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English Version

Food processing machinery - Portable and/or hand-guided machines and appliances with mechanically driven cutting tools - Safety and hygiene requirements

Machines pour la transformation des produits alimentaires - Machines et appareils portatifs et/ou guidés à la main munis d'outils coupants mus mécaniquement - Prescriptions relatives à la sécurité et à l'hygiène

Nahrungsmittelmaschinen - Tragbare und/oder handgeführte Maschinen und Geräte mit mechanisch angetriebenen Schneidwerkzeugen - Sicherheits- und Hygieneanforderungen

This European Standard was approved by CEN on 26 September 2005 and includes Amendment 1 approved by CEN on 6 May 2010.

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

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Foreword

This document (EN 12984:2005+A1:2010) has been prepared by Technical Committee CEN/TC 153 “Food processing machinery — Safety and hygiene requirements”, 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of an identical text or by endorsement, at the latest by December 2010, and conflicting national standards shall be withdrawn at the latest by December 2010.

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

This document includes Amendment 1, approved by CEN on 2010-05-06.

This document supersedes EN 12984:2005.

The start and finish of text introduced or altered by amendment is indicated in the text by tags ▌A1⟩ ⟨A1▌.

This European Standard 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).

▌A1⟩ For relationship with EU Directive(s), see informative Annex ZA, which is an integral part of this document. ⟨A1▌

It is one of a series of European Standards for meat processing machinery, in compliance with ▌A1⟩ EN 1672-2:2005 ⟨A1▌ and Annex B.

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, Romania, Slovakia, Slovenia, Spain, Sweden, Switzerland and United Kingdom.

Introduction

This European Standard 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 European 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.

1 Scope

1.1 This European Standard covers portable and/or hand-guided machines and appliances equipped with mechanically driven cutting tools.

This European Standard specifies requirements for the design and manufacture of portable and/or hand-guided machines and appliances equipped with electrically, hydraulically or pneumatically driven cutting tools (see Figures 1 to 9), hereinafter referred to as “machines”.

The machines covered by this European Standard are used for slaughtering animals, for cutting up animal carcasses, poultry and other foodstuff such as e.g. fish.

They are mainly intended for use in slaughterhouses and rooms, which are used for cutting and preparing. These machines are used for the industry and trade.

〚A1〛 This European Standard specifies all significant hazards, hazardous situations and events relevant to the machines in the scope, when they are used as intended and under conditions of misuse which are reasonably foreseeable by the manufacturer (see Clause 4). 〈A1〛

This European Standard deals with the hazards which can arise during commissioning, operation, maintenance and de-commissioning of the machine.

This European Standard is not applicable to portable and/or hand-guided machines and appliances equipped with electrically, hydraulically or pneumatically driven cutting tools, which are manufactured before the date of publication of this European Standard by CEN.

1.2 This European Standard covers the following machines subdivided into tool types:

1.2.1 Saws (see Figures 1 to 5)

— Circular saws (see Figures 1 and 2);

— straight blade reciprocating saws (see Figures 3 and 4);

— band saws (see Figure 5).

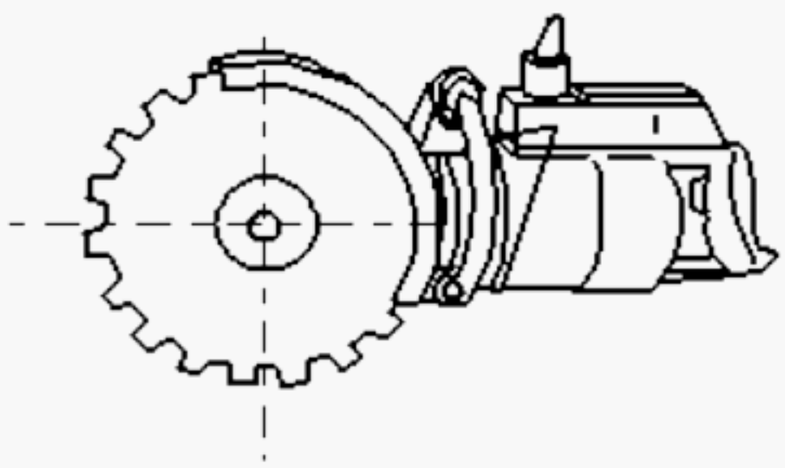


Figure 1 — Cutting saw

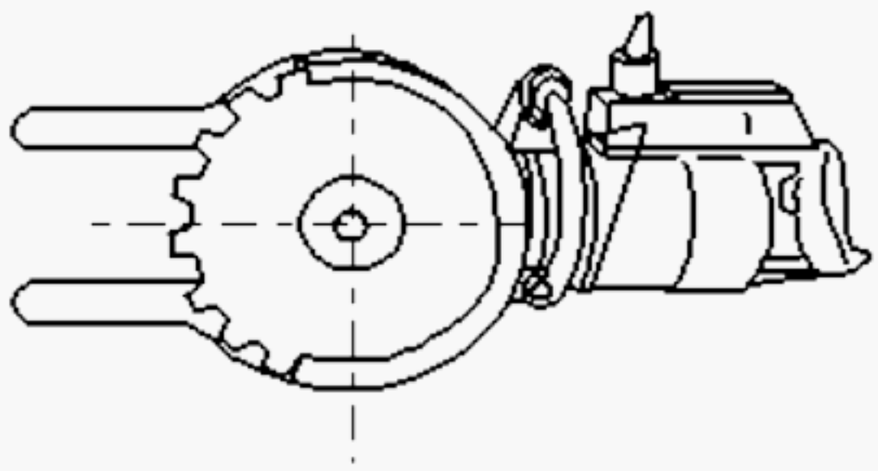


Figure 2 — Leg saw, horn saw

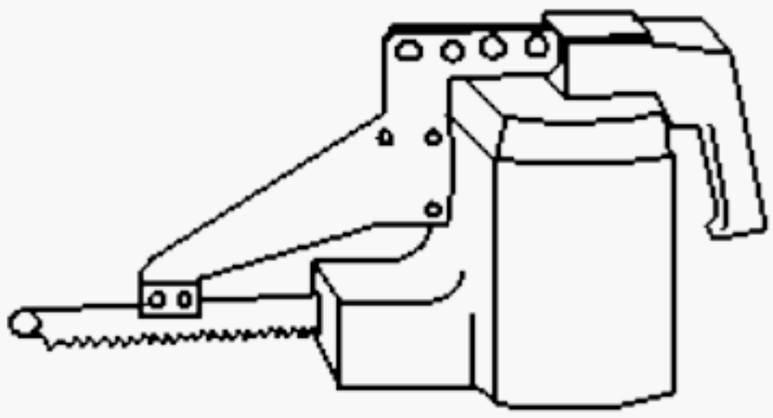


Figure 3 — Sternum saw

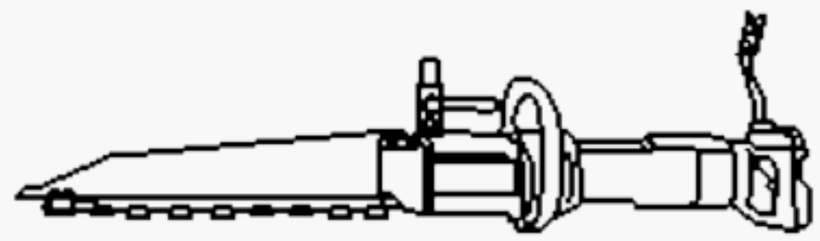


Figure 4 — Reciprocating saw

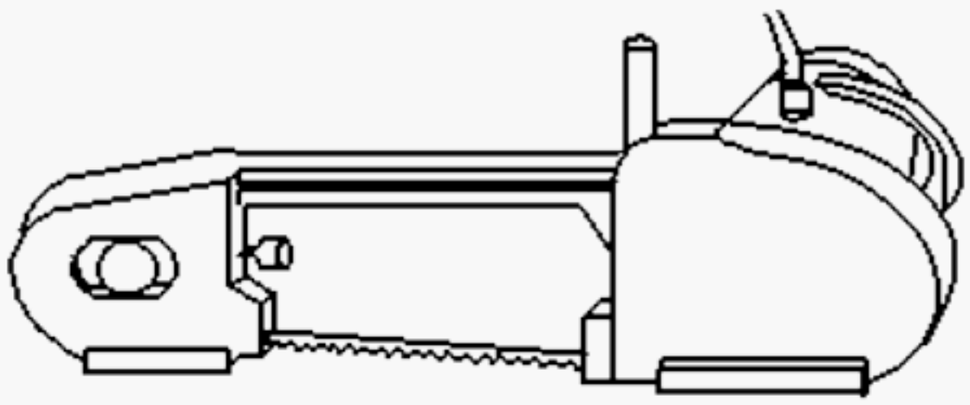


Figure 5 — Band saw for carcasses

1.2.2 Shears, pincers (see Figures 6 and 7)

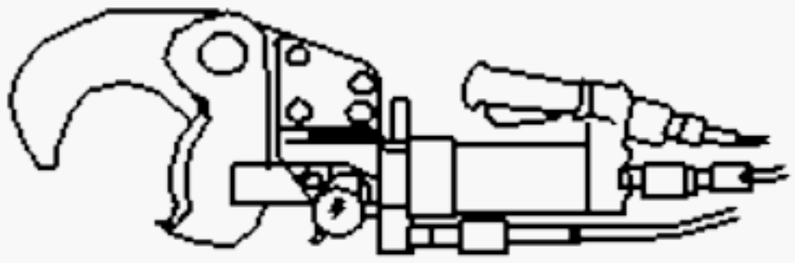


Figure 6 — Pincer/shear

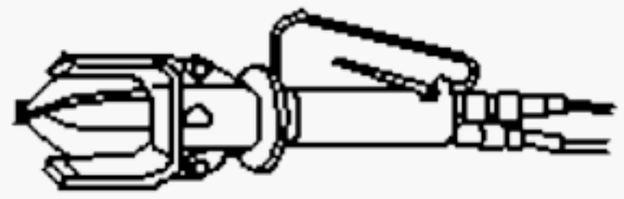


Figure 7 — Pincer for cutting the feet of pigs/shear

1.2.3 Knives (see Figures 8 and 9)

— Ring-blade circular knives;

— circular knives with simple or double blade;

— reciprocating knives with one or two straight blades;

— rotating knives.

Figure 8 — Derinder

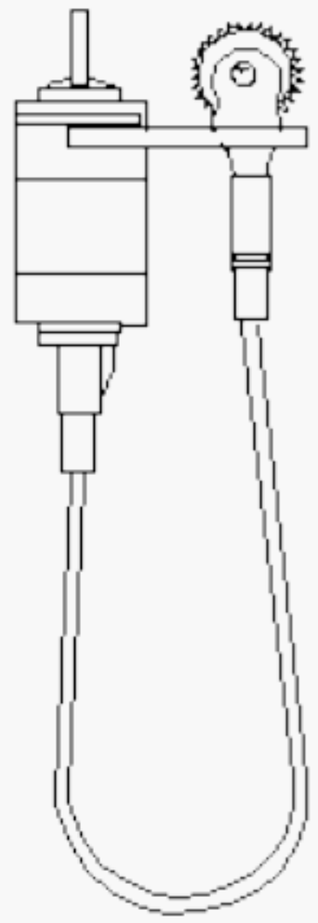


Figure 9 — Flexible driven circular knife

Portable and/or hand-guided machines are constructed of a machine housing with a motor or pressure cylinder within the housing, or a motor which drives the tool via a flexible drive cable, the tool being hand-held at the place of use or being hand-guided on a movable device.

The motor or drive can comprise electrical, hydraulic or pneumatic components.

For weight balancing, a suspension unit with a tensioning spring or a counter-balancer can make the work easier for the operator. This equipment is not covered by this European Standard.

1.3 Intended use

Portable and/or hand-guided machines are used on suspended or lying, stunned and blood-drained animals for cutting off legs, feet and horns, for cutting out anuses, for skinning, for opening the sternum, for halving, quartering or further cutting carcasses and for removing fat.

Although it should be advised against, this European Standard, taking into account practice, deals with the hazards due to cleaning with pressurised water.

With the aim of clarifying the intentions of this European Standard and avoiding doubts when reading it, the following assumptions were made for operation:

— only designated and instructed persons operate the machine,

— place of use is adequately lit, and

the equipment will be used in an environment with hygiene hazards but without other special hazards.

2 Normative references

The following referenced documents are indispensable for the application of this European Standard. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

〈A1〉 CR 1030-1, *Hand-arm vibration — Guidelines for vibration hazards reduction — Part 1: Engineering methods by design of machinery*

EN 574:1996, *Safety of machinery — Two-hand control devices — Functional aspects — Principles for design*

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

EN 953, *Safety of machinery — Guards — General requirements for the design and construction of fixed and movable guards*

EN 982, *Safety of machinery — Safety requirements for fluid power systems and their components — Hydraulics*

EN 983, *Safety of machinery — Safety requirements for fluid power systems and their components — Pneumatics*

EN 1672-2:2005, *Food processing machinery — Basic concepts — Part 2: Hygiene requirements*

EN 60204-1:2006, *Safety of machinery — Electrical equipment of machines — Part 1: General requirements (IEC 60204-1:2005, modified)*

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

EN 60745-1:2006, *Hand-held motor-operated electric tools — Safety — Part 1: General requirements (IEC 60745-1:2006, modified)*

EN 61558-2-6, *Safety of power transformers, power supply units and similar — Part 2-6: Particular requirements for safety isolating transformers for general use (IEC 61558-2-6:1997)*

EN ISO 4287, *Geometrical product specifications (GPS) — Surface texture: Profile method — Terms, definitions and surface texture parameters (ISO 4287:1997)*

EN ISO 11688-1:1998, *Acoustics — Recommended practice for the design of low noise-machinery and equipment — Part 1: Planning (ISO/TR 11688-1:1995)*

EN ISO 12100-1:2003, *Safety of machinery — Basic concepts, general principles for design — Part 1: Basic terminology, methodology (ISO 12100-1:2003)*

EN ISO 12100-2:2003, *Safety of machinery — Basic concepts, general principles for design — Part 2: Technical principles (ISO 12100-2:2003)*

EN ISO 13849-1:2008, *Safety of machinery — Safety-related parts of control systems — Part 1: General principles for design*

EN ISO 13857:2008, *Safety of machinery — Safety distances to prevent hazard zones being reached by the upper and lower limbs (ISO 13857:2008)* 〈A1〉

3 Terms and definitions

For the purposes of this European Standard, the terms and definitions given in EN ISO 12100-1:2003 and the following apply.

3.1
hand-guided machines
motor or pressure cylinder and the tool are one and are mounted on a movable device and hand-guided during use

3.2
portable machines
drive and the tool are one and are carried to their place of use and hand-guided during use; power transmission between motor and tool is also possible by means of a flexible drive cable. The drive can be a motor or a cylinder

3.3
spring balancer – counterbalance
system on which the machine is suspended and which balances the major portion of the weight

4 List of significant hazards

4.1 General

This clause and Annex B contains all the significant hazards, hazardous situations and events, as far as they are dealt with in this European Standard, identified by risk assessment as significant for this type of machinery and which require action identified to eliminate or reduce risk.

NOTE Before using this European Standard it is important to carry out a risk assessment according to EN 1050:1996 of the portable and/or hand-guided machines to check that it has identified all significant hazards hazardous situations and events in this clause.

4.2 Mechanical hazards

4.2.1 Zone 1

Cutting part

Hazard from cutting or severing limbs and injuries of the body

4.2.2 Zone 2

Transmission mechanism from motor to cutting part

Severing or entanglement hazard of fingers or hand

4.2.3 Zone 3

Protective covers

Hazard from ejected parts

4.3 Electrical hazards

4.3.1 Direct or indirect contact with live parts

Hazard from electrical shock to the body

4.3.2 Electrical components with insufficient safety level

Hazard from mechanical injury to the body due to malfunction

4.4 Hydraulic/pneumatic hazards

Hazard to the operator from ejection of high-pressure fluid or compressed air

4.5 Noise hazards

Portable and/or hand-guided machines may generate noise which can result in hearing damage, accidents due to interference with speech communication and interference with the perception of acoustic signals.

4.6 Vibration hazards

Vibration-level, produced by the machine

Risk of angioneurotic disorders (such as “vibration white finger”), osteo-articular disorders

4.7 Hazards from non-compliance with ergonomic principles

Hazard from physical damage to the body by:

— unhealthy body posture or excessive physical effort;

— inadequate consideration of human hand/arm or foot/leg anatomy during machine design

4.8 Hazard from non-compliance with hygiene principles

Hazard from damage to human health of the consumer through inner damages by:

4.8.1 Microbial causes

Hazard (spoilage) of foodstuff

Hazard of damage to health of the consumer through food poisoning

4.8.2 Chemical causes

Hazard (contamination) of foodstuff through residues of cleaning and disinfecting agents and hydraulic fluid

Hazard from damage to health of the consumer

4.8.3 Physical causes

Foreign objects originating from raw materials, machines or other sources

Hazard from damage to health of the consumer

5 Safety and hygiene requirements and/or protective measures

5.1 General

Portable and/or hand-guided machines shall comply with the safety requirements and/or protective measures of this clause and Annex B.

In addition, they shall be designed according to the principles of EN ISO 12100 for hazards relevant but not significant, which are not dealt with by this European Standard (e.g. sharp edges).

A1 For hazards which are to be reduced by the application of the type B-standards such as EN 614-1, EN 953, EN 60204-1, EN 60529, EN ISO 12100, EN ISO 13849-1 and EN ISO 13857, 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. A1

Where the means of reducing the risk is by the physical arrangement or positioning of the machine the manufacturer shall include in the information for use a reference to the reduction means to be provided, and to any limiting value of the requirement, and, if appropriate, to the means of verification.

Where the means of reducing the risk is by a safe system of working the machinery, the manufacturer shall include in the information for use details of the system and of the elements of training required by the operating personnel.

5.2 Mechanical hazards

5.2.1 General

Portable and/or hand-guided machines shall be designed and constructed in accordance with the conditions mentioned below and Annex B.

5.2.2 Zone 1 – Cutting part

5.2.2.1 Non-cutting part of circular saws

Circular saws shall be provided with guards made of a material strong enough to contain any part of a blade which might be ejected due to failure. The guards shall have the following characteristics:

5.2.2.1.1 Circular saws shall be provided with a fixed guard (see EN ISO 12100-1:2003, 3.25.1) covering the part of the blade which is not required for sawing for an angle $\beta \geq 135°$ and placed in such a way that angle (see Figure 10) has a minimum value of:

$\alpha \geq 15°$ for cutting saws

$\alpha \geq 30°$ for other types of circular saws

Dimensions in millimetres

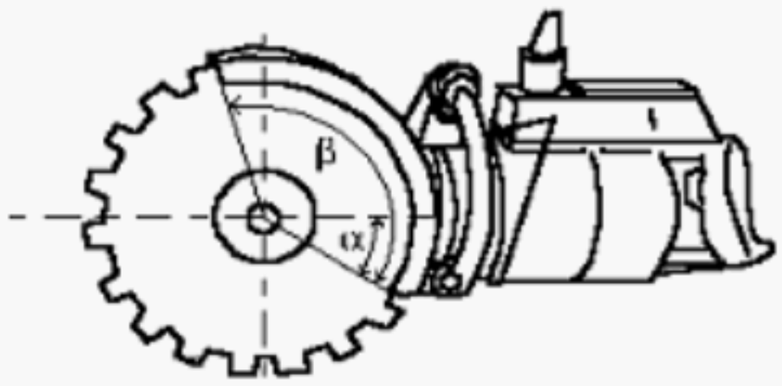


Figure 10 — Fixed guard on circular saws

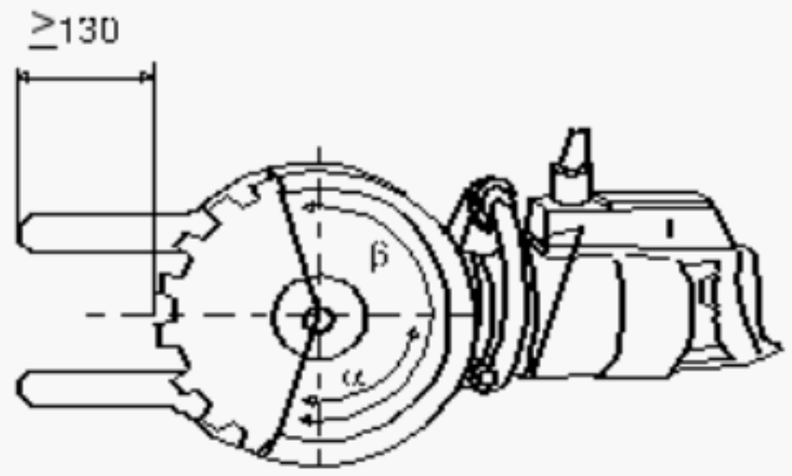


Figure 11 — Fixed guard on horn or leg saws

5.2.2.1.2 Circular saws used for severing feet and horns shall be provided with two guides with a minimum length of 130 mm (see Figure 11) to prevent the tool from slipping. In this case, the guard shall cover the teeth of the blade with the angle ≥ 190° and the angle $\alpha \geq 95°$.

For this type of saw a two-hand control of at least type I, EN 574 shall be used.

〈A1〉

5.2.2.1.3 Fixing systems of fixed guards shall remain attached to these guards or to the machine when the guards are removed. 〈A1〉

5.2.2.2 Non-cutting part of band saws

〈A1〉 Band saws shall be so designed and constructed that access to the parts of the blade which are not used during operation is prevented by a interlocking guard with locking according to at least Performance Level “c” or “d” of EN ISO 13849-1:2008 (see 3.25.4 of EN ISO 12100-1:2003).

Alternatively a two-hand control according to type I of EN 574:1996 can be used. In this case there shall also be a guard with interlocking according to at least Performance Level “b” of EN ISO 13849-1:2008. A PDF[1)] is a good solution for the position sensor of the interlocking. 〈A1〉

5.2.2.3 Stopping time

Circular saws and band saws shall stop in less than 3 s after being switched off.

5.2.3 Zone 2 – Moving transmission elements

Access to dangerous zones at moving power transmission parts shall be prevented by fixed guards in accordance with EN 953.

〈A1〉 Fixing systems of fixed guards shall remain attached to these guards or to the machine when the guards are removed. 〈A1〉

5.2.4 Protective cover

The protective cover shall be designed to avoid penetration of ejected parts.

〈A1〉 1) PDF (**P**roximity **D**evices with defined behaviour under **F**ault conditions). 〈A1〉

5.2.5 Other requirements

5.2.5.1 Control devices

The control device shall be of the hold-to-run type.

This requirement does not apply to flexible driven cable derinders and flexible driven machines with ring blade circular knives with a diameter < 55 mm. It is sufficient that they switch off automatically when the appliance is suspended and have to be switched on intentionally before use.

5.2.5.2 Two hand control

Circular saws with a blade diameter > 320 mm and shears and pincers weighing > 4 kg shall be equipped with a two-hand control according to type I of EN 574:1996.

5.2.5.3 Hand guard

For shears and pincers weighing ≤ 4 kg, a safety device shall be fitted which minimises the probability of contact of the non-working hand with the cutting tool. This device can be a u-shaped cover with a width of at least 60 mm oriented to the non-working hand (see Figure 12).

〈A1〉 Dimensions in millimetres 〈A1〉

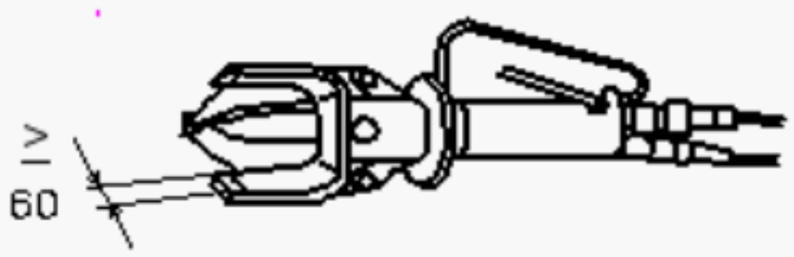


Figure 12 — Fixed guard (spacer) on shear for cutting the feet of pigs

5.2.5.4 Unintended start-up

The operating switch shall be so designed, located and protected as to prevent unintentional start-up of the tool.

This requirement can be fulfilled by e.g.:

— two keys, which generate only an output-signal, if they are activated within 0,5 s. It shall be prevented, that both keys can be activated with one hand;

— locking system for the switch, which needs to be deliberately unlocked to switch-on, the locking shall be achieved without delay;

— device covering the whole length of the operating switch in order to prevent unexpected start-up in case of impact;

— equivalent system.

5.3 Electrical hazards

5.3.1 General

The electrical equipment shall comply with A1 EN 60204-1:2006 A1 with the following specification:

5.3.2 Protection against water ingress

The whole machine shall be according to IP X4 according to EN 60529 or alternatively:

For use in slaughter area, the machines shall be operated with 50 V protective low voltage.

For machines with protective low voltage ≤ 50 V, the manufacturer shall indicate the use of a safety transformer in the instruction handbook.

5.3.3 Protective low voltage

The whole machine can be powered with VLV 50 V by a safety transformer according to EN 61558-2-6.

For machines with VLV ≤ 50 V, the manufacturer shall specify the use of a safety transformer in the instruction handbook.

5.3.4 Stop function of switches

The stop function of switches shall be in accordance with category 0 or 1 of 9.2.2 of A1 EN 60204-1:2006 A1.

5.3.5 Safety requirements related to electromagnetic phenomena

The machines shall have sufficient immunity to electromagnetic disturbances to enable them to operate safely as intended and not fail to danger when exposed to the levels and types of disturbances intended by the manufacturer.

The manufacturer of the machines shall design, install and wire the equipment and sub-assemblies taking into account the recommendations of the suppliers of these sub assemblies.

The manufacturer shall select only components that have been marked as conforming to the EMC Directive and shall apply them in accordance to the supplier's recommendations.

5.4 Hydraulic and pneumatic hazards

The hydraulic and pneumatic equipment shall conform to the requirements of EN ISO 12100-2:2003, 4.10,

— EN 982, and

— EN 983.

The bursting pressure of hydraulic hoses shall be four times the maximum working pressure.

The instruction handbook shall indicate the maximum working pressure.

5.5 Noise

5.5.1 Noise reduction

Noise reduction shall be an integral part of the design process thus taking into account measures at source as given in EN ISO 11688-1. The success of the applied noise reduction measures is assessed on the basis of the actual noise emission values [A1] *deleted text* [A1] in relation to other machines of the same family.

At pneumatic machines the compressed air shall be released with low noise.

5.5.2 Noise emission test code

The required noise emission values shall be determined and declared according to 6.1.2 of EN 60745-1:2003. All machines shall be measured at no load and maximum speed.

5.6 Vibrations

The intensity of vibration transmitted to the hands of operators shall be reduced to the lowest technically achievable level in accordance with CR 1030-1.

[A1] *deleted text* [A1]

5.7 Ergonomic requirements

5.7.1 Grips

Machines weighing more than 4 kg shall be provided with two grips.

For machines weighing 4 kg or less, the outer end of the power unit, if it has an ergonomic shape, may be considered as a grip.

5.7.2 Suspension

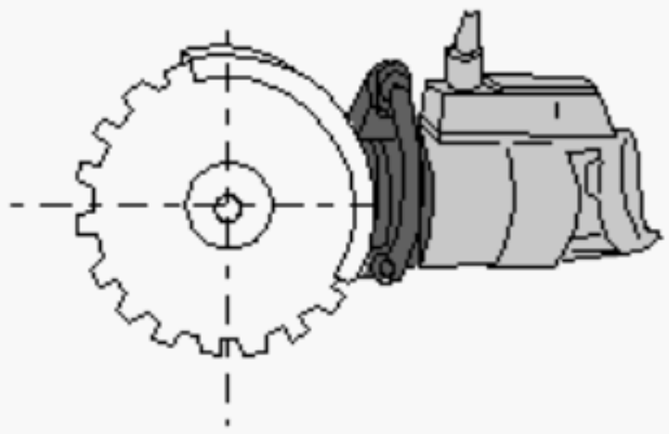
Machines weighing more than 1,5 kg shall be fitted with fastening points allowing them to be fastened to a balancer or counter-balancer system.

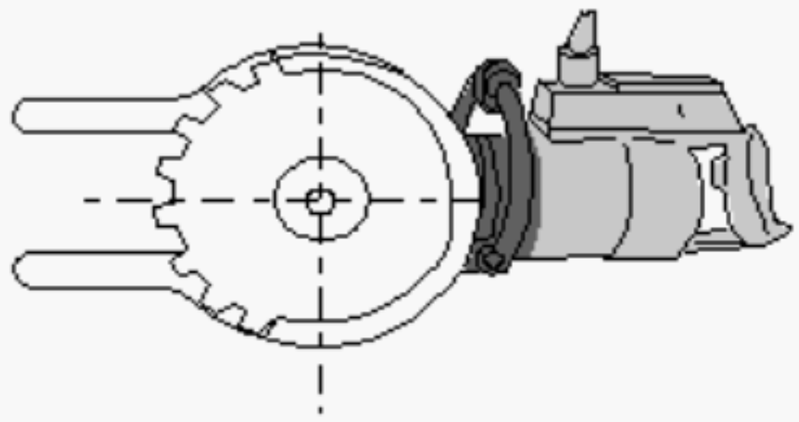
5.8 Hygiene and cleaning

Machines shall be designed and built according to EN 1672-2, the requirements mentioned below and Annex B.

If there is any hazard, that hydraulic oils could contact the foodstuff, non-toxic hydraulic oils shall be used.

The 3 areas defined in EN 1672-2:2005 are shown in Figures 13 to 20.





Key

Food area

Splash area

Non food area

Figure 13 — Cutting saw

Figure 14 — Leg saw, horn saw

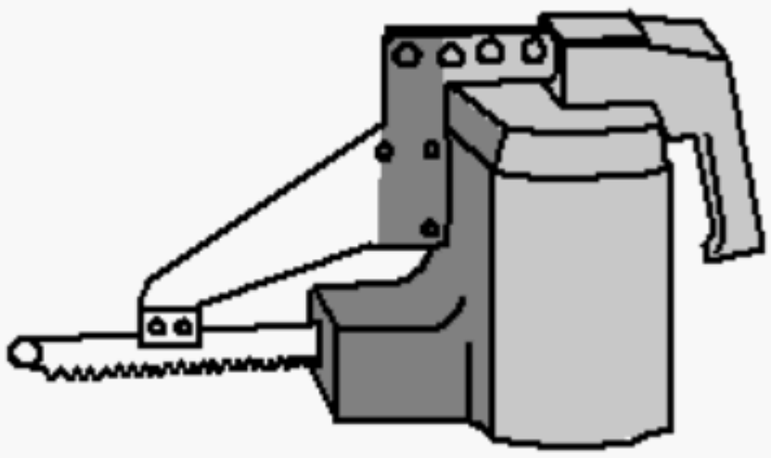


Figure 15 — Sternum saw

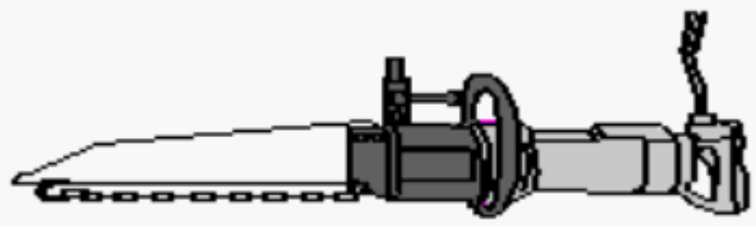


Figure 16 — Reciprocating saw

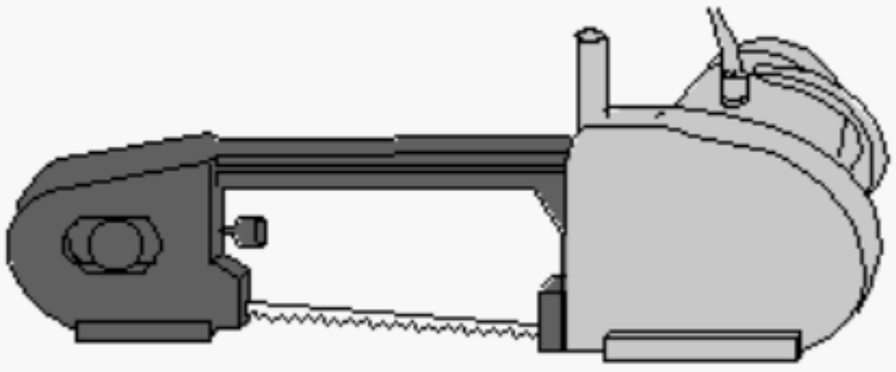


Figure 17 — Band saw for carcasses

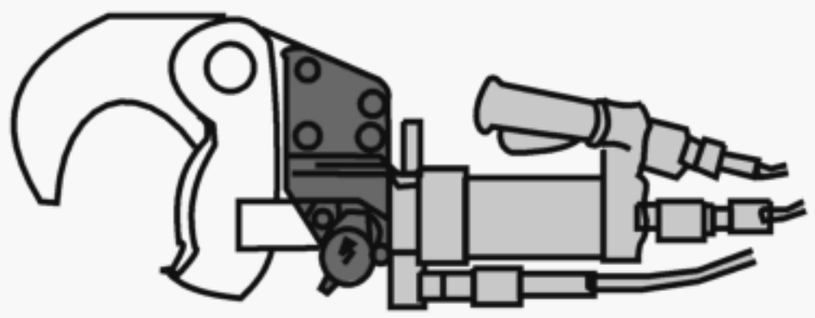


Figure 18 — Horn, leg shear

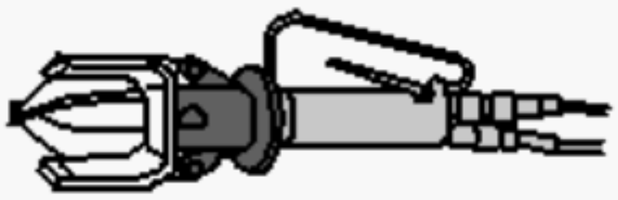


Figure 19 — Shear for cutting the feet of pigs

Figure 20 — Derinder

6 Verification of safety and hygiene requirements and/or protective measures

This clause contains the methods for verification of the compliance with the safety requirements of this European Standard. As far as the criteria for acceptance and the conditions during verification are not self-evident, they can also be found in the table.

The criteria of acceptance shall follow the detailed requirements of Clauses 5 and 7 and Annex B, or of this clause.

Table 1 – Testing methods

Clause	Testing method
5.2.2.1	Calculation (type)
5.2.2.1.1	Measuring (type) Inspection (type)
5.2.2.1.2	Measuring (type) Inspection (type)
5.2.2.2	Verification (type
5.2.2.3	Measuring of the stopping time (individual)
5.2.3	Inspection (type) Verification (type)
5.2.4	Calculation (type)
5.2.5.1	Verification (type)
5.2.5.2	Inspection (type) Measuring (type) Verification (type)
5.2.5.3	Inspection (type) Measuring (type)
5.2.5.4	Inspection (type) Test (individual) Verification (type)
5.3.2	Verification (type)
5.3.3	Verification (type) Verification of documentation (type)
5.4	Verification of documentation (type)
5.5.2	Noise emission measurement according to 5.5.2
5.6	Measuring (type)
5.7.1	Inspection (type) Weight test (type)
5.7.2	Measuring (type)
5.8	Inspection (type) Measuring of surface roughness and radii (type)
7	Verification of the information for use (type)
A.7	Visual inspection whether a noise declaration is given in the instruction manual

7 Information for use

7.1 General

The user information shall fulfil the requirements of Clause 6 of EN ISO 12100-2:2003. An instruction handbook shall be provided.

7.2 Operating instructions

The instruction handbook shall at least contain the following information:

a) [A1] Information about the machine: [A1]

— detailed description of the machine and its components;

— information on the range of applications for which the machine is intended;

— noise emission declaration according to 5.5.2;

— pictograms and plates.

[A1]

The instruction handbook shall inform about the vibration total value to which the hand-arm system is subjected, if it exceeds 2,5 m/s². Where this value does not exceed 2,5 m/s², this shall be mentioned.

When vibration emission values are given:

— the values shall be either those actually measured for the machinery in question or those established on the basis of measurements taken for technically comparable machinery which is representative of the machinery to be produced;

— the uncertainty surrounding these values shall be specified;

— if harmonised standards are not applied, the vibration data shall be measured using the most appropriate measurement code for the machinery. The operating conditions during measurement and the methods used for measurement, or the reference of the harmonised standard applied, shall be specified.

NOTE For measurement, in absence of a specific measurement code, the general method in EN ISO 20643:2005 can be followed, while guidance for the determination of the uncertainty can be found in EN 12096:1997. [A1]

b) Information relating to the installation of the machine:

— information on how to connect the machines to electrical, hydraulic or pneumatic power supply;

— installation of a pressure relief valve, which can be sealed if required, for limiting the necessary working pressure;

— operating instruction shall indicate the characteristics of the necessary weight balancer: Type, cable, length etc. It shall specify the applications for which a weight balancer is recommended;

— for other machines, a supporting device shall be provided to hold them when not in use;

— information on the need to supply VLV machines by means of a safety transformer complying with EN 61558-2-6;

c) Information relating to transportation and storage of the machine:

— information on dimensions, weight, position of centre of gravity;

d) Information relating to the use of the machine:

— information on commissioning;

— information on setting and adjustment;

— information on items which require setting;

— information on devices which stop the machine;

— information on residual risks;

— information on non toxic hydraulic fluids;

— information on particular risks which may arise in certain applications or by the use of certain accessories, as e.g. effective acceleration values from vibrations;

— information relating to hearing protection, if necessary;

e) Information relating to maintenance:

— information on the nature and frequency of inspections and maintenance activities;

— maximum working pressure;

— information on risks of failures and their repair;

— drawings and diagrams, which enable the maintenance personnel to do their task;

— [A1] the specifications of the spare parts to be used when these affect the health and safety of operators; [A1]

f) Information to the cleaning of the machine:

— cleaning of tools which shall be done as often as necessary to prevent the accumulation of residues of product in the machine;

— instructions for the fitting and removal of the knives;

— information on the types of oils and/or greases to be used for lubrication;

— information on the:

  — method of cleaning;

  — types of cleaning agents;

  — method of disinfecting;

  — types of disinfectants;

— types of rinsing agents;

— maximum pressure for cleaning water.

7.3 Training of operators

The operator should be trained in the dangers associated with the use and cleaning of portable and/or hand-guided machines and appliances equipped with mechanically driven cutting tools and with the precautions to be observed. Information shall be given in the instruction handbook which specifies the elements of training and the standard of training required.

NOTE It is recommended that operating personnel should be instructed during installation by a representative of the manufacturer or the supplier of the machine.

Also, that the training should be repeated as required in regular intervals. It is recommended that the safety related part of the training should be repeated twice a year.

7.4 Marking

[A1] Portable and/or hand-guided machines conforming to this document shall be marked permanently and legibly with the following information on its rating plate: [A1]

[A1]

— the business name and full address of the manufacturer and, where applicable, his authorised representative;

— designation of the machinery;

— designation of series or type;

— serial number;

— mandatory marking [2)];

— the year of construction, that is the year in which the manufacturing process is completed;

— rating information, including supply voltage and frequency, power rating. [A1]

[A1] 2) For machines and their related products intended to be put on the market in the EEA, CE marking as defined in the applicable European Directive(s), e.g. Machinery. [A1]

Annex A
(normative)

Design principles to ensure cleanability of portable and/or hand-operated machines and appliances equipped with mechanically driven cutting tools

A.1 Terms and definitions

For the purpose of this annex, the following terms and definitions apply.

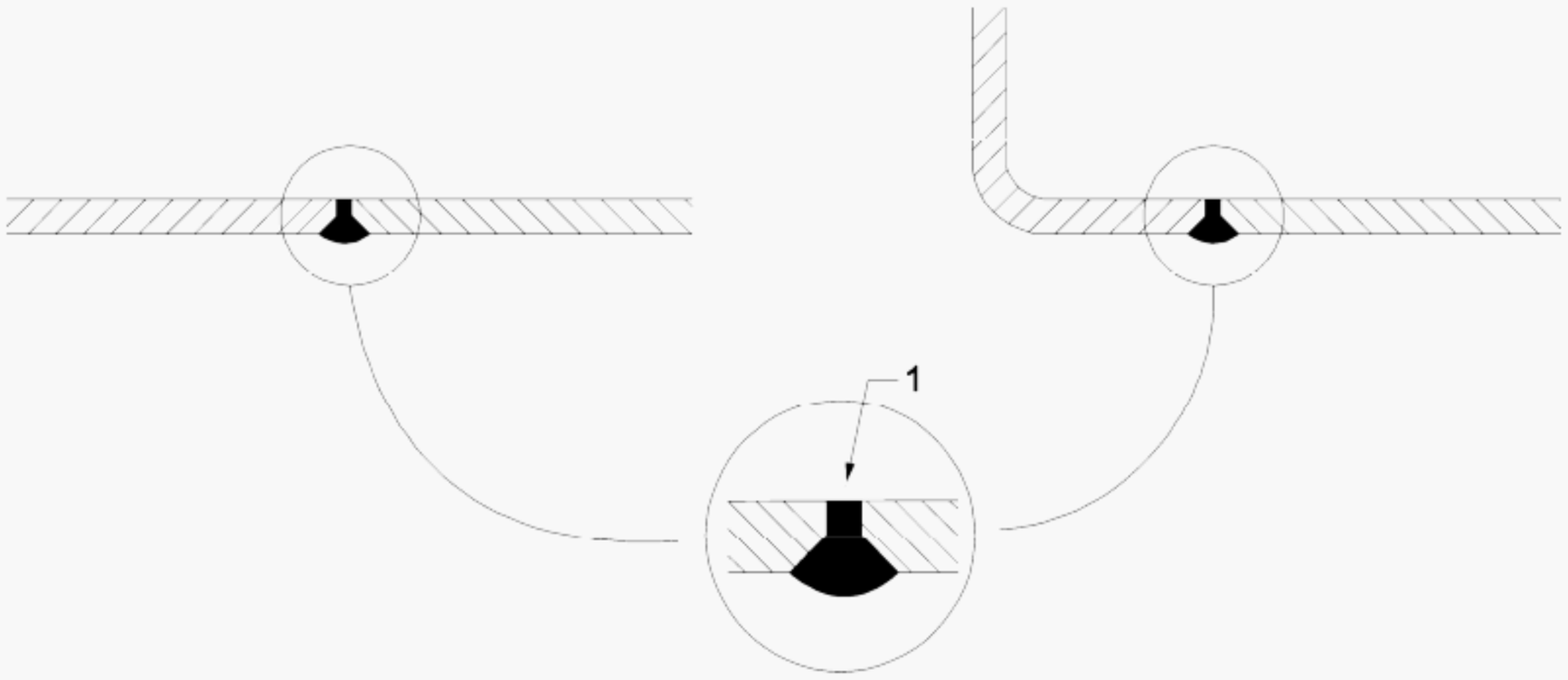
A.1.1
food area
area comprising surfaces which will come into contact with foodstuff; the food area also comprises those surfaces with which the foodstuff may come into contact under normal operating conditions and returns into the main product stream (see Figures 13 to 20)

A.1.2
splash area
area comprising surfaces on which part of the foodstuff may splash or flow along under normal operating conditions and does not return into the main product stream (see Figures 13 to 20)

A.1.3
non-food area
all other areas not specified above (see Figures 13 to 20)

A.1.4
joined surfaces
surfaces shall be joined such that product particles cannot be trapped, can be easily removed and do not cause a contamination hazard

A.1.5
easy to clean
machines are designed and constructed such that it is possible to remove dirt with a simple cleaning method e.g. cleaning agent and pressurised water (see Figure A.1)



Key

1 Smooth surfaces

Figure A.1 — Smooth surfaces – food area

A.2 Materials of construction

A.2.1 General

Materials of construction shall comply with [A1] EN 1672-2:2005, 5.2 [A1].

A.2.2 Type of materials

A.2.2.1 Materials for food area

[A1] All legal requirements in force for materials and articles in contact with food shall be met, as well the general requirements as those related to specific materials, e.g. plastics. [A1]

A.2.2.2 Materials of splash area

Shall comply with [A1] EN 1672-2:2005, 5.3.2 [A1].

A.2.2.3 Non-food area

Shall comply with [A1] EN 1672-2:2005, 5.3.3 [A1].

A.3 Design

A.3.1 Food area

A.3.1.1 The surfaces

The surfaces in the food area shall be smooth and free of grooves and depressions (see Figure A.1).

A.3.1.2 Inside corners

The angle formed by the intersection of two surfaces shall be ≥ 90° and have a radius of ≥ 3,2 mm (see Figure A.2).

Smaller radii are admissible if no other solutions can be found for reasons of process engineering, manufacturing technology (e.g. welding seam) or economic feasibility (see Figure A.2).

Key

1 Radius, machining operation, bent blade

2 Radius, welded seam

Figure A.2 — Angles and radii in the food area

Parts of machines, e.g. conveyors can have recesses, grooves and corners with smaller radii due to product manufacturing necessities. These rollers should be easy to clean.

A corner with an angle of ≥ 135° without a radius is permissible. The distance between two edges shall than be ≥ 8,0 mm (see Figure A.3).

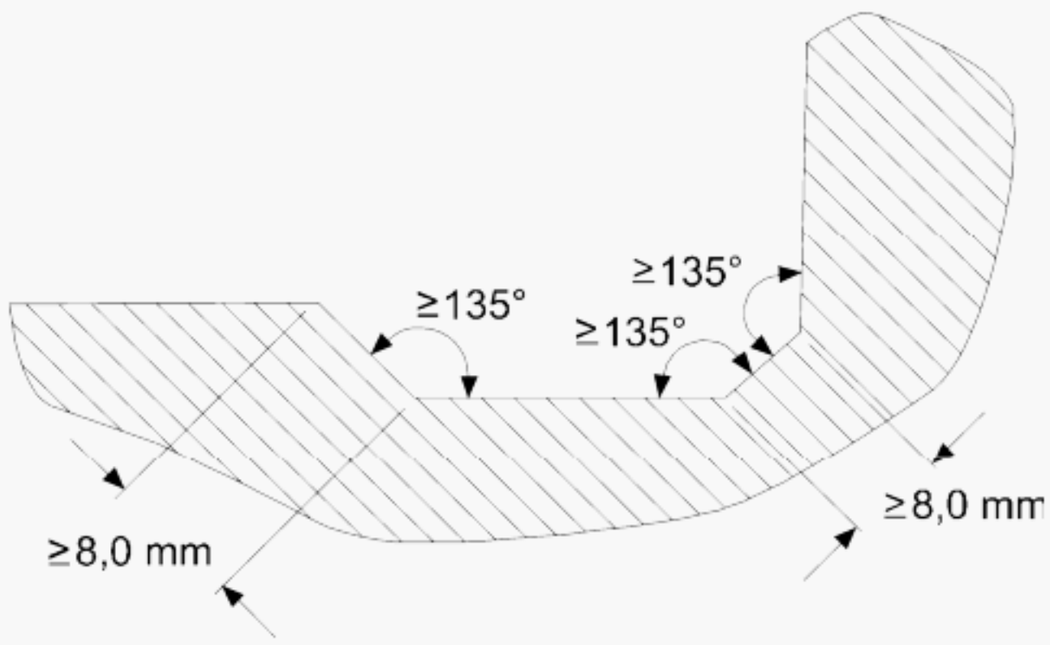
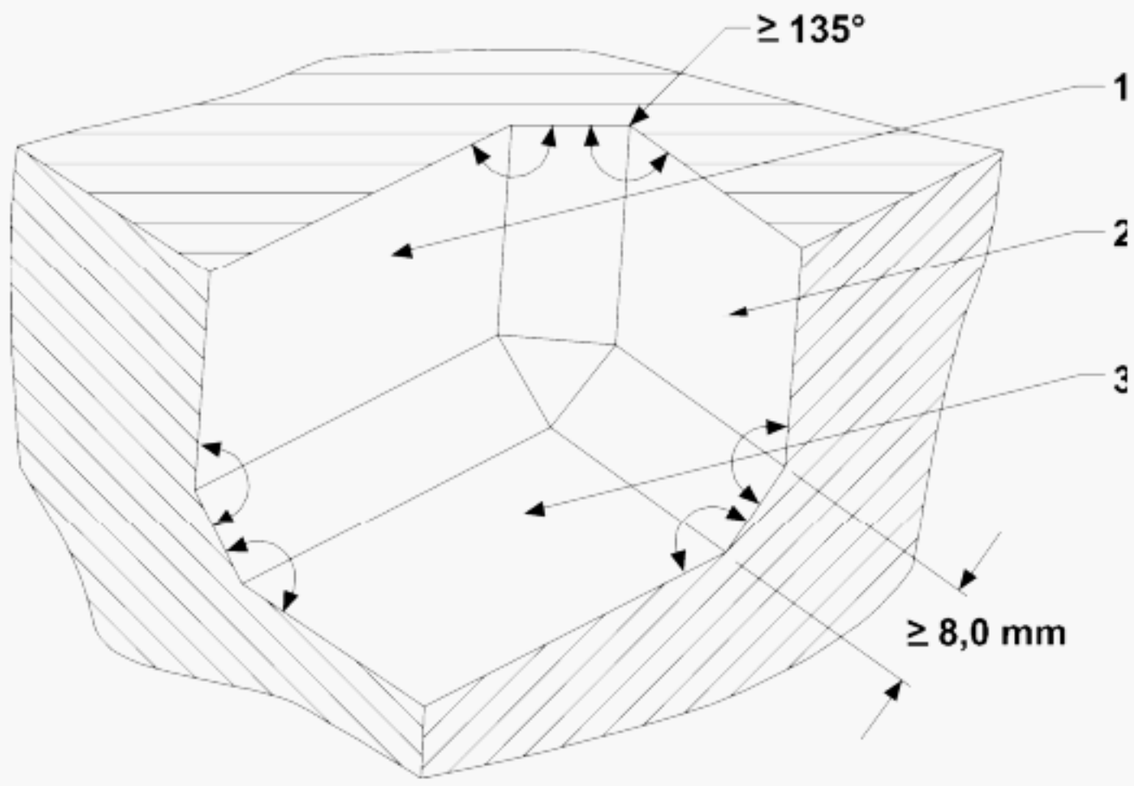


Figure A.3 — Angles in the food area

Should a corner be formed by the intersection of three planes, then the corners formed shall have angles of ≥ 90° and radii of ≥ 6,4 mm, also corners with an angle of ≥ 135° are permitted without a radius (see Figure A.4).



Key

1 Surface A
2 Surface B
3 Surface C

Figure A.4 — Intersecting surfaces in the food area

A.3.1.3 Grooves

Grooves may be used if the inner radius is ≥ 3,2 mm and the depth < 0,7 times the radius.

A.3.1.4 Joints and seams

Joints and seams shall be welded or sealed and as smooth as the connected surfaces (see Figure A.1).

A.3.1.5 The surface roughness

The surface roughness shall be ≤ Rz 25 µm (see EN ISO 4287), in those areas where it is technically possible ≤ Rz 16 µm should be selected.

A.3.2 Splash area

A.3.2.1 Surfaces

Surfaces shall be smooth (see Figure A.1).

A.3.2.2 Inside corners

Inside corners: The angle formed by the intersection of two surfaces shall be ≥ 80° and have a radius ≥ 3,2 mm.

If a corner is formed by the intersection of three surfaces, the corner formed by the intersection of two surfaces shall have a radius ≥ 6,4 mm. No requirements apply to the radius for the joining points of the third surface.

Angles ≥ 110° without radii are admissible (see Figure A.4).

A.3.2.3 Grooves

Grooves may be used if the inner radius is ≥ 3,2 mm and the depth < 1,0 times the radius.

A.3.2.4 Openings

Openings are permissible if they go right through and have a diameter ≥ 16 mm.

A.3.2.5 Joints and seams

Joints and seams shall be welded or continuously sealed. This requirement does not apply if these joints are formed by overlapping sheet metal surfaces from the top to the bottom in a vertical plane such that there are no horizontal corners in which dirt may be trapped. The overlap shall be ≥ 12 mm. Joints which do not overlap shall be easily separated for cleaning purposes. Information see EN 1672-2:2005, Annex B.

A.3.2.6 Fastening methods

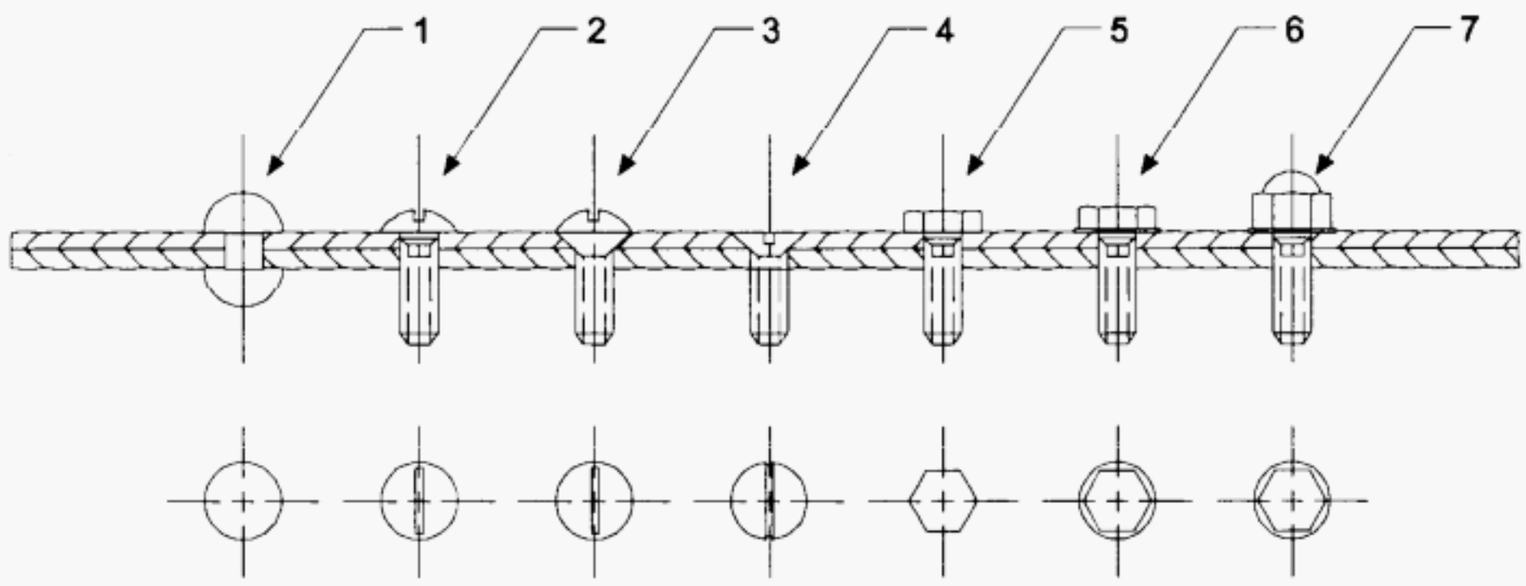
Screws, bolts and rivets with low profile heads and of the types shown in Figure A.5 may be used only when other fastening methods are impracticable and they are easy to clean (see Figure A.5).

The following types of screws shall not be used:

— cross head recessed screws,

— hexagon socket head cap screws, and

— screws with a diameter < 3 mm.



Key

1 Round head
2 Oval head
3 Slotted raised countersunk head
4 Slotted countersunk head
5 Hexagon head
6 Hexagon head with flach
7 Hex domed head

Figure A.5 — Admissible fasteners – head profiles

A.3.2.7 The surface roughness

The surface roughness shall comply with the requirements of A.3.1.5.

A.3.3 Non-food area

Surfaces shall be smooth as far as possible. Grooves, corners, holes, gaps and joints shall be avoided as far as possible. Closed hollow spaces shall be sufficiently wide to allow thorough cleaning and, where required, disinfection.

Annex B
(normative)

Common hazards for food processing machines and reduction requirements applicable to portable and/or hand-operated machines

B.1 Cutting and shearing hazards

B.1.1 Hazards on saw blades/saw bands

Saw blades/saw bands handling: Saw blades/saw bands have to be removed periodically. They are sharp and special protective measures shall be taken. An explanation on the use and the storage shall be included in the Instructions for use.

Verification: Examination of the documentation

B.1.2 Hazards on shearing

By wrong handling of shears there can arise hazards for the operator and/or third parties. An explanation on the use and the storage shall be included in the Instructions for use.

Verification: Examination of the documentation

B.2 Risks from cleaning

In the food industry the risk from cleaning is increased due to the need for operators to clean the danger zones so frequently.

Hazards commonly arise from the cleaning processes or substances used to obtain the hygiene condition needed. Where hazardous chemicals are used, e.g. concentrated caustic solutions, the food machine shall be designed so that it removes the operator from contact. Where contact is unavoidable, the instructions to the user shall include appropriate information on the need to select and use suitable personal protective equipment and any other protective recommendations.

Verification: By visual inspection and examination of documentation

B.3 External influences on electrical equipment

Many food machines are exposed to humid environments and wet cleaning methods which increase the risk from electrical shock.

The designer shall employ safeguarding strategies such as:

Ensuring the possibility of impact on electrical equipment from direct (or indirect) water jets is minimised

Verification: By functional test, or examination of documentation

B.4 Hazards from neglecting use of PPE

Certain personal protective equipment is required at food machines to deal with residual risks e.g.:

— wearing gloves to clean and remove blades, saw blades and saw bands, and

— aprons for cleaning.

The instructions to the user shall include appropriate information on the need to select and use suitable personal protective equipment.

Verification: Examination of the documentation

B.5 Hazards of materials being processed

The Instructions for use shall warn of the possible adverse effects on operators from allergic reactions, irritation, toxic or microbiological to materials being processed or recommended for use for cleaning.

Verification: Examination of the documentation.

B.6 Hazards of slip and trip

The manufacturer shall include advice in the instructions for use concerning the need to select suitable flooring materials in order to reduce the possibility of the operator slipping on wet, greasy, or otherwise contaminated flooring and platforms. He shall also include recommendation that the area surrounding the standing area of the operator is maintained free of debris from leakage or spillage, etc. that might lead to the operator tripping-up.

Annex ZA
(informative)

A1 Relationship between this European Standard and the Essential Requirements of EU Directive 2006/42/EC

This European Standard has been prepared under a mandate given to CEN by the European Commission and the European Free Trade Association to provide one means of conforming to Essential Requirements of the New Approach Directive 2006/42/EC on machinery.

Once this standard is cited in the Official Journal of the European Union under that Directive and has been implemented as a national standard in at least one Member State, compliance with the normative clauses of this standard confers, within the limits of the scope of this standard, a presumption of conformity with the relevant Essential Requirements of that Directive and associated EFTA regulations.

WARNING — Other requirements and other EU Directives may be applicable to the product(s) falling within the scope of this standard. A1

Bibliography

A1 *deleted text* A1

[1] EN 1050:1996, *Safety of machinery — Principles for risk assessment*

[2] EN 1088:1995, *Safety of machinery — Interlocking devices associated with guards — Principles for design and selection*

[3] EN 1299:1997, *Vibration isolation of machines — Information for the application of source isolation*

A1

[4] EN 12096:1997, *Mechanical vibration — Declaration and verification of vibration emission values* A1

[5] A1 EN ISO 3743-1:2009 A1, *Acoustics — Determination of sound power levels of noise sources — Engineering methods for small, moveable sources in reverberant fields — Part 1: Comparison method in hard-walled test rooms (ISO 3743-1:1994)*

[6] EN ISO 8662-10:1998, *Hand-held portable power tools — Measurement of vibrations at the handle — Part 10: Nibblers and shears (ISO 8662-10:1998)*

[7] EN ISO 8662-12:1997, *Hand-held portable power tools — Measurement of vibrations at the handle — Part 12: Saws and files with reciprocating action and saws with oscillating or rotating action (ISO 8662-12:1997)*

[8] A1 EN ISO 12001:2009 A1, *Acoustics — Noise emitted by machinery and equipment — Rules for the drafting and presentation of a noise test code (ISO 12001:1996)*

A1 *deleted text* A1

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[9] EN ISO 20643:2005, *Mechanical vibration — Hand-held and hand-guided machinery — Principles for evaluation of vibration emission (ISO 20643:2005)* A1