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Stroji za predelavo hrane - Stroji za sponkanje - Varnostne in higienske zahteve

Food processing machinery - Clipping machines - Safety and hygiene requirements

Nahrungsmittelmaschinen - Clipmaschinen - Sicherheits- und Hygieneanforderungen

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

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Food processing machinery - Clipping machines - Safety and hygiene requirements

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

Nahrungsmittelmaschinen - Clipmaschinen -
Sicherheits- und Hygieneanforderungen

This European Standard was approved by CEN on 13 June 2022.

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CEN-CENELEC Management Centre: Rue de la Science 23, B-1040 Brussels

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European foreword

This document (EN 13885:2022) 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of an identical text or by endorsement, at the latest by January 2023, and conflicting national standards shall be withdrawn at the latest by January 2023.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. CEN shall not be held responsible for identifying any or all such patent rights.

This document supersedes EN 13885:2005+A1:2010.

The significant changes with respect to the previous edition EN 13885:2005+A1:2010 are listed below:

- structure adapted to CEN Guide 414:2017;
- figures were improved, partly exchanged or newly inserted;
- Clause 1 Scope: simplified, the description of machine types has been integrated in Clause 3, technical features have been transformed into requirements;
- Clause 2 Normative references: completed and updated;
- Clause 3 Descriptions, terms and definitions: completed with descriptions and terms updated;
- Clause 4 Safety requirements: safety requirements were revised;
- Clause 5 Verification: adapted to the requirements of Clause 4;
- Clause 6 Information for use: improved and supplemented with references to the relevant clauses;
- Annex A Noise test code: updated;
- Annex B Design principles to ensure the cleanability: updated;
- Annex C Performance level required: added to give a quick-view summary of PLr for each safety function;
- Annex D List of significant hazards: contains the former Clause 4;
- Annex ZA Relationship to Directive 2006/42/EC: improved and updated.

This document has been prepared under a Standardization Request given to CEN by the European Commission and the European Free Trade Association, and supports essential requirements of EU Directive(s) / Regulation(s).

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

Any feedback and questions on this document should be directed to the users’ national standards body. A complete listing of these bodies can be found on the CEN website.

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

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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, 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);
- consumers (in case of machinery intended for use by consumers).

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 and 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. <https://standards.iteh.ai/catalog/standards/sist/fa503522-a30b-44c1-98fc-48a11140bd51/sist-en-13885-2022>

EN 13885:2022 (E)**1 Scope**

This document specifies safety and hygiene requirements of clipping machines (hereafter referred to as machine) for closing of casings filled with foodstuffs (hereafter referred to as product) by a clip deformed by a closing tool, and which are intended to be used in butcheries, meat processing factories, main kitchens and other food processing factories.

This document deals with all significant hazards, hazardous situations and hazardous events relevant to machinery when it is used as intended and under conditions of misuse which are reasonably foreseeable by the manufacturer (see Annex D).

This document does not cover any devices whose clip is exclusively formed manually.

This document is not applicable to clipping machines manufactured before the date of its publication.

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

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 1005-4:2005+A1:2008, *Safety of machinery - Human physical performance - Part 4: Evaluation of working postures and movements in relation to machinery*

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 61496-1:2013, *Safety of machinery - Electro-sensitive protective equipment - Part 1: General requirements and tests (IEC 61496-1:2012)*

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)*

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

EN ISO 4414:2010, *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 7010:2020, *Graphical symbols - Safety colours and safety signs - Registered safety signs (ISO 7010:2019, Corrected version 2020-06)*

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

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 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)*

EN ISO 21469:2006, *Safety of machinery - Lubricants with incidental product contact - Hygiene requirements (ISO 21469:2006)*

EN ISO 21920-2:2022, *Geometrical product specifications (GPS) - Surface texture: Profile - Part 2: Terms, definitions and surface texture parameters (ISO 21920-2:2021)*

EN 13885:2022 (E)**3 Terms, definitions and descriptions**

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 Terms and definitions**3.1.1****clipping machine**

machine for closing of casings filled with foodstuffs by using a clip

3.1.2**product**

clipped casing filled with foodstuff

3.1.3**infeed**

area where casing and foodstuff are fed to the closing zone

3.1.4**outfeed**

area where product leaves the closing zone

3.1.5**clip**

element for closing the gathering

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3.1.6**clip guide**

device for guiding the clip through the channel to the closure tool

3.1.7**casing**

flexible element for receiving the foodstuff

EXAMPLE Skins, tubular films, foil bags.

3.1.8**casing brake**

device for retaining and braking of the casing on the filling horn

3.1.9**thread dispenser****loop dispenser**

device which adds a means to the closing zone for hanging up the product

3.1.10**labelling device**

device which feeds a label tape to the closing zone

Note 1 to entry: Optionally, further information can be applied to the label during feeding, and the label can also be cut to length by a cutting device directly before setting the clip.

3.1.11**hanging device**

device which holds the product in the outfeed of the clipping machine, hangs it onto sticks and transports the filled sticks to the discharge station

3.1.12**casing sealing device**

device which is located between the inlet opening on the filling horn and the closing zone, which shapes a flat film tape into a tube and seals the longitudinal seal

3.1.13**gathering**

radial folding of the casing

3.1.14**loop**

fixed eye for hanging

3.1.15**removal**

device for gathering the casing and creating a foodstuff-free area for setting the clip

3.1.15.1**manual removal**

device for closing the removal by hand

Note 1 to entry: Only for semi-automatic machines.

3.1.15.2**powered removal**

device for closing the removal by means of a power unit

Note 1 to entry: For semi-automatic machines and automatic machines.

3.1.15.3**spread removal**

powered removal accompanied by axial spreading of the removal

Note 1 to entry: Only for automatic machines.

3.1.16**closure tool**

combination of punch and die

3.1.17**dividing knife**

powered knife for automatically cutting through the casing

EN 13885:2022 (E)**3.1.18****sleeve**

casing slipped axially onto the filling horn

3.1.19**closing zone**

space in which the closure tool, removal and, if applicable, the dividing knife are located

3.1.20**filling horn**

device for receiving the casing and feeding the foodstuff

3.1.21**rotor**

device with several filling horns

Note 1 to entry: One filling horn is in working position while the others are in a position suitable for taking the next sleeve. As soon as the sleeve of the filling horn that is currently in working position is nearly used up, then the next filling horn provided with a new sleeve can be turned into working position.

3.2 Descriptions

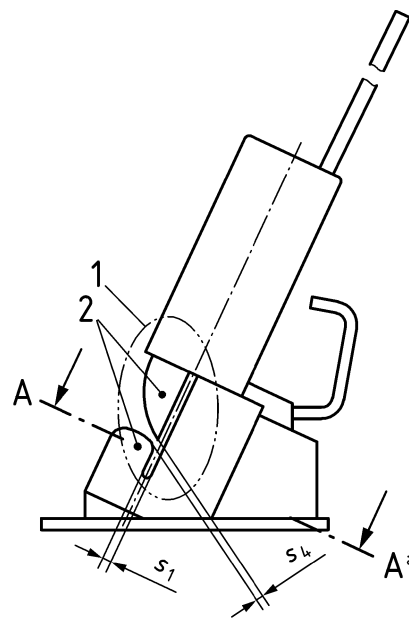
This clause describes the types of clipping machines, semi-automatic machine (see Figure 1 and Figure 2) and automatic machines (see Figure 3).

Clipping machines are used to close casings with a single clip (one side) or a double clip (end locking and start locking).

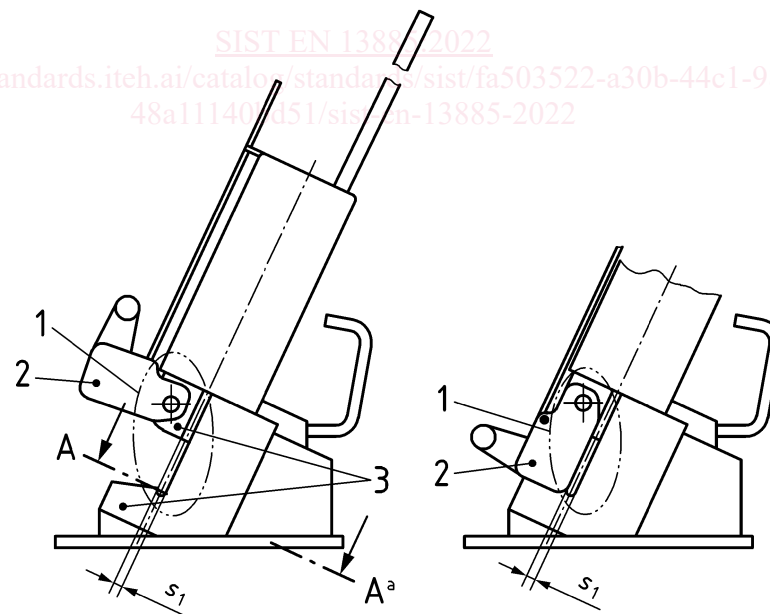
The machines are equipped with a closure tool, which creates the closure by deforming the clip.

On semi-automatic machines every closure operation is triggered by the action of an operator.

An automatic machine, once started, performs each further closure operation without manual intervention or start command.

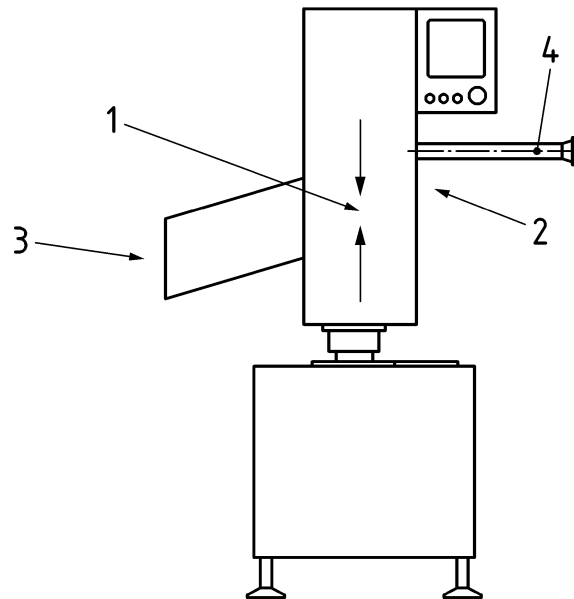
**Key**

1	closing zone	s_1	distance between the parts of the clip guide
2	fixed clip guide	s_4	width of the feed opening of the clip guide
a	cut A/A see Figure 4 and Figure 5		

Figure 1 — Example of a semi-automatic machine without removal**a) Removal open****b) Removal closed****Key**

1	closing zone	3	fixed part of clip guide
2	movable part of clip guide	s_1	distance between the parts of the clip guide
a	cut A/A see Figure 4 and Figure 5		

Figure 2 — Example of a semi-automatic machine with manual removal

**Key**

1	closing zone	3	outfeed
2	infeed	4	filling horn

Figure 3 — Example of an automatic machine

4 Safety requirements and/or protective reduction measures

4.1 General

Clipping machines 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 the EN ISO 12100:2010, Clause 4, for relevant but not significant hazards which are not dealt with by this document (e.g. sharp edges).

The interlocking devices associated with guards shall at least comply with EN ISO 14119:2013 Type 1, and shall not be positioned in the food area (e.g. inside the machine housing or another housing).

Machines safety functions are implemented and ensured through Safety-Related Parts of the Control System (SRP/CS) that shall achieve a required Performance Level (PL_r) in accordance with EN ISO 13849-1:2015. This requirement is given for each safety function in the relevant subclauses of Clause 4.

Table C.1 summarizes PL_r for each safety function; however, the provisions of Clause 4 remain the sole and complete normative set of requirements and explanations.

The maximum forces which can act on body parts shall not exceed the values stated in Table 1.

Table 1 — Maximum forces on body parts (biomechanical limit values)

	Quasi static contact (clamping)		Transient contact (free impact) ^a	
	Peak pressure [N/cm ²]	Force [N]	Peak pressure [N/cm ²]	Force [N]
Lower arm and wrist	180	160	360	320
Hand and finger	190	140	380	280
Skull and forehead	110	130	not applicable	not applicable
Neck	140	150	280	300
NOTE The values in the table have been defined according to ISO/TS 15066:2016.				
^a The transient contact is based on a maximum action duration of 0,5 s.				

On clipping machines, a normal stop device shall be provided on each workstation to stop the machine. The normal stop device requires a performance level PL_r of at least “c” in accordance with EN ISO 13849-1:2015. The stopping function of the normal stop device shall be in accordance with EN 60204-1:2018, 9.2.2, Category 0.

When power is recovered or when the power supply is switched on, restarting of the machine shall be prevented.

4.2 Mechanical hazards

4.2.1 Closing zone

4.2.1.1 General

This clause deals with the different types of displacement in order to enable the setting of the clip.

4.2.1.2 Semi-automatic machines

4.2.1.2.1 General

On semi-automatic machines there exists a crushing hazard for fingers caused by the closure tool and severing hazard for fingers due to the movement of the dividing knife.

Access to the danger point shall be prevented or secured:

- at a distance $s_1 \leq 8$ mm by the dimensions $x \geq 2$ mm and $y \geq 5$ mm (see Figure 4);
- at a distance $s_1 > 8$ mm by the dimensions $x \geq 2$ mm, $y \geq 5$ mm $s_2 \leq 8$ mm and $s_3 \leq 15$ mm (see Figure 5).