

BRITISH STANDARD

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**BS EN  
60335-2-14:  
1997**

*Incorporating  
Amendment No. 1,  
Corrigendum No. 1  
and Amendment No. 2*

# Safety of household and similar electrical appliances —

## Part 2: Particular requirements —

### Section 2.14 Kitchen machines

The European Standard EN 60335-2-14:1996 with the incorporation of amendments A11:1998 and A1:1998 has the status of a British Standard

ICS 97.040.50

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## Committees responsible for this British Standard

The preparation of this British Standard was entrusted by Technical Committee CPL/61, Safety of electrical appliances, to Subcommittee CPL/61/27 Food preparation machines, upon which the following bodies were represented:

Association of Control Manufacturers (TACMA (BEAMA Ltd.))  
 Association of Manufacturers of Domestic Electrical Appliances  
 British Electrotechnical Approvals Board  
 Consumer Policy Committee of BSI  
 Department of Trade and Industry (Consumer Safety Unit, CA Division)  
 Electricity Association

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## National foreword

This British Standard has been prepared by Subcommittee CPL/61/27 and is the English language version of EN 60335-2-14:1996, *Safety of household and similar electrical appliances Part 2-14: Particular requirements for kitchen machines*, including amendments A11:1998, A1:1998 and Corrigendum November 1998 published by the European Committee for Electrotechnical Standardization (CENELEC). It was derived by CENELEC from IEC 60335-2-14:1994, including amendment 1:1998 published by the International Electrotechnical Commission (IEC).

This British Standard supersedes BS 3456-202:Section 202.14:1990 which will be withdrawn on 1 January 1999 in accordance with the CENELEC Internal Regulations. Certificates and marks will not be awarded after this date with respect to BS 3456-202:Section 202.14:1990. However, such certificates and marks, already awarded, may continue to apply for production until 1 January 2004.

The CENELEC common modifications have been implemented at the appropriate places in the text. The start and finish of each common modification is indicated in the text by tags [C] [C]. Where a common modification has been introduced by amendment, the tags carry the number of the amendment. For example, the common modifications introduced by CENELEC amendment A11 are indicated by [C11] [C11].

The start and finish of the text introduced or altered by amendment is indicated in the text by tags [A] [A]. Tags indicating changes to IEC text carry the number of the IEC amendment. For example, text altered by IEC amendment 1 is indicated by [A1] [A1].

Corrigendum November 1998 introduced the CENELEC introduction.

This British Standard is to be read in conjunction with BS EN 60335-1:1995 *Specification for safety of household and similar electrical appliances Part 1: General requirements*. The many references to Part 1 should be read as references to BS EN 60335-1, which is the English language version of EN 60335-1:1994 which was derived from the second impression, 1993, of IEC publication 60335-1 (third edition 1991). Amendments and revisions of Part 1 have also to be taken into account and the dates when such changes become applicable will be stated in the relevant amendment or revision of Part 1.

**Product approval.** Attention is drawn to the fact that products conforming to this British Standard may be approved by the British Electrotechnical Approvals Board for the purposes of participation in the CENELEC Certification Agreement and in the CB Scheme of the IECEE. (Details of the BEAB Approval Scheme are given on the inside back cover.)

A British Standard does not purport to include all the necessary provisions of a contract. Users of British Standards are responsible for their correct application.

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### Summary of pages

This document comprises a front cover, an inside front cover, pages i and ii, the EN title page, pages 2 to 19 and a back cover.

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EUROPEAN STANDARD  
NORME EUROPÉENNE  
EUROPÄISCHE NORM

EN 60335-2-14

September 1996

+ A11

October 1998

+ A1

November 1998

ICS 97.040.50

Supersedes EN 60335-2-14:1988 and its amendments and EN 60335-2-33:1990  
Includes Corrigendum November 1998

Descriptors: Household electrical appliances, kitchen machines, safety requirements, protection against electric shock, fire protection, protection against mechanical hazard

English version

## Safety of household and similar electrical appliances Part 2-14: Particular requirements for kitchen machines

(includes amendments A11:1998 and A1:1998)

(IEC 60335-2-14:1994, modified + A1:1998)

Sécurité des appareils électrodomestiques et analogues

Partie 2: Règles particulières pour les machines de cuisine

(inclut les amendements A11:1998 et A1:1998)  
(CEI 60335-2-14:1994, modifiée + A1:1998)

Sicherheit elektrischer Geräte für den Hausgebrauch und ähnliche Zwecke  
Teil 2: Besondere Anforderungen für Küchenmaschinen

(enthält Änderungen A11:1998 und A1:1998)  
(IEC 60335-2-14:1994, modifiziert + A1:1998)

This European Standard was approved by CENELEC on 1996-07-02. CENELEC members are bound to comply with the CEN/CENELEC Internal Regulations which stipulate the conditions for giving this European Standard the status of a national standard without any alteration.

Up-to-date lists and bibliographical references concerning such national standards may be obtained on application to the Central Secretariat or to any CENELEC member.

This European Standard exists in three official versions (English, French, German). A version in any other language made by translation under the responsibility of a CENELEC member into its own language and notified to the Central Secretariat has the same status as the official versions.

CENELEC members are the national electrotechnical committees of Austria, Belgium, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Luxembourg, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland and United Kingdom.

## CENELEC

European Committee for Electrotechnical Standardization  
Comité Européen de Normalisation Electrotechnique  
Europäisches Komitee für Elektrotechnische Normung

Central Secretariat: rue de Stassart 35, B-1050 Brussels

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Ref. No. EN 60335-2-14:1996 + A11:1998 + A1:1998 E

**EN 60335-2-14:1996****Foreword**

The proposal to endorse IEC 335-2-14:1994, document CLC/TC 61 (SEC) 980, was circulated under the enquiry procedure in September 1994. This proposal was discussed during the Dublin meeting in May 1995, when it was decided to submit a draft for EN 60335-2-14 to the formal vote.

This draft was circulated in January 1996 and was ratified by CENELEC as EN 60335-2-14 on 1996-07-02.

This European Standard has been prepared by the secretariat of CENELEC Technical Committee TC 61.

The following dates are applicable:

- latest date by which the EN has to be implemented at national level by publication of an identical national standard or by endorsement (dop) 1997-01-01
- date on which national standards conflicting with the EN have to be withdrawn (dow) 1999-01-01

For products which have complied with EN 60335-2-14:1988 including its amendments A1:1990, A51:1991, A52:1992, A53:1993, A54:1995 and EN 60335-2-33:1990 before 1999-01-01, as shown by the manufacturer or by a certification body, these previous standards may continue to apply for production until 2004-01-01.

This standard has to be used in conjunction with EN 60335-1, *Safety of household and similar electrical appliances, Part 1: General requirements*. It was established on the basis of the 1994 edition of that standard. Amendments and revisions of Part 1 have also to be taken into account and the dates when such changes become applicable will be stated in the relevant amendment or revision of Part 1.

This Part 2 supplements or modifies the corresponding clauses of EN 60335-1, so as to convert it into the European Standard; Safety requirements for electric kitchen machines.

Where a particular subclause of Part 1 is not mentioned in this Part 2, that subclause applies as far as is reasonable. Where this standard states "addition", "modification" or "replacement", the relevant text of Part 1 is to be adapted accordingly. Subclauses and figures which are additional to those in Part 1 are numbered starting with 101.

There are no special national conditions causing a deviation from this European Standard, other than those listed in annex ZA to EN 60335-1.

There are no national deviations from this European Standard, other than those listed in annex ZB to EN 60335-1.

NOTE 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 2. When a definition of Part 1 concerns an adjective, the adjective and the associated noun are also in bold.

**Foreword to amendment A11**

A proposal to amend EN 60335-2-14:1996, document CLC/BT(IT)206, was discussed during the Fehrlortorf meeting of TC 61 in October 1997, when it was decided to establish a working group to prepare a proposal for further consideration. The outcome of the working group was presented to the 94th CENELEC Technical Board meeting, when it was decided to submit the draft to a 3-month enquiry, document CLC/TC 61(SEC)1164.

The results of the enquiry were discussed during the Brussels meeting of TC 61 in May 1998 when it was decided to submit a draft for an amendment to the formal vote (2MV) after further consideration by the working group.

This draft was circulated in July 1998 and was ratified by CENELEC as amendment A11 on 1998-10-01.

The following dates are applicable:

- latest date by which the amendment has to be implemented at national level by publication of an identical national standard or by endorsement (dop) 1999-03-01
- date on which national standards conflicting with the amendment have to be withdrawn (dow) 1999-06-01

This amendment supplements or modifies the corresponding clauses of EN 60335-2-14:1996.

There are no special national conditions causing a deviation from this amendment.

There are no national deviations from this amendment.

**Foreword to amendment A1**

The text of document 61/1465/FDIS, future amendment to IEC 60335-2-14:1994 prepared by the IEC Technical Committee 61, was submitted to the IEC-CENELEC parallel vote and was approved by CENELEC as amendment A1 to EN 60335-2-14 on 1998-10-01.

The following dates are applicable:

- latest date by which the amendment has to be implemented at national level by publication of an identical national standard or by endorsement (dop) 1999-07-01
- date on which national standards conflicting with the amendment have to be withdrawn (dow) 2001-07-01

This amendment supplements or modifies the corresponding clauses of EN 60335-2-14:1996.

There are no special national conditions causing a deviation from this amendment.

There are no national deviations from this amendment.

**Introduction**

An investigation by CENELEC TC 61 has shown that all risks from products within the scope of this standard are fully covered by the Low Voltage Directive, 73/23/EEC. If the product has mechanical moving parts, a risk assessment in accordance with the Machinery Directive, 89/392/EEC, has shown that the risks are mainly of electrical origin and consequently this directive is not applicable. However, the relevant essential safety requirements of the Machinery Directive are covered by this standard together with the principal objectives of the Low Voltage Directive.

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## 1 Scope

This clause of part 1 is replaced by:

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

NOTE 1 Examples of appliances which are within the scope of this standard are

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

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

So 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.

This standard does not in general take into account:

- the use of appliances by young children or infirm persons without supervision;
- playing with the appliance by young children.

NOTE 2 Attention is drawn to the fact that:

- for appliances intended to be used in vehicles or on board ships or aircraft, additional requirements may be necessary;
- for appliances intended to be used in tropical countries, special requirements may be necessary;
- in many countries additional requirements are specified by the national health authorities, the national authorities responsible for the protection of labour and similar authorities.

NOTE 3 This standard does not apply to:

- slicing machines provided with a circular knife the blade of which is inclined at an angle exceeding 45° to the vertical;
- kitchen machines intended for commercial purposes (IEC 335-2-64);
- kitchen machines intended exclusively 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);
- food waste disposers (IEC 335-2-16);
- ice-cream appliances with incorporated motor compressors (IEC 335-2-57).

## 2 Definitions

This clause of part 1 is applicable except as follows:

### 2.2.9 Replacement:

**normal operation:** The appliance is operated under the conditions specified or at **rated power input** if this is more unfavourable.

NOTE 1 If the conditions are not specified, the appliance is operated with the most unfavourable load indicated in the instructions for use.

NOTE 2 **Rated power input** is obtained by applying a constant torque to the appliance placed in its normal position of use without subjecting it to imbalance forces greater than those occurring in normal use.

NOTE 3 Operation at **rated power input** is considered as being more unfavourable if the power input determined during the test of 10.1 differs from the **rated power input** by more than

- -20 % for appliances having a **rated power input** not exceeding 300 W;
- -15 % (or -60 W if greater) for appliances having a **rated power input** exceeding 300 W.

### 2.2.9.1

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

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

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

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



for **hand-held food mixers**, the kneaders are moved in a figure-of-eight movement at a rate of 10 to 15 movements a min. 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 which has a height of approximately 13 cm and an inner diameter of approximately 17 cm at the top, tapering down to approximately 15 cm at the bottom. Its inner surface is smooth and the wall and bottom blend smoothly

#### 2.2.9.2

**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 for use. 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 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  $29\text{ }^{\circ}\text{C} \pm 1\text{ }^{\circ}\text{C}$ , measured using a farinograph.

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

#### 2.2.9.3

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

#### 2.2.9.4

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 for use

NOTE If necessary, the coffee beans are conditioned for 24 h at a temperature of  $30\text{ }^{\circ}\text{C} \pm 2\text{ }^{\circ}\text{C}$  and a relative humidity of  $(60 \pm 2)\%$ .

controls are set to the position resulting in the smallest grain size

#### 2.2.9.5

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

NOTE 1 If necessary, the wheat is conditioned for 24 h at a temperature of  $30\text{ }^{\circ}\text{C} \pm 2\text{ }^{\circ}\text{C}$  and a relative humidity of  $(60 \pm 2)\%$ .

NOTE 2 Corn is used instead of wheat when instructions state that it can be ground.

#### 2.2.9.6

blenders are operated with the bowl filled to its maximum indicated level with a mixture comprising two parts by mass of soaked carrots and three parts water. If this level is not indicated, the bowl is filled to two-thirds of its total capacity. The carrots are soaked in water for 24 h and cut so that the dimensions of the pieces do not exceed 15 mm. If the bowl is not provided, a cylindrical bowl is used which has a capacity of approximately 1 l and an inner diameter of approximately 11 cm

blenders for liquid are operated with water instead of the mixture

#### 2.2.9.7

sieving machines are operated without load

#### 2.2.9.8

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

#### 2.2.9.9

slicing machines and bean slicers are operated without load

#### 2.2.9.10

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 for use

for appliances with cooling elements, the cooling elements are pre-cooled for 24 h at  $-20\text{ }^{\circ}\text{C} \pm 5\text{ }^{\circ}\text{C}$

NOTE A cooling element is a removable component that cools the ice-cream mixture after having been stored in a freezer.

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

ice-cream machines for use in refrigerators and freezers are placed on two lengths of thermal insulating material approximately 1 cm thick. They are operated without load at an ambient temperature of  $-4\text{ }^{\circ}\text{C} \pm 1\text{ }^{\circ}\text{C}$

#### 2.2.9.11

citrus fruit squeezers are operated with orange halves pressed against the reamer with a force of 50 N

#### 2.2.9.12

centrifugal juicers are operated with carrots which 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 for use. Pushers are pressed with a force of 5 N against the carrots

**2.2.9.13**

**mincers** are fed with sinewless, boneless and fatless beef, cut into pieces approximately 2 cm × 2 cm × 6 cm. Pushers are pressed with a force of 5 N against the meat

NOTE A brake may be used to apply the mean value of the load determined by mincing meat for 2 min.

**2.2.9.14**

noodle makers are fed with a 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

**2.2.9.15**

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

**2.2.9.16**

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

**hand-held potato peelers** are operated by peeling potatoes

**2.2.9.17**

vegetable graters and shredders are operated with carrots which 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

**2.2.9.18**

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

**2.2.9.19**

knife sharpeners are operated without load

**2.2.9.20**

can openers are operated with cans of tinned steel and having a diameter of approximately 10 cm

**2.2.9.21**

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

NOTE Salami is a suitable hard sausage.

for the other tests, knives are operated with the cutting edge of the blade pressed against a length of soft wood having a cross-section approximately 5 cm × 10 cm. A force is gradually applied to the knife until the power input measured when cutting the sausage is obtained

**2.101****food mixer**

appliance intended for mixing food ingredients

**2.102****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 Other functions may be performed by rotating blades, disks, paddles, or similar means used in place of the cutting blades.

**2.103****mincer**

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

**2.104****biased-off switch**

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

**3 General requirement**

This clause of part 1 is applicable.

**4 General conditions for the tests**

This clause of part 1 is applicable except as follows:

**4.2 Addition:**

NOTE 1 Three additional coffee mills and grain grinders are required for the test of 19.101.

☞ NOTE 2 The additional test of 25.14 is carried out on a separate appliance. ☞

☞ NOTE Z1 Three additional centrifugal juicers are required if the test of 20.Z3 is carried out. Three sieves of centrifugal juicers are required if the tests of annex ZAA are carried out. ☞

**4.6 Addition:**

*Unless otherwise specified, speed controls are set in accordance with the instructions for use.*

**5 Void****6 Classification**

☞ This clause of part 1 is applicable except as follows:

**6.1 Addition:**

**Hand-held kitchen machines** shall be of **class II** or **class III**. ☞

## 7 Marking and instructions

This clause of part 1 is applicable except as follows:

### 7.12 Addition:

The instructions for use shall include the operating times and speed settings for accessories.

The instructions for use for slicing machines provided with a base having a plain 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 for use for **food processors** shall warn against misuse. They shall state that care is needed when handling cutting blades, especially when removing the blade from the bowl, emptying the bowl and during cleaning.

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

Do not use the appliance if the rotating sieve is damaged. Ⓒ

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

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

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

Switch off the appliance before changing accessories or approaching parts which move in use. Ⓒ

## 8 Protection against access to live parts

This clause of part 1 is applicable.

## 9 Starting of motor-operated appliances

This clause of part 1 is not applicable.

## 10 Power input and current

This clause of part 1 is applicable.

## 11 Heating

This clause of part 1 is applicable except as follows:

### 11.7 Replacement:

*The appliance is operated for the period specified. However, if this period exceeds that stated in the instructions for use and if the temperature rise limits of Table 3 are exceeded, the test is carried out with the maximum quantity of ingredients stated in the instructions as follows:*

- *twice the maximum period stated in the instructions, for specified operating periods not exceeding 1 min;*
- *the maximum period stated in the instructions plus 1 min, for specified operating periods exceeding 1 min, but not exceeding 7 min;*
- *the maximum period stated in the instructions, for specified operating periods exceeding 7 min.*

*If it is necessary to perform a number of operations to obtain these periods, the rest periods are equal to the time taken to empty and refill the container.*

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

**11.7.1** Ⓔ **Food mixers** with beaters for cake-batter mixing are operated for 15 min unless they incorporate a **biased-off switch** in which case they are operated for 5 min. Ⓒ For the first 30 s the control is set at the lowest position for cake-batter mixing stated in the instructions for use, after which the control is set at the highest position stated for cake-batter mixing.

NOTE 1 If the appliance stalls with the control at its lowest setting, sufficient sand is removed to permit motion. The sand is replaced for the remainder of the test.

**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 the first 30 s the control is set at the lowest position after which the control is set at the position for yeast dough mixing stated in instructions for use.*

NOTE 2 If the mixing action automatically stops when the dough is ready, the test is terminated.

**11.7.2 Food processors** are operated with the setting of the control and for the period stated in the instructions for use to mix the maximum quantity of yeast dough that can be processed in one batch. This operation is carried out five times or a sufficient number of times to process at least 1 kg of flour, whichever is less. However, at least two operations are performed. There shall be a rest period of 2 min between each operation.

NOTE If instructions for mixing yeast dough are not provided, the **food processor** is operated with the setting of the control for the period stated for the recipe which results in the most unfavourable conditions. The operation is carried out three times.

**11.7.3 Cream whippers and egg beaters** are operated for 10 min with the control set at the highest position.

**11.7.4 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.

**11.7.5 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.

**11.7.6 Blenders which have to be kept switched on by hand and hand-held blenders** are operated for 1 min with the control set at the highest position. The operation is carried out five times with rest periods of 1 min when the mixture is replaced.

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

**11.7.7 Sieving machines, churns, slicing machines and bean slicers** are operated for 30 min.

**11.7.8 Ice-cream machines** are operated for 30 min. Ice-cream machines for use in refrigerators and freezers are operated for 5 min after which the stirrer is stalled for 25 min.

**11.7.9 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.

NOTE 1 The appliance is left idling during the rest periods unless it switches off automatically.

NOTE 2 If necessary, fruit residue is removed during the rest periods.

**11.7.10 Centrifugal juicers having separate outlets for the juice and residue** are operated for 30 min.

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

**11.7.11 Mincers, noodle makers and berry juice extractors** are operated for 15 min.

**11.7.12 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 for 2 min.

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

NOTE 1 When checking that the potatoes are adequately peeled, eyes are ignored.

NOTE 2 Timers are reset if necessary.

**11.7.13 Vegetable graters and shredders** are operated until a batch of carrots is shredded. The operation is carried out five times with rest periods of 2 min.

**11.7.14 Cheese graters** are operated until the cheese is grated.

**11.7.15 Knife sharpeners** are operated for 10 min.

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

**11.7.17 Knives** are operated for 15 min. The cutting operation is simulated at a rate of 10 per min with the blades unloaded for 2 s between each cut.

**11.8 Addition:**

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

## 12 Void

## 13 Leakage current and electric strength at operating temperature

This clause of part 1 is applicable.

## 14 Void

## 15 Moisture resistance

This clause of part 1 is applicable except as follows:

**15.2** **(A)** Addition:

Water outlets for potato peelers are blocked.

**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. **(A)**

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**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 food mixers, food processors, blenders for food, mincers, noodle makers, berry juice extractors, churns, ice-cream machines and centrifugal juicers.*

*For coffee mills and grain grinders which have to be kept switched on by hand, compliance is checked by the test of 19.102 followed by the test of 19.10, if applicable.*

*For other coffee mills and grain grinders, compliance is checked by the tests of 19.101, 19.102, and 19.10 if applicable.*

**19.7 Addition:**

*Food mixers, food processors, mincers, berry juice extractors, blenders for food and centrifugal juicers for fruit and vegetables are operated for 30 s.*

*Noodle makers, coffee mills and grain grinders are tested for 5 min.*

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

**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.*

**19.101** *Coffee mills and grain grinders are subjected to the following test which is carried out on three additional appliances.*

*Coffee mills are filled with 40 g of coffee beans to which are added two granite chips which pass through an 8 mm screen but not a 7 mm screen.*

*Grain grinders are operated under normal operation but with two granite chips which 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 19.7.*

**19.102** *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,
  - 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 6.*

**20 Stability and mechanical hazards**

This clause of part 1 is applicable except as follows:

**20.2 Addition:**

**Detachable accessories** are removed and covers are opened except that for:

- centrifugal juicers, the cover and the container collecting the residue are in position;
- graters and shredders, only those accessories are removed which are removed while the appliance is in operation.

NOTE 1 A feed pusher is an example of an accessory which is removed.

The test finger is not applied to:

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

NOTE 2 Accessible drive shafts which may not be in use when the appliance is in operation, may be protected by means of a collar or by being positioned in a recess.

The test finger is not applied to feed openings provided with a throat having 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 which does not exceed 65,5 mm;
- a maximum cross-sectional dimension of the feed opening which does not exceed 76 mm.

For blenders and graters, other than those which are hand-held, and shredders, the test is made with a test finger similar to that of Figure 1 but having a circular stop plate with a diameter of 125 mm instead of the non-circular plate, the distance between the tip of the test finger and the stop plate being 100 mm.

**20.101** Accessories of **hand-held food mixers**, cream whippers and egg beaters 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 rev/min.

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

**20.102** Blades of **hand-held blenders** shall be completely screened from above and shall not be able to touch a flat surface when 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** **Hand-held blenders** shall incorporate a **biased-off switch**, its actuating member being positioned in a recess or otherwise guarded to prevent accidental operation.

NOTE This requirement does not apply to **hand-held food mixers** provided with a blender attachment.

Compliance is checked by applying a cylindrical rod having a diameter of 40 mm and a hemispherical end, to the switch. The appliance shall not operate.

**20.104** Push-button switches of blenders having cutting blades which can be operated when the bowl is not in place, shall be recessed or guarded to prevent accidental operation.

NOTE This requirement does not apply to **hand-held blenders**.

Compliance is checked by applying a cylindrical rod having a diameter of 40 mm and a hemispherical end, to the switch. The appliance shall not operate.

**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 rev/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 which 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 being applied in the most unfavourable direction to covers which shall not open.

**20.106** For appliances having a feed screw, the maximum cross-sectional dimension of the hopper measured at least 100 mm from the upper edge of the feed screw, shall not exceed 45 mm. A feed pusher which fills the throat of the hopper shall be provided.

Compliance is checked by inspection and by measurement.

**20.107** Slicing machines shall be provided with means to hold the appliance in place and allow it to be released after use.

NOTE 1 This requirement does not apply to **fixed appliances** and those incorporating a **biased-off switch**.

NOTE 2 Suction cups are suitable means to hold the appliance in place.

Compliance is checked by the following test:

The slicing machine is fixed in accordance with the instructions for use on a plain glass plate which is placed on a horizontal surface.

NOTE 3 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 101.

Knife guards shall be non-detachable unless the motor cannot be switched on after their removal. It shall not be possible to operate interlocks by means of the test finger of Figure 1.

The angle  $\theta$  of the upper part of the open sector shown in Figure 102 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  $a$  between the outer circumference of the knife and the knife guard shall not exceed

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

When the thickness of the slices is set to zero, the distance  $c$  between the outer circumference of the knife and the plate which sets the thickness of the slices shall not exceed 6 mm. At the upper and lower points of the open sector, the distance  $e$  between the plate which sets the thickness of the slices and any other protecting part shall not exceed 5 mm.

NOTE 1 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 which sets the thickness of the slices or an extension of the knife guard are examples of additional guarding.

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 (distance  $f$ ). The distance  $d$  between the plane of the thumb guard and the knife 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 by means such as 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 rev/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 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 by measurement and for recessed actuating members, by applying a cylindrical rod having a diameter of 40 mm and a hemispherical end, to the switch. 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 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 shall be provided which fills the throat of the hopper.

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 constructed so that they return automatically to the **off position** when an external force is removed from the part which actuates the switch contacts.

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 the test finger of Figure 1.*

**20.114** Access to dangerous moving parts of **food processors** shall be prevented for all conditions of assembly of **detachable parts** which permit the motor to operate.

*Compliance is checked by the following test:*

**Detachable parts** are removed or assembled incorrectly in a manner which 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 with the test finger of Figure 1.*

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

*Compliance is checked by inspection and by applying a cylindrical rod having a diameter of 40 mm and a hemispherical end, to the switch. The appliance shall not operate.*

**[A<sub>1</sub>]**

**20.116** 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 which is carried out without load.*

*The appliance with the lid removed is supplied at **rated voltage** with the control set 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. **[A<sub>1</sub>]***

**[C]**

**20.Z1** Cutting blades of blenders for food shall have adequate mechanical strength.

*Compliance is checked by the following test.*

*Ice cubes with sides of about 2 cm and at a temperature of about -18 °C are placed in the bowl. The number of cubes is equal to 0,025 times the capacity of the bowl in cm<sup>3</sup>, rounded up to a whole number.*

**NOTE 1** 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.

*The appliance is supplied at **rated voltage** and is operated continuously or intermittently, in order to obtain the best crushing results.*

*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 for use as follows:*

— for durations not exceeding 1 min, twice the maximum period specified;

— for durations exceeding 1 min, but not exceeding 7 min, the maximum period specified plus 1 min;

— for durations exceeding 7 min, the maximum period specified.

*After the test, the cutting blade shall not be broken.*

**NOTE 2** Distorted or blunt edges are ignored.

**NOTE 3** Care is taken to ensure that the blade is not jammed by the ice cubes.

**20.Z2** Centrifugal juicers shall be constructed so that no part can be ejected from the appliance when operating at high speed.

*Compliance is checked by the following test.*

*The appliance is supplied at **rated voltage** with the speed control set at the maximum position, the lid being removed. The appliance is operated ten times.*

*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 ten times.*

*During the tests no part shall be ejected from the appliance. **[C]***

**[C<sub>11</sub>]**

**20.Z3** Centrifugal juicers shall withstand the stresses resulting from parts rotating at high speed.

*Compliance is checked by the following test which is carried out on three new appliances or by testing the sieve in accordance with annex ZAA.*

*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.*

**NOTE** 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. **[C<sub>11</sub>]***



## 21 Mechanical strength

This clause of part 1 is applicable except as follows:

*Addition:*

*This test is also made on **detachable parts** which are necessary for protection against mechanical hazards.*

## 22 Construction

This clause of part 1 is applicable except as follows:

**22.40 Addition:**

Any switch controlling the motor shall also disconnect **electronic circuits**, the malfunction of which would impair compliance with this standard.

*Compliance is checked during the tests of clause 19.*

**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 places which could cause electrical or mechanical faults.

*Compliance is checked by inspection.*

## 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:**

*Instead of 10 000 cycles of operation, switches incorporated in the following appliances are tested for 3 000 cycles:*

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

## 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 be provided with an appliance inlet.

**25.5 Addition:**

**Type Z attachment** is allowed for

- 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;
- can openers.

**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 subclauses 8.1, 8.2 and 8.3 of IEC 811-1-4, these tests being made at a temperature of  $-25\text{ °C} \pm 2\text{ °C}$ .*

Ⓐ

**25.14 Addition:**

**Hand-held mixers and hand-held blenders** are also subjected to the following test while mounted on an apparatus similar to that of figure 11.

*Initially the **supply cord** hangs vertically and is 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.*

NOTE 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. Ⓐ

**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 Creepage distances, clearances and distances through insulation**

This clause of part 1 is applicable.

**30 Resistance to heat, fire and tracking**

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.*

**30.2 Addition:**

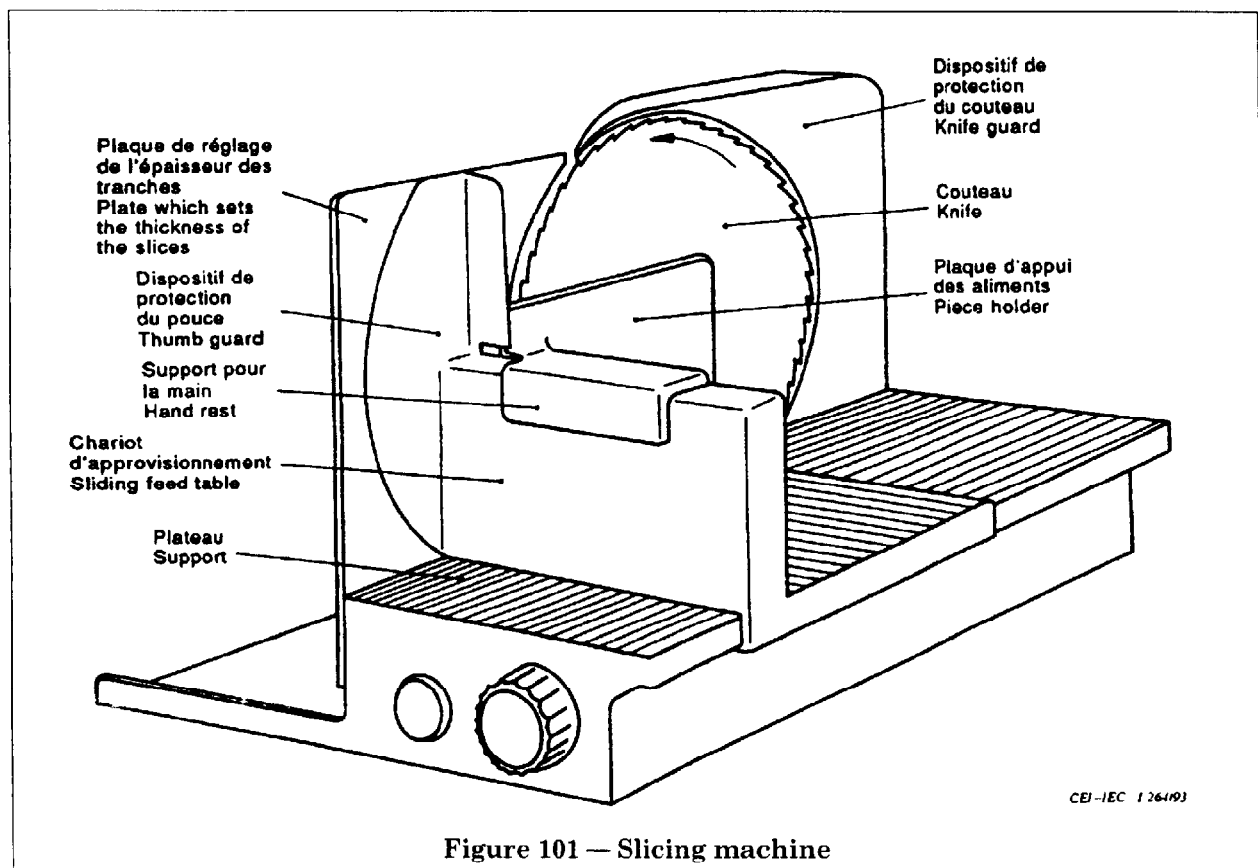
*30.2.3 is applicable for ice-cream machines and churns, 30.2.2 is applicable for other appliances.*

**31 Resistance to rusting**

This clause of part 1 is applicable.

**32 Radiation, toxicity and similar hazards**

This clause of part 1 is applicable.



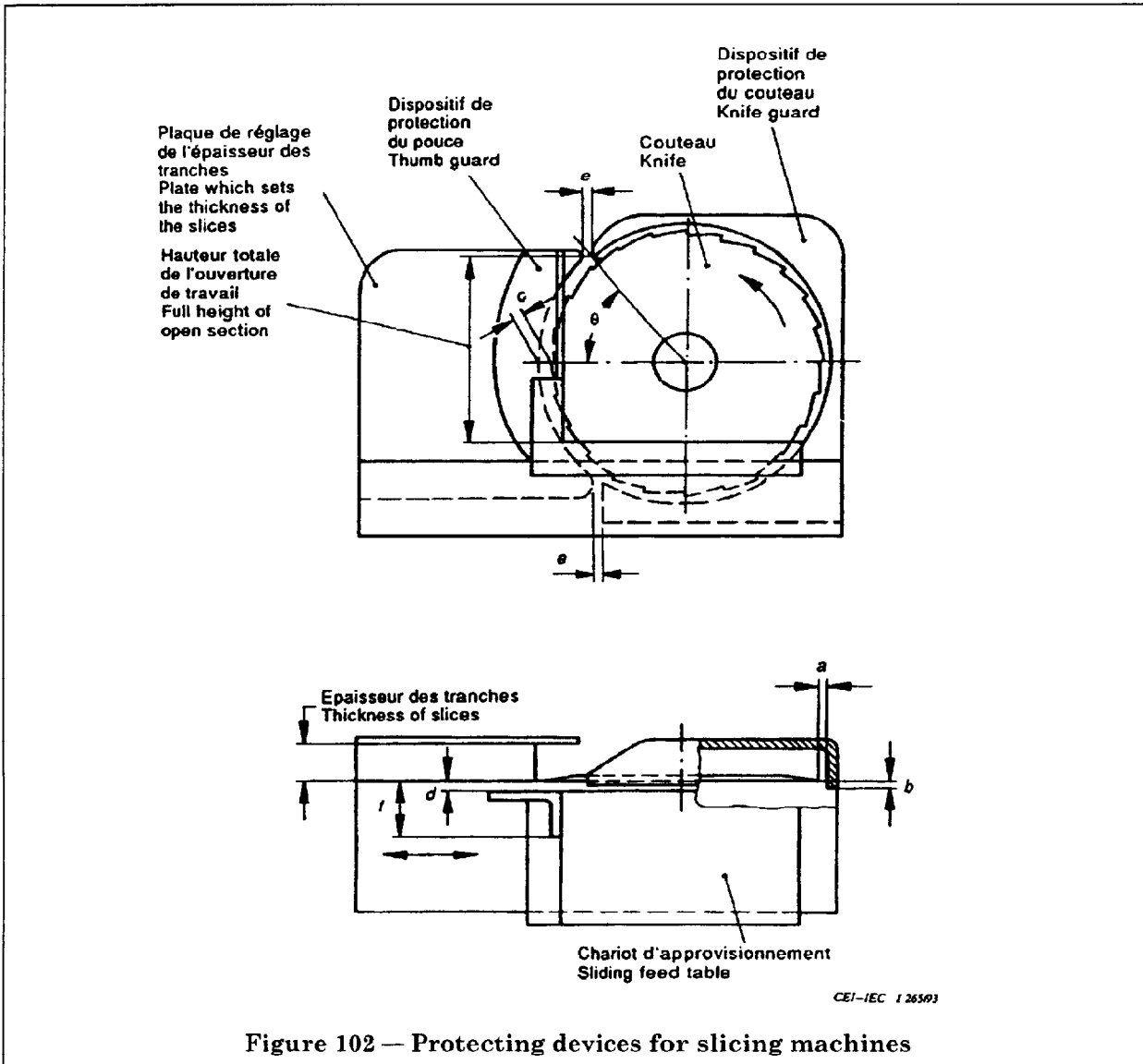


Figure 102 — Protecting devices for slicing machines

## Annexes

The annexes of part 1 are applicable except as follows:

Ⓒ

### Annex A (normative)

#### Normative references

#### International publications with their relevant European publication

*Addition:*

<u>IEC standard</u>	<u>Year</u>	<u>Title</u>	<u>EN/HD</u>	<u>Year</u>
811-1-4	1985	<i>Common test methods for insulating and sheathing materials of electric cables Part 1: Methods for general application Section Four: Tests at low temperature</i>	EN 60811-1-4	1995 Ⓒ

### Annex C (normative)

#### Ageing test on motors

*Addition:*

The value of p equals 2 000 except for the following appliances for which it equals 500:

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

**Annex ZAA (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.

These tests are an alternative means of complying with the requirement of **20.Z3** and are carried out on three sieves.

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 consists of:*

— trisodium citrate dihydrate	30,0 %
— sokalan CP5 compound (50 % active substance)	12,0 %
— plurafac LF403	2,0 %
— sodium disilicate	25,0 %
— sodium carbonate	23,0 %
— sodium perborate monohydrate	5,0 %
— TAED	2,0 %
— amylase	0,5 %
— protease	0,5 %

NOTE This detergent corresponds to the detergent type B specified in IEC 60436.

*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 for 1 h in a dry atmosphere at a temperature of 83 °C ± 2 °C. They are then plunged into water having a temperature of 20 °C ± 2 °C.*

*The 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 which 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.

NOTE Dents in the mesh are disregarded.

**National annex NA (informative)****Original IEC text amended by CENELEC common modifications****6 Classification**

The text has been modified. It read as follows.

“This clause of part 1 is applicable.”

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