont mises en fonctionnement en épluchant des pommes de terre.

3.1.9.118 Les râpes à légumes et les coupe-légumes sont mis en fonctionnement avec des carottes mises à tremper dans de l'eau pendant environ 24 h et coupées en morceaux convenables. Cinq lots de 0,5 kg de carottes trempées sont utilisés. Les pilons sont pressés avec une force de 5 N contre les carottes.

3.1.9.119 Les machines à couper les haricots, les affûtes-couteaux, les machines à tamiser et les machines à trancher sont mis en fonctionnement sans charge.

3.1.101

capacité assignée

capacité assignée à l'appareil par le fabricant

3.1.102**capacité totale**

capacité maximale sans débordement

3.5 Définitions relatives aux types d'appareils**3.5.101****batteur**

appareil destiné à mélanger les ingrédients alimentaires

3.5.102**préparateur culinaire**

appareil conçu pour couper finement des morceaux de viande, fromage, légumes et autres aliments au moyen de lames coupantes qui tournent dans un récipient

Note 1 à l'article: D'autres fonctions peuvent être exécutées au moyen de lames, disques, aubes ou moyens similaires rotatifs, utilisés à la place des lames coupantes.

Note 2 à l'article: Les mini-**hachoirs** sont considérés comme des **préparateurs culinaires**.

3.5.103**hachoir**

appareil destiné à couper finement de la viande et autres aliments au moyen d'une vis d'approvisionnement, de couteaux et de grilles perforées

3.5.104**mélangeur**

appareil destiné à pulvériser des solides, tels que glaçons, légumes ou fruits, à les mélanger entre eux ou à les mélanger avec des liquides (**mélangeur d'aliments**), ou appareil destiné à mélanger uniquement des liquides (**mélangeur de liquides**)

3.5.105**mélangeur sans câble**

mélangeur qui incorpore un moteur et qui n'est raccordé à l'alimentation et ne fonctionne que s'il est installé sur son socle associé

3.5.106**appareil pour faire des nouilles**

appareil sans fonction de mélange, destiné à réaliser des nouilles par extrusion ou par d'autres moyens, ou appareil qui possède une fonction de mélange et destiné à réaliser des nouilles par extrusion uniquement

3.5.107**extracteur de jus à broyeur**

appareil destiné à extraire le jus de différents fruits et légumes à l'aide d'un broyeur pour écraser la charge d'aliments et d'une crépine pour séparer le jus de la pulpe

Note 1 à l'article: Un broyeur est une vis qui transporte une charge d'aliments dont le volume diminue et qui écrase donc la charge d'aliments.

3.7 Définitions relatives à la sécurité des composants**3.7.101****interrupteur sans verrouillage**

interrupteur qui revient automatiquement en **position arrêt** lorsque son organe de manœuvre est relâché

4 Exigences générales

L'article de la Partie 1 s'applique.

5 Conditions générales d'essais

L'article de la Partie 1 s'applique, avec les exceptions suivantes.

5.2 Addition:

L'essai décrit en 15.2 peut être effectué sur un appareil séparé.

Trois moulins à café et moulins à grains supplémentaires sont exigés pour l'essai du 19.102.

L'essai supplémentaire décrit en 25.14 est effectué sur un appareil distinct.

5.9 Addition:

Pour les appareils prévus pour réaliser plusieurs des fonctions spécifiées du 3.1.9.101 au 3.1.9.119, l'essai est effectué avec les fonctions qui donnent les conditions les plus défavorables.

6 Classification

L'article de la Partie 1 s'applique, avec l'exception suivante.

6.1 Addition:

Les **machines de cuisine portatives** doivent être de la **classe II** ou de la **classe III**. Toutefois, elles peuvent être de la **classe 0** ou de la **classe I** si leur **tension assignée** ne dépasse pas 150 V.

7 Marquage et instructions

L'article de la Partie 1 s'applique, avec les exceptions suivantes.

7.1 Modification:

Les appareils doivent porter le marquage de leur **puissance assignée**.

Addition:

Les socles fournis avec les **mélangeurs sans câble** doivent porter les marquages suivants:

- le nom, la marque commerciale ou la marque d'identification du fabricant ou du vendeur responsable;
- la référence du modèle ou du type.

7.12 Modification:

Ajouter le texte suivant avant le quatrième alinéa et ajouter "Pour les autres appareils," au début du quatrième alinéa:

Pour les couteaux, les **mélangeurs**, y compris les **mélangeurs portatifs**; les extracteurs de jus autres que les presse-agrumes, les **batteurs**, les **préparateurs culinaires**, les **hachoirs**, les **appareils pour faire des nouilles**, les **éplucheuses de pommes de terre portatives** ou du type à tour, les râpes à légumes/coupe-légumes, les machines à couper les haricots et les machines à trancher, les instructions doivent comporter, en substance, les indications suivantes:

Cet appareil n'est pas destiné à être utilisé par des enfants. Maintenir l'appareil et son câble d'alimentation hors de portée des enfants.

Cet appareil n'est pas destiné à être utilisé par des personnes dont les capacités physiques, sensorielles ou mentales sont réduites, ou par des personnes dénuées d'expérience ou de connaissance, sauf si elles ont bénéficié, par l'intermédiaire d'une personne responsable de leur sécurité, d'une surveillance ou d'instructions préalables concernant l'utilisation de l'appareil.

Il convient de surveiller les enfants pour s'assurer qu'ils ne jouent pas avec l'appareil.

Addition:

Pour les appareils qui possèdent une **capacité assignée**, la **capacité assignée** doit être décrite dans les instructions, sauf si elle est marquée sur l'appareil.

Les accessoires, autres que ceux fournis avec l'appareil, doivent être accompagnés d'instructions afin d'assurer une utilisation en toute sécurité.

Les instructions des appareils prévus pour réaliser plusieurs des fonctions spécifiées du 3.1.9.101 au 3.1.9.119 doivent identifier la fonction de l'appareil sur laquelle est fondée la **puissance assignée** ou la **plage assignée de puissances**, sauf si la **puissance assignée** ou la **plage assignée de puissances** est fondée sur la fonction de l'appareil qui donne la puissance la plus élevée lors de l'essai de l'Article 10.

Les instructions des machines à trancher avec une base équipées d'une surface plane sous le chariot d'approvisionnement doivent comporter, en substance, l'indication suivante:

Cet appareil doit être utilisé avec le chariot d'approvisionnement et la plaque d'appui en place, sauf si cela n'est pas possible du fait de la taille ou de la forme de l'aliment.

Les instructions doivent prévenir des risques de blessures en cas d'utilisation non prévue. Elles doivent indiquer que des précautions doivent être prises lors de la manipulation des lames coupantes affûtées, lorsque le récipient est vidé et lors du nettoyage.

Les instructions des **préparateurs culinaires** et des **mélangeurs** doivent comporter, en substance, l'indication suivante:

Faire preuve de vigilance si un liquide chaud est versé dans le préparateur culinaire ou le mélangeur dans la mesure où il peut être éjecté de l'appareil en raison d'une ébullition soudaine.

Les instructions doivent comporter, en substance, les indications suivantes:

Toujours déconnecter l'appareil de l'alimentation avant de le monter, le démonter ou le nettoyer.

Les instructions des **mélangeurs portatifs** doivent comporter, en substance, l'indication suivante:

Toujours déconnecter le mélangeur de l'alimentation s'il est laissé sans surveillance.

Les instructions des centrifugeuses doivent comporter, en substance, l'indication suivante:

Ne pas utiliser l'appareil si le filtre rotatif ou le couvercle de protection est endommagé ou présente des fissures visibles.

Les instructions des **mélangeurs sans câble** doivent indiquer que le **mélangeur** doit être utilisé uniquement avec le socle fourni.

Si le **mélangeur** et le socle du **mélangeur sans câble** peuvent être soulevés ensemble en prenant la poignée du **mélangeur**, les instructions doivent comporter, en substance, l'indication suivante:

ATTENTION S'assurer que le mélangeur est éteint avant de le retirer de son socle.

Les instructions doivent comporter des détails sur la façon de nettoyer les surfaces en contact avec les aliments.

Les instructions des appareils qui comportent un interrupteur nécessaire pour assurer la conformité au 22.40 doivent comporter, en substance, l'indication suivante:

Mettre l'appareil à l'arrêt et le déconnecter de l'alimentation avant de changer les accessoires ou d'approcher les parties qui sont mobiles lors du fonctionnement.

Les instructions relatives aux **appareils pour faire des nouilles** qui possèdent une fonction de mélange doivent indiquer la quantité maximale d'ingrédients qu'il convient d'utiliser.

Les instructions doivent comporter, en substance, les indications suivantes:

Cet appareil est destiné à être utilisé dans des applications domestiques et analogues telles que:

- les coins cuisines réservés au personnel des magasins, bureaux et autres environnements professionnels;
- les fermes;
- par les clients dans les hôtels, les motels et autres environnements résidentiels;
- les environnements de type chambre d'hôtes.

Si le fabricant souhaite limiter l'utilisation de l'appareil à un domaine plus restreint que celui décrit ci-dessus, cette restriction doit être clairement indiquée dans les instructions.

8 Protection contre l'accès aux parties actives

L'article de la Partie 1 s'applique, avec l'exception suivante.

8.1.1 Addition:

Le calibre d'essai 18 n'est pas appliqué pour les appareils identifiés en 7.12 comme non destinés à être utilisés par des enfants.

9 Démarrage des appareils à moteur

L'article de la Partie 1 ne s'applique pas.

10 Puissance et courant

L'article de la Partie 1 s'applique, avec l'exception suivante.

10.1 Addition:

À l'exception des **appareils pour faire des nouilles** qui possèdent une fonction de mélange, une période représentative correspond à la durée la plus courte entre:

- 2 min ou la période de fonctionnement spécifiée au 11.7.1 pour un cycle de fonctionnement, lorsque les conditions spécifiées du 3.1.9.101 au 3.1.9.119 sont utilisées;
- 2 min ou la période de fonctionnement spécifiée dans les instructions pour un cycle de fonctionnement, lorsque la charge la plus défavorable indiquée dans les instructions est utilisée.

11 Échauffements

L'article de la Partie 1 s'applique, avec les exceptions suivantes.

11.3 Addition:

Lorsque les **surfaces accessibles** extérieures sont suffisamment planes et permettent l'accès, le calibre d'essai de la Figure 101 est utilisé pour mesurer les échauffements des **surfaces accessibles** extérieures spécifiées dans le Tableau 101. Le calibre est appliqué sur la surface avec une force de $4\text{ N} \pm 1\text{ N}$ de manière à établir le meilleur contact possible entre le calibre et la surface. Le mesurage est effectué après une durée de contact de 30 s.

Le calibre peut être maintenu en place à l'aide d'une pince de laboratoire sur statif ou d'un dispositif analogue. Tout instrument de mesure qui donne les mêmes résultats que le calibre peut être utilisé.

11.5 Remplacement:

Les **appareils à moteur** sont alimentés sous la tension la plus défavorable comprise entre 0,94 fois et 1,06 fois la **tension assignée**.

11.6 Remplacement:

Les **appareils combinés** sont alimentés sous la tension la plus défavorable comprise entre 0,94 fois et 1,06 fois la **tension assignée**.

11.7 Modification:

Remplacer le premier alinéa par ce qui suit:

L'appareil est soumis aux essais du 11.7.1 et si nécessaire aux essais du 11.7.2 et du 11.7.3.

Les appareils équipés d'un programmeur ou d'une minuterie sont mis en fonctionnement pendant la durée maximale admise par le programmeur ou la minuterie, ou jusqu'à l'établissement des conditions de régime, si cela se produit en premier. Si l'appareil peut également être utilisé sans le programmeur ou la minuterie, l'appareil est mis en fonctionnement pendant la période maximale admise par le programmeur ou la minuterie ou pendant la période de fonctionnement spécifiée au 11.7.1, 11.7.2 ou 11.7.3, selon le cas, si celle-ci est plus défavorable. Un appareil qui comporte une fonction de limiteur de durée qui:

- s'active après une durée supérieure à la période de fonctionnement spécifiée en 11.7.1, 11.7.2 et 11.7.3; ou
- n'est pas identifiée sur le dispositif de commande ou dans les instructions d'utilisation

n'est pas considéré comme étant équipé d'une minuterie lors de l'essai d'échauffement et la période de fonctionnement spécifiée en 11.7.1, 11.7.2 et 11.7.3 s'applique.

Les appareils prévus avec une **commande à distance** sont également mis en fonctionnement pendant la durée maximale de fonctionnement qui peut être réglée pour la **commande à distance**, ou pendant la durée maximale avant l'arrêt automatique de l'appareil.

Remplacer le premier tiret du troisième alinéa par ce qui suit:

- la **batterie complètement déchargée** est chargée, l'appareil étant mis en fonctionnement de la manière spécifiée au 11.7.1, au 11.7.2 et au 11.7.3, selon le cas, et remplissant sa fonction prévue, si cela est admis par la construction de l'appareil;

11.7.1 L'appareil est mis en fonctionnement

- dans les conditions de charge spécifiées du 3.1.9.101 au 3.1.9.119,
- pendant la période de fonctionnement spécifiée du 11.7.101 au 11.7.118, et
- pendant le nombre de cycles et de périodes de repos spécifié du 11.7.101 au 11.7.118 (le cas échéant).

11.7.2 Si la puissance, mesurée conformément à l'Article 10, d'une charge quelconque indiquée dans les instructions dépasse la puissance de la charge utilisée pour l'essai du 11.7.1, l'appareil est mis en fonctionnement comme cela est spécifié au point a). Si la période de fonctionnement spécifiée dans les instructions dépasse la période de fonctionnement utilisée pour l'essai du 11.7.1, l'appareil est mis en fonctionnement comme cela est spécifié au point b). Cependant, le fonctionnement selon les instructions n'est pas nécessaire pour les appareils mis en fonctionnement sans charge conformément au 3.1.9.119.

a) L'appareil est mis en fonctionnement

- dans les conditions de charge maximale spécifiées dans les instructions,
- pendant la période de fonctionnement spécifiée dans les instructions, et
- pendant le nombre de cycles et de périodes de repos spécifié du 11.7.101 au 11.7.118 (le cas échéant).

Cependant, si la période de fonctionnement spécifiée dans les instructions est inférieure à celle spécifiée au 11.7.1 et ne dépasse pas 7 min, la période de fonctionnement doit correspondre à:

- la durée maximale indiquée dans les instructions plus 1 min;
- la période de fonctionnement spécifiée au 11.7.1; ou
- 7 min,

si cette durée est plus courte.

b) *L'appareil est mis en fonctionnement*

- *dans les conditions de charge spécifiées dans les instructions,*
- *pendant la période de fonctionnement maximale spécifiée dans les instructions; et*
- *pendant le nombre de cycles et de périodes de repos spécifié du 11.7.101 au 11.7.118 (le cas échéant).*

11.7.3 *Si aucune des puissances mesurées conformément à l'Article 10 n'est:*

- *supérieure à 80 % de la **puissance assignée** pour une **puissance assignée** inférieure ou égale à 300 W;*
- *supérieure à la **puissance assignée** moins 60 W pour une **puissance assignée** comprise entre 300 W et 400 W;*
- *supérieure à 85 % de la **puissance assignée** pour une **puissance assignée** supérieure à 400 W,*

l'essai suivant est alors réalisé. Pour les appareils prévus pour réaliser plusieurs des fonctions spécifiées du 3.1.9.101 au 3.1.9.119, si la puissance de l'une de ces fonctions remplit les critères ci-dessus, cet essai n'est pas réalisé.

L'appareil est mis en fonctionnement

- *à la charge qui permet d'obtenir la **puissance assignée** lorsqu'il est alimenté à la **tension assignée** ou à la limite haute de la plage de **tensions assignées** en appliquant un couple à l'appareil placé dans sa position normale d'utilisation et sans le soumettre à des déséquilibres supérieurs à ceux qui se produisent en usage normal;*
- *pendant la période de fonctionnement spécifiée du 11.7.101 au 11.7.118, et*
- *pendant le nombre de cycles et de périodes de repos spécifié du 11.7.101 au 11.7.118 (le cas échéant).*

*Le couple appliqué est maintenu lorsque la tension d'essai est réglée à 0,94 et 1,06 fois la **tension assignée**.*

*Cependant, pour les appareils prévus pour réaliser plusieurs des fonctions spécifiées du 3.1.9.101 au 3.1.9.119, la période de fonctionnement applicable et le nombre de cycles et de périodes de repos spécifié du 11.7.101 au 11.7.118 pour la fonction sur laquelle est fondée la **puissance assignée**, comme cela est spécifié dans les instructions, sont utilisés. Si les instructions n'identifient pas la fonction sur laquelle est fondée la **puissance assignée**, la période de fonctionnement applicable pour la fonction qui donne la puissance la plus élevée lors de l'essai de l'Article 10 est utilisée.*

11.7.101 *Pour les machines à couper les haricots, les barattes, les machines à tamiser et les machines à trancher:*

- *la période de fonctionnement est de 30 min;*
- *le nombre de cycles est de un.*

11.7.102 *Pour les **extracteurs de jus à broyeur** et les **hachoirs**:*

- *la période de fonctionnement est de 15 min;*
- *le nombre de cycles est de un.*

11.7.103 *Pour les **mélangeurs** qui doivent être maintenus sous tension à la main et les **mélangeurs portatifs**:*

- *la période de fonctionnement est de 1 min en réglant le dispositif de commande sur la position la plus élevée;*
- *le nombre de cycles est de cinq avec des périodes de repos de 1 min pendant lesquelles le mélange est remplacé.*

Pour les autres mélangeurs,

- la période de fonctionnement est de 3 min en réglant le dispositif de commande sur la position la plus élevée;
- le nombre de cycles est de 10 avec des périodes de repos de 1 min pendant lesquelles le mélange est remplacé.

11.7.104 *Pour les ouvre-boîtes,*

- la période de fonctionnement correspond au temps nécessaire pour ouvrir complètement la boîte;
- le nombre de cycles est de cinq avec des périodes de repos de 15 s.

11.7.105 *Pour les extracteurs de jus qui comportent des évacuations séparées pour le jus et pour la pulpe:*

- la période de fonctionnement est égale à 15 min ou au temps nécessaire pour traiter 5 kg de carottes, si cette durée est plus courte,
- le nombre de cycles est de un.

Pour les autres extracteurs de jus,

- la période de fonctionnement est égale à 2 min ou au temps nécessaire pour traiter 0,5 kg de carottes, si cette durée est plus courte;
- le nombre de cycles est de 10 avec des périodes de repos de 2 min pendant lesquelles tout récipient est vidé.

11.7.106 *Pour les râpes à fromage,*

- la période de fonctionnement correspond au temps nécessaire pour râper le fromage;
- le nombre de cycles est de un.

11.7.107 *Pour les presse-agrumes,*

- la période de fonctionnement est de 15 s durant lesquelles deux moitiés de fruit sont pressées;
- le nombre de cycles est de 10 avec des périodes de repos de 15 s durant lesquelles l'appareil est laissé en fonctionnement sans charge, sauf s'il s'éteint automatiquement.

Si nécessaire, les pulpes de fruits sont enlevées pendant les périodes de repos.

11.7.108 *Pour les moulins à café qui comportent un récipient séparé pour collecter la mouture,*

- la période de fonctionnement correspond au temps nécessaire pour remplir le récipient ou pour vider la trémie, si cela se produit en premier;
- le nombre de cycles est de deux avec une période de repos de 1 min.

Pour les autres moulins à café,

- la période de fonctionnement correspond au temps nécessaire pour que les grains de café soient complètement moulus ou correspond à 30 s, selon la période la plus longue;
- le nombre de cycles est de trois avec des périodes de repos de 1 min.

11.7.109 *Pour les fouets à crème et les fouets à œufs,*

- la période de fonctionnement est de 10 min en réglant le dispositif de commande sur la position la plus élevée;
- le nombre de cycles est de un.

11.7.110 Pour les **batteurs** équipés de fouets pour le mélange de la pâte à gâteau,

- la période de fonctionnement est de 15 min, sauf s'ils doivent être maintenus sous tension à la main, auquel cas la période de fonctionnement est de 5 min;
- le nombre de cycles est de un.

Pour les **batteurs** avec fouets prévus pour pétrir la pâte à lever,

- la période de fonctionnement est de:
 - 5 min pour les **batteurs portatifs**;
 - 10 min pour les autres **batteurs**;
- le nombre de cycles est de un.

Pendant les 30 premières secondes, le dispositif de commande est réglé à son niveau le plus bas, après quoi il est réglé à la position indiquée dans les instructions pour pétrir la pâte à lever. Si l'action de mélange s'arrête automatiquement lorsque la pâte est prête, l'essai est terminé.

11.7.111 Les **préparateurs culinaires** sont mis en fonctionnement dans les conditions les plus défavorables parmi les suivantes, selon le cas:

- en râpant, en tranchant ou en hachant des légumes lorsque la période de fonctionnement et le nombre de cycles et de périodes de repos sont ceux spécifiés pour les râpes à légumes et les coupe-légumes;
- en râpant du fromage lorsque la période de fonctionnement et le nombre de cycles sont ceux spécifiés pour les râpes à fromage. Si nécessaire, le bol est rempli jusqu'à la **capacité assignée** et vidé aussi rapidement que possible;
- en coupant, lorsque
 - la période de fonctionnement correspond à la durée indiquée dans les instructions ou est de 10 s, si cette durée est plus longue;
 - le nombre de cycles est de 3 avec des périodes de repos de 2 min;
- en pétrissant, pour les **préparateurs culinaires** accompagnés d'instructions pour le pétrissage de la pâte à lever, lorsque
 - la période de fonctionnement et le réglage du dispositif de commande sont ceux spécifiés dans les instructions pour le pétrissage de la pâte à lever;
 - le nombre de cycles est de cinq, avec une période de repos de 2 min entre chaque opération, ou le nombre de cycles nécessaire pour traiter au moins 1 kg de farine, si cette durée est plus courte. Toutefois, au moins deux cycles sont réalisés.
- en mélangeant, pour les pâtes autres que la pâte à lever, lorsque
 - la période de fonctionnement correspond à la durée indiquée dans les instructions pour le mélange ou est de 10 s, si cette durée est plus longue;
 - le nombre de cycles est de trois avec des périodes de repos de 2 min.

11.7.112 Pour les moulins à grains à chargement fractionné qu'il est nécessaire de remplir plusieurs fois pour traiter 1 kg de blé ou de maïs:

- la période de fonctionnement correspond au temps nécessaire pour moudre le contenu d'une trémie remplie de blé ou de maïs;
- le nombre de cycles correspond au nombre nécessaire pour moudre au moins 1 kg de blé ou de maïs avec des périodes de repos de 30 s.

Pour les autres moulins à grains:

- la période de fonctionnement correspond au temps nécessaire pour moudre 1 kg de blé ou de maïs;

- le nombre de cycles est de un.

11.7.113 Pour les sorbetières utilisées dans les réfrigérateurs et les congélateurs:

- la période de fonctionnement est de 5 min, après quoi l'agitateur est bloqué pendant 25 min;
- le nombre de cycles est de un.

Pour les autres sorbetières,

- la période de fonctionnement est de 30 min;
- le nombre de cycles est de un.

11.7.114 Pour les affûte-couteaux,

- la période de fonctionnement est de 10 min;
- le nombre de cycles est de un.

11.7.115 Pour les couteaux,

- la période de fonctionnement est de 4 s, en simulant l'opération de tranchage;
- le nombre de cycles est de 150 avec des périodes de repos de 2 s, les lames étant mises en fonctionnement à vide.

11.7.116 Pour les éplucheuses de pommes de terre du type à cuve,

- la période de fonctionnement correspond au temps nécessaire pour éplucher convenablement les pommes de terre;
- le nombre de cycles correspond au nombre nécessaire pour éplucher 5 kg de pommes de terre avec des périodes de repos de 2 min.

Si les pommes de terre comportent des yeux, ceux-ci ne sont pas pris en considération pour juger si les pommes de terre sont convenablement épluchées. Les minuteriers sont réarmés, si nécessaire.

Pour les **éplucheuses de pommes de terre portatives**,

- la période de fonctionnement correspond au temps nécessaire pour éplucher une pomme de terre;
- le nombre de cycles correspond au nombre nécessaire pour éplucher des pommes de terre pendant 10 min sans période de repos.

Pour les éplucheuses de pommes de terre du type à tour,

- la période de fonctionnement correspond au temps nécessaire pour éplucher une pomme de terre;
- le nombre de cycles correspond au nombre nécessaire pour éplucher des pommes de terre pendant 10 min avec des périodes de repos égales à la durée nécessaire pour remplacer la pomme de terre.

11.7.117 Pour les coupe-légumes et les râpes à légumes,

- la période de fonctionnement correspond au temps nécessaire pour râper un lot de carottes;
- le nombre de cycles est de cinq avec des périodes de repos de 2 min.

11.7.118 Pour les **appareils pour faire des nouilles** sans fonction de mélange,

- la période de fonctionnement est de 15 min;
- le nombre de cycles est de un.