BRITISH STANDARD

BS EN 15166:2008

Food processing machinery — Automatic back splitting machines of butchery carcasses — Safety and hygiene requirements

ICS 67.260

BSI
British Standards

National foreword

This British Standard is the UK implementation of EN 15166:2008.

The UK participation in its preparation was entrusted to Technical Committee MCE/3/5, Food industry machines.

A list of organizations represented on this committee can be obtained on request to its secretary.

This publication does not purport to include all the necessary provisions of a contract. Users are responsible for its correct application.

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Nahrungsmittelmaschinen - Automatische Rückenspaltmaschinen für Schlachttierkörper - Sicherheits- und Hygieneanforderungen

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Foreword

This document (EN 15166:2008) 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 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of an identical text or by endorsement, at the latest by June 2009, and conflicting national standards shall be withdrawn at the latest by June 2009.

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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 98/37/EC and 2006/42/EC.

For relationship with EU Directive(s), see informative Annexes ZA and ZB, which are integral parts of this document.

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, 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 the United Kingdom.

Introduction

This document 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 document.

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

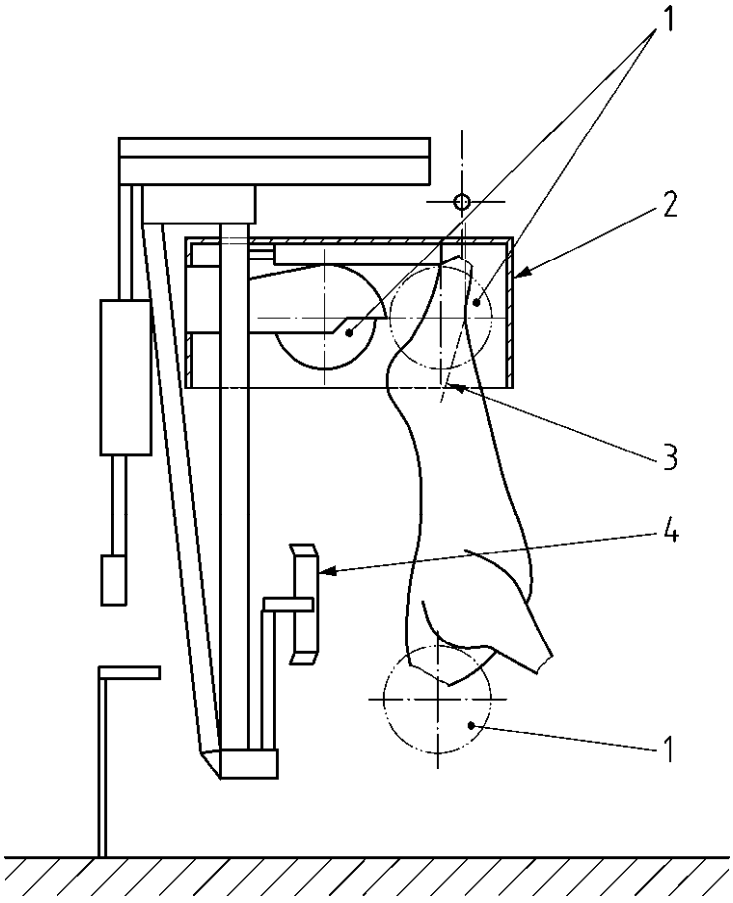
1.1 General

This European Standard applies to automatic back splitting machines and specifies safety and health requirements for machines used in slaughterhouses in order to fully automatically split meat animal (beef and pork) along the back-bone axis, splitting the carcass into two parts (see Figure 1).

This document deals with all significant hazards, hazardous situations and events relevant to automatic back splitting machines, when they are used as intended and under conditions of misuse which are reasonably foreseeable by the manufacturer (see Clause 4).

This document deals with the significant hazards, hazardous situations and events during transport, assembly and installation, commissioning and use as defined in EN ISO 12100-1:2003, 5.3.

This document is not applicable to automatic back splitting machines, which are manufactured before the date of its publication as EN.



Key

1 saw blade
2 saw blade cover
3 guiding device
4 bearing device
1 + 2 + 3 + 4 = cutting system

Figure 1 —Back splitting machine for beef, type C

1.2 Description of the concerned machines

The machines concerned by this standard are those used in slaughterhouses. They are fitted with a cutting device and are driven by electric, hydraulic and/or pneumatic energy.

The utilized cutting tools are:

— circular saws,

— splitting tools.

Three types of machines are considered (see Figures 1 to 11):

— Splitting machines for pork carcasses, type A (splitter),

— Splitting machines for pork carcasses, type B (circular saw),

— Splitting machines for beef carcasses, type C (circular saw).

There are two different operation cycles:

— carcasses can be splitted when they are at standstill (in general they are hanging on a sequence conveyed transport system);

— carcasses can also be splitted during their continuous movement by conveyor; in this case the movement of the tool is synchronized with that of the carcass.

When the split is finished, the cutting tool returns automatically to its initial position.

The machines run automatically. Under normal operating conditions there is no manual intervention.

2 Normative references

The following referenced documents are indispensable for the application 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, *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 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 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 1088:1995, *Safety of machinery — Interlocking devices associated with guards — Principles for design and selection*

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 61310-1, *Safety of machinery — Indication, marking and actuation — Part 1: Requirements for visual, auditory and tactile signals (IEC 61310-1:2007)*

EN ISO 3744:1995*, Acoustics — Determination of sound power levels of noise sources using sound pressure — Engineering method in an essentially free field over a reflecting plane (ISO 3744:1994)*

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 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, *Safety of machinery — Safety-related parts of control systems — Part 1: General principles for design (ISO 13849-1:2006)*

EN ISO 13850*, Safety of machinery — Emergency stop — Principles for design (ISO 13850:2006)*

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

EN ISO 14121-1, *Safety of machinery — Risk assessment — Part 1: Principles (ISO 14121-1:2007)*

3 Terms and definitions

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

3.1
guiding device
device for guiding the saw blade

3.2
bearing device
system for fixation of carcass during splitting process

3.3
circular saw
cutting tool in shape of a dented disc

3.4
splitting device
cutting tool in shape of a knife or guillotine

3.5
splitting tool
cutting tool (circular saw or splitting device inclusive guard)

3.6
splitting cycle
cycle including the following operations:

— positioning the splitting tool,

— cutting of the carcass by lowering of the splitting tool,

— returning of the splitting tool,

— cleaning

3.7
gambrel
device for hanging a carcass with two legs

4 List of significant hazards

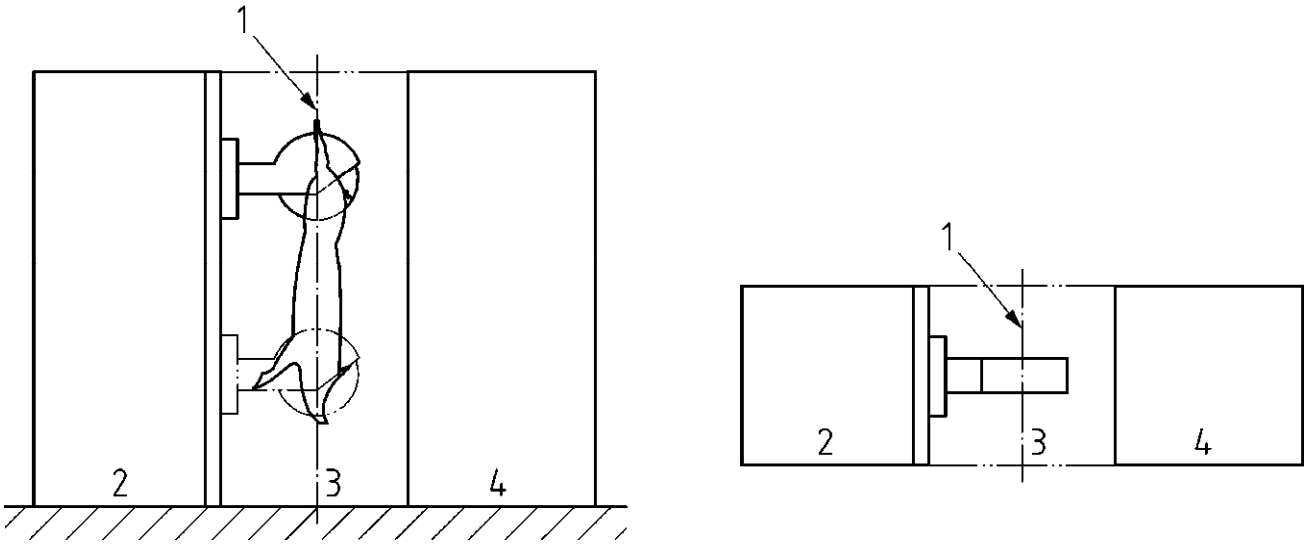
4.1 General

This clause and Annex C contains all the significant hazards, hazardous situations and events, as far as they are dealt with in this standard, identified by risk assessment as 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 according to EN ISO 14121-1 of the automatic back splitting machine to check that it has identified all significant hazards, hazardous situations and events in this clause.

4.2 Mechanical hazards (see Figures 2 to 4)

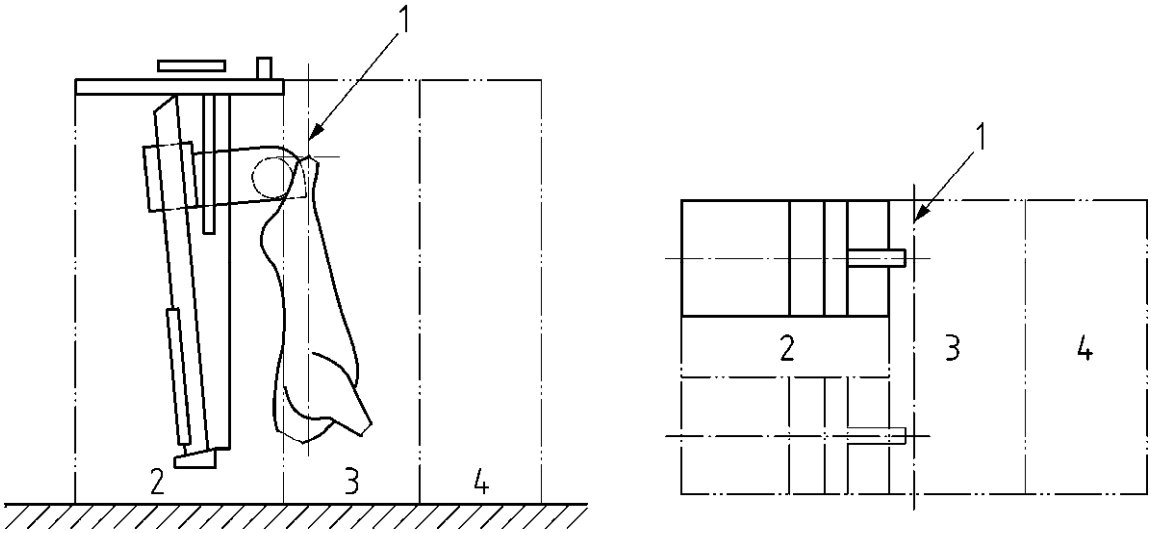
4.2.1 3 different types of automatic back splitting machines



Key

1 rail axis
2 zone 2
3 zone 1
4 zone 3

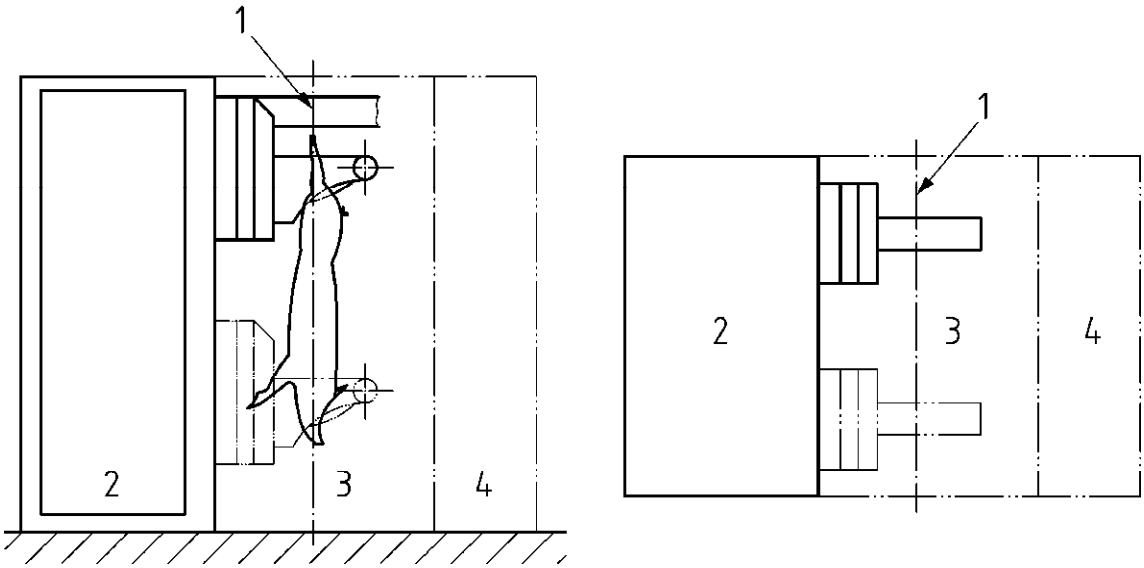
Figure 2 — Automatic back splitting machine for pork, type B



Key

1 rail axis
2 zone 2
3 zone 1
4 zone 3

Figure 3 — Automatic back splitting machine for beef, type C



Key

1 rail axis
2 zone 2
3 zone 1
4 zone 3

Figure 4 — Automatic back splitting machine for pork, type A

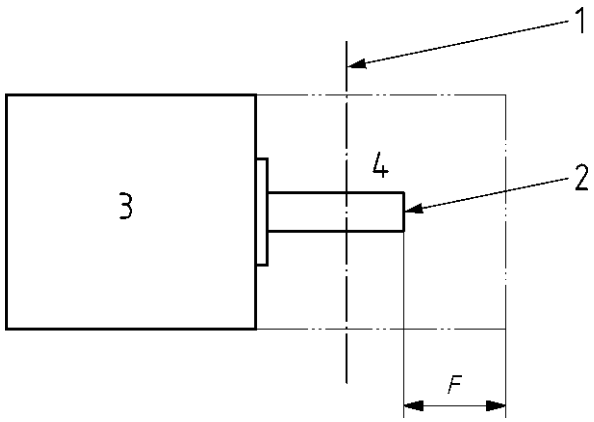
4.2.2 Automatic back splitting machines, Effective range of splitting tool

— Zone 1

Cutting, severing, crushing, impact, entanglement hazard.

This zone represents the working zone of the cutting system.

The length of the zone 1 ranges from the front panel of the machine frame, to 1 m from the end of the cutting system, in its furthest position forward. The width of the zone is that of the machine structure, in its widest part.



Key

1 conveyor axis
2 cutting system in its furthest position forward
3 machine structure
4 zone 1
F = 1 m (+/- 0,2 m)

Figure 5 — Effective range

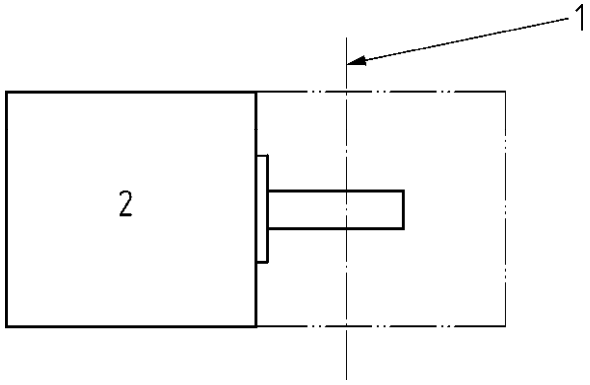
4.2.3 Zone of driving- and guiding mechanisms of splitting tools and bearing device of the carcass

— Zone 2

Cutting, entanglement, crushing, jamming impact hazard to the body.

This zone is made up of the surface area taken up by the frames, the machine structures or the zones of machine movement, in their widest dimensions, excluding the cutting system.

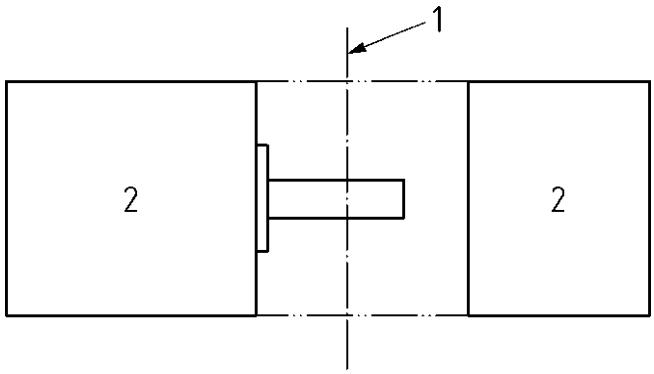
This zone is limited by the range of the movement of all moving parts, excluding the cutting system.



Key

1 conveyor axis
2 zone 2

Figure 6 — Single structure



Key
1 conveyor axis
2 zone 2

Figure 7 — Multiple structure

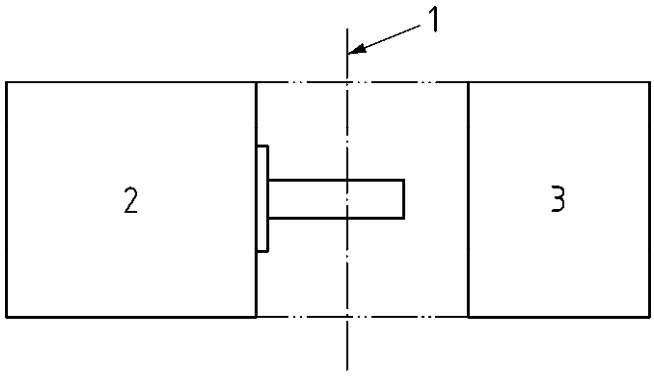
4.2.4 Ejection of cutting tools or parts of cutting tools and of bone particles, falling of tools

— Zone 3

Cutting and impact hazard to the whole body.

Hazards can appear during the operations of mounting and dismounting of the splitting tools.

In the case of a machine with a multiple structure, this zone 3 is superimposed on the second zone 2.



Key
1 conveyor axis
2 zone 2
3 zone 3 = zone 2

Figure 8 — Multiple structure

4.3 Electrical hazards and hazards related to the control system

4.3.1 Direct or indirect contact with live parts

Hazard by electric shock to the body.

4.3.2 Control systems with insufficient safety level

Hazard of mechanical or other injury to the body due to malfunction.

4.4 Hydraulic and pneumatic hazards

Hazard due to ejection of high-pressure liquid.

4.5 Hazards due to loss of stability

Insufficient strength of anchoring.

Impact or crushing hazard to the body.

4.6 Hazard generated by noise

Automatic back splitting machines may generate noise which can result in hearing damage, in accidents due to interference with speech communication and interference with the perception of acoustic signals.

4.7 Hazards from non-compliance with ergonomic principles

Unhealthy posture or excessive physical effort.

Inadequate consideration of human anatomy of hand/arm or foot/leg during machine design.

Hazard of physical damage to body.

4.8 Hazards from non-compliance with hygiene principles

4.8.1 Microbial causes

Hazard (spoilage) of foodstuff.

Hazard of damage to health of the consumer due to food poisoning.

4.8.2 Chemical causes

Hazard (contamination) to foodstuff by residues of cleaning and disinfecting agents and hydraulic fluid.

Hazard of damage to health of the consumer.

4.8.3 Physical causes

Foreign objects (bone sawdust, blood and bone marrow) originating from raw materials, machines or other sources.

Ejection of bone sawdust, blood and bone marrow.

Hazard of damage to health of the consumer.

5 Safety and hygiene requirements and/or protective measures

5.1 General

Machinery shall comply with the safety and hygiene requirements and/or protective measures of this clause and of Annex C.

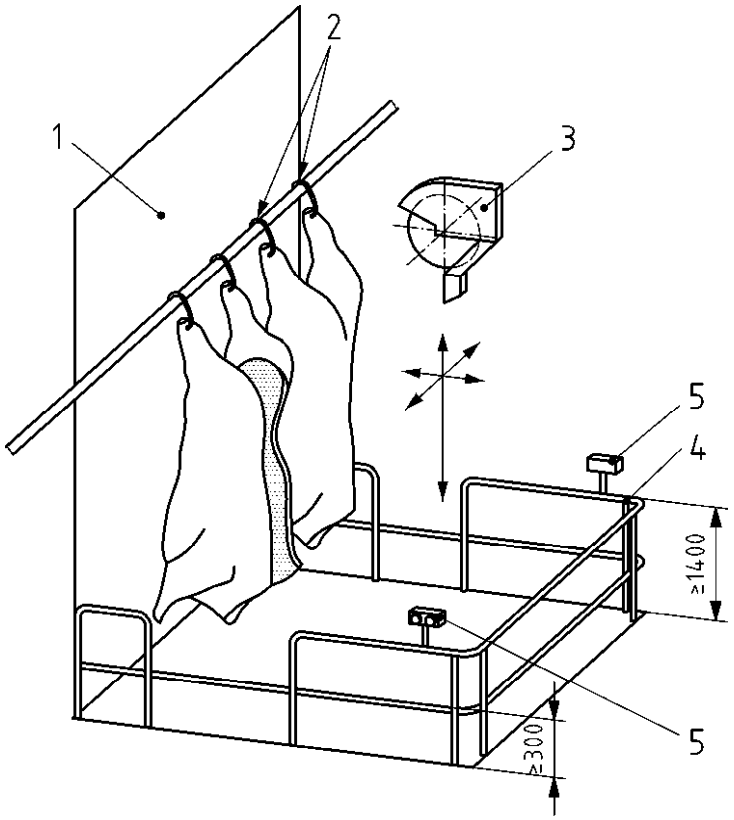
In addition, the machine shall be designed according to the principles of EN ISO 12100-2 for hazards relevant but not significant, which are not dealt with by this document (e. g. sharp edges).

NOTE Or the machine should be designed for hazards which are to be reduced by the application of a B-level standard such as EN ISO 13857, EN 614-1, EN 953, EN ISO 13849-1, EN 1088, EN 1672-2, EN 60204-1, EN ISO 4287 etc. The manufacturer should carry out a risk assessment to establish the requirements of the B-standard which are to be applied. This specific risk assessment should be part of the general risk assessment of the machine.

Where 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 Zone 1: Effective range of splitting tool (see Figure 5)



Key

1 protective shield
2 double control of the presence of the carcass
3 guard
4 fence
5 emergency stop

Figure 9 — Installations diagram of the machine, type C

Although protected by the carcasses themselves this zone should be marked and protected:

— either by a fixed distance guard (see Figure 9 and 10) according to 3.2.2 of EN 953:1997, as high as possible and in any case higher than 300 mm; or

— by a movable guard, interlocked according to 3.5 of EN 953:1997, as high as possible and in any case higher than 300 mm (see Figure 9).

In any case, this device shall cover the total length of zone 1 (see Figure 5).

Provisions shall be made for preventing the splitting tools from descending when not operating.

5.2.2 Zone 2: Driving and guiding mechanism (see Figures 6 and 7)

This zone is limited by the range of the movement of all moving parts, excluding the cutting system.

This zone shall be safeguarded with (see Figure 9):

— fixed guards according to 3.2.2 of EN 953:1997; and/or

— movable interlocking guards in accordance with 3.5 of EN 953:1997.

Distance guards shall have a height in accordance with Table 1 of EN ISO 13857:2008. The machine housing can be part of these guards.

5.2.3 Zone 3: Ejection zone of cutting tools (see Figures 5 and 9)

This zone is the area, where the operator can be injured by the ejection of cutting tools or parts thereof, or bone particles. It is mainly defined by the limit of zone 1 (1 m from the end of the cutting system).

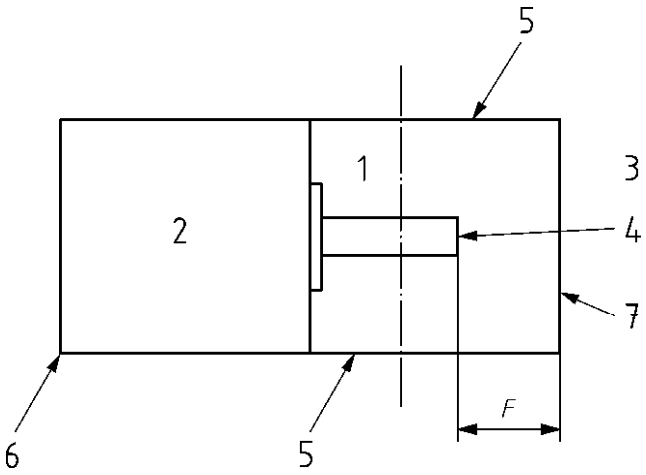
The limit between the zone 1 and the zone 3 (*F*, see Figure 5) shall be safeguarded with (see 7, Figure 10):

— fixed guards according to 3.2.2 of EN 953:1997; and/or

— movable interlocking guards in accordance with 3.5 of EN 953:1997.

The height of the safeguarding device shall at least correspond to the highest point of the cutting tool. The guards shall have no openings.

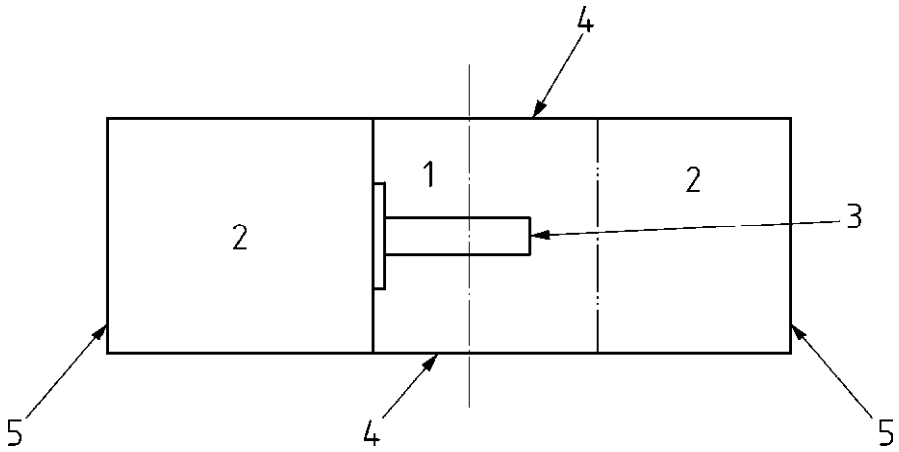
5.2.4 Examples of protection devices (see 5.2.1, 5.2.2, 5.2.3)



Key

1 zone 1
2 zone 2
3 zone 3
4 cutting system in its forward position
5 fixed protection device (h min = 300 mm), infeed and outfeed sides of the carcass
6 fixed protection device (h min: according to EN ISO 13857)
7 fixed protection device (h min = top of tool in its highest position)
F = 1 m (+/- 0,2 m)

Figure 10 — Single structure, protection using fixed devices



Key

1 zone 1
2 zone 2
3 cutting system in its furthest position forward
4 fixed protection device (h min = 300 mm)
5 housing of the machine (h min in accordance with EN ISO 13857)

Figure 11 — Multiple structure, protection by the machine structure

5.2.5 Common measures to the 3 zones

5.2.5.1 Interlocking devices shall comply with 5.2.7.

5.2.5.2 The following provisions shall be made for ensuring that in normal running mode starting of the splitting operation is only possible, when a carcass is correctly positioned:

— when the machine can be used with gambrels:

a) a detection device for the gambrel, and

b) a detection device for the carcass

and/or

— when the machine can be used with hooks:

c) a detection device for hooks, and

d) a detection device for the carcass.

A special mode can be provided enabling a full cycle to be carried out without carcass.

The selection mode shall be in accordance with 5.2.5.4.

5.2.5.3 In the event of a drive failure (e.g. pipe or hose breakage), the splitting tool shall be automatically locked in its position or the movement of the splitting tool shall be reduced to a non hazardous speed.

Provisions shall be made for preventing the splitting tool from descending unintentionally, when not operating.

5.2.5.4 A mode selection device shall be provided allowing the following modes:

— a mode, in which a full cycle can be carried out without carcass;

— a “maintenance and cleaning mode”, in which the cutting tool is placed in an appropriate position for enabling maintenance and cleaning;

— a manual mode, enabling individual control of the actuators.

The instruction handbook shall give information on the correct use of this device.

The mode selection device shall be according to 4.11.9 and 4.11.10 of EN ISO 12100-1:2003.

5.2.6 Protection of the cutting tools

5.2.6.1 The fixation of the cutting tools shall prevent their accidental projection during operation by positive locking.

5.2.6.2 Cutting tools, except for the active part, shall be protected by a cover. The force, necessary to move the cover shall not exceed 200 N (see 5.7).

5.2.7 Interlocking devices

For interlocking of guards (at least) interlocking devices without guard locking as defined in 4.2.1 of EN 1088:1995 shall be used. The related parts of the control system shall be at least performance level “d” according to EN ISO 13849-1.

Position detectors use for guard interlocking shall be designed or selected and installed:

— in accordance with the requirements of 5.8 for hygiene (taking account of cleaning methods and agents, cleaning with water),

— in accordance with the requirements of 5.7 of EN 1088:1995 for minimising defeat possibilities,

— for withstanding the mechanical constraints that can be reasonably expected.

Preferably they shall be located inside the machine enclosure.

In the instructions handbook, the manufacturer shall express the need for verification, minimum daily and before operating the machine, of the guard interlocking devices and explain the verification methods.

5.3 Electrical hazards and control system

5.3.1 General

The electrical equipment shall comply with EN 60204-1.

5.3.2 Stopping function of switching devices

Stopping function shall be in accordance with 9.2.2, category 0 or 1 of EN 60204-1:2006.

5.3.3 Emergency stop device

The machines shall have at least one emergency stopping device in accordance with EN ISO 13850, stopping all dangerous movements as fast as possible. The manufacturer shall carry out a risk assessment for defining the need for complementary emergency stopping devices and their location (e. g. at the operators station(s) and/or at outfeed/infeed sides) and for defining possible additional safety measures.

The parts of the control system related to the emergency stopping shall be at least performance level “d” in accordance with EN ISO 13849-1.

5.3.4 IP degrees of protection against water ingress

Electrical operating components shall comply with the following degrees of protection in accordance with EN 60529.

a) IP X5: External electrical operating components

   1) on the machine,

   2) on the control box enclosure on the machine,

   3) on the control box enclosure located in the process room;

b) IP X3: Internal electrical operating components

   1) in the machine with enclosed housing with the degree of protection of IP X5 and open lower surface,

   2) Protection against direct and indirect impact of a water jet shall be assured;

c) IP X2: Internal electrical operating components

   1) in a machine with completely enclosed housing with the degree of protection IP X5,

2) protection against condensate water shall be provided,

3) in the control box enclosure;

d) IP X0: Internal electrical operating components

1) in a machine with completely enclosed housing with the degree of protection IP X5,

2) protection against condensate water shall be provided, and the safety of fingers and the back of hand assured.

5.3.5 On and Off switch

On automatic back splitting machines, On and Off switches shall be provided. The switches shall be positioned on the operator's station(s) of machines. The On switch shall be protected against unintended operation (e. g. by protective collar).

5.3.6 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.

5.3.7 Safety related parts of the control system

Safety related parts of the control system shall be at least performance level "c" in accordance with EN ISO 13849-1.

5.4 Hydraulic and pneumatic hazards

The hydraulic and pneumatic equipment has to be in accordance with:

— EN ISO 12100-2:2003, 4.10,

— EN 982,

— 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 Hazards of loss of stability

Automatic splitting machines shall be designed to be stable under normal operating conditions.

The manufacturer shall give detailed information on the foundation load and the fixation in the instruction handbook. The use of the locking device and the quality of the floor shall be described.

5.6 Noise reduction

The machines shall be so designed and constructed that risks from airborne noise emission are reduced to the lowest level by specifically applying measures at source to control noise (see for example

EN ISO 11688-1). The success of the applied noise reduction measures is assessed on the basis of the actual noise emission values (see Annex A) in relation to other machines of the same family.

5.7 Ergonomic requirements

Attention shall be paid to the ergonomic requirements described in 4.8 of EN ISO 12100-2:2003 as well as in EN 614-1 and EN 1005, parts 1 to 3. Any information for the user which is relevant for achieving the ergonomic objectives shall be contained in the instruction handbook.

Grips and detachable knife holders and hoods have to be designed and attached in such a way, that no forces higher than 200 N are necessary for the handling.

5.8 Hygiene and cleaning

5.8.1 General

The design of the machines shall be in accordance with EN 1672-2 and with the requirements laid down below as well as in accordance with Annex B.

5.8.2 Food areas

The following components are defined according to EN 1672-2 and regarded as food areas:

— cutting tool,

— splitting tool,

— guard of the cutting tool (internal and external surfaces),

— carcass keeping system,

— carcass guiding system.

5.8.3 Splash area

The following components are defined according to EN 1672-2 and regarded as splash areas:

— guards of zone 3,

— splitting tool support.

5.8.4 Non-food areas

The non-food areas include all other surfaces.

5.8.5 Surface conditions

The surface design shall comply with the requirements of EN 1672-2.

The maximum surface roughness values shall comply with the requirements of Annex B.

5.8.6 Cleaning

All surfaces in the food area shall be easy to clean and disinfect. They shall be designed such that cleaning liquids can run off freely.

Some components in the food area e. g. cutting tools and guard are not easy to clean. Specific information on cleaning and adequate removal of cleaning and disinfection agents shall be given in the instruction handbook (see 7.1).

Concerning cleaning during production, the cutting tools, and more generally all parts coming into contact with the meat during the cutting cycle, shall be cleaned automatically between 2 cycles to minimize cross-contamination. The cleaning shall be carried out by spraying with hot water.

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 the 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. These testing methods shall be applied with machines:

— fully commissioned; or

— partly dismantled.

A dismantling can be necessary for some tests. A partial dismantled machine shall not invalidate the result of the verification.

Table 1 — Test methods

Section	Testing method
5.2	Measurement (individual) Visual inspection (individual) Measurement of stopping time (individual)
5.2.1	Visual inspection (individual) Functional test (individual)
5.2.2	Visual inspection (individual) Functional test (individual)
5.2.3	Visual inspection (individual) Test according to EN 953 (type)
5.2.4	Visual inspection (individual) Measurement of height (individual)
5.2.5	Visual inspection (individual) Functional test (individual)
5.2.6	Visual inspection (individual) Functional test (individual) Measurement of the force (individual)
5.2.7	Visual inspection (individual) Functional test (individual)
5.3.1	Visual inspection (individual) Test according to EN 60204-1 (individual)
5.3.2	Visual inspection (individual) Test according to EN 60204-1 (individual)
5.3.3	Visual inspection (individual) Test according to EN ISO 13849-1 (individual) Test of function (individual)
5.3.4	Visual inspection (individual) Test according to EN 60529 (individual)
5.3.5	Visual inspection (individual) Functional test (individual)
5.3.6	Functional test (individual)
5.3.7	Functional test (individual)
5.4	Visual inspection of components and pipes, test for leaks (individual)
5.5	Visual inspection (individual) Calculation (type)
5.6	Noise test, according to Annex A (type)
5.7	Visual inspection (individual) Measurement (type) Weight check (type)
5.8	Visual inspection (individual) Measurement of surface roughness, radii, corners, edges, screws, welds (type)
7.1	Verification of the data (type)
A.7	Verification of noise emission values (type)

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 Signals and warning devices

If there are safety-marks or pictograms, they shall be according to EN 61310-1 and be explained in the instruction handbook.

7.3 Instruction handbook

The instruction handbook shall at least contain the following information in accordance with 6.5 of EN ISO 12100-2:2003:

a) Information relating to the machine:

   1) Detailed description of the machine and its components,

   2) Information on intended use and prohibited use,

   3) Information on the range of applications for which the machine is intended and all prohibited applications,

   4) Diagrams giving a schematic representation of the installation, safety functions (with description),

   5) Information on the maximal rotation speed, the maximum diameter of tools, the weight of removable parts,

   6) The business name and full address of the manufacturer and (if relevant) of his authorised representative.

b) Information relating to assembling, installation and disassembling of the machine:

   1) Information on the necessary space for operation and maintenance of the machine,

   2) Information on how to connect the machine to different power supplies,

   3) Information on the characteristics of different components of the machine and on their using before scrapped,

   4) Information on waste water draining.

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

   Information on dimensions, weight, position of centre of gravity and indications for handling.

d) Information relating to the use of the machine:

   1) Instructions for commissioning and decommissioning,

   2) Instructions for setting and adjustment,

   3) Inspection frequency,

   4) Information on components which stop the machine,

5) Information on hazard of residual risks,

6) Information on particular hazards which may arise for certain applications or by the use certain fittings,

7) Information on prohibited uses,

8) Declaration of noise emission values (see Annex A).

NOTE Noise emission data should also be given in the sales literature.

e) Information relating to maintenance:

1) Information on the nature and frequency of inspections and maintenance activities,

2) Information on the:

i) method of cleaning,

ii) type of cleaning agents,

iii) method of disinfecting,

iv) type of disinfecting agents,

v) type of rinsing agents,

3) Instructions concerning the installation and the removal of cutting tools,

4) Instructions for locking and unlocking of cutting tools protectors,

5) Information on the types of oils and/or greases to be used for lubrification,

6) Drawing and diagrams to enable maintenance staff members to carry out their task,

7) Information on risks of failures and the means to cure them.

7.4 Operator training

Information shall be given which specifies the elements of training required for normal operating, cleaning, transportation and installation of the machines.

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, however at a minimum of a half year.

7.5 Marking

Back splitting machines conforming to this standard shall be marked with the following information on its rating plate:

— the business name and full address of the manufacturer and (if relevant) of his authorised representative;

— designation of the machinery;

— mandatory marking [1)];

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

— designation of series or type, if any;

— serial or identification number, if any;

— rating information (mandatory for electrotechnical products: voltage, frequency, power, etc.).

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

Annex A
(normative)

Noise test code for automatic back splitting machines of butchery carcasses (grade 2)

A.1 Sound measurements

A.1.1 Emission sound pressure level determination

EN ISO 11204 shall be applied in order to determine the emission sound pressure level, according to the requirements of grade 2.

The measurements shall be taken at the normal operator position at a distance of:

— 1 m from the back splitting machine.

The location of the microphone shall be defined as follows:

At a height of 1,55 m above the floor, square with the machine with the microphone directed against the machine.

A.1.2 Sound power level determination

The sound power level shall be determined according to EN ISO 3744 using the parallelepiped measurement surface.

A.2 Installation and mounting conditions

The test environment shall be in accordance with Clause 4 of EN ISO 3744:1995

NOTE In free-field tests it is assumed, that the environmental correction factor K_2 is equal or smaller than 0,5 dB and therefore is negligible.

Floor mounted machines shall be placed on a reflective floor and be sufficiently distant from any reflective walls or ceilings or any other objects.

A.3 Operating conditions

The measurement of the noise emission of the machine is done running with no load after a running time of 5 min.

A.4 Measurement

The A-weighted-time average level of the noise emission shall be measured at the specified position.

The measuring instruments shall be in compliance with Section 5 of 10.2.1 of EN ISO 11204:1995.

The measuring time shall be at least 15 s.

Determination of sound power level shall be in accordance with EN ISO 3744.

A.5 Information to be recorded

The information to be recorded shall comply with Clause 12 of EN ISO 11204:1995 and EN ISO 3744.

All deviations from this noise test code and from EN ISO 11204 shall be documented together with the technical justification for these deviations.

A.6 Measurement uncertainty

A standard deviation of reproducibility of 0,5 dB to 2,5 dB is expected for the A – weighted emission sound pressure level determined according to EN ISO 11204. The same applies for the sound power level determined according to EN ISO 3744.

A.7 Information to be reported

The information to be reported shall comply with Clause 13 of EN ISO 11204:1995 and EN ISO 3744.

As a minimum, the following information shall be included:

— reference to EN ISO 11204 and EN ISO 3744,

— description of the operation and installation conditions during the measurement,

— location of the measurement points,

— noise emission values measured,

— confirmation that all requirements of this noise test code have been fulfilled, or, if this is not the case, any unfulfilled requirements shall be identified.

A.8 Declaration and verification of the noise emission values

The noise emission value shall be declared according to the two number declaration of EN ISO 4871 thus declaring the emission sound pressure level L_{pA} at the workstation and the uncertainty K_{pA}. K_{pA} is assumed to be 2,5 dB.

The noise emission value shall be rounded to the next entire Decibel.

The noise emission declaration shall explicitly state that the emission values have been measured according to the specification of this noise test code as well as to EN ISO 11204.

If this is not the case, it shall be explicitly mentioned which deviation with regard to EN ISO 11204 exists.

The verification shall be carried out according to EN ISO 4871 and under the same mounting-, installation- and operating conditions as those which were applied to the original determination of the noise emission values.

Declaration and verification of sound power level shall be in accordance with EN ISO 3744.

NOTE Additional noise emission values can be indicated in the declaration.

Annex B
(normative)

Design principles to ensure cleanability of automatic back splitting machines of butchery carcasses

B.1 Definitions

For the purpose of this annex, the following definitions apply:

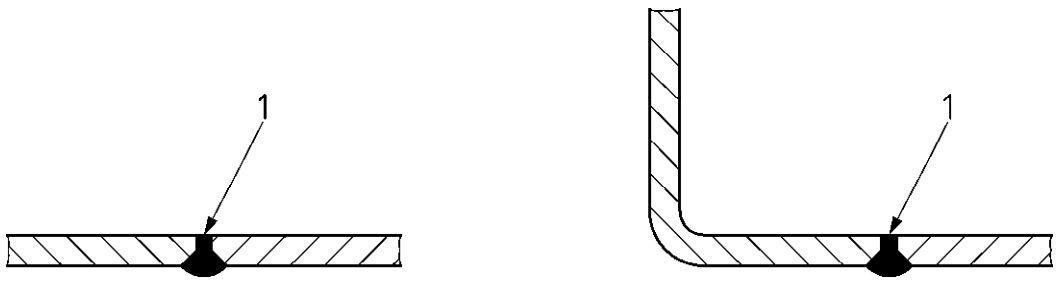
B.1.1
food area
area which is composed of those surfaces in contact with food and which also includes the surfaces with which the product may come in contact with under normal condition of use, after which it returns into the product

B.1.2
splash area
area composed of surfaces on which a part of the food may splash or flow along under condition of use and does not return into the product

B.1.3
non-food area
any area other than those specified above

B.1.4
joined surfaces
surfaces that are joined such so that no particle or product becomes rapped in small crevices, thus becoming difficult to dislodge and so introduce a contamination hazard (see Figure B.1)

B.1.5
easily cleanable
designed and constructed such that the elimination of contaminants can be achieved through a simple cleaning method, e. g. cleaning agents and water under pressure



Key
1 smooth surfaces

Figure B.1 — Smooth surfaces – Food area

B.2 Materials of construction

B.2.1 General

Materials of construction shall comply with 5.2 of EN 1672-2:2005.

B.2.2 Type of materials

B.2.2.1 Materials for food area

All valid general and – related to specific materials, e. g. plastics – specific legal requirements for materials and articles in contact with food shall be met.

B.2.2.2 Materials for splash area

See 5.3.2 in EN 1672-2:2005.

B.2.2.3 Non-food area

See 5.3.3 in EN 1672-2:2005.

B.3 Design

B.3.1 General

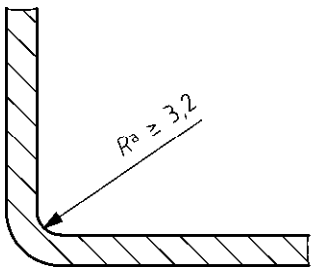
Surfaces and components in the various areas shall meet the following requirements:

B.3.2 Food area

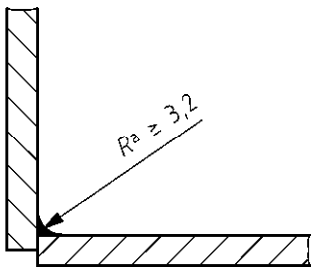
B.3.2.1 The **surfaces:** in the food area shall be smooth and free of grooves and depressions (see Figure B.1).

B.3.2.2 **Inside corners:** The angle formed by the intersection of two surfaces shall be ≥ 90° and have a radius of ≥ 3,2 mm (see Figure B.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 B.2).



Key
Radius
Machining operation, bent blade



Key
Radius
Welding seam

Figure B.2 — Angles and radii in food area

Parts of machines, e. g. tooth, transport or cleaning rolls can have recesses, grooves and corners with smaller radii due to product manufacturing necessities. The rolls shall be easy to clean.

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

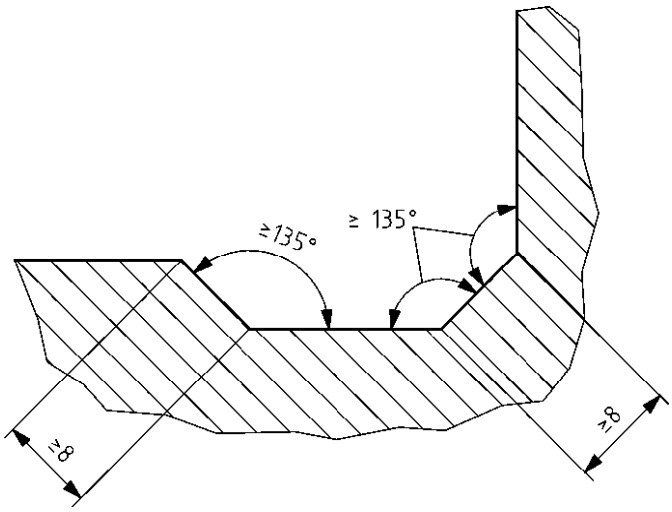
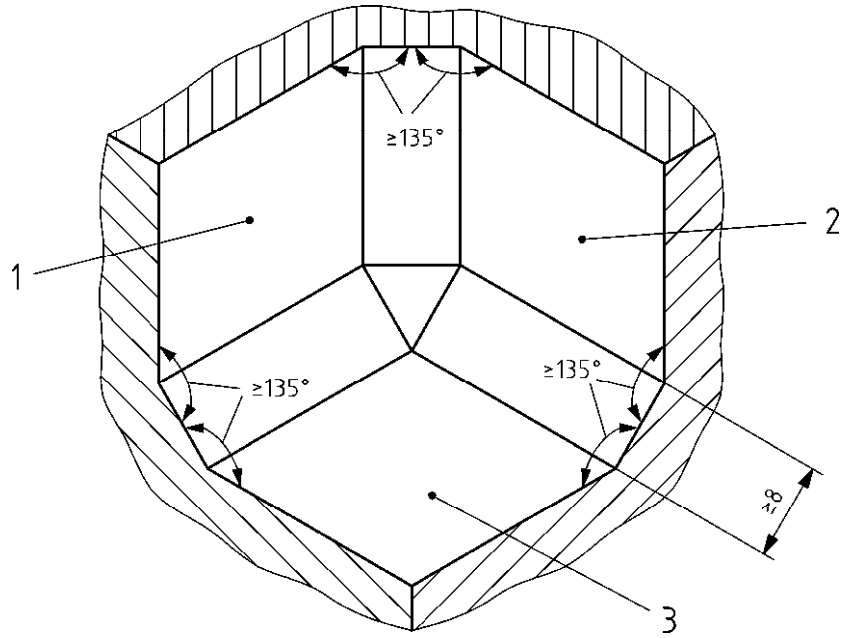


Figure B.3 — Angles in food area

Should a corner be formed by the intersection of three surfaces, 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 B.4).



Key

1 surface 1
2 surface 2
3 surface 3

Figure B.4 — Intersecting surfaces in food area

B.3.2.3 **Grooves** may be used if the inner radius is ≥ 3,2 mm and the depth < 0,7 times the radius.

B.3.2.4 **Joints and seams** shall be welded or sealed and as smooth as the connected surfaces (see Figure B.1).

B.3.2.5 **The surface roughness** shall be ≤ R_z 25 μm. In those areas where it is technically possible < *R*z 16 μm should be selected.

B.3.3 Splash area

B.3.3.1 **Surfaces** shall be smooth (see Figure B.1).

B.3.3.2 **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 B.4).

B.3.3.3 **Grooves** may be used if the inner radius is ≥ 3,2 mm and the depth < 1,0 times the radius.

B.3.3.4 **Openings** are permissible if they go right through and have a diameter ≥ 16 mm. Gaps are permissible provided the gap is at least 16 mm in width, the depth is not more than 16 mm and the gap is open.

B.3.3.5 **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. For information, see EN 1672-2:2005, Annex B.

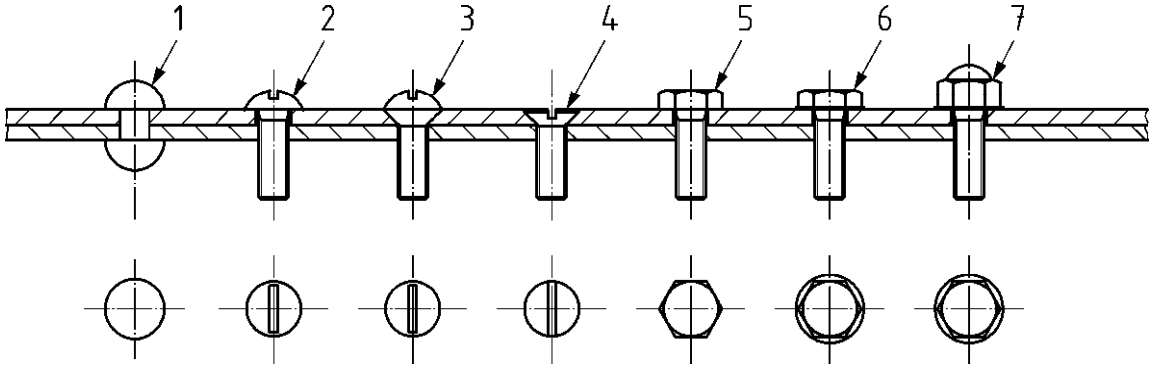
B.3.3.6 **Fastenings methods:** Screws and rivets with low profile heads and of the types shown in Figure B.5 may be used only when other fastening methods are impracticable and they are easy to clean (see Figure B.5).

The following types of screws shall not be used:

— Cross head recessed screws,

— Hexagon socket head cap screws,

— Screws with a diameter < 3 mm.



Key

1	round head	4	slotted countersunk head	7	hex domed head
2	oval head	5	hexagon head		
3	slotted raised countersunk head	6	hexagon head with flange		

Figure B.5 — Permissive fastening methods – head profiles

B.3.3.7 The surface roughness conditions shall comply with the requirements of B.3.2.5.

B.3.4 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 C
(normative)

Common hazards for food processing machines and reduction requirements applicable to back splitting machines

C.1 Cutting hazards

Cutting tool handling: Cutting tools have to be removed periodically. Cutting tools are sharp and special measures shall be taken. For such blades, designers shall provide means of attaching a tool to the blade to avoid hand contact and a box or surround guard, to protect against the sharp edges of the blade during handling and transportation. Explanations on the use of these protective means shall be included in the Instructions for use.

Verification: Visual inspection of the machine and its documentation.

C.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 including removal of blockages, assisting product flow and cleaning between different products during a working day and gaining access to the machine parts for a thorough clean to meet the hygiene needs as required throughout or at the end of a working day.

The designer shall carry out a hazard assessment of the cleaning requirements, the risks from the different cleaning options to the operator and the risks of contaminating food subsequently processed.

Verification: By visual inspection and examination of documentation.

C.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 as far as possible.

Verification: By functional test or examination of documentation.

C.4 Restoration of energy supply after an interruption

The hazards from mechanical parts unexpectedly restarting exist at all food machines where access is made into the danger zone.

EN 60204-1 provides the options of specifying, or not, devices to prevent unexpected start up of machines following a power interruption. For food machines, as the risk from mechanical hazards and the frequency of approach to danger zones is so high, such devices shall always be used.

Verification: By visual inspection.

C.5 Hazards due to cleaning substances

Hazards commonly arise from the cleaning processes or substances used to obtain the hygiene condition needed in food processing. Where hazardous chemicals are used, e. g. concentrated caustic solutions, these should be designed so that the substance is handled, diluted, used and recovered in an enclosed system (e. g. cleaning in place) which removes the operator from contact.

Verification: Examination of documentation.

C.6 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,

— aprons for cleaning,

— gloves to handle frozen products.

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

Verification: Examination of documentation.

C.7 Hazard from noise

The designer shall design and construct the machinery so that risks arising from the emission of airborne noise are reduced to the lowest level, taking account of the technical progress and available means of reducing noise in the following order: at source, by preventive measures (e. g. enclosure), by instructions to the user.

Verification: Examination of documentation.

Annex ZA
(informative)

Relationship between this European Standard and the Essential Requirements of EU Directive 98/37/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 Machinery 98/37/EC, amended by 98/79/EC.

Once this standard is cited in the Official Journal of the European Communities 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.

Annex ZB
(informative)

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 Communities 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.

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