SLOVENSKI STANDARD
SIST EN 12331:2004

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Stroji za predelavo hrane – Stroji za mletje mesa – Varnostne in higienske zahteve

Food processing machinery - Mincing machines - Safety and hygiene requirements

Nahrungsmittelmaschinen - Wölfe - Sicherheits- und Hygieneanforderungen

Machines pour les produits alimentaires - Hachoirs - Prescriptions relatives a la sécurité et a l'hygiene

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Food processing machinery - Mincing machines - Safety and hygiene requirements

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

Nahrungsmittelmaschinen - Wölfe - Sicherheits- und Hygieneanforderungen

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Foreword

This document (EN 12331:2003) has been prepared by Technical Committee CEN/TC 153 “Food processing machinery – Safety and hygiene specifications”, the secretariat of which is held by DIN.

This standard has been prepared by Working Group 2 "Meat Processing Machinery" of CEN/TC 153.

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of an identical text or by endorsement, at the latest by June 2004, and conflicting national standards shall be withdrawn at the latest by June 2004.

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 EC Directive(s).

For relationship with EC Directives, see informative annex ZA, which is an integral part of this document.

It is one of a series of standards, which have been prepared for machines and equipment for meat processing in accordance with EN 1672-2 and annex C.

Annexes A, B and C are normative parts.

This European Standard also contains a Bibliography.

According to the CEN/CENELEC Internal Regulations, the national standards organizations of the following countries are bound to implement this European Standard: Austria, Belgium, Czech Republic, Denmark, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Luxembourg, Malta, Netherlands, Norway, Portugal, Slovakia, Spain, Sweden, Switzerland and the United Kingdom.

0 Introduction

This standard covers

— mincing machines used in shops and preparation rooms,

— mincing machines used in kitchens where sausages are prepared,

— mincing machines used industrially,

and accessories.

The extent to which hazards are covered is indicated in this standard. For other hazards which are not covered by this standard, machinery should comply with EN 292 where applicable.

1 Scope

1.1 This European Standard specifies requirements for the design and manufacture of mincing machines (see Figures 1 and 2) used in a stationary position.

The machines covered by this standard are used for size reduction of fresh or frozen meat, meat products and fish by cutting in a set of cutting tools.

Mincing machines for domestic uses are not included in this standard. Filling mincers are covered by prEN 12463 "Food processing machinery - Filling machines and auxiliary machines - Safety and hygiene requirements".

This standard applies only to machines that are manufactured after the date of issue of this standard.

Mincing machines in connection with using a hold to run foot switch are not covered by this standard.

1.2 This standard covers the following types:

— Mincing machine with tray, feed intake and pusher, diameter ≤ 52 mm on feed intake (see Figure 5)

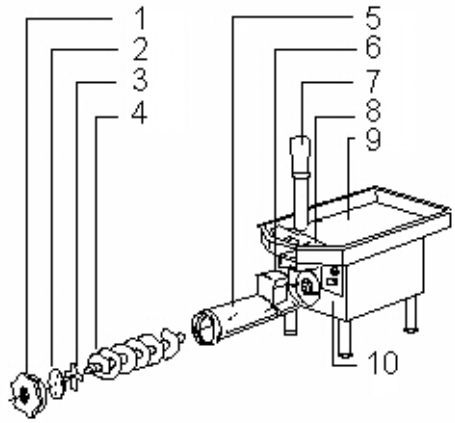
— Mincing machine with tray, feed intake, restrictor plate and pusher, diameter > 52 mm on feed intake (see Figure 6)

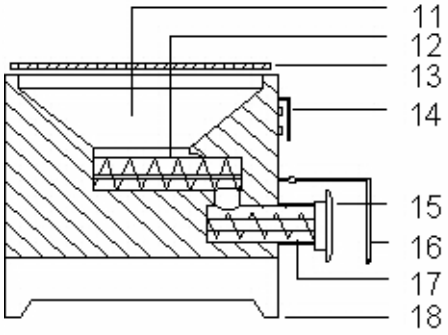
— Mincing machine with feed intake hopper and cover, screw conveyor, with[1)] or without mixing screw in feed intake hopper (see Figure 7)

— Mincing machine with feed intake hopper, with or without cover, screw conveyor, with[1)] or without mixing screw in feed intake hopper, with loading device (continuously or discontinuously)

Mincing machines comprise a machine base, a worm casing with a worm, a feed intake tray or hopper, a screw conveyor (and sometimes an additional mixing screw in the feed intake hopper), a set of cutting tools, a lock nut, a loading device, a drive motor and, depending on machine type, electrical, hydraulic and pneumatic components. They will also have various safeguarding devices as examples in clause 5.

[1)] In this case, the draft standard prEN 13570 „Food processing machinery - Mixers and mixing machines - Safety and hygiene requirements“ should be taken into consideration





Key

1	LOCK NUT	6	FEED INTAKE	11	FEED INTAKE	15	LOCK NUT
2	HOLE PLATE	7	PUSHER	12	HOPPER	16	PROTECTIVE HOOD
3-	BLADE	8	RESTRICTOR PLATE	13	SCREW CONVEYOR	17	WORM
4	WORM	9	TRAY	14	COVER	18	MACHINE RACK
5	WORM CASING	10	ON/OFF SWITCH PROTECTIVE HOOD		ON/OFF SWITCH PROTECTIVE HOOD		

Figure 1 — Arrangement of a mincing machine with tray and restrictor plate

Figure 2 — Arrangement of a mincing machine with feed intake hopper, cover and screw conveyor

Mincing machines may be equipped e.g. with

- an extraction claw,
- an ejector or extractor,
- a protective hood over the discharge outlet,
- a cover over the inlet opening of the feed intake hopper,
- a transport carriage for the lock nut, the set of cutting tools, the worm and the screw conveyor,
- a lifting device for the lock nut, the set of cutting tools, the worm and the screw conveyor,
- a loading device.

1.3 Intended use

The fresh or frozen meat, meat product or the fish is fed manually or by means of the loading device into the mincing machine. The product is fed to the worm either by means of a pusher or a screw conveyor and size reduced in the set of cutting tools.

It is not intended that mincing machines are cleaned with pressurized water. However, it is to be foreseen that it is difficult to guarantee that this method will never be used in practice. In order to deal with this eventuality, the requirements of 5.3.3.2 should apply.

Intended use is defined in 3.12 of EN 292-1:1991.

2 Normative references

This European Standard incorporates by dated or undated reference, provisions from other publications. These normative references are cited at the appropriate places in the text, and the publications are listed hereafter. For dated references, subsequent amendments to or revisions of any of these publications apply to this European Standard only when incorporated in it by amendment or revision. For undated references the latest edition of the publication referred to applies (including amendments).

EN 292-1:1991*, Safety of machinery - Basic concepts, general principles for design - Part 1: Basic terminology, methodology.*

EN 292-2, *Safety of machinery - Basic concepts, general principles for design - Part 2: Technical principles and specifications.*

EN 292-2:1991+ A1:1995*, Safety of machinery - Basic concepts, general principles for design - Part 2: Technical principles and specifications.*

EN 294:1992, *Safety of machinery - Safety distance to prevent danger zones being reached by the upper limbs.*

EN 349, *Safety of machinery - Minimum gaps to avoid crushing of parts of the human body.*

EN 614-1*, Safety of machinery - Ergonomic design principles - Part 1: Terminology and general principles.*

EN 953:1997, *Safety of machinery - Guards - General requirements for the design and construction of fixed and movable guards.*

EN 954-1:1996, *Safety of machinery - Safety-related parts of control systems - Part 1: General principles for design.*

EN 1005-1, *Safety of machinery - Human physical performance - Part 1: Terms and definitions.*

EN 1005-2, *Safety of machinery - Human physical performance - Part 2: Manual handling of machinery and component parts of machinery.*

EN 1005-3 *Safety of machinery - Human physical performance - Part 3: Recommended force limits for machinery operation.*

EN 1070:1998, *Safety of machinery – Terminology.*

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.*

EN 60204-1:1997, *Safety of machinery - Electrical equipment of machines - Part 1: General requirements (IEC 60204-1:1997).*

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

EN 61000-6-1, *Electromagnetic compatibility (EMC) - Part 6-1: Generic standards - Immunity for residential, commercial and light-industrial environments (IEC 61000-6-1:1997, modified).*

EN 61000-6-2*, Electromagnetic compatibility (EMC) - Part 6-2: Generic standards - Immunity for industrial environments (IEC 61000-6-2:1999, modified).*

EN 61000-6-3, *Electromagnetic compatibility (EMC) - Part 6-3: Generic standards - Emission standard for residential, commercial and light-industrial environments (IEC 61000-6-3:1996, modified).*

EN 61000-6-4, *Electromagnetic compatibility (EMC) - Part 6-4: Generic standards - Emission standard for industrial environments (IEC 61000-6-4:1997, modified).*

EN 61496-1:1997, *Safety of machinery – Electro-sensitive protective equipment - Part 1: General requirements and tests (IEC 61496-1:1997).*

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

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 (ISO 11204:1995).*

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

EN ISO 4287, *Surface roughness - Parameters, their values and general rules for specifying requirements.*

3 Terms and definitions

For the purposes of this European Standard, the terms and definitions given in EN 1070:1998 and the following apply.

3.1
platform
accessible standing area

3.2
worm
rotating screw-shaped component in the worm casing for meat transport to the set of cutting tools

3.3
step
interlocked standing area

3.4
ejector/extractor
device for detaching the set of cutting tools and the worm

3.5
extraction claw
tool for detaching the set of cutting tools and the worm

3.6
loading device
lift tilt device for the lifting and tilting of transport cars and containers

3.7
container
device for holding products to be processed

3.8
cover
movable device with safety function

3.9
feed intake
housing between the tray and the worm casing

3.10
feed intake hopper
container for holding the products to be processed with safety function

3.11
locking device
device for locking the trolley or container in the load bearing device

3.12
trolley
movable device for holding the products to be processed

3.13
design dimension
sum of dimensions measured from the floor, in the case of steps, intermediate steps or platforms from the standing place to the hopper edge and from the hopper edge to the first danger point in the feed intake hopper (see Figures 8 and 9)

3.14
cooling mincer
machine with a cooling device for the feed intake and the worm casing

3.15
light barrier/light curtain
optical-electrical safety component

3.16
hole plate
fixed plate with bores

3.17
mixing screw
rotating screw-shaped component in the feed intake hopper above the screw conveyor for mixing the product

3.18
blade
cutting tool with one or several blades

3.19
tray
container for holding the product to be processed

3.20
mechanical bar
movable device with safety function

3.21
worm casing
casing for holding the worm and the set of cutting tools

3.22
cutting chamber
chamber inside the worm casing for holding the set of cutting tools

3.23
set of cutting tools
rough-cutter, blade and hole plate for size reduction of product

3.24
protective grid
movable device on the feed intake hopper mouth

3.25
protective hood
movable device on the discharge outlet

3.26
restrictor plate
stationary non detachable device above the feed intake

3.27
pusher
device used to push the product further in the feed intake

3.28
screw conveyor
rotating screw-shaped component in the feed intake hopper for meat transport to the worm

3.29
transport carriage
movable device for holding the lock nut, set of cutting tools, worm and screw conveyor

3.30
lock nut
device for locking the set of cutting tools in the cutting chamber

3.31
preparation room
room for preparation of sale products

4 List of hazards

4.1 General.

This clause and annex C contain the hazards and hazardous situations which may arise during operation of mincing machines as far as they are dealt with in this European Standard, identified by a risk assessment significant for this type of machinery and which require action identified to eliminate or reduce risk.

Before using this standard it is important to carry out a risk assessment of the mincing machine to check that it has the hazards identified in this clause.

4.2 Mechanical hazards

4.2.1 Mincing machines with feed intake and worm

Zone 1

Rotating screw conveyor at the end of the feed intake (see Figure 3).

Hazards of entanglement, shearing or severing of fingers or hand.

4.2.2 Mincing machines with feed intake hopper and screw conveyor/mixing screw

— Zone 2

Rotating screw conveyor or mixing screw in the feed intake hopper (see Figure 4).

Hazards of entanglement, shearing or severing of fingers, hand or forearm.

4.2.3 Discharge outlet on mincing machines

— Zone 3

Rotating blade behind the hole plate at the discharge outlet (see Figure 4).

Hazards of shearing of fingers.

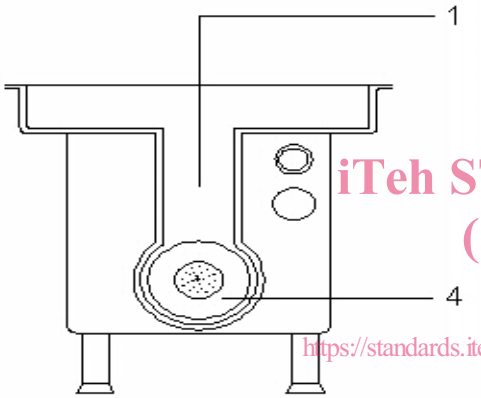


Figure 3 — Mincing machine with feed intake - Danger zones

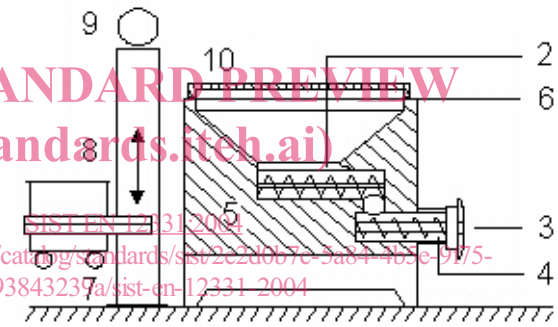


Figure 4 — Mincing machine with feed intake hopper - Danger zones

Key

1	ZONE 1	4	ZONE 4	7	ZONE 7
2	ZONE 2	5	ZONE 5	8	ZONE 8
3	ZONE 3	6	ZONE 6	9	ZONE 9
				10	ZONE 10

4.2.4 Installation and removal of worm and set of cutting tools

— Zone 4

Worm casing with worm and set of cutting tools at discharge outlet (see Figures 3 and 4).

Hazard of crushing to hands and feet during installation and removal.

4.2.5 Drive mechanism

— Zone 5

Drive of worm, screw conveyor and mixing screw (see Figure 4).

Hazards of crushing, shearing or entanglement to fingers or hand.

4.2.6 Machine components e.g. cover over hopper edge

— Zone 6

Unintentional shutting and intentional closing of the cover (see Figure 4).

Hazards of crushing to fingers or hand.

4.2.7 Loading device on mincing machines (see Figure 4)

— Zone 7

Space below transport carriage or container.

Hazards of trapping or crushing on floor level during descent to the body.

Hazards of impact during uncontrolled descent e.g. in the case of mechanical upsets to the body.

— Zone 8

Path of movement of transport carriage and container.

Hazards of impact from moving components to the body.

Hazards of crushing or shearing between moving and stationary components of fingers or hand.

— Zone 9

Drive elements and (where used) pulleys, chains or wire ropes.

Hazard of drawing-in, shearing, crushing or entanglement of fingers or hand.

— Zone 10

Discharge area.

Hazards of impact or crushing from load-bearing device to finger or hand.

— Other mechanical hazards

Hazard of crushing or impact caused by tilting (loss of stability) to the body.

4.3 Electrical hazards

4.3.1 Direct or indirect contact with live parts

Hazard of electric shock to the body.

4.3.2 Electrical components with insufficient safety level

Hazard of mechanical injury to the body due to malfunction.

4.4 Hazard from loss of stability

Hazard of impact or crushing, if the machine or the loading device topples over to the body.