



SLOVENSKI STANDARD

SIST EN 12042:2006

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Stroji za predelavo hrane – Avtomatski delilniki testa – Varnostne in higienske zahteve

Food processing machinery - Automatic dividers - Safety and hygiene requirements

Nahrungsmittelmaschinen - Teigteilmaschinen - Sicherheits- und Hygieneanforderungen

Machines pour les produits alimentaires - Diviseuses automatiques - Prescriptions relatives a la sécurité et a l'hygiene

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ICS:

67.260

Tovarne in oprema za
živilsko industrijo

Plants and equipment for the
food industry

SIST EN 12042:2006

en

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English Version

Food processing machinery - Automatic dividers - Safety and hygiene requirements

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Nahrungsmittelmaschinen - Teigteilmaschinen - Sicherheits- und Hygieneanforderungen

This European Standard was approved by CEN on 1 August 2005.

CEN 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 CEN member.

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EUROPÄISCHES KOMITEE FÜR NORMUNG

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Foreword

This European Standard (EN 12042:2005) has been prepared by Technical Committee CEN/TC 153 “Food processing machinery — Safety and hygiene specifications”, 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of an identical text or by endorsement, at the latest by April 2006, and conflicting national standards shall be withdrawn at the latest by April 2006.

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

For relationship with EU Directive(s), see informative Annex ZA, which is an integral part of this European Standard.

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

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Introduction

This European Standard is a type C standard as stated in EN ISO 12100-1.

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 applies to the design and manufacture of automatic dividers whose function is based on the volumetric principle using one or more suction and/or pressing pistons. Dough dividers working in other ways are excluded from the scope of this European Standard.

These automatic dividers are used in the food industry and shops (pastry-making, bakeries, confectionery, etc.) for dividing dough or pastry into portions to produce the required weight of dough piece. These machines can be fed by hand or automatically.

This European Standard deals with all significant hazards, hazardous situations and events relevant to the installation, adjustment, operation, cleaning and maintenance of automatic dividers, when they are used as intended and under the conditions foreseen by the manufacturer (see clause 4).

When drafting this European Standard, it has been assumed that the machines are not intended to be cleaned with water.

1.2 The following machines are excluded:

- experimental and testing machines, under development by the manufacturer;
- weighting devices;
- “knife and belt” dividers and other types of machines where the dividing mechanism is based on the functioning of a moving knife;
- lifting and tilting machines¹⁾ or other separate feeding machines.

1.3 A noise test code is included in Annex A to assist manufacturers to measure noise levels for the purpose of the noise emission declaration.

1.4 This European Standard is not applicable to machines which are manufactured before the date of publication of this European Standard by CEN.

2 Normative references

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

EN 294:1992, *Safety of machinery — Safety distance to prevent danger zones being reached by the upper limbs.*

EN 614-1:1995, *Safety of machinery — Ergonomic design principles — Part 1: Terminology and general principles.*

EN 619, *Continuous handling equipment and systems — Safety and EMC requirements for equipment for mechanical handling of unit loads.*

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

EN 954-1:1996, *Safety of machinery — Safety related parts of control systems — Part 1: General principles for design.*

1) see EN 13288

EN 982, *Safety of machinery — Safety requirements for fluid power systems and their components — Hydraulics.*

EN 983, *Safety of machinery — Safety requirements for fluid power systems and their components — Pneumatics.*

EN 1037, *Safety of machinery — Prevention of unexpected start-up.*

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.*

EN 1760-2, *Safety of machinery — Pressure sensitive protective devices — Part 2: General principles for the design and testing of pressure sensitive edges and pressure sensitive bars.*

EN 60204-1:1997, *Safety of machinery — Electrical equipment of machines — Part 1: General requirements (IEC 60204-1:1997).*

EN 60529, *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 ISO 3743-1, *Acoustics — Determination of sound power levels of noise sources — Engineering methods for small, movable sources in reverberant fields — Part 1: Comparison method for hard-walled test rooms (ISO 3743-1:1994).*

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

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

EN ISO 11201, *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, *Acoustics — Recommended practice for the design of low-noise machinery and equipment — Part 1: Planning (ISO/TR 11688-1:1995).*

EN ISO 12001, *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 (ISO 12100-2:2003).*

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 apply.

3.2 Description

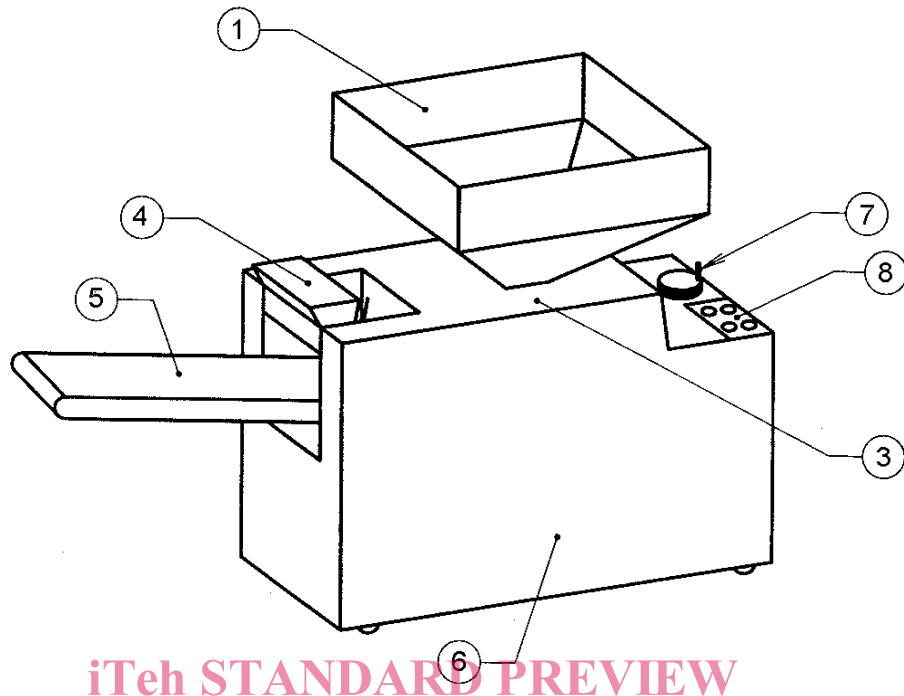
The dividers in the scope consist of the elements listed below (covered optional equipment is also included) (see Figure 1):

- 1) loading hopper;
- 2) feeding assistance device (optional, see Figure 2);
- 3) volumetric dividing device which can be of one of the following types:
 - drum and piston;
 - sliding drawer;and the operating mechanisms;
- 4) flour duster at the delivery of pieces of dough (optional);
- 5) one or more conveyor belts designed to discharge pieces of dough;
- 6) one or more drive units to operate the dividing device and the discharge devices;
- 7) sundry devices, e. g. to set the weight of the portions;
- 8) control system.

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Figure 1 — Main parts of an automatic divider

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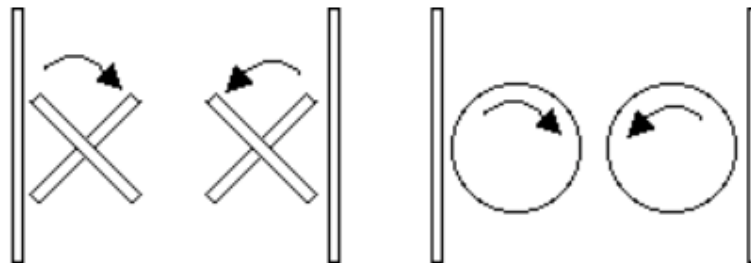


Figure 2 — Examples of feeding assistance devices

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 European Standard, identified by risk assessment as significant for this type of machinery and which require action to eliminate or reduce the risk.

Before using this European Standard it is important to carry out a risk assessment of the automatic dividers to check that they have the hazards identified in this clause.

4.2 Mechanical hazards

The significant mechanical hazards are:

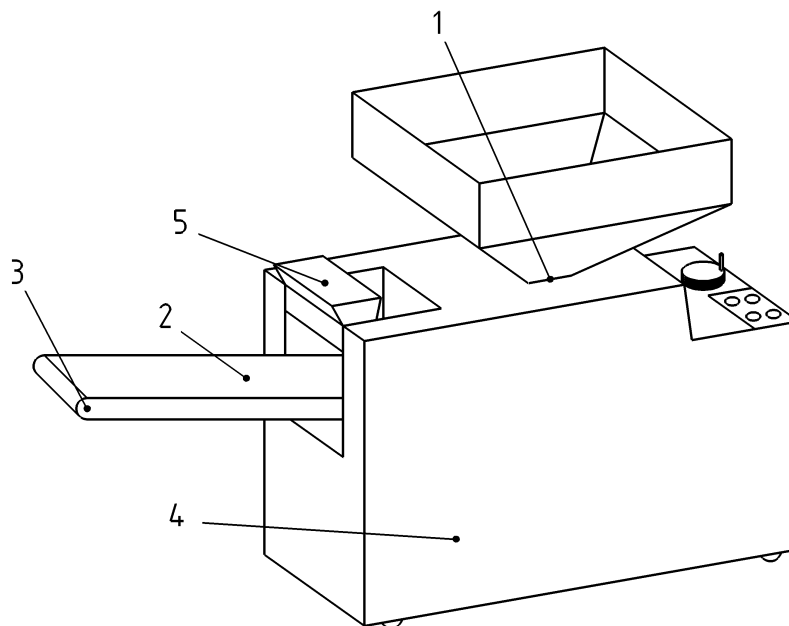
- crushing;
- shearing;
- cutting;
- drawing-in;
- abrasion;
- loss of stability.

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Figure 3 illustrates five danger zones associated with mechanical hazards:

- Zone 1: dividing zone or feeding device zone if any, access via hopper:
hazards of shearing, crushing, cutting;
- Zone 2: Access to dividing mechanisms and other moving parts via discharge opening/discharge belt:
hazards of entanglement and crushing;

NOTE In principle, there is no significant hazard at the discharge side of a drum and piston type dividing mechanism.
- Zone 3: discharge belt, space between belt and roller:
hazard of crushing;
- Zone 4: drive mechanisms and other moving internal components:
hazards of crushing, impact, shearing, drawing-in;
- Zone 5: Flour duster:
hazard of entanglement.

**Key**

- 1 zone 1
- 2 zone 2
- 3 zone 3
- 4 zone 4
- 5 zone 5

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Figure 3 — Danger zones of an automatic divider

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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).

4.4 Hazards generated by noise

Automatic dividers may generate airborne noise which can result in hearing damage, in accidents due to interference with speech communication and in interference with the perception of acoustic signals.

4.5 Hazards resulting from dust inhalation

Use of flour dusters exposes operators to dust including flour and ingredients which may be harmful to their health, causing rhinitis (running noses), watering eyes and possibly occupational asthma.

4.6 Hygiene

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

4.7 Hazards generated by neglecting ergonomic principles

During operation, cleaning and maintenance there is a risk of injury or chronic damage to the body resulting from awkward body postures.

4.8 Hazards specific to divider oil

A slipping hazard results if divider oil is allowed to spill onto the floor around the divider.

4.9 Pneumatic and hydraulic equipment

Pneumatic and hydraulic equipment presents crushing, shearing, ejection of parts, explosion and injection of fluids hazards. Stored energy in pneumatic or hydraulic systems may cause mechanisms to move unexpectedly even when power supplies are disconnected. In addition hydraulic oil and pneumatic lubricating oil present a potential fire hazard and can contaminate agri-foodstuffs.

5 Safety and hygiene requirements and/or measures

5.1 General

Machinery shall comply with the safety and hygiene requirements and/or protective measures of this clause.

In addition, the machine shall be designed according to the principles of EN ISO 12100 for hazards relevant but not significant, which are not dealt with by this European Standard (e. g. sharp edges).

NOTE For hazards which are to be reduced by the application of type B standards such as EN 294, EN 614-1, EN 953, EN 954-1, EN 982, EN 983, EN 1037, EN 1088, EN 1760-2, EN 60529, EN 60204-1 and EN 61310-1, the manufacturer should carry out a risk assessment to establish the requirements of that standard which are to be applied. This specific risk assessment is part of the general risk assessment of the machine.

Where the means of reducing the risk is by the physical arrangement or positioning of the installed machine, the manufacturer shall include in the information for use a reference to the reduction means to be provided, and to any limiting value of the requirement, and, if appropriate, to the means of verification.

Where the means of reducing the risk is by a safe system of working the machinery, the manufacturer shall include in the Information for use details of the system and of the elements of training required by the operating personnel.

5.2 Mechanical hazards

5.2.1 General

Guards shall comply with EN 953. Where reference is made to interlocking devices throughout clause 5, they shall comply with 4.2.1 of EN 953:1997 (guard interlocking without locking) and clauses 5 and 6 of EN 1088:1995. Interlocking devices on hinged hoppers and similar equipment shall be activated before the opening between the movable and the fixed parts exceeds 25 mm.

Where the interlocking mechanism has movable parts, e.g. position switches, these shall be protected from contamination by dough or dry ingredients, e.g. by mounting them within the machine body. Alternatively, magnetic switches may be used if total removal of any guard is required.

Safety related control systems shall be at least category 1 as defined in clause 6 of EN 954-1:1996.

The outside walls of the machine shall be designed (e. g. vertical and smooth) to prevent the operator climbing on the machine.

Folding interlocked steps, if fitted, shall either be designed so that they are always active or designed so that it is not possible to climb on them in the folded position.

5.2.2 Zone 1: Access to the dividing zone or feeding device zone if any, via the hopper

5.2.2.1 General

When a hoist or lifting and tilting machine is used to feed the hopper of the dough divider, the hazardous area, at the interface between the tilting machine and the automatic dividers, shall be safeguarded. This can be achieved by enclosure of the hoist or lifting and tilting machine and divider hopper by a combination of fixed and interlocked guards whose dimensions comply with Table 2 or Table 4 of EN 294:1992, by pressure sensitive bars around the top of the hopper, or by a combination of both.

In addition, warning signs (see Figure 4) shall be attached to the hopper, warning of the shearing hazards that exist within the hopper.

For machines where the upper rim of the hopper is equal to or higher than 1,6 m, the following additional requirements also apply on machines where no interlocking steps or working platforms are provided (see 5.2.2.4):

- means for observing of the dough from floor level shall be provided, for example one or more mirrors or transparent panels in the side of the hoppers;
- facility to allow cleaning from floor level, for example an interlocked hinged hopper or removable hopper panels that comply with EN 953.



Figure 4 — Safety signs

5.2.2.2 Automatically fed machines

Access via the hopper opening to the hazardous zone shall be prevented while the machine is in operation. The hazardous area shall be enclosed by fixed and/or interlocked guards whose dimensions comply with Table 4 of EN 294:1992.

The principle of distance guarding shall only be used if the height of the protective structure in the sense of EN 294 is at least 3 m.

Where an intermediate hopper is fitted this can form part of the guarding system.

5.2.2.3 Hand-fed machines

The access to the danger zones in the feed intake hopper shall be restricted or prevented by one of the following methods:

- a) by the provision of an interlocked lid or guard (see 3.25.4 of EN ISO 12100-1:2003) which is dimensioned and positioned in accordance with Table 4 of EN 294:1992. Where the distance to the danger point is at least 850 mm, an aperture measuring no more than 180 mm x 180 mm is allowed in the lid provided, warning signs are fitted next to the aperture. The dimensions of the warning signs shall be in accordance