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Stroji za predelavo hrane - Stroji za rezanje - Varnostne in higienske zahteve

Food processing machinery - Slicing machines - Safety and hygiene requirements

Nahrungsmittelmaschinen - Aufschnittschneidemaschinen - Sicherheits- und Hygieneanforderungen

Machines pour les produits alimentaires - Trancheurs - Prescriptions relatives à la sécurité et à l'hygiène

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Food processing machinery - Slicing machines - Safety and hygiene requirements

Machines pour les produits alimentaires - Trancheurs - Prescriptions relatives à la sécurité et à l'hygiène

Nahrungsmittelmaschinen - Aufschnittschneidemaschinen - Sicherheits- und Hygieneanforderungen

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Foreword

This document (EN 1974:1998+A1:2009) has been prepared by Technical Committee CEN/TC 153 “Machinery intended for use with foodstuffs and feed”, the secretariat of which is held by DIN.

This Standard has been prepared by Working Group 3 "Slicing Machines" of CEN/TC 153.

The Working Group comprised representatives from the following countries: Austria, Denmark, France, Germany, Italy, Netherlands and United Kingdom.

Annex A is a normative part of this Standard.

This European Standard shall be given the status of a national standard, either by publication of an identical text or by endorsement, at the latest by February 2010, and conflicting national standards shall be withdrawn at the latest by February 2010.

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This document includes Amendment 1, approved by CEN on 2009-07-23.

This document supersedes EN 1974:1998.

The start and finish of text introduced or altered by amendment is indicated in the text by tags ⟨A1⟩ ⟨A1⟩.

This European Standard has been prepared under a mandate given to CEN by the European Commission and the European Free Trade Association, and supports essential requirements of EU Directive(s).

⟨A1⟩ For relationship with EU Directive(s), see informative Annexes ZA and ZB, which are integral parts of this document. ⟨A1⟩

According to the CEN/CENELEC Internal Regulations, the national standards organizations of the following countries are bound to implement this European Standard: Austria, Belgium, Bulgaria, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, Switzerland and United Kingdom.

Introduction

〈A1〉 This document is a type C standard as stated in EN ISO 12100.

The machinery concerned and the extent to which hazards, hazardous situations and hazardous events are covered are indicated in the scope of this document.

When provisions of this type C standard are different from those which are stated in type A or B standards, the provisions of this type C standard take precedence over the provisions of the other standards, for machines that have been designed and built to the provision of this type C standard.

Complementary to the hygiene requirements common to all food processing machines, specific requirements for cleanability and sanitation of the machines in the scope are formulated. 〈A1〉

1 Scope

1.1 This European Standard specifies the safety and hygiene requirements for the design and manufacture of slicing machines which are fitted with power driven circular cutting blade of more than 150 mm in diameter, with a reciprocating feed carriage and are transportable. These types of slicing machines are intended to be used in shops, restaurants, supermarkets, canteens etc.

Industrial slicers are excluded. They are normally used in meat and sausage processing plants; they are not intended to be transportable and are permanently placed in position.

It covers all significant hazards at such machines, as identified by risk assessment (see EN 1050), which are listed in 4 of this Standard.

It applies when such machines are operated under the intended use as defined in 〈A1〉 3.22 and 5.2 of EN ISO 12100-1:2003 〈A1〉 and stated in the instruction handbook (see 7.2), included cleaning, dismantling of removable parts and changing the blade.

NOTE If the machine is not used under the above conditions, the manufacturer should, when informed of such a situation, check by a new risk analysis that the preventative measures remain valid.

Noise and vibration are not considered to be significant hazards for these machines.

1.2 This Standard covers the following types of slicing machines:

— Horizontal feed slicers (manual – see figure 1 – or automatic – see figure 13 -);

— Gravity feed slicers (manual – see figure 2 – or automatic).

Slicing machines consist of a base, a blade, a blade cover, a blade guard, a blade sharpener, a gauge plate (a guard plate for automatic slicers), a product holder, a reciprocating carriage, a product pusher and electrical control components.

Slicing machines can be equipped with:

— Clamping device,

— Stacker,

— Discharge conveyor.

This Standard applies to machines which are manufactured after the date of issue of this Standard.

〉A1〈 NOTE Nevertheless the manufacturers should minimise as much as possible noise and vibration emissions. 〉A1〈

2 Normative references

〉A1〈 The following referenced documents are indispensable for the application of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies 〉A1〈

〉A1〈 *deleted text* 〉A1〈

EN 294:1992, *Safety of machinery – Safety distances to prevent danger zones being reached by the upper limbs*

EN 349:1993, *Safety of machinery – Minimum gaps to avoid crushing of parts of the human body*

〉A1〈 EN 614-1:2006 〉A1〈, *Safety of machinery - Ergonomic design principles – Part 1: Terminology and general principles*

〉A1〈 *deleted text* 〉A1〈

EN 1088:1995, *Safety of machinery - Interlocking devices associated with guards - Principles for design and selection*

〉A1〈 EN 1672-2:2005 〉A1〈, *Food processing machinery – Basic concepts – Part 2: Hygiene requirements*

〉A1〈 EN 60204-1:2006 〉A1〈, *Safety of machinery - Electrical equipment of machines – Part 1: General requirements*

〉A1〈 EN 60529:1991 〉A1〈, *Degrees of protection provided by enclosures (IP CODE)*

〉A1〈 *deleted text* 〉A1〈

〉A1〈 EN ISO 12100-1:2003, *Safety of machinery — Basic concepts, general principles for design — Part 1: Basic terminology, methodology*

EN ISO 12100- 2:2003 *Safety of machinery — Basic concepts, general principles for design — Part 2: Technical principles and specifications* 〉A1〈

〉A1〈 EN ISO 13849-1:2008, *Safety of machinery – Safety-related parts of control systems – Part 1: General principles for design (ISO 13849-1:2006)* 〉A1〈

ISO 468:1982, *Surface roughness – Parameters, their values and general rules for specifying requirements*

3 〉A1〈 Terms and definitions 〉A1〈

3.1 Definitions

For the purposes of this standard, the definitions given in 〉A1〈 EN ISO 12100:2003 〉A1〈 and the following apply (see also figures 1 and 2):

3.1.1
slicer
a machine with a circular rotating blade used to cut food products into slices of varying thickness

3.1.2
horizontal feed slicer
a slicer in which the product is fed horizontally to the blade

3.1.3
gravity feed slicer
a slicer in which the product to be cut is fed to the blade by gravity. The product holder is inclined to the horizontal plane

3.1.4
blade guard
a fixed annular ring mounted around the edge of that part of the blade which is not used for the cutting operation

3.1.5
blade cover
a removable cover for the blade which covers the side of the blade adjacent to the carriage which is not used for the cutting operation

3.1.6
gauge plate
a reference plate parallel to the blade against which the product is fed to the blade. The plate can be moved so that the desired thickness of slice is achieved.

3.1.7
slice thickness control
a control device by which the position of the gauge plate can be set in order to give the desired slice thickness

3.1.8
guard plate
a plate similar to a gauge plate fitted to machines with automatic product feeding. It is approximately parallel to the blade and protects the space located between the blade and the extreme front of the stroke of the product holder.

3.1.9
blade sharpener
a device equipped with suitable abrasive wheels used to sharpen the blade edge. It may be an integral part of the slicer or may be applied to the machine only during the sharpening operation.

3.1.10
product holder
a support for the product to be sliced. Some different kinds of holder are used for sausages, ham, fresh meat etc. The product holder can be equipped with a pusher or a feed carriage and/or a clamping device.

3.1.11
carriage
a support for the product holder which allows the longitudinal movement of the product holder

3.1.12
carriage handle
a handle on the carriage, or on the product holder, provided to move the carriage. It may also be used to feed the product against the gauge plate.

3.1.13
feed carriage
a carriage on which the product is placed and which slides on top of the product holder to feed more easily the product towards the blade

3.1.14
pusher
a device used to move the product along the product holder against the gauge plate

3.1.15
last slice device
a plate fitted on the pusher, on the clamping device or on the feed carriage and so constructed that the last portion of the product may be fed to the blade

3.1.16
pusher guard
a plate attached to the pusher to prevent access to the cutting edge of the blade

3.1.17
finger guard
a plate mounted on (or part of) the product holder which keeps the fingers of the operator's hand away from the cutting edge of the blade

3.1.18
thumb guard
a plate mounted on the product holder parallel to the blade and extending from the finger guard. It covers the blade when the product holder is in the backward position.

3.1.19
clamping device
a device which keeps the product positioned in the intended place on the feed carriage during the slicing operation

3.1.20
slice support
a device to support the product until it is fully cut

3.1.21
slice receiving surface
an area on which the slices are laid during the cutting operation

3.1.22
stacker
a device which picks up slices cut by the blade and places them on a receiving tray

3.1.23
discharge conveyor
a motor driven belt or roller conveyor which moves the slices from the slicing machine

3.1.24
blade removing device
a device for the safe handling of the blade; e.g. when it is necessary to remove the blade from the machine for cleaning of changing

3.1.25
automatic product feeding
machines with automatic product feeding are machines where the product is moved mechanically along the product holder towards the blade

3.1.26
power supply cord
an electrical cord that supplies current to control devices and electrical equipment of the machine

3.2 Machine description (see figures 1 and 2)

A slicer is a machine equipped with a power driven circular cutting blade intended to cut food products. The machine can have the blade set on the vertical plane or set at an angle. The machine is provided with a carriage which moves parallel to the cutting edge of the blade. The carriage may either be hand operated or power operated and may be fitted with a variety of devices to hold the product to enable it to be presented to the cutting edge of the blade. The machine may also be fitted with a variety of automatic devices to receive the cut slices and convey them away from the machine.

3.3 Operating conditions

Slicing machines are intended to cut food products in accordance with the operating instructions supplied with the machine (see 7.2).

NOTE For the conditions of slicing meat from which the bone has not been removed see 7.2.1.

4 〈A1〉 List of significant hazards 〈A1〉

〈A1〉 This clause contains all the significant hazards, hazardous situations and events, as far as they are dealt with in this European Standard, identified by risk assessment as significant for this type of machinery and which require action to eliminate or reduce the risk. 〈A1〉

4.1 Mechanical hazards

〈A1〉 *deleted text* 〈A1〉

4.1.1 The hazards related to all slicers are the following:

— Area around the circular cutting blade: hazard of cutting or severing (e.g. fingers, hands, arms);

— Handling the blade: hazard of cutting or severing parts of the body (e.g. fingers, hands, arms, feet);

— Power supply cord: hazard of tripping over and falling.

4.1.2 Slicers with automatic product feeding and without a gauge plate

Trapping between product holder and blade.

NOTE A slicer with an automatic feed mechanism driven by a hand wheel is considered to have automatic product feeding

4.1.3 Slicers with a power driven carriage

Trapping between the carriage and the frame of the machine (e.g. fingers, hands). Being struck by the moving carriage.

4.1.4 Slicers with an automatic feature to handle the sliced product (discharge conveyor, stacker, etc.)

Being caught or pierced by the gripper spikes (e.g. fingers, hands).

Trapping by the depositing mechanism (e.g. fingers, hands).

Trapping by the rotating transport mechanism (e.g. fingers, hands).

4.1.5 Slicers with a discharge conveyor

Trapping between the conveyor belt and the end rollers or tensioning roller (e.g. fingers, hands).

4.2 Electrical hazards

4.2.1 Direct or indirect electrical contact with live parts: hazard of electric shock to the body.

4.2.2 Electrical components with insufficient safety: hazard of injuries to the body due to malfunction.

4.2.3 Mechanical or chemical damage of the power supply cord: hazard of electric shock to the body.

4.3 Loss of stability hazards

Slipping or toppling over of the machine.

4.4 Hazards from neglecting hygiene principles

Inability to clean food, splash and accessible non food areas effectively and thoroughly: hazard of infection, sickness or contagion.

Contamination of the food by undesirable materials including residues of food, cleaning and disinfecting agents can lead to infection, sickness or contagion.

If cleaning is carried out with prohibited cleaning and disinfecting agents: hazard of damage to machine, harmful effects on operator and contamination of the product.

NOTE The food, non food and splash areas are to be specified as set out in figure 14.

4.5 Hazards from neglecting ergonomic principles

Lack of ergonomic design can be anything that causes wrong operation of controls, physical damage due to over-reaching, heavy loads, awkward posture, etc.

4.6 Noise and vibration hazards

Noise and vibration are not considered to be significant hazards for these machines.

5 〈A1〉 Safety requirements and/or protective measures 〈A1〉

〈A1〉 Machinery shall comply with the safety requirements and/or protective measures of this clause. In addition, the machine shall be designed according to the principles of EN ISO 12100 for relevant but not significant hazards, which are not dealt with by this document. 〈A1〉

5.1 Mechanical hazards

5.1.1 Requirements for all slicers

[A1] All the interlocking devices shall comply with 5.7 of EN 1088:1995. The performance level of the safety relevant part of the control system shall be defined in accordance with EN ISO 13849-1:2008, with a minimum of “c”.

Maximum stopping time is four seconds for all types of slicers.

Fixing systems of fixed guards shall remain attached to these parts or to the machine when the parts are removed. [A1]

5.1.2 Blade protection

5.1.2.1 The blade shall be provided with suitable protection which covers all the cutting edge of the blade which is not necessarily exposed to enable the product to be cut.

5.1.2.2 Blade protection consists of:

a) A blade guard,

b) A gauge plate or a guard plate,

c) A product holder,

d) A blade sharpener (if integrated)

And may also include on some machines a blade cover and a blade removing device.

5.1.2.3 The blade guard shall project at least 1 mm from the cutting edge of the blade (see figures 3 and 4). When a force of 50 N is applied from any position to the blade guard the guard shall not be deflected to such an extent that the blade guard projects less than 1 mm from the cutting edge of the blade. The blade guard shall be non-removable (see figures 3 and 4).

5.1.2.4 If no blade cover is fitted (as shown in figure 3) the gap between the blade guard and the cutting edge of the blade shall not exceed 6 mm.

When a blade cover is fitted without interlocking device as shown in figure 4 b, the gap between the guard blade and the cutting edge of the blade shall not exceed 6 mm.

When a blade cover is fitted as shown in figure 4a, the gap between the blade guard and the cutting edge of the blade shall not exceed 12 mm and the blade cover shall be interlocked with the motor driving the blade so that the motor cannot run when the cover is removed.

5.1.2.5 The gauge plate in the zero position shall be overlapped by the blade guard at the upper and lower edges for at least 10 mm. The gap between the gauge plate and the blade shall not exceed 6 mm when the gauge plate is in the zero position (see figure 5). The machine shall not be capable of cutting slices more than 40 mm thick.

5.1.2.6 When the slice thickness control is set to zero the gauge plate shall overlap the cutting edge of the blade by at least 1 mm in order to give protection to the part of the blade used for cutting. When a force of 50N is applied from any position to the gauge plate when the slice thickness control is set to zero, the gauge plate shall not be deflected to such an extent that the cutting edge of the blade is covered for less than 1 mm (see figure 6). In the bottom area the blade guard shall be designed in a way, that the distance to the slice support is not more than 6 mm (see figure 6).

5.1.2.7 The machines may be equipped with a slice support (see figure 6) which acts as a part of the blade guard. The slice support can be adjustable and shall satisfy the same overlapping criteria as in 5.1.2.3 and 5.1.2.6 above.

5.1.2.8 The segment of unprotected blade used for slicing shall be no more than 60° above the horizontal centre line of the blade (see figure 6).

5.1.2.9 The gauge plate and slice support shall be fixed to the machine in such a way that they cannot be removed from the machine without the use of tools.

5.1.3 Requirements for blade sharpeners

5.1.3.1 The construction of the blade sharpener shall not allow the blade to be sharpened any longer when the gap between the blade and the blade guard exceeds 12 mm in the case of machines fitted with a blade cover as shown in figure 4a, and, in any other case, when the gap exceeds 6 mm (see figure 8b).

5.1.3.2 Blade sharpener integral with the machine

5.1.3.2.1 The blade sharpener shall be made in such a way that during the normal use of the machine it ensures a continuous cover over the blade in the same manner as the blade guard or the blade cover.

5.1.3.2.2 In the sharpening position that part of the blade which is exposed shall not exceed a distance of 6 mm on each side of the abrasive wheels used for grinding (see figure 7).

5.1.3.2.3 When the blade sharpener has been removed (e.g. for servicing), the residual risk of the exposed part of the blade shall be mentioned in the instruction handbook.

5.1.3.3 Separate blade sharpener

5.1.3.3.1 The blade sharpener shall, when fixed to the gauge plate or to the product holder, have attached to it a suitable guard to cover all the part of the blade adjacent to the product holder normally used for slicing the product. Any gap between the abrasive wheels used for grinding and any fixed guard shall not exceed 6 mm (see figure 8a).

5.1.3.3.2 The blade sharpener shall be suitably marked to indicate the machine with which it is to be used. The Instruction Manual shall state that a blade sharpener shall only be used with the machine for which it was provided.

5.1.4 Product holder

5.1.4.1 The product holder shall be equipped with a thumb guard so that it covers all parts of the blade not otherwise protected. When the carriage is at the backward stroke, the cutting edge of the blade shall be covered completely by the thumb guard and shall overlap at least 10 mm. The gap between the thumb guard and the cutting edge shall not exceed 6 mm (see figure 6).

5.1.4.2 The finger guard shall be fixed to the product holder and shall be non-removable. The height of the finger guard shall be the same as the height of the cutting part of the blade and extend at least 150 mm from the blade (see figures 1 and 2). The radius at the corner of the finger guard shall not exceed 30 mm.

5.1.4.3 It shall not be possible to remove or to lift the product holder unless the gauge plate or guard plate is in the zero position. It shall not be possible to adjust the gauge plate or guard plate when the product holder has been removed or lifted from the carriage.

5.1.5 Additional requirements depending on the configuration of the slicer

5.1.5.1 Product holder with clamping device