



DPC: 21/30430839 DC

BSI Group Headquarters

389 Chiswick High Road London W4 4AL

Tel: +44 (0)20 8996 9000

Fax: +44 (0)20 8996 7400

www.bsigroup.com

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Interested committees:

Title: Draft BS EN 15180 Food processing machinery - Food depositors - Safety and hygiene requirements.

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Introduction

This draft standard is based on national and international discussions. Your comments on this draft are invited and will assist in the preparation of the consequent standard.

For international standards, comments will be reviewed by the relevant UK national committee before sending the consensus UK vote and comments to the international committee, which will then decide appropriate action. If the international standard is approved, it is usual for the text to be published as a British Standard.

For national standards, comments will be reviewed by the relevant UK national committee and the resulting standards published as a British Standard.

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Please indicate whether you consider the UK should submit a negative (with supporting technical reasons) or positive vote on this draft. Please indicate if you are aware of any reason why this draft standard should not be published as a British Standard.

Submission of Comments

- **Annotated drafts are not acceptable and will be rejected.**
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Template for comments and secretariat observations

Date: xx/xx/20xx	Document: ISO/DIS xxxx
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1	2	(3)	4	5	(6)	7
MB	Clause No./ Subclause No./Annex (e.g. 3.1)	Paragraph/Figure/ Table/Note	Type of comment	Commend (justification for change) by the MB	Proposed change by the MB	Secretariat observations on each comment submitted
	3.1	Definition 1	ed	Definition is ambiguous and needs clarifying.	Amend to read '...so that the mains connector to which no connection...'	
	6.4	Paragraph 2	te	The use of the UV photometer as an alternative cannot be supported as serious problems have been encountered in its use in the UK.	Delete reference to UV photometer.	

English Version

Food processing machinery - Food depositors - Safety and hygiene requirements

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

Nahrungsmittelmaschinen -
Nahrungsmittelportioniermaschinen - Sicherheits- und
Hygieneanforderungen

This draft European Standard is submitted to CEN members for enquiry. It has been drawn up by the Technical Committee CEN/TC 153.

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.

This draft European Standard was established by CEN in three official versions (English, French, German). A version in any other language made by translation under the responsibility of a CEN member into its own language and notified to the CEN-CENELEC Management Centre has the same status as the official versions.

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Recipients of this draft are invited to submit, with their comments, notification of any relevant patent rights of which they are aware and to provide supporting documentation.

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

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European foreword

This document (prEN 15180:2021) 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 will supersede EN 15180:2014.

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.

In comparison with the previous edition, the following technical modifications have been made:

- a) Normative references have been changed to reflect the changes that have been made to B1- and B2- standards.
- b) The structure of the standard has been changed so it complies with CEN Guide 414:2017.
- c) Annex ZA has been revised so it complies with CEN Guide 414:2017.

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.

This document is of relevance, in particular, for the following stakeholder groups representing the market players with regard to machinery safety:

- machine manufacturers (small, medium and large enterprises);
- health and safety bodies (regulators, accident prevention organizations, market surveillance etc.).

Others can be affected by the level of machinery safety achieved with the means of the document by the above-mentioned stakeholder groups:

- machine users/employers (small, medium and large enterprises);
- machine users/employees (e. g. trade unions, organizations for people with special needs);
- service providers, e. g. for maintenance (small, medium and large enterprises);

The above-mentioned stakeholder groups have been given the possibility to participate at the drafting process of this document.

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

When requirements of this type-C standard are different from those which are stated in type-A or type-B standards, the requirements of this type-C standard take precedence over the requirements of the other standards for machines that have been designed and built according to the requirements of this type-C standard.

1 Scope

1.1 General

This document deals with all significant hazards, hazardous situations and events relevant to food depositors as listed in 1.2 and the equipment typically integrated 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 Annex B).

This document deals with the significant hazards, hazardous situations and events during transport, assembly and installation, commissioning, use, decommissioning, disabling, dismantling and scrapping.

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

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

This document 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;
- automatic dough dividers, safety requirements for these machines are contained in EN 12042;
- filling machines for sausages, safety requirements for these machines are contained in EN 12463;
- mincing machines, safety requirements for these machines are contained in EN 12331;
- food depositors that are powered exclusively by manual effort.

This document does not deal with the following hazards:

- hazards related to the use of food depositors in a potentially explosive atmosphere;
- hazards that may arise from using a food depositor to deposit a non-food product.

This document is not applicable to food depositors that were manufactured before the date of its publication as a European Standard.

1.2 Types of food depositors

1.2.1 General

This document deals with five different types of food depositor. The component parts of each of the different types of depositor are labelled in the figures shown in Clause 4 of this document.

1.2.2 Piston depositor

A piston depositor 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 shows the typical cross section of a piston depositor.

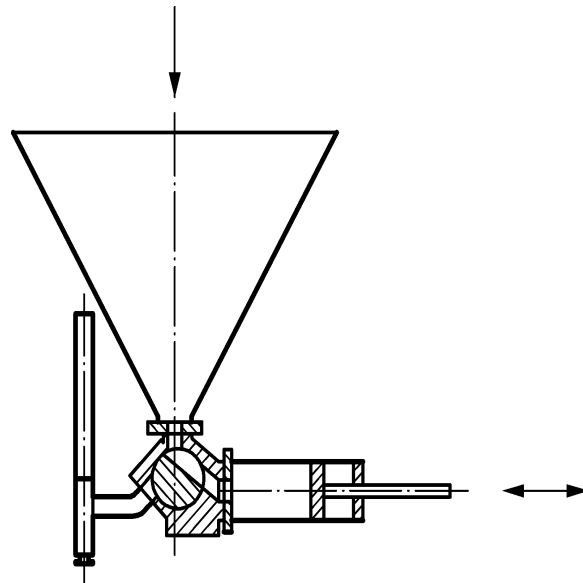


Figure 1 — Piston depositor

1.2.3 Chamber depositor

A chamber depositor 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 product 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 shows the typical cross section of a chamber depositor.

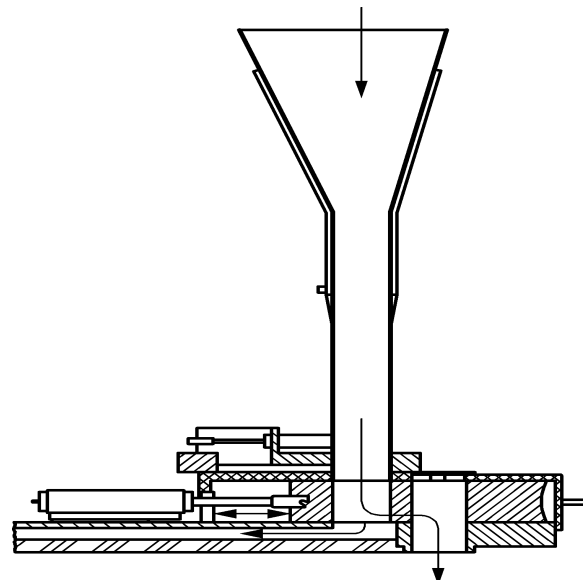


Figure 2 — Chamber depositor

1.2.4 Roller depositor

A roller depositor 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 shows the typical cross section of a roller depositor.

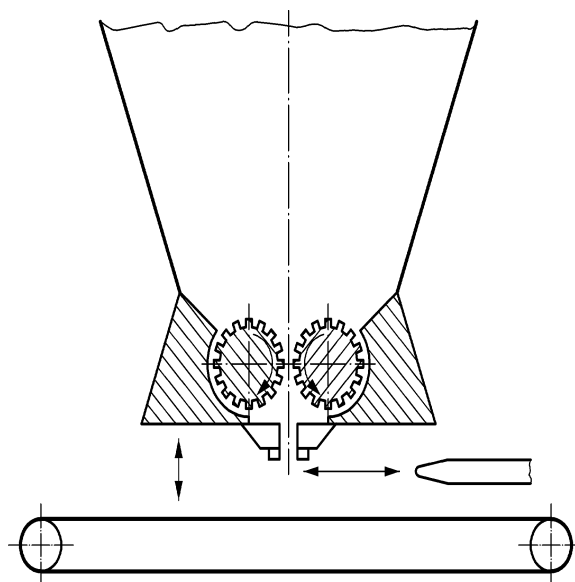


Figure 3 — Roller depositor

1.2.5 Pump depositor

A pump depositor 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 synchronization 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 shows the typical cross section of a pump depositor.

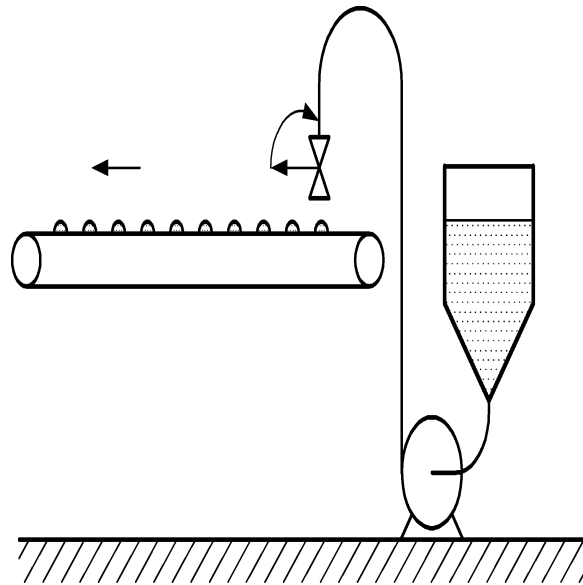


Figure 4 — Pump depositor

1.2.6 Screw depositor

A screw depositor 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 shows the typical cross section of a screw depositor.

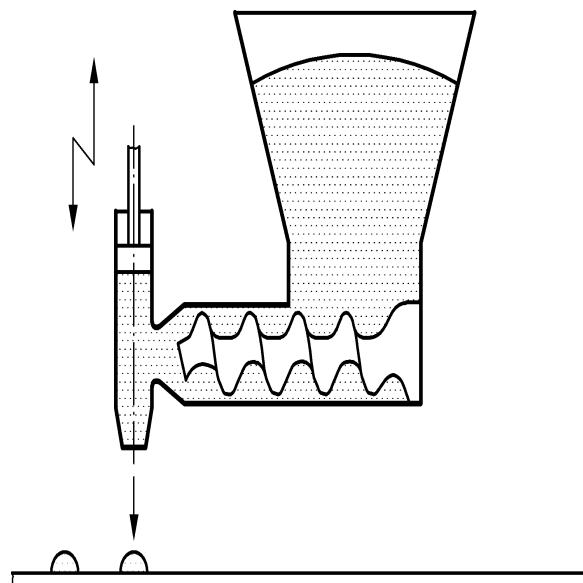


Figure 5 — Screw depositor

2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements 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 618:2002+A1:2010, *Continuous handling equipment and systems — Safety and EMC requirements for equipment for mechanical handling of bulk materials except fixed belt conveyors*

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 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 — Part 3: Control actuators*

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

EN 1672-2:2020, *Food processing machinery — Basic concepts — Part 2: Hygiene and cleanability requirements*

EN 60204-1:2018, *Safety of machinery — Electrical equipment of machines — Part 1: General requirements (IEC 60204-1:2016, modified)*

EN 60529:1991¹⁾, *Degrees of protection provided by enclosures (IP Code) (IEC 60529:1989)*

EN 61310-1:2008, *Safety of machinery — Indication, marking and actuation — Part 1: Requirements for visual, acoustic 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 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 4413:2010, *Hydraulic fluid power — General rules and safety requirements for systems and their components (ISO 4413:2010)*

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

1) As impacted by EN 60529:1991/A1:2000 and EN 60529:1991/A2:2013.

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

EN ISO 7010:2020, *Graphical symbols — Safety colours and safety signs — Registered safety signs (ISO 7010:2019)*

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 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 13849-1:2015, *Safety of machinery — Safety-related parts of control systems — Part 1: General principles for design (ISO 13849-1:2015)*

EN ISO 13850:2015, *Safety of machinery — Emergency stop function — Principles for design (ISO 13850:2015)*

EN ISO 13851:2019, *Safety of machinery — Two-hand control devices, principles for design and selection (ISO 13851:2019)*

EN ISO 13854:2019, *Safety of machinery — Minimum gaps to avoid crushing of parts of the human body (ISO 13854:2017)*

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 13857:2019, *Safety of machinery — Safety distances to prevent hazard zones being reached by upper and lower limbs (ISO 13857:2019)*

EN ISO 14118:2018, *Safety of machinery — Prevention of unexpected start-up (ISO 14118:2017)*

EN ISO 14119:2013, *Safety of machinery — Interlocking devices associated with guards — Principles for design and selection (ISO 14119:2013)*

EN ISO 14120:2015, *Safety of machinery – Guards – General requirements for the design and construction of fixed and moveable guards (ISO 14120:2015)*

EN ISO 14122-1:2016, *Safety of machinery — Permanent means of access to machinery — Part 1: Choice of fixed means and general requirements of access (ISO 14122-1:2016)*

EN ISO 14122-2:2016, *Safety of machinery — Permanent means of access to machinery — Part 2: Working platforms and walkways (ISO 14122-2:2016)*

EN ISO 14122-3:2016, *Safety of machinery — Permanent means of access to machinery — Part 3: Stairs, stepladders and guard-rails (ISO 14122-3:2016)*

3 Terms and definitions

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

ISO and IEC maintain terminological databases for use in standardization at the following addresses:

- IEC Electropedia: available at <http://www.electropedia.org/>
- ISO Online browsing platform: available at <https://www.iso.org/obp>

3.1

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

3.2

food depositor

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

3.3

product cutting device

mechanism that separates portions of food from a bulk supply of product

Note 1 to entry: Typical devices include rotary valves, wire-cut mechanisms, shear blades and iris valves.

3.4

product dispensing device

mechanism that controls the flow of product at the point of product delivery

Note 1 to entry: Typical devices include rotary valves, seating valves and slide valves.

3.5

product measuring chamber

chamber that is filled with product to measure out a predetermined volume of product and that will typically incorporate a mechanism that allows the volume of the chamber to be varied so that the volume of product dispensed can be changed

3.6

rise and fall mechanism

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

3.7

D-valve

rotary valve with a rotating element, which has a D-shaped cross-section (see Figure 1), used in a piston depositor to move product from the hopper to the product measuring chamber and from the product measuring chamber to the product dispensing valve

3.8

work cycle

single cycle of the measuring chamber of the dispensing valve

4 Safety requirements

4.1 General

All the machines in the scope of this document shall comply with the safety requirements and protective or risk reduction measures in 4.2 and the relevant machine specific measures in 4.3 to 4.7.

4.2 General requirements for food depositors

4.2.1 Introduction

The following requirements apply to all food depositors in the scope of this document where the equivalent hazard exists.

4.2.2 Requirements to eliminate mechanical hazards

4.2.2.1 Safeguarding of moving parts

4.2.2.1.1 Safety by design

Moving parts can be considered to be safe by design provided the parts are smooth, the force exerted by the moving parts does not exceed 75 N, the pressure they exert against the part of the body most likely to be in contact with the mechanism is less than 25 N/cm² and their energy is less than 4 J. If the hazardous movement is automatically reversed within 1 s when resistance is detected, the movement can be considered as safe provided the force does not exceed 150 N, the pressure does not exceed 50 N/cm² and the energy is less than 10 J.

Some crushing hazards from moving parts can also be made safe by design by ensuring sufficient distance between moving and fixed parts and between one moving part and another part using the dimensions indicated in EN ISO 13854:2019.

4.2.2.1.2 Fixed and interlocked guards

Moving parts which cannot be made safe by design shall be safeguarded by fixed or interlocked enclosing guards complying with EN ISO 14120:2015 and dimensioned using EN ISO 13857:2019, Table 3, Table 4 and Table 6. Where distance guards are used they shall be dimensioned and positioned in accordance with EN ISO 13857:2019, Table 2, but shall be at least 1 600 mm high. Where it is foreseeable that someone will try to put their feet into a machine, e.g. because it is next to an access platform, guards shall be dimensioned and positioned in accordance with EN ISO 13857:2019, Table 7, and any other relevant tables of EN ISO 13857:2019.

4.2.2.1.3 Openings in guards

Openings in guards shall be positioned or dimensioned to prevent access to hazard zones within the machine when standing on the floor or access level and reaching into the opening.

The minimum reach distance to the nearest hazard zone through the opening shall comply with EN ISO 13857:2019, Table 3, Table 4, and Table 6.

4.2.2.1.4 Interlocking devices associated with guards

Moveable guards shall be interlocked with devices that comply with EN ISO 14119:2013, 4.2 and 4.3. The requirements of EN ISO 14119:2013, Clauses 5, 7 and 8, shall be satisfied.

The design of the control system shall ensure that hazardous mechanisms, that can be reached by the operator shall stop within 1,0 s of an interlocking guard without guard locking being opened. Where this cannot be achieved, the guard shall be fitted with a guard locking device that prevents the guard from being opened until the hazardous movement has stopped.