# SLOVENSKI STANDARD
# oSIST prEN 15180:2011

**01-december-2011**

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**Stroji za predelavo hrane - Dodajalne naprave - Varnostne in higienske zahteve**

Food processing machinery - Food depositors - Safety and hygiene requirements

Nahrungsmittelmaschinen - Nahrungsmittelportioniermaschinen - Sicherheits- und Hygieneanforderungen

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



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| 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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**prEN 15180**

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English Version

# Food processing machinery - Food depositors - Safety and hygiene requirements

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

Nahrungsmittelmaschinen - Nahrungsmittelportioniermaschinen - Sicherheits- und Hygieneanforderungen

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If this draft becomes a European Standard, 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.

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COMITÉ EUROPÉEN DE NORMALISATION
EUROPÄISCHES KOMITEE FÜR NORMUNG

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## Foreword

This document (prEN 15180:2011) 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 document is currently submitted to the CEN Enquiry.

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(s).

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

# Introduction

Food depositors are used extensively in Europe, in commercial and industrial food preparation applications. They present some health and safety hazards that have the potential to cause serious injury.

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 events are covered are indicated in the scope of this standard.

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 according to the provisions of this Type C-standard.

## 1 Scope

This European Standard deals with all significant hazards, hazardous situations and events relevant to food depositors as defined in Clause 3 and the equipment typically associated with them i.e. product pumps, product elevators, conveyors and indexing mechanisms, when they are used as intended and under conditions of misuse which are reasonably foreseeable by the manufacturer (see Clause 4).

This document deals with the significant hazards, hazardous situations and events during transport, assembly and installation, commissioning and use as defined in EN ISO 12100, Clause 5.4.

NOTE 1 According to the clause referred to, "use" includes setting, teaching/programming or process changeover, operation, cleaning, fault finding and maintenance.

NOTE 2 Although this standard is intended to apply to depositors used in the food industry, many of its requirements can also be used for similar machines used in other industries.

This standard is not applicable to the following machines:

— auger depositors or auger fillers and gravimetric filling machines; safety requirements for these machines are contained in EN 415-3:1999+A1:2009;

— filling machines for sausages, safety requirements for these machines are contained in EN 12463:2004+A1:2011;

— food depositors that are powered exclusively by manual effort.

This document does not deal with the hazards related to the use of food depositors in a potentially explosive atmosphere.

This document is not applicable to food depositors that were manufactured before the date of its publication as a 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 349:1993+A1:2008, *Safety of Machinery — Minimum gaps to avoid crushing of parts of the human body*

EN 574:1996+A1:2008, *Safety of machinery — Two-hand control devices — Functional aspects — Principles for design*

EN 614-1:2006+A1:2009, *Safety of machinery — Ergonomics design principles — Part 1: Terminology and general principles*

EN 614-2:2000+A1:2008, *Safety of machinery — Ergonomic design principles — Part 2: Interactions between the design of machinery and work tasks*

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

EN 620:2002+A1:2010, *Continuous handling equipment and systems — Safety and EMC requirements for fixed belt conveyors for bulk materials*

EN 626-1:1994+A1:2008, *Safety of machinery — Reduction of risks to health from hazardous substances emitted by machinery — Part 1: Principles and specifications for machinery manufacturers*



EN 626-2:1996+A1:2008, *Safety of machinery — Reduction of risk to health from hazardous substances emitted by machinery — Part 2: Methodology leading to verification procedures*

EN 894-1:1997+A1:2008, *Safety of machinery — Ergonomics requirements for the design of displays and control actuators — Part 1: General principles for human interactions with displays and control actuators*



EN 894-2:1997+A1:2008, *Safety of machinery — Ergonomics requirements for the design of displays and control actuators — Part 2: Displays*

EN 894-3:2000+A1:2008, *Safety of machinery — Ergonomics requirements for the design of displays and control actuators — Part 3: Control actuators*

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

EN 1005-2:2003+A1:2008, *Safety of machinery — Human physical performance — Part 2: Manual handling of machinery and component parts of machinery*

EN 1005-3:2002+A1:2008, *Safety of machinery — Human physical performance — Part 3: Recommended force limits for machinery operation*

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 1127-1:2007, *Explosive atmospheres — Explosion prevention and protection — Part 1: Basic concepts and methodology*

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

EN 1760-2:2001+A1:2009, *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 13478:2001+A1:2008, *Safety of machinery — Fire prevention and protection*

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

EN 60529:1991+A1:2000, *Degrees of protection provided by enclosures (IP code)* (IEC 60529:1989+A1:1999)

EN 61310-1:2008, *Safety of machinery — Indication, marking and actuation — Part 1: Requirements for visual, audible and tactile signals* (IEC 61310-1:2007)

EN 61310-3:2008, *Safety of machinery — Indication, marking and actuation — Part 3: Requirements for the location and operation of actuators* (IEC 61310-3:2007)

EN 61496-1:2004+A1:2008, *Safety of machinery — Electro-sensitive protective equipment — Part 1: General requirements and tests* (IEC 61496-1:2004, mod. + A1:2007)

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 3746:2010, *Acoustics — Determination of sound power levels and sound energy levels of noise sources using sound pressure — Survey method using an enveloping measurement surface over a reflecting plane* (ISO 3746:2010)



EN ISO 3747:2010, *Acoustics — Determination of sound power levels and sound energy levels of noise sources using sound pressure — Engineering/survey methods for use in situ in a reverberant environment* (ISO 3747:2010)



EN ISO 4413:2011, *Hydraulic fluid power — General rules and safety requirements for systems and their components* (ISO 4413:2010)

EN ISO 4414:2011, *Pneumatic fluid power — General rules and safety requirements for systems and their components* (ISO 4414:2010)

EN ISO 4871:2009, *Acoustics — Declaration and verification of noise emission values of machinery and equipment* (ISO 4871:1996)

EN ISO 9614-2:2009, *Acoustics — Determination of sound power levels of noise sources using sound intensity — Part 2: Measurement by scanning* (ISO 9614-2:1996)

EN ISO 11161:2007+A1:2010, *Safety of machinery — Integrated manufacturing systems — Basic requirements* (ISO 11161:2007 + Amd 1:2010)

EN ISO 11200:2009, *Acoustics — Noise emitted by machinery and equipment — Guidelines for the use of basic standards for the determination of emission sound pressure levels at a work station and at other specified positions* (ISO 11200:1995)

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 11202:2010, *Acoustics — Noise emitted by machinery and equipment — Determination of emission sound pressure levels at a work station and at other specified positions applying approximate environmental corrections* (ISO 11202:2010)

EN ISO 11203:2009, *Acoustics — Noise emitted by machinery and equipment — Determination of emission sound pressure levels at a work station and at other specified positions from the sound power level* (ISO 11203:1995)

EN ISO 11204:2010, *Acoustics — Noise emitted by machinery and equipment — Determination of emission sound pressure levels at a work station and at other specified positions applying accurate environmental corrections* (ISO 11204:2010)

EN ISO 11688-1:2009, *Acoustics — Recommended practice for the design of low-noise machinery and equipment — Part 1: Planning* (ISO/TR 11688-1:1995)

EN ISO 12001:2009, *Acoustics — Noise emitted by machinery and equipment — Rules for the drafting and presentation of a noise test code* (ISO 12001:1996)

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

EN ISO 13732-1:2008, *Ergonomics of the thermal environment — Methods for the assessment of human responses to contact with surfaces — Part 1: Hot surfaces* (ISO 13732-1:2006)

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 13850:2008, *Safety of machinery — Emergency stop — Principles for design* (ISO 13850:2006)

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

EN ISO 14122-1:2001, *Safety of machinery — Permanent means of access to machinery — Part 1: Choice of fixed means of access between two levels* (ISO 14122-1:2001)

EN ISO 14122-2:2001, *Safety of machinery — Permanent means of access to machinery — Part 2: Working platforms and walkways* (ISO 14122-2:2001)

EN ISO 14122-3:2001, *Safety of machinery — Permanent means of access to machinery — Part 3: Stairs, stepladders and guard-rails* (ISO 14122-3:2001)



## 3 Terms and Definitions

### 3.1 Terms

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

**3.1.1**
**product**
material processed in a food depositor which may be a liquid e. g. sauce, liquid containing suspended solids e. g. batter, paste e. g. biscuit dough or solids e. g. cooked rice

**3.1.2**
**food depositor**
machine that dispenses a food product in a predetermined volume or shape

**3.1.3**
**product cutting device**
mechanism that separates portions of food from a bulk supply of product. Typical devices include rotary valves, wire-cut mechanisms, shear blades and iris valves

**3.1.4**
**product dispensing valve**
mechanism that controls the flow of product at the point of product delivery. Typical devices include rotary valves, seating valves and slide valves

**3.1.5**
**product measuring chamber**
chamber that is filled with product to measure out a predetermined volume of product. Typically the chamber will incorporate a mechanism that allows the volume of the chamber to be varied so that the volume of product dispensed can be changed

**3.1.6**
**rise and fall mechanism**
mechanism used to raise and lower a product dispensing valve to suit a particular container or dispensing requirement

**3.1.7**
**D-valve**
rotary valve with a rotating element, which has a D-shaped cross-section

## 3.2 Types of food depositor



This document deals with five different types of food depositors. These machines can be free standing machines or be assemblies incorporated into other machines e. g. pie and tart machines. Food depositors may work fully automatically integrated with a product conveyor or product indexing mechanism or semi-automatically discharging a deposit when required by an operator.



**3.2.1**
**piston depositor**
food depositor that typically comprises a hopper, a rotary valve, a product measuring chamber in the form of a piston and a product dispensing valve. Some piston depositors incorporate several product measuring chambers and dispensing valves. Some designs dispense the product directly from the rotary valve without the use of a separate product dispensing valve. The volume of product dispensed is varied by altering the stroke of the product measuring chamber piston. Piston depositors are used to fill liquids, liquids containing solids in suspension and pastes. The product dispensing valve may be attached rigidly to the depositor or using a flexible pipe and in some cases is held by the operator.

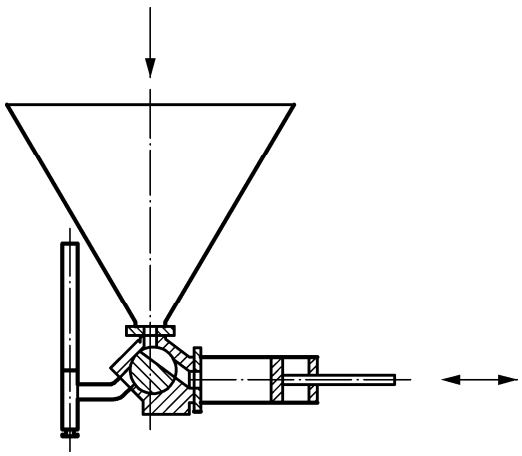

**Figure 1 — Piston depositor**

**3.2.2**
**chamber depositor**
food depositor that comprises a hopper feeding one or more product measuring chambers that are filled under gravity from the top. When the chamber has been filled with product the flow of product is stopped either by moving the chamber or using a product cutting device. The chamber is then discharged through the bottom of the chamber either by moving the chamber or by moving a plate in the base of the chamber. The volume of product dispensed is varied by altering the volume of the chamber. Chamber depositors are typically used to deposit free-flowing products like cooked rice or pasta.

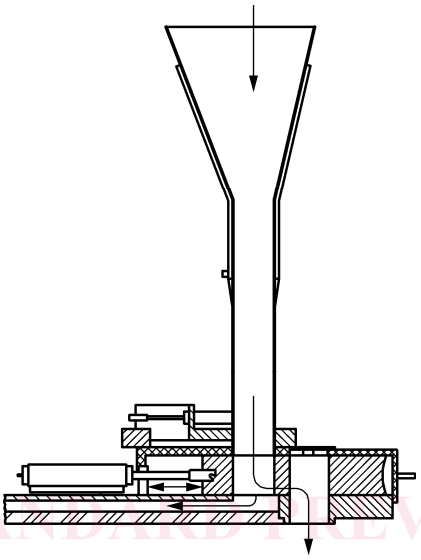



**Figure 2 — Chamber depositor**



**3.2.3**
**roller depositor**
food depositor that typically comprises a hopper that feeds product to two or more fluted contra-rotating rollers. These rollers force the product through one or more dies that shape the product. The product is then separated using a product cutting device like a wire cut mechanism. On some designs of the machine the dies are moved while the product is dispensed to produce a shaped product. The volume of product dispensed is varied by altering the timing of the product cut-off device. Roller depositors are typically used to deposit dough or confectionery products.

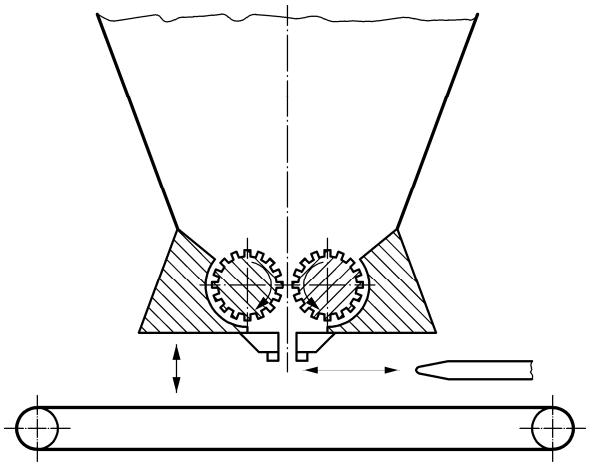

**Figure 3 — Roller depositor**

**3.2.4**
**pump depositor**
food depositor that comprises a hopper that feeds a pump which in turn feeds pipe-work on which are mounted one or more product dispensing valves. The dispensing valves may remain fixed, move up and down or from side to side in synchronisation with a product conveyor. The volume of product dispensed is varied by altering the length of time that the dispensing valves are open. Pump depositors are typically used to deposit liquids or liquids containing finely divided solids.

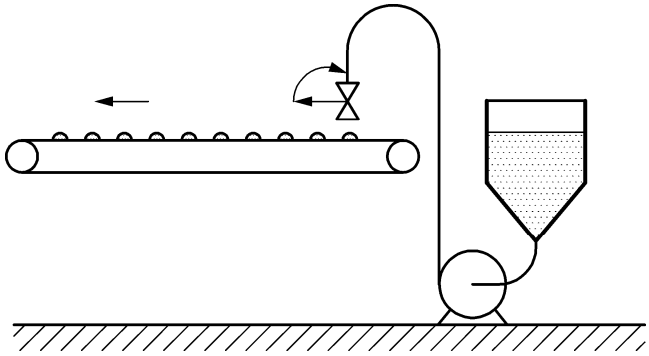

**Figure 4 — Pump depositor**

**3.2.5**
**screw depositor**
food depositor that comprises a hopper in which a screw is mounted. When the screw rotates it draws product from the hopper into a pipe. The hopper may be equipped with stirrers to move the product towards the screw and a product measuring chamber or product dispensing valve may be fitted to the discharge of the screw. The volume of product can be varied by increasing or decreasing the speed of the screw, by varying the volume of the measuring chamber or by controlling the actuation of the product dispensing valve. Screw depositors are typically used to deposit dough, pastes or creams.



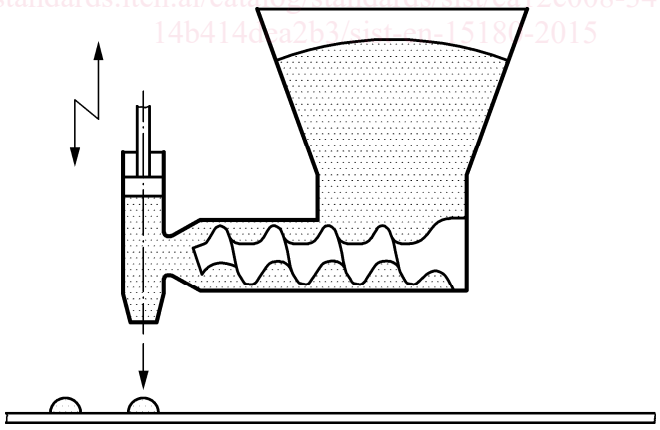

**Figure 5 — Screw depositor**

## 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.

If his machine presents hazards not dealt with in this standard (see scope), the manufacturer shall assess these hazards by using the principles detailed in EN 12100.

The hazards that can occur on all food depositors are listed in 4.2 and the hazards that are specific to particular types of food depositor are listed in Clauses 4.3 to 4.7.

## 4.2 General food depositor hazards

### 4.2.1 Introduction

The following hazards can occur on all food depositors.

### 4.2.2 Mechanical hazards

#### 4.2.2.1 Moving parts

Food depositors incorporate moving parts which present a variety of mechanical hazards including crushing, shearing, cutting, entanglement, friction, drawing-in. Some of these hazards may persist after the power supply has been cut off, due to stored energy.

#### 4.2.2.2 Risks that may arise from hygienic design features

##### 4.2.2.2.1 Use of quick release fixings

Food depositors are frequently fitted with quick release fixings that can be undone without the use of tools, so that machines can be dismantled quickly for cleaning. A risk can arise if undoing these quick release fixings allows a machine part or guard that is designed to prevent access to danger zones to be removed.



##### 4.2.2.2.2 Cleaning under machines

There is a risk from danger zones on food depositors, when operators reach under guards to clean the machine or the floor under the machine when it is in motion.

##### 4.2.2.2.3 Spillage trays

Food depositors may be fitted with trays to collect spillages of food from the machine. It is good hygienic design practice for spillage trays to be easily removable so that product can be emptied frequently; however when the trays are removed, the operator may be exposed to danger zones on the machine.

#### 4.2.2.3 High pressure fluid injection or ejection hazards

Where food depositors contain pressurised product there is a risk of this product ejecting in an uncontrolled way during troubleshooting or cleaning.

If compressed air or pressurised hydraulic fluid comes into contact with the skin, it can enter the skin or blood stream and result in a variety of health damaging effects.

### 4.2.3 Electrical hazards

#### 4.2.3.1 Electrical equipment

Electrical equipment on the machine generates a potential electric shock and burn hazard.

In the presence of combustible materials there is a potential fire hazard. Electrical systems may act as an ignition source. In the presence of flammable substances or products that may create explosive atmospheres, this could give rise to an explosion hazard.