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Stroji za predelavo hrane - Dvigalniki in zvračalniki za posode - Varnostne in higienske zahteve

Food processing machinery - Bowl lifting and tilting machines - Safety and hygiene requirements

Nahrungsmittelmaschinen - Hub- und Kippeinrichtungen für Bottiche - Sicherheits- und Hygieneanforderungen

Machines pour les produits alimentaires - Élévateurs/basculeurs de cuve - Prescriptions relatives à la sécurité et à l'hygiène

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Food processing machinery - Bowl lifting and tilting machines - Safety and hygiene requirements

Machines pour les produits alimentaires - Élévateurs/basculeurs de cuve - Prescriptions relatives à la sécurité et à l'hygiène

Nahrungsmittelmaschinen - Hub- und Kippeinrichtungen für Bottiche - Sicherheits- und Hygieneanforderungen

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European foreword

This document (prEN 13288:2021) 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 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.

The signification modification regarding the previous version, EN 13288:2005+A1:2009, are the following:

- normative references were updated;
- new informative annex relating to updated list of significant hazards;
- all safety requirements were updated;
- list of verification was updated;
- Annex ZA was updated regarding requests of the European Commission on Machinery Directive (2006/42/EC).

Introduction

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

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 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 This document specifies safety and hygiene requirements for the design, installation, operation and maintenance of lifting and tilting machines used in bakeries and pastry shops for lifting and/or tilting a container or a machine with non-removable bowl containing dough or pastry foodstuff and for tipping the contents.

The lifting and tilting machines can be stationary or movable and are designed for products (e.g. mixtures of flour, water and other ingredients) or raw material (e.g. flour, mixtures etc.).

This document deals with the significant hazards, hazardous situations and events relevant to lifting and tilting machines, when they are used as intended and under conditions of misuse which are reasonably foreseeable by the manufacturer (see Annex B).

1.2 This document does not deal with the hazards due to the mixing or other function of the bowl (for dough mixers see EN 453:2014 and for planetary mixers see EN 454:2014).

This document does not deal with specific hazards associated to the properties of the foodstuff (except the mass).

The following machines are excluded:

- experimental and testing machines under development by the manufacturer;
- domestic appliances;
- motorized driven mobile equipment;
- lift trucks;
- automatic devices working in automatic production lines (where the initiation of the movement is not due to a human action).

In case of a movable machine, this document does not deal with:

- hazards due to transportation of bowls with the machine;
- hazards due to the displacement of the machine on its own wheels;
- powered equipment that may be provided to assist the mobility of mobile bowl lifting and tilting machine.

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

This document does not deal with any specific requirements on noise emitted from lifting and tilting machines as the generated noise does not cause a relevant hazard.

This document is not applicable to lifting and tilting machines for bakery which have been manufactured before the date of publication of this document by CEN.

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

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 60204:2005, modified)*

EN 60529:1991,[1] *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*

EN ISO 4287:1998,[2] *Geometrical Product Specifications (GPS) — Surface texture: profile method — Terms, definitions and surface texture parameters (ISO 4287:1997)*

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)*

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

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 13849-2:2012, *Safety of machinery — Safety-related parts of control systems — Part 2: Validation (ISO 13849-2:2012)*

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)*

[1] As impacted by EN 60529:1991/A1:2000, EN 60529:1991/A2:2013, EN 60529:1991/corrigendum May 1993, EN 60529:1991/A2:2013/AC:2019-02 and EN 60529:1991/AC:2016-12.
[2] As impacted by EN ISO 4287:1998/AC:2008 and EN ISO 4287:1998/A1:2009.

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 movable guards (ISO 14120:2015)*

3 Terms, definitions 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.

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

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

3.1.1
bowl
any container and its trolley (if applicable) or an entire mixing machine (mixer)

3.1.2
lifting system
device for the ascending and descending of the bowl

3.1.3
tilting system
device for inclining and discharging of the bowl

Note 1 to entry: In some case, the tilting movement can be included in the ascending movement.

3.1.4
bowl locking device
grip and hold device which keeps the bowl in a safe position before lifting and during lifting, tilting and descending of the bowl

3.1.5
distance guard
guard which does not completely enclose a hazard zone, but which prevents or reduces access by virtue of its dimensions and its distance from the hazard zone, for example perimeter fence or tunnel guard

Note 1 to entry: A distance guard can be partially or fully surrounding.

[SOURCE: EN ISO 14120:2015, 3.2.2]

3.1.6
functional automatic stop
stop command given by functional control position device at the end of the stroke

3.1.7
mechanical stop
mechanical obstacle (for example wedge, spindle, strut, scotch) which, by virtue of its own strength, can prevent any hazardous movement

[SOURCE: Adapted from EN ISO 12100:2010, 3.28.7]

3.1.8
safety automatic stop
safety device providing a stop command which prevents the bowl support from reaching the mechanical stop

[SOURCE: Adapted from EN ISO 12100:2010, 3.28.8]

3.1.9
stopping time
time interval between the actuation of the sensing function and the termination of the hazardous machine function

[SOURCE: EN ISO 13855:2010, 3.1.2, modified]

3.1.10
positive mechanical action
positive mechanical action is achieved when a moving mechanical component inevitably moves another component along with it through rigid elements which are connected together mechanically

[SOURCE: EN ISO 12100:2010, 6.2.5, modified]

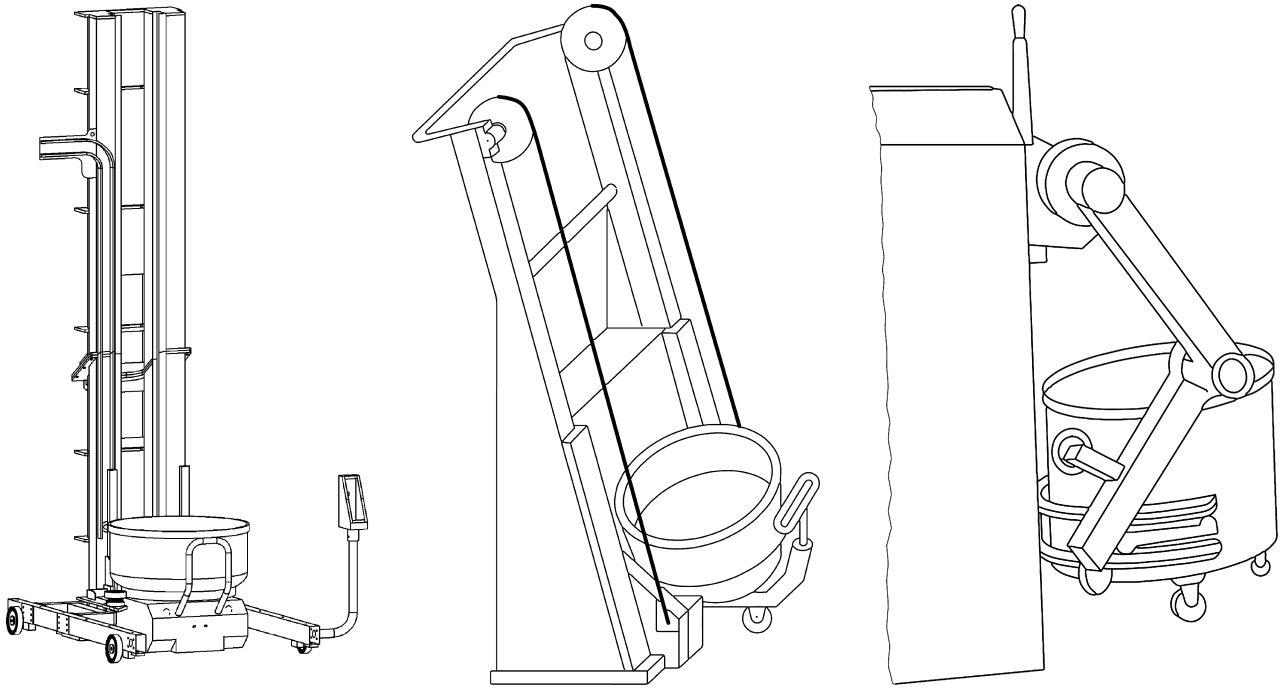
3.2 Description

3.2.1 General

Lifting and tilting machines include devices which lift and/or overturn an entire mixing machine (mixer) or a container (container: vessel containing the product; it can be e.g. a bowl, a tank, a skip, a trolley).

3.2.2 Type A: Lifting and tilting bowl

The bowl can be dismantled from the dough mixer (see examples in Figure 1).



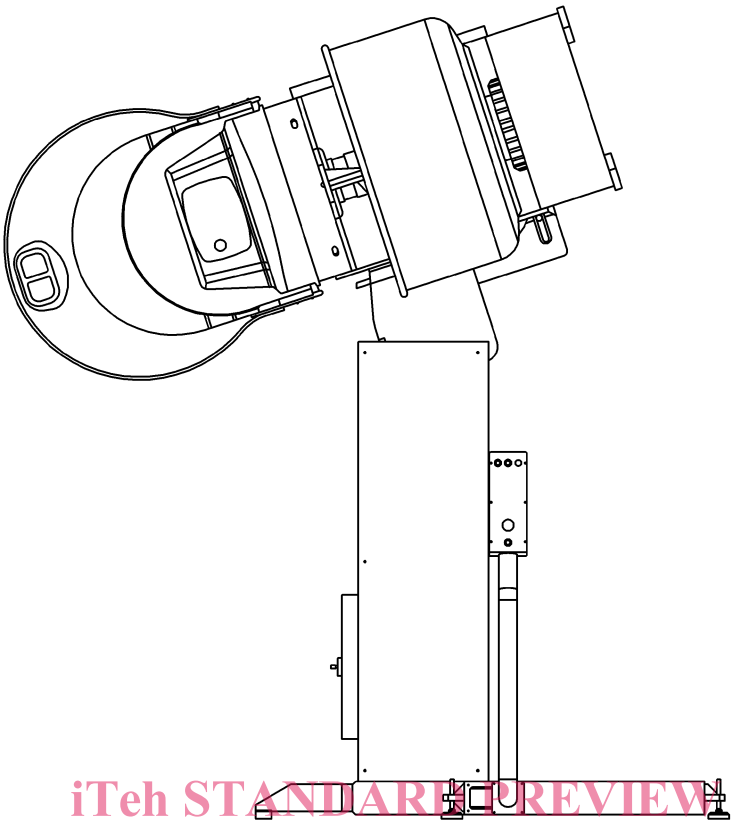
1a) Type A — Simple guide 1b) Type A — Double guide 1c) Type A — Articulated arm

Figure 1 — Examples of Type-A machine

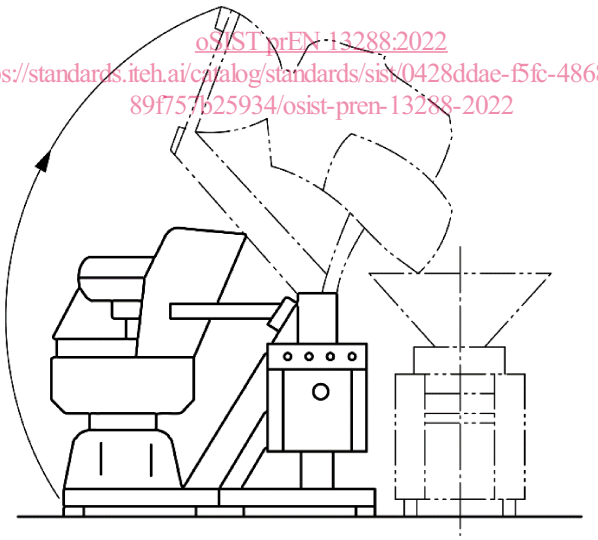
3.2.3 Type B: Lifting and tilting mixing machine

The mixing machine (usually dough mixer) is incorporated into the elevator and guided by a single or double, vertical or inclined mast or even by one or more articulated arms (see examples in Figure 2).

Raising or lowering may occur by a screw or chain or hydraulic or pneumatic lifting system.



2a) Type B — Mixing machine incorporated into simple guide elevator



2b) Type B — Mixing machine incorporated into articulated arm elevator

Figure 2 — Examples of Type-B machine

3.2.4 Type C: Tilting bowl

The bowl can be dismantled from the dough mixer and is located on a fork or platform. When the bowl is in position, the machine makes a rotation around a fixed axis (see example in Figure 3).

The device is driven mechanically or hydraulically or pneumatically.

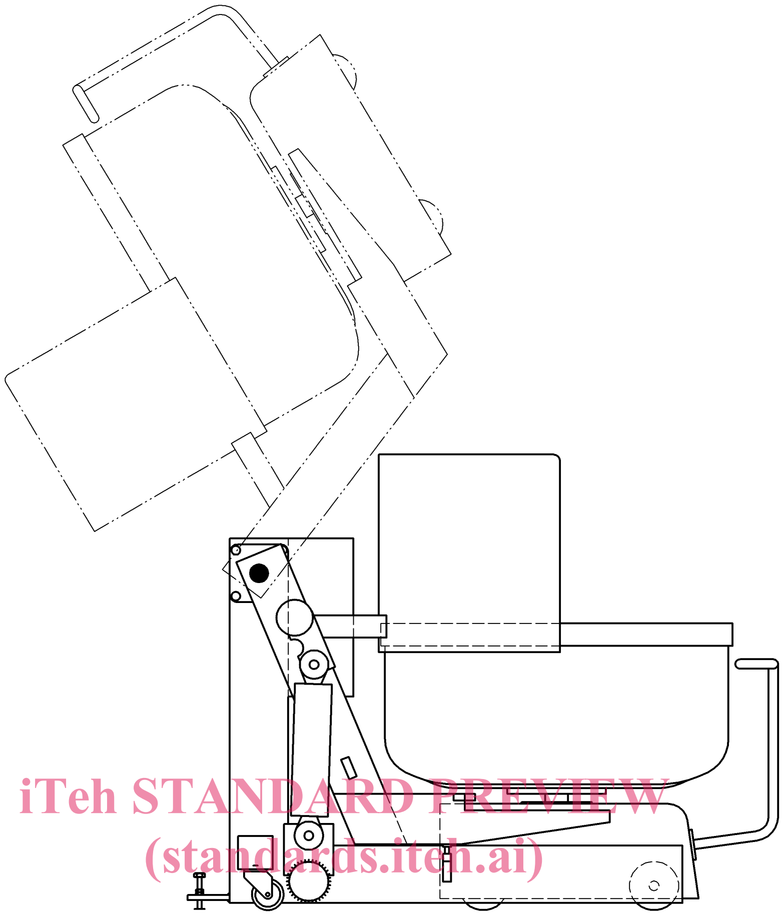


Figure 3 — Examples of Type-C machine

4 Safety and hygiene requirements and/or protective measures

4.1 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 12100:2010 for hazards relevant but not significant which are not dealt with by this document.

For hazards which are to be reduced by the application of type-B-standards such as EN ISO 13857:2019, EN ISO 13854:2019, EN ISO 13851:2019, EN 614-1:2006+A1:2009, EN ISO 14120:2015, EN ISO 4413:2010, EN ISO 4414:2010, EN ISO 14118:2018, EN ISO 14119:2013, EN 60204-1:2018, EN 60529:1991[2]), EN ISO 12100:2010 and EN ISO 13849-1:2015, the manufacturer shall carry out a risk assessment to establish the requirements of the type B-standard. This specific risk assessment shall be part of the general risk assessment of the machine.

4.2 Mechanical hazards

4.2.1 General

Every electrical control circuit with safety functions shall meet at least a performance level “c” defined in accordance with EN ISO 13849-1:2015, unless otherwise indicated. The validation of the performance level according to EN ISO 13849-1:2015, Clause 8, is not necessary, but the components of the safety circuits shall comply with EN ISO 13849-2:2012, Annexes A to D.