SLOVENSKI STANDARD
SIST EN 12042:2014

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Nadomešča:
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Stroji za predelavo hrane - Avtomatski delilniki testa - Varnostne in higienske zahteve

Food processing machinery - Automatic dough dividers - Safety and hygiene requirements

Nahrungsmittelmaschinen - Teigteilmaschinen - Sicherheits- und Hygieneanforderungen

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

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ICS:

67.260	Tovarne in oprema za živilsko industrijo	Plants and equipment for the food industry

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EUROPEAN STANDARD

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English Version

Food processing machinery - Automatic dough dividers - Safety and hygiene requirements

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

Nahrungsmittelmaschinen - Teigteilmaschinen - Sicherheits- und Hygieneanforderungen

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EUROPEAN COMMITTEE FOR STANDARDIZATION
COMITÉ EUROPÉEN DE NORMALISATION
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Foreword

This document (EN 12042:2014) 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of an identical text or by endorsement, at the latest by October 2014, and conflicting national standards shall be withdrawn at the latest by October 2014.

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This document supersedes EN 12042:2005+A1:2010.

This document 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 2006/42/EC.

For relationship with EU Directive 2006/42/EC, see informative Annex ZA, which is an integral part of this document.

Significant changes

The significant changes with respect to the previous edition EN 12042:2005+A1:2010 are listed below:

— Normative references updated;

— Clause 4: new presentation in a table;

— 5.2.2, zone 1:

  — the requirements are the same when the loading of the machine is manual or automatic;

  — addition of new requirements for pressure sensitive edge (see 5.2.2.2.2), AOPD (see 5.2.2.2.3), cleaning of the hopper (se 5.2.2.2.6) and feeding assistance device inside the hopper (see 5.2.2.2.7);

  — new stopping time ≤ 0,35 s;

  — new performance level *d*.

— 5.2.3, zone 2: Table 1 (Dimensions of the guard or tunnel) replaced by a reference to EN ISO 13857;

— Instruction handbook updated (environmental information).

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, Former Yugoslav Republic of Macedonia, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey and the United Kingdom.

Introduction

This document is a type C standard as stated in EN ISO 12100:2010.

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

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.

1 Scope

1.1 This European Standard applies to the design and manufacture of standalone automatic dough dividers, having a feed hopper, an outlet and a dividing system (see 3.2).

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

This European Standard deals with all significant hazards, hazardous situations and events relevant to the transport, installation, adjustment, operation, cleaning, maintenance, dismantling, disassembling and scrapping of automatic dough dividers, when they are used as intended and under conditions of misuse which are reasonably foreseeable by the manufacturer (see Clause 4).

These machines are not intended to be cleaned with pressurized water.

1.2 This European Standard is not applicable to the following:

— experimental and testing machines, under development by the manufacturer;

— weighing devices;

— pressure dough dividers, without a feed hopper, using knives for the dividing process;

— lines with separate cutting or forming elements outside the housing;

— lifting and tilting machines[1)] or other separate feeding machines;

— additional hazards generated when the machine is used in a line or mechanically fed.

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 its publication as EN.

2 Normative references

The following documents, in whole or in part, are normatively referenced in this document and are indispensable for its application. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

EN 619:2002+A1:2010, *Continuous handling equipment and systems - Safety and EMC requirements for equipment for mechanical handling of unit loads*

EN 894-4:2010, *Safety of machinery - Ergonomics requirements for the design of displays and control actuators - Part 4: Location and arrangement of displays and control actuators*

EN 953:1997+A1:2009, *Safety of machinery - Guards - General requirements for the design and construction of fixed and movable guards*

1) see EN 13288

EN 1037:1995+A1:2008, *Safety of machinery - Prevention of unexpected start-up*

EN 1088:1995+A2:2008, *Safety of machinery - Interlocking devices associated with guards - Principles for design and selection*

EN 1672-2:2005+A1:2009, *Food processing machinery - Basic concepts - Part 2: Hygiene requirements*

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

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

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

EN ISO 3743-1:2010, *Acoustics - Determination of sound power levels and sound energy levels of noise sources using sound pressure - Engineering methods for small movable sources in reverberant fields - Part 1: Comparison method for a hard-walled test room (ISO 3743-1:2010)*

EN ISO 3744:2010, *Acoustics - Determination of sound power levels and sound energy levels of noise sources using sound pressure - Engineering methods for an essentially free field over a reflecting plane (ISO 3744:2010)*

EN ISO 4413, *Hydraulic fluid power - General rules and safety requirements for systems and their components (ISO 4413)*

EN ISO 4414, *Pneumatic fluid power - General rules and safety requirements for systems and their components (ISO 4414)*

EN ISO 4871:2009, *Acoustics - Declaration and verification of noise emission values of machinery and equipment (ISO 4871)*

EN ISO 11201:2010, *Acoustics - Noise emitted by machinery and equipment - Determination of emission sound pressure levels at a work station and at other specified positions in an essentially free field over a reflecting plane with negligible environmental corrections (ISO 11201:2010)*

EN ISO 12100:2010, *Safety of machinery - General principles for design - Risk assessment and risk reduction (ISO 12100:2010)*

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

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 13855:2010, *Safety of machinery - Positioning of safeguards with respect to the approach speeds of parts of the human body (ISO 13855:2010)*

EN ISO 13856-1, *Safety of machinery - Pressure-sensitive protective devices - Part 1: General principles for design and testing of pressure-sensitive mats and pressure-sensitive floors (ISO 13856-1)*

EN ISO 13856-2, *Safety of machinery - Pressure-sensitive protective devices - Part 2: General principles for design and testing of pressure-sensitive edges and pressure-sensitive bars (ISO 13856-2)*

EN ISO 14122-2, *Safety of machinery - Permanent means of access to machinery - Part 2: Working platforms and walkways (ISO 14122-2)*

3 Terms, definition and description

3.1 Terms and definitions

For the purposes of this document, the terms and definitions given in EN ISO 12100:2010 and the following apply.

3.1.1
stopping time (time for hazard elimination)
period between the point at which the interlocking device initiates the stop command and the point at which the risk from hazardous machine functions has passed

[SOURCE: EN 1088:1995+A2:2008, 3.8]

3.2 Description

The dividers in the scope consist of the elements listed below (including optional equipment) (see Figure 1):

1) loading hopper;

2) feeding assistance device inside the hopper (optional, see one example at Figure 2);

3) dividing device which can be of one of the following types:

   — rotating drum with chamber and piston;

   — piston with or without cutting slide;

   — rotating blades or cutting devices (e.g. knives, star rollers);

   — 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) miscellaneous devices, e.g. to set the volume of the portions;

8) control panel;

9) oiling device (optional, not included in Figure 1);

10) moulding/rounding device (optional, not included in Figure 1).

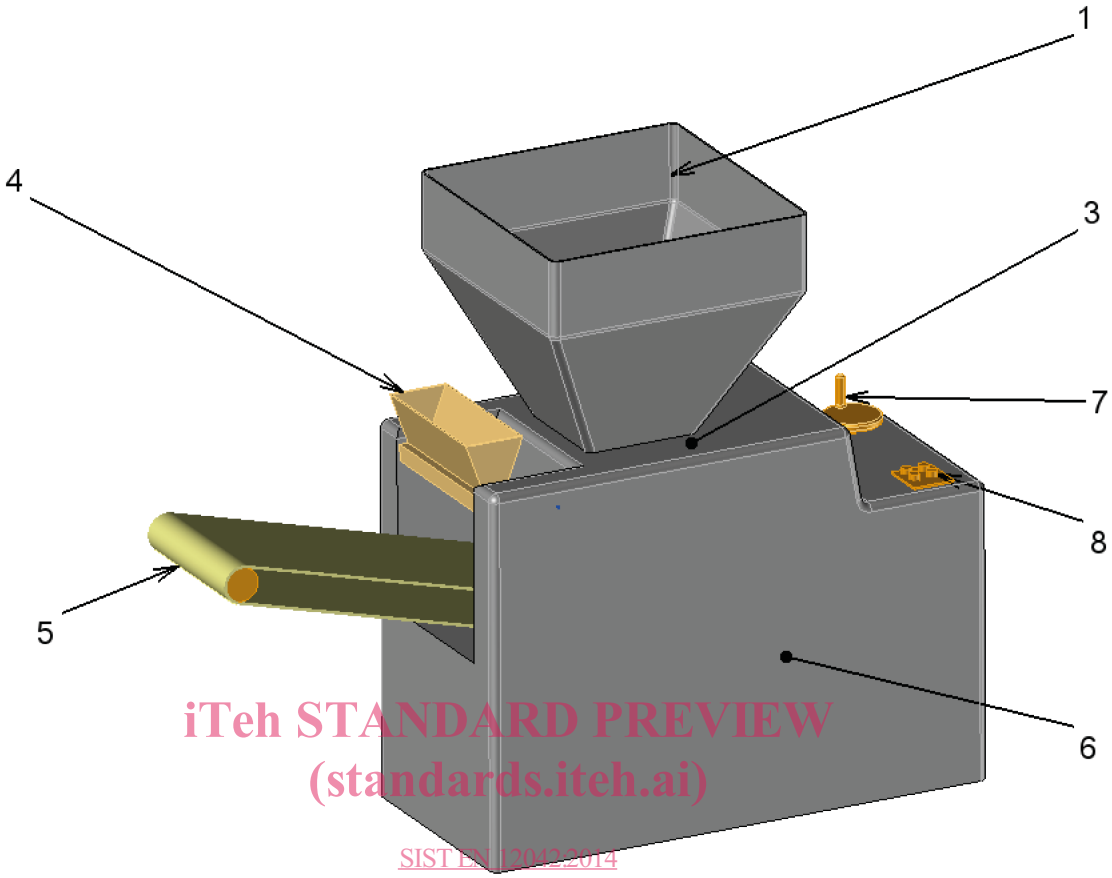
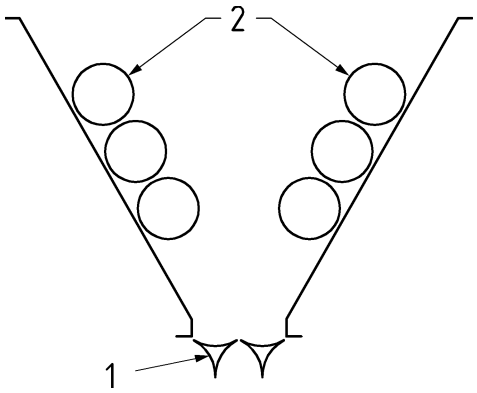


Figure 1 — Main parts of an automatic dough divider



Key

1 star rollers

2 feeding assistance device (rollers)

Figure 2 — Example of a hopper equipped with a feeding assistance device and star rollers

4 List of significant hazards

This clause contains all the significant hazards, hazardous situations and events identified by risk assessment as significant for this type of machinery and which require action to eliminate or reduce the risk (see Table 1).

Table 1 — List of significant hazards

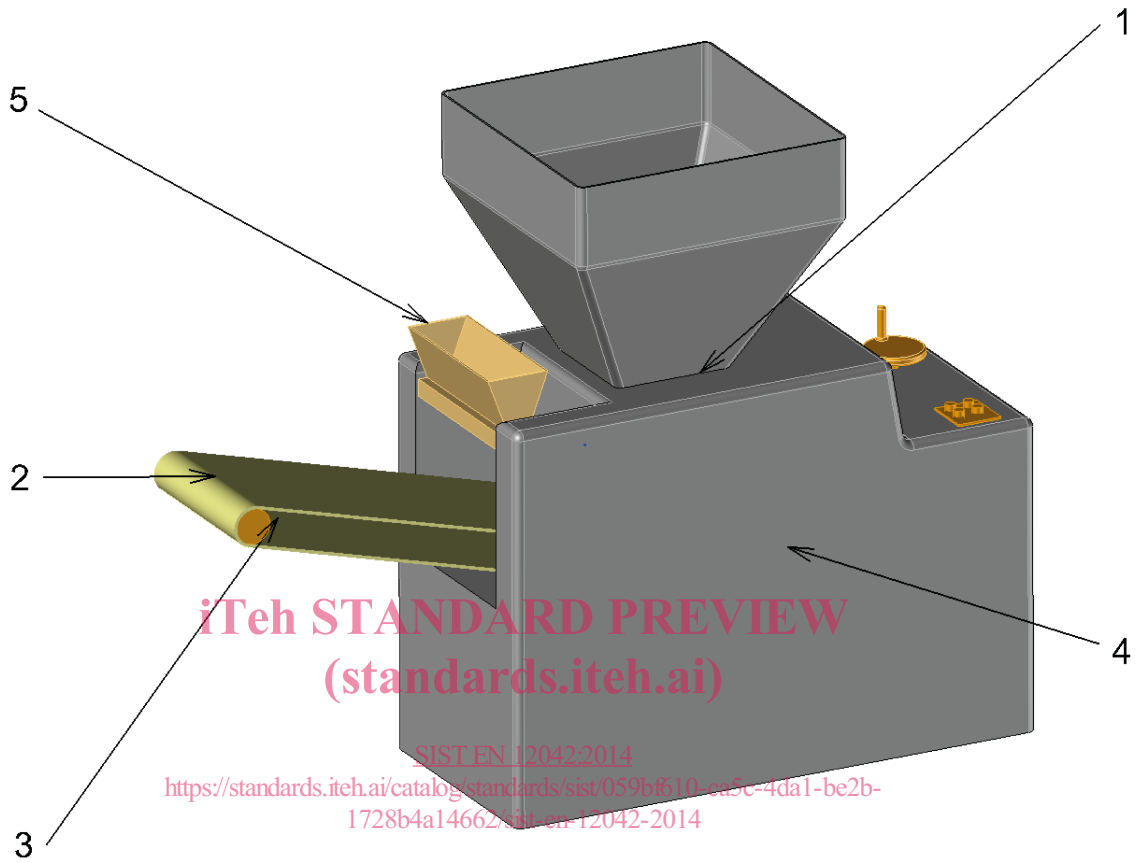
Hazards, hazardous situations and hazardous events	Location or cause	Clause/subclause in this European Standard
Mechanical hazards (see Figure 3)		5.2
— shearing, crushing and cutting	Zone 1 - dividing zone or feeding assistance device zone (if any) access via the hopper	
— entanglement and crushing	Zone 2 - access to dividing mechanisms and other moving parts via discharge opening/discharge belt	
— drawing-in	Zone 3 - discharge belt, in-running nip between belt and roller	
— crushing, impact, shearing and drawing-in	Zone 4 - drive mechanisms and other moving internal components	
— entanglement	Zone 5 - flour duster	
Electrical hazards	Electric shock from direct or indirect contact with live components external influences on electrical equipment (e.g. cleaning with water)	5.3
Stopping of the machine	No access to the normal OFF of the machine	5.4
Unexpected start-up	Start-up of the machine	5.5
Hazards generated by noise	Hearing damage, accidents due to interference with speech communication and interference with the perception of acoustic signals	5.6 7.2
Hazards generated by materials and substances (inhalation of dust)	Flour dusters	5.7
Hazards generated by neglecting hygienic design principles	e.g. contamination by microbial growth or foreign materials	5.8
Hazards generated by neglecting ergonomic principles	During operation, cleaning and maintenance	5.9
Hazards generated by spilling oil	If divider oil is allowed to spill onto the floor around the divider.	5.10
Hazards generated by pneumatic and hydraulic equipment	Ejection of parts, explosion and injection of fluid	5.11

Figure 3 illustrates the danger zones associated with the mechanical hazards:

— Zone 1: dividing zone or feeding assistance device zone (if any) access via the hopper;

— Zone 2: access to dividing mechanisms and other moving parts via discharge opening/discharge belt;

— Zone 3: discharge belt, in-running nip between belt and roller;
— Zone 4: drive mechanisms and other moving internal components;
— Zone 5: flour duster.



Key

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

Figure 3 — Danger zones associated with mechanical hazards

5 Safety and hygiene requirements and/or protective measures

5.1 General

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 12100:2010 for relevant but not significant hazards, which are not dealt with by this document.

Fixing systems of fixed guards or of parts of the machine acting as such shall remain attached to the guards or to the machinery when the guards are removed.

5.2 Mechanical hazards

5.2.1 General

Guards shall comply with EN 953:1997+A1:2009. Where reference is made to interlocking devices throughout Clause 5, they can be interlocked without guard locking and shall comply with EN 1088:1995+A2:2008, Clause 5 and Clause 6.

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.

The safety related parts of the control systems shall present at least a performance level d defined in accordance with EN ISO 13849-1:2008.

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

5.2.2.1 General

The safeguarding objective is to prevent contact by the operator (or other person) reaching down the hopper and coming into contact and being injured in the danger zone which is the cutting/crushing zone of the dividing device.

When a working platform is provided by the manufacturer according to 5.9, it shall comply with EN ISO 14122-2 and the working platform, or the access to it, shall be interlocked to stop the machine if the vertical distance between the flooring of the platform and the edge of the hopper is less than or equal to 1100 mm. In that case, the interlocking may be realized, e.g. by:

— use of a pressure sensitive mat or floor according to EN ISO 13856-1, or

— use of an AOPD to prevent access to the working platform, or

— use of an interlocked guard.

5.2.2.2 Feeding — Safeguarding at the hopper

5.2.2.2.1 General

Access via the hopper opening to the danger zone shall be prevented while the machine is in operation.

The access to the danger zones in the feed intake hopper may be restricted or prevented by example with one of the following:

— a pressure sensitive edge (see 5.2.2.2.2 and Figure 4);

— an AOPD (see 5.2.2.2.3);

— a swan neck hopper (see 5.2.2.2.4 and Figure 5);

— an interlocked guard (see 5.2.2.2.5).

If none of the previous solution is used, the height of the protective structure and the position of danger zone shall comply with EN ISO 13857:2008, Table 2.

5.2.2.2.2 Pressure sensitive edge

If a pressure sensitive edge is used as a safeguarding measure to stop the hazardous movement, the following requirements apply:

— the pressure sensitive edge shall comply with EN ISO 13856-2, and

— it shall be attached to the upper rim of the hopper or to a provided supporting system, and

— the stopping time after activation of the pressure sensitive edge shall be less than or equal to 0,35 s (calculated by taking into account EN ISO 13855:2010), and

— the distance between the pressure sensitive edge and the edge of the hopper shall be less than or equal to 8 mm, and

— the vertical distance (*D*) between the upper edge of the hopper and the cutting/crushing zone shall be more than or equal to 550 mm, and

— a distance bar shall be provided when the vertical distance (*D*) is less than 850 mm. In that case:

  — the safety distance from the distance bar to the danger zone shall be more than or equal to $E+F \geq 850$ mm, and

  — the distance bar shall be placed at a maximum height (*G*) comprised between 0 mm and 50 mm from the edge of the hopper, and with a minimum horizontal distance (*F*) from the edge of the hopper of 200 mm.