
Stroji za predelavo hrane – Dozirni stroji – Varnostne in higienske zahteve

Food processing machinery - Food depositors - Safety and hygiene requirements

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ICS

English version

Food processing machinery - Food depositors - Safety and hygiene requirements

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

Nahrungsmittelmaschinen - Sicherheits- und Hygieneanforderungen

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Foreword

This document (prEN 15180:2005) has been prepared by Technical Committee CEN/TC 153 “Food processing machines — Safety and hygiene requirements”, 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.

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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 12100-1.

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.

The requirements of this standard affect designers, manufacturers, suppliers and importers of food depositors. This standard also contains requirements for signs and symbols that must be fitted on machines and information, which shall accompany the machine when it is first supplied.

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1 Scope

This European Standard establishes safety requirements for food depositors. This group of machines is defined in detail in clause 3.2 of this standard, with diagrams illustrating examples of the principle of operation of each machine type.

This standard covers the safety requirements for machine design, construction, installation, commissioning, operation, adjustment, maintenance and cleaning. This standard applies to machines manufactured after the date of issue of this standard.

NOTE Although this standard is primarily intended to apply to depositors used in the food industry, it should also be noted that the same machines are also used to deposit non-food products. Where depositors are used for non-food products, the health and safety requirements of this standard will apply, but the hygiene requirements will not apply.

Exclusions

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 415-3:2000.
- Food depositors that are powered exclusively by manual effort;
- Food depositors that were manufactured before the date of publication of this document by CEN;

This standard does not consider the following hazards:

- the use of food depositors in potentially explosive atmospheres;
- the health, safety or hygiene hazards associated with the products that may be handled by the machines, but does include general advice on this subject;
- hazards that may be associated with electromagnetic emissions from food depositors;
- hazards that may be associated with decommissioning food depositors.

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 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.*

EN 415-3:2000, *Safety of packaging machines — form, fill and seal machines.*

EN 418:1992, *Safety of machinery — Emergency stop equipment; functional aspects — Principles for design.*

EN 457:1992, *Safety of machinery — Auditory danger signals — General requirements, design and testing.*

EN 563:1994, *Safety of machinery — Temperature of touchable surfaces — Ergonomics data to establish temperature limit values for hot surfaces.*

- EN 574:1996, *Safety of machinery — Two-hand control devices — Functional aspects — Principles for design.*
- EN 614-1:1995, *Safety of machinery — Ergonomic design principles — Part 1: Terminology and general principles.*
- EN 614-2: 1995, *Safety of machinery — Ergonomic design principles — Part 2: Interaction between machinery design and work tasks.*
- EN 619:2002, *Continuous handling equipment and systems — Safety requirements for equipment for mechanical handling of unit loads.*
- EN 626-1:1994, *Safety of machinery — Reduction of risks to health from hazardous substances emitted by machinery — Part 1: Principles and specifications for machinery manufacturers.*
- EN 842:1996, *Safety of machinery — Visual danger signals — General requirements, design and testing.*
- EN 953:1997, *Safety of machinery — Guards — General requirements for the design and construction of fixed and moveable guards.*
- EN 954-1:1996, *Safety of machinery — Safety related parts of control systems — Part 1: General principles for design.*
- EN 982:1996, *Safety of machinery — Safety requirements for fluid power systems and components — Hydraulics.*
- EN 983:1996, *Safety of machinery — Safety requirements for fluid power systems and components — Pneumatics.*
- EN 999:1998, *Safety of machinery — The positioning of protective equipment in respect of approach speeds of parts of the human body.*
- EN 1037:1996, *Safety of machinery — Prevention of unexpected start-up.*
- EN 1050:1996, *Safety of machinery — Principles of risk assessment.*
- EN 1088:1995, *Safety of machinery — Interlocking devices associated with guards — Principles for design and selection.*
- EN 1672-2:1997, *Food processing machinery — Basic concepts — Part 2: Hygiene requirements.*
- prEN 1760-2:1996, *Safety of machinery — Pressure sensitive protective devices — Part 2: Edges and bars.*
- EN 60204-1:1997, *Safety of machinery — Electrical equipment of machines — Part 1: General requirements.*
- EN 60529:1992, *Specification for degrees of protection provided by enclosures (IP code).*
- EN 61310-1:1995, *Safety of machinery — Indication marking and actuation — Part 1: Requirements for visual, auditory and tactile signals.*
- EN 61310-2:1995, *Safety of machinery — Indication marking and actuation — Part 2: Requirements for marking.*
- EN 61310-3:1999, *Safety of machinery — Indication marking and actuation — Part 3: Requirements for the location and operation of actuators.*
- EN 61496-1:1998, *Safety of machinery — Electro-sensitive protective equipment — Part 1: General requirements and tests.*

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EN 61496-2, *Safety of machinery — Electro-sensitive protective equipment — Part 2: Photo-electric devices.*

EN 61496-3, *Safety of machinery — Electro-sensitive protective equipment — Part 3: Proximity sensing devices.*

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

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

EN ISO 11202:1995, *Acoustics — Noise emitted by machinery and equipment — Measurement of emission sound pressure levels at a work station and at other specified positions — Survey method in situ.*

EN ISO 11204:1995, *Acoustics — Noise emitted by machinery and equipment — Measurement of emission sound pressure levels at a work station and at other specified positions — Method requiring environmental corrections.*

EN ISO 11546-1:1996, *Acoustics — Determination of sound insulation performances of enclosures — Part 1: Measurements under laboratory conditions (for declaration purposes).*

EN ISO 11546-2:1996, *Acoustics — Determination of sound insulation performances of enclosures — Part 2: Measurements in situ (for acceptance and verification purposes).*

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

EN ISO 11691:1996, *Acoustics — Measurement of insertion loss of ducted silencers without flow — Laboratory survey method.*

EN ISO 11820:1996, *Acoustics — Measurements on silencers in situ.*

EN ISO 11821:1997, *Acoustics — Measurement of the in situ sound attenuation of a removable screen.*

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

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.*

EN ISO 14122-1:2000, *Safety of machinery — Permanent means of access to machines and industrial plants — Part 1: Choice of a fixed means of access between two levels.*

EN ISO 14122-2:2000, *Safety of machinery — Permanent means of access to machines and industrial plants — Part 2: Working platforms and walkways.*

EN ISO 14122-3:2000, *Safety of machinery — Permanent means of access to machines and industrial plants — Part 3: Stairways, stepladders and guard-rails.*

ISO 7000:1989, *Graphical symbols for use on equipment — Index and synopsis.*

3 Terms and Definitions

3.1 Terms

In addition to those terms defined in EN ISO 12100-1, the following definitions apply, for the purposes of this standard.

3.1.1

food

product, ingredient or material intended to be orally consumed by either humans or animals

3.1.2

product

food or non-food material processed in a food depositor

3.1.3

food depositor

machine that dispenses a food product in a predetermined volume or shape

3.1.4

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

3.1.5

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.

3.1.6

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.

3.1.7

rise and fall mechanism

mechanism used to raise and lower a product dispensing valve to suit a particular container or dispensing requirement

3.1.8

rotary valve

valve that incorporates a rotating element. The cross-section of the rotating element can be cylindrical, star shaped or D shaped

3.1.9

D – valve

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

3.2 Types of food depositor

This standard identifies five different types of food depositor.

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

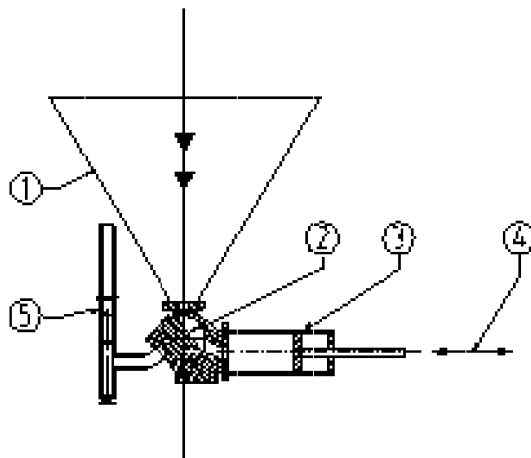


Figure 1 — Piston depositor

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

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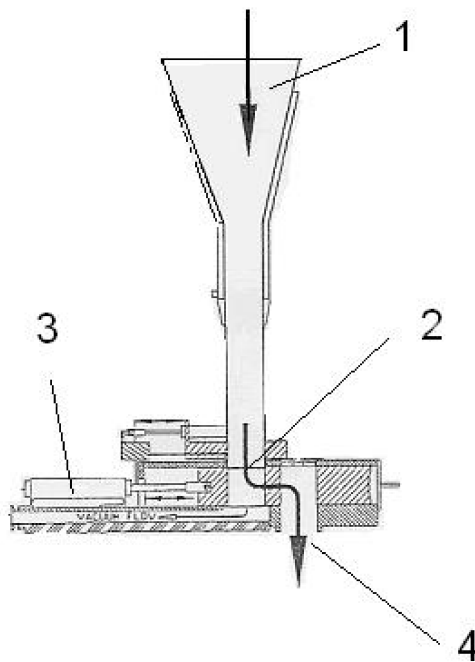


Figure 2 — Chamber depositor

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.

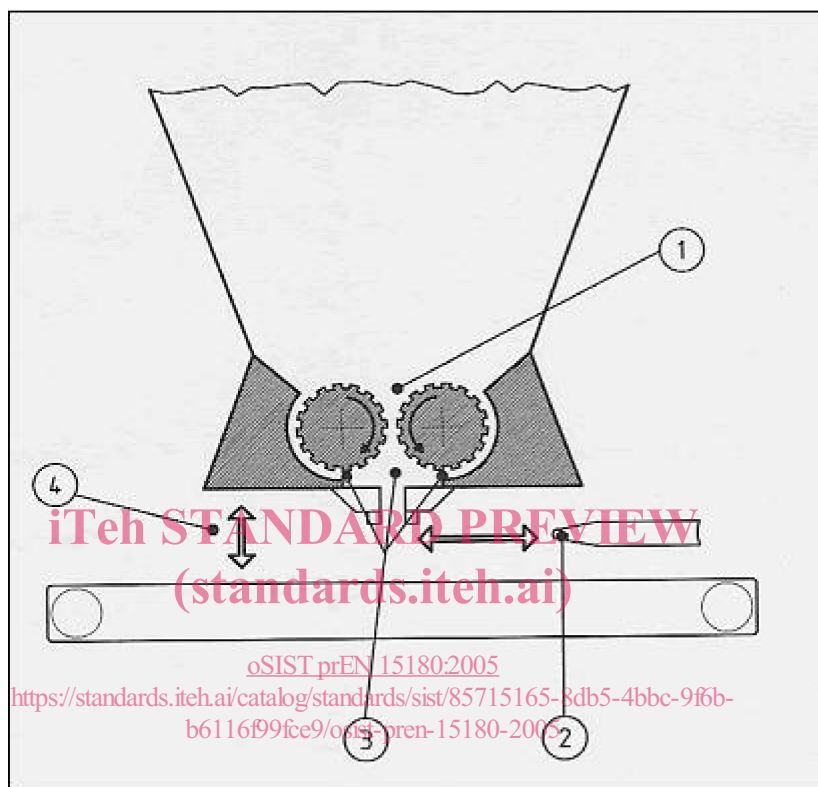


Figure 3 — Roller depositor

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 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

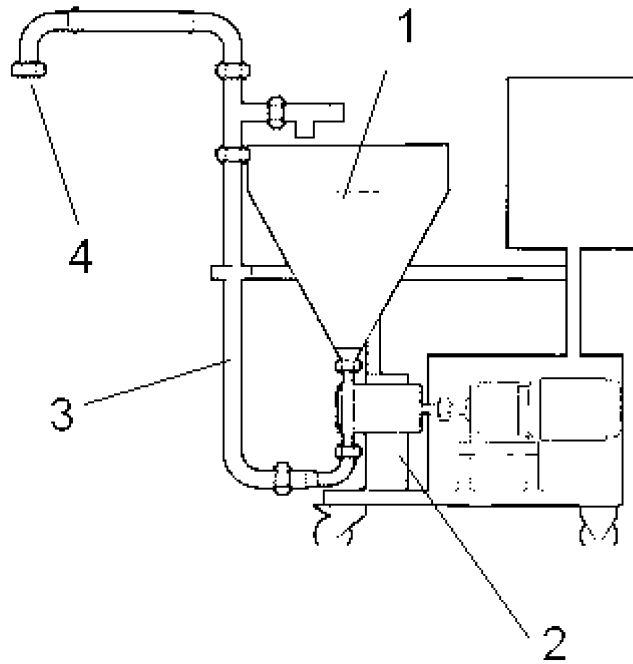


Figure 4 — Pump depositor

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

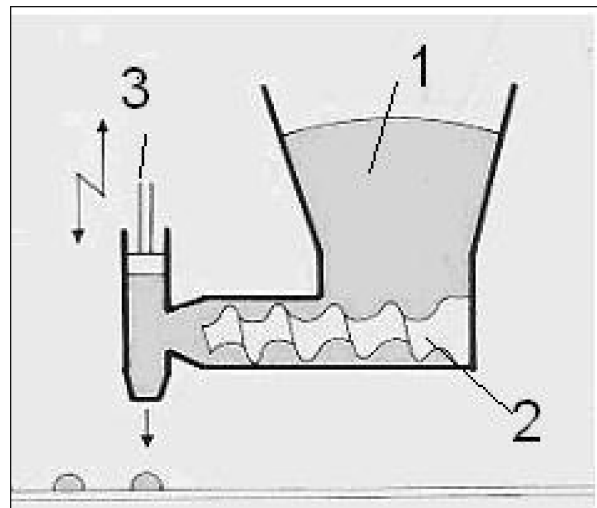


Figure 5 —Screw Depositor

4 List of hazards

This clause lists all the significant hazards, hazardous situations and events that can be found on typical food depositors and their associated equipment.

Before using this standard, the manufacturer shall establish that the hazards on his machine correspond to the hazards described in this standard.

If the manufacturer identifies hazards that are not listed in this clause, he shall assess these hazards by using the principles detailed in EN 1050.

The hazards on a particular food depositor can vary depending on the product being deposited and any ancillary equipment that may be supplied with the machine.

The hazards that occur on most food depositors are listed in 4.1 and the hazards that are specific to particular types of food depositor are listed in clauses 4.2 to 4.6.

4.1 General food depositor hazards

The following hazards occur on most food depositors.

4.1.1 Mechanical hazards

4.1.1.1 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.

4.1.1.2 Risks that may arise from hygienic design features

4.1.1.2.1 Use of quick release fixings

On food depositors quick release fixings that can be undone without the use of tools, are frequently fitted so that machines can be dismantled for cleaning. A risk may arise if quick release fittings allow access to danger zones.

4.1.1.2.2 Cleaning space under machines

There is a risk from danger zones on food depositors, when operators kneel on the floor and reach under guards to clean the machine or the floor under the machine when it is in motion. This risk is increased if an open design structure has been used to allow food to fall freely through the machine's mechanisms onto the floor.

4.1.1.2.3 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.

4.1.1.3 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.