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**Stroji za predelavo hrane - Rezalniki kruha - Varnostne in higienske zahteve  
(vključno z dopolnilom A1)**

Food processing machinery - Bread slicers - Safety and hygiene requirements

Nahrungsmittelmaschinen - Brotschneidemaschinen - Sicherheits- und  
Hygieneanforderungen

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Machines pour les produits alimentaires - Machines à couper le pain - Prescriptions  
relatives à la sécurité et à l'hygiène

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Tovarne in oprema za  
živilsko industrijo

Plants and equipment for the  
food industry

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EUROPEAN STANDARD

**EN 13954:2005+A1**

NORME EUROPÉENNE

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## Food processing machinery - Bread slicers - Safety and hygiene requirements

Machines pour les produits alimentaires - Machines à couper le pain - Prescriptions relatives à la sécurité et à l'hygiène

Nahrungsmittelmaschinen - Brotschneidemaschinen - Sicherheits- und Hygieneanforderungen

This European Standard was approved by CEN on 8 August 2005 and includes Amendment 1 approved by CEN on 17 January 2010.

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EUROPEAN COMMITTEE FOR STANDARDIZATION  
COMITÉ EUROPÉEN DE NORMALISATION  
EUROPÄISCHES KOMITEE FÜR NORMUNG

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## Foreword

This document (EN 13954:2005+A1:2010) 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 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of an identical text or by endorsement, at the latest by September 2010, and conflicting national standards shall be withdrawn at the latest by September 2010.

This document includes Amendment 1, approved by CEN on 2010-01-17.

This document supersedes EN 13954:2005.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. CEN [and/or CENELEC] shall not be held responsible for identifying any or all such patent rights.

The start and finish of text introduced or altered by amendment is indicated in the text by tags  $\square_{A1}$   $\square_{A1}$ .

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).

$\square_{A1}$  For relationship with EU Directive(s), see informative Annexes ZA and ZB, which are integral parts of this document.  $\square_{A1}$

This European Standard is complementary to EN 14655:2005 that is covering bread slicing machines with crescent blade(s) (type 3).

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, Croatia, 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

There are various types of bread slicing machines. They are divided mainly into the following types:

- Type 1: Frame cutter machines with multiple blades moving vertically;
- Type 2: Machines with rotary crescent (sickle) or circular blade fixed to a shaft with oscillating movement and horizontal manual loading;
- Type 3: Machines with crescent blade fixed to a shaft, with a rotating movement and vertical manual loading;
- Type 4: Machines with one or more rotating band blades.

This European Standard is a type C standard as stated in  $\square_{A1}$  EN ISO 12100  $\square_{A1}$ .

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

When provisions of this type C standard are different from those that 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 according to the provisions of this type C standard.

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## 1 Scope

**1.1** This European Standard specifies safety and hygiene requirements for the design and manufacture of bread slicing machines of type 1 and 2 as defined in Clause 3.

The intended use of these machines is to cut baked bread into slices.

This European Standard deals with all significant hazards, hazardous situations and events relevant to bread slicers machines, when they are used as intended and under conditions of misuse which are reasonably foreseeable by the manufacturer (see Clause 4).

This European Standard covers requirements for the safe operation of the machine including: loading, cutting, unloading, cleaning, crumb removal and maintenance.

These machines can be manually or automatically operated.

**1.2** The following machines are excluded from the scope of this document:

- experimental and testing machines under development by the manufacturer;
- frame cutter machines with multiple blades moving horizontally;
- domestic appliances and machines intended for use by the general public;
- machines with horizontal circular cutting systems;
- rectangular cutting machines for cutting or sawing of panel size products into small pieces.

The significant hazards covered by this document are described in Clause 4.

**1.3** In drafting this European Standard, it has been assumed that the bread slicers falling within the scope are operated only by trained personnel and that the machines are not intended to be cleaned with water jet.

**1.4** This European Standard is not applicable to bread slicing machines which are manufactured before the date of publication of this European Standard.

## 2 Normative references

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.

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

EN 614-1:2006, *Safety of machinery — Ergonomic design principles — Part 1: Terminology and general principles*

EN 953:1997, *Safety of machinery — Guards — General requirements for design and construction of fixed and movable guards*

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

EN 1672-2:2005, *Food processing machinery — Basic concepts — Part 2: Hygiene requirements*

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EN 60204-1:2006, *Safety of machinery — Electrical equipment of machines — Part 1: General requirements (IEC 60204:2005, modified)*

EN 60529:1991, *Degrees of protection provided by enclosures (IP code) (IEC 60529:1989)*

EN 61310-1, *Safety of machinery — Indication, marking and actuation — Part 1: Requirements for visual, auditory and tactile signals (IEC 61310-1:1995)*

EN 61496-1:2004, *Safety of machinery — Electro-sensitive protective equipment — Part 1: General requirements and tests (IEC 61496-1:2004, modified)*

EN ISO 3744:1995, *Acoustics — Determination of sound power levels of noise sources using sound pressure — Engineering method in an essentially free field over a reflecting plane (ISO 3744:1994)*

EN ISO 4287:1997, *Geometrical Product Specifications (GPS) — Surface texture: Profile method — Terms, definitions and surface texture parameters (ISO 4287:1997)*

EN ISO 4871:1996, *Acoustics — Declaration and verification of noise emission values of machinery and equipment (ISO 4871:1996)*

EN ISO 11201:1995, *Acoustics — Noise emitted by machinery and equipment — Measurement of emission sound pressure levels at the work station and at other specified positions — Engineering method in an essentially free field over a reflecting plane (ISO 11201:1995)*


EN ISO 11688-1:1998, *Acoustics — Recommended practice for the design of low noise machinery and equipment — Part 1: Planning (ISO 11688-1:1995)*

EN ISO 12001:1996, *Acoustics — Noise emitted by machinery and equipment — Rules for the drafting and presentation of a noise test code (ISO 12001:1996)*

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

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

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

EN ISO 13857:2008, *Safety of machinery — Safety distances to prevent hazard zones being reached by the upper limbs (ISO 13857:2008)* 

### **3 Terms, definitions and description**

#### **3.1 Terms and definitions**

For the purposes of this European Standard, the terms and definitions given in EN ISO 12100-1:2003 and the following apply.

##### **3.1.1**

##### **type 1 machines**

bread slicers with reciprocating multiple blades moving vertically

##### **3.1.2**

##### **type 2 machines**

machines with rotary crescent (sickle) or circular blade fixed to a shaft with oscillating or rotating movement and horizontal manual loading



## 3.2 Description

### 3.2.1 Type 1 machines

Type 1 bread slicers usually consist of a frame supporting the following main elements (see example in Figure 1):

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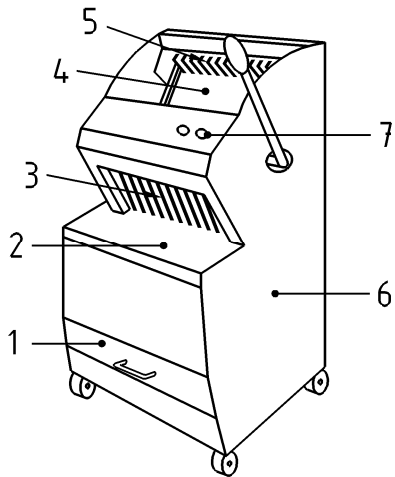


Figure 1.1 — type 1a

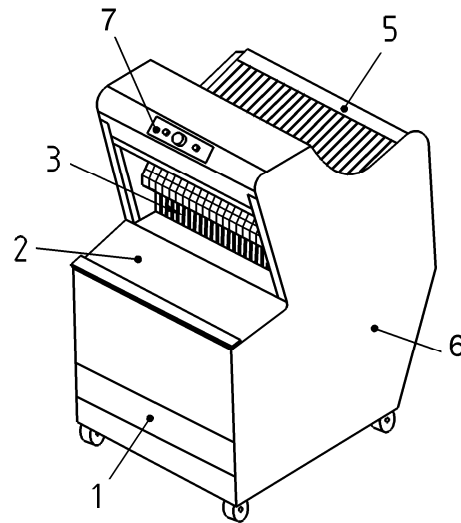


Figure 1.2 — type 1b

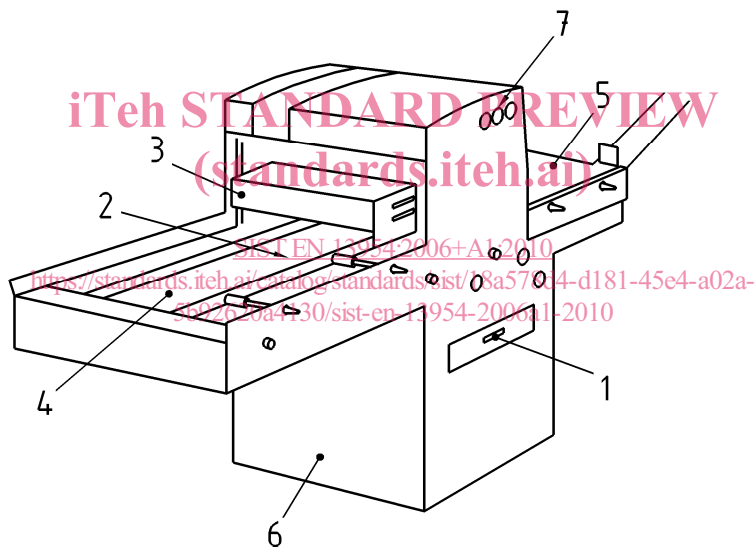


Figure 1.3 — type 1c

**Key**

- 1 crumb tray;
- 2 discharge area or device;
- 3 cutting device: multiple blades which have reciprocating motion;
- 4 infeed area or device;
- 5 feed device (e.g. pusher, special conveyor belt), which pushes and guides the loaf of bread for the cutting action;
- 6 drive mechanisms;
- 7 electrical controls.

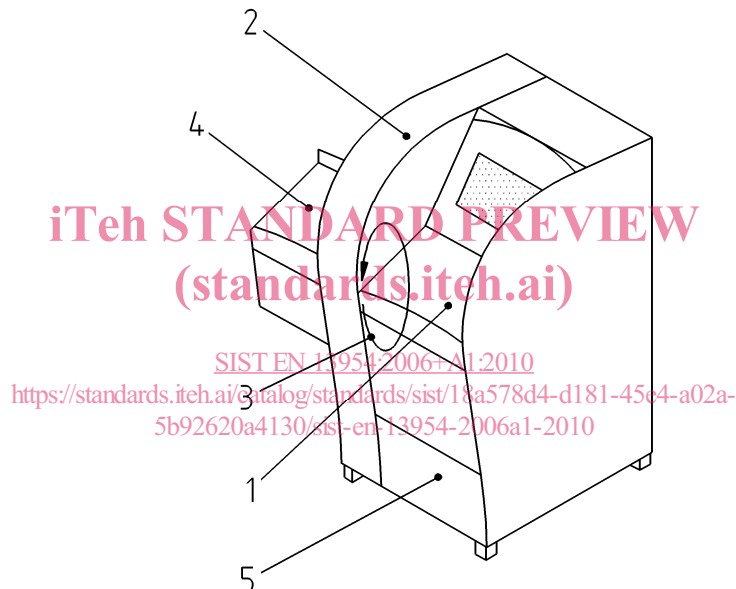
**Figure 1 — Example of a bread slicer of type 1**

According to the way the bread is brought to the slicing tool, the following distinctions are made:

- Type 1a "hand operated machines" (Figure 1.1): the loaf of bread is pushed by a manual pusher. The machine is equipped with a lever which acts at the same time as a start/stop control device.
- Type 1b "automatic machines" (Figure 1.2): the bread is pushed by a power operated mechanical pusher. A control device allows to activate the blades and the pusher until the bread is totally cut and the pusher has come back to the feeding position. Then the machine stops and the cycle is finished. The next loaf of bread is placed manually in front of the pusher.
- Type 1c "automatic machines with continuous feeding" (Figure 1.3): the machine is fed manually or continuously and the loaves of bread are brought to the blades by (a) conveyor belt(s).

### 3.2.2 Type 2 machines

A type 2 bread slicing machine consists of a machine frame supporting the following main elements: (see example in Figure 2):



#### Key

- 1 feed device in a feed trough;
- 2 blade housing;
- 3 rotary (sickle) crescent or circular blade;
- 4 discharge trough;
- 5 crumb tray

**Figure 2 — Bread slicing machine of type 2 with discharge trough**

The machine housing holds associated drives, electrical and/or hydraulic and pneumatic components, depending on the machine type.

Type 2 bread slicing machines in the scope of this document may be equipped with

- an in-feed conveyor belt,
- a discharge conveyor belt, and

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- an oiling mechanism for the blade.

The bread to be cut is laid upon the feed device and transported to the cutting chamber to be cut. The slices are discharged into the discharge trough or onto a conveyor.

**4 List of significant hazards****4.1 General**

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

**4.2 Mechanical hazards**

**4.2.1** The significant mechanical hazards for type 1 machines are:

- cutting hazard;
- drawing in hazard;
- shearing hazard;
- loss of stability.

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The examples shown in Figure 3 illustrates 4 danger zones associated with these hazards:

Zone 1: Access to cutting side of blades through infeed area.

Hazards of cutting.

Zone 2: Access to cutting side of blades through discharge area.

Hazards of cutting.

Zone 3: Access to cutting side of blades and to other moving parts of the machine through the crumb tray opening, when it is removed.

Hazards of shearing, drawing in, cutting.

Zone 4: Access to all moving parts (e.g. drive mechanisms) through other sides of the machine.

Hazards of shearing, drawing in.

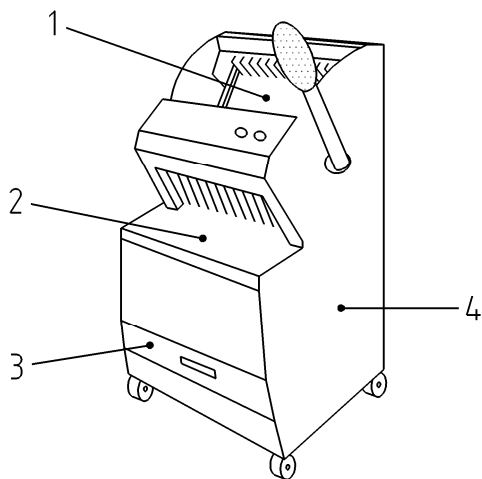


Figure 3.a

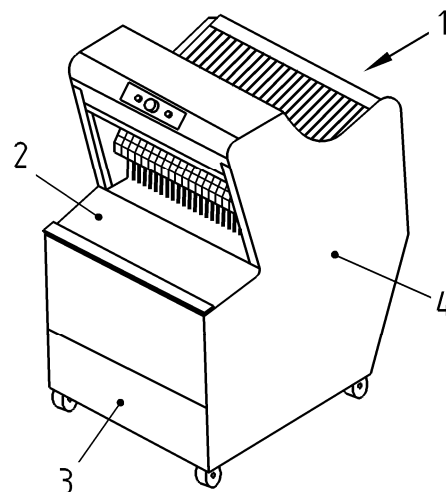


Figure 3.b

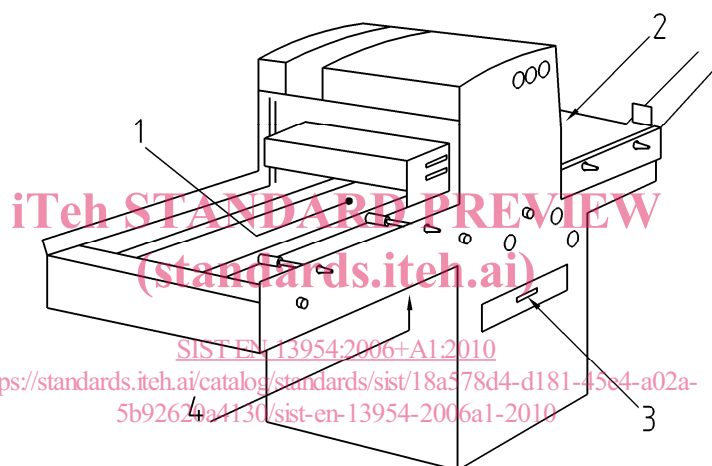


Figure 3.c

**Key**

1	Zone 1
2	Zone 2
3	Zone 3
4	Zone 4

**Figure 3 — Danger zones of bread slicers of type 1**

**4.2.2** The significant mechanical hazards for type 2 machines are listed below:

- crushing hazard;
- shearing hazard;
- severing hazard;
- entanglement hazard;
- cutting hazard;
- drawing-in hazard;

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— loss of stability.

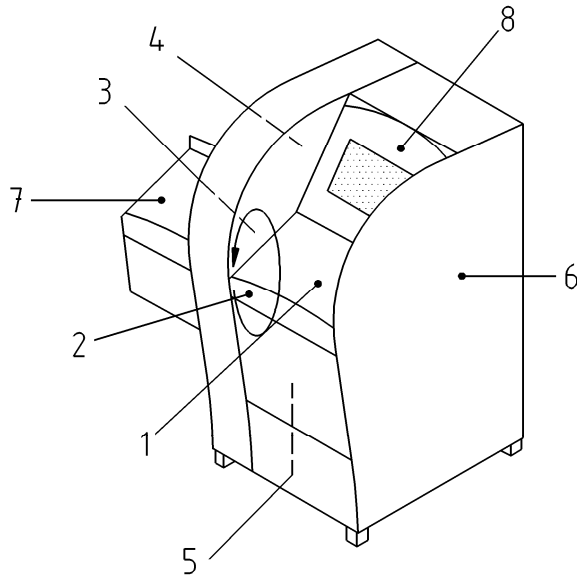
The example shown in Figure 4 illustrates 8 danger zones associated with these hazards:

- Zone 1: Movement of the feed device in feed trough.  
Crushing or shearing and cutting or severing hazard to fingers or hand.
- Zone 2: Rotating blade in cutting area, access from feed trough.  
Entanglement, cutting or severing hazard to fingers or hand.
- Zone 3: Rotating blade in cutting area, access via discharge trough.  
Entanglement, cutting or severing hazard to fingers or hand.
- Zone 4: Rotating blade in the blade housing.  
Cutting or severing hazard to fingers or hand.  
Breakage of blade or detachment of blade mounting.  
Hazard caused by ejected parts.
- Zone 5: Rotating blade, access via the crumb tray.  
Entanglement, cutting or severing hazard to fingers or hand.
- Zone 6: Drive mechanisms of blade and feed device/ bread holder.  
Crushing, shearing or drawing-in hazard to fingers or hand.
- Zone 7: Outlet conveyor belt.  
Entanglement, drawing-in or crushing hazard to fingers or hand.
- Zone 8: Unintentional or intentional closing of machine parts.  
Crushing hazard to fingers or hand.

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### Key

1	Zone 1
2	Zone 2
3	Zone 3
4	Zone 4
5	Zone 5
6	Zone 6
7	Zone 7
8	Zone 8

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**Figure 4 — Danger zones on a bread slicing machine of type 2 with discharge trough and outlet conveyor belt**

### 4.3 Electrical hazards

Hazard of electric shock from direct or indirect contact with live components.

Hazard of external influences on electrical equipment (e.g. cleaning with water and dust generated by slicing the bread).

### 4.4 Lack of hygiene

Lack of hygiene can create a risk to human health and unacceptable alteration of foodstuff e.g. contamination by microbial growth or foreign materials.

### 4.5 Hazards generated by neglecting ergonomic principles

Risk of injury or chronic damage to the body resulting from harmful body postures during operation, cleaning and maintenance.

### 4.6 Hazards from cleaning and handling

Cutting while cleaning, whereas the blades are stopped.

Cutting while removing the blade assembly.