BS EN 12268:2014

BSI Standards Publication

Food processing machinery — Band saw machines — Safety and hygiene requirements

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National foreword

This British Standard is the UK implementation of EN 12268:2014. It supersedes BS EN 12268:2003+A1:2010 which is withdrawn.

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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Compliance with a British Standard cannot confer immunity from legal obligations.

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Nahrungsmittelmaschinen - Bandsägemaschinen - Sicherheits- und Hygieneanforderungen

This European Standard was approved by CEN on 13 September 2014.

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Foreword

This document (EN 12268:2014) has been prepared by Technical Committee CEN/TC 153 “Machinery intended for use with foodstuffs and feed”, the secretariat of which is held by DIN.

This European Standard shall be given the status of a national standard, either by publication of an identical text or by endorsement, at the latest by May 2015 and conflicting national standards shall be withdrawn at the latest by May 2015.

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 supersedes EN 12268:2003+A1:2010.

This document has been prepared under a mandate given to CEN by the European Commission and the European Free Trade Association, and supports essential requirements of EU Directive 2006/42/EC.

For relationship with EU Directive 2006/42/EC, see informative Annex ZA, which is an integral part of this document.

Significant changes:

The significant changes with respect to the previous edition EN 12268:2003+A1:2010 are listed below:

— Clause 1: clarification of the scope; new clause to describe the machine types; displacement of requirements in the appropriate clauses;

— Clause 2: normative references updated;

— Clause 3: terms partly revised (e.g. fixed feed table); consistent use throughout the standard;

— Clause 4: new presentation in a table;

— Clause 5: new 5.2 according to the danger zones; more specific requirements to product pusher, protective rail and blade guide;

— Clause 6: verification list updated;

— Clause 7: completion of 7.2 with all information referred to in Clause 5, now including operator training; 7.3 now contains the marking;

— annexes: old Annex C “Common hazard” deleted and shifted into appropriate clauses;

— figures partly renewed.

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

Introduction

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

The machinery concerned and the extent to which hazards, hazardous situations and hazardous 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 specifies requirements for the design and manufacturing of band saw machines as described in 1.2 (see Figures 1 to 5).

The machines covered by this European Standard are used to cut:

— bones;

— fresh or deep frozen meat with or without bones;

— fresh or deep frozen fish, natural or in fillets;

— deep frozen block food products;

— fresh or deep frozen vegetables;

— other products such as pork fat or similar products.

The band saw machines covered by this European Standard do not include band saw machines for processing wood and similar materials which are covered by the EN 1807 series.

Band saw machines for domestic use are not included in this European Standard.

This European Standard is not applicable to band saw machines which were manufactured before its date of publication as EN.

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

This European Standard deals with the hazards which can arise during all the lifetime of the machine, including the phases of transport, assembly, commissioning, operation, cleaning, use, maintenance, decommissioning, dismantling, disabling and scrapping of the machine.

This European Standard covers the following types of machines:

— band saw machines designed as table-top machines with and without base;

— band saw machines designed as floor-type machines with and without castors.

1.2 Description of various machine types

1.2.1 General

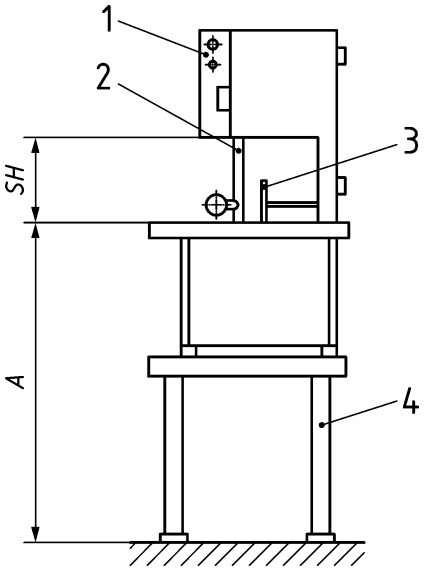
Band saw machines consist of a machine casing, a fixed feed table or a sliding feed table, a roller conveyor or conveyor belt, a product pusher, a height-adjustable protective rail, a top and a bottom wheel, a saw blade, an upper and lower blade guide, a blade tensioning device, a drive and electrical components, depending on machine type. This standard does not deal with machinery with automatic loading/unloading systems (e.g. automatic conveyors).

On floor-type band saw machines, the product to be cut is placed by hand onto the fixed feed table or sliding feed table and pushed against the cutting zone of the saw blade by means of the product pusher or the rear table wall on the sliding feed table or by means of the roller conveyor or conveyor belt and sawed.

1.2.2 Type A

Band saw machine with a fixed feed table and a non-detachable, movable product pusher:

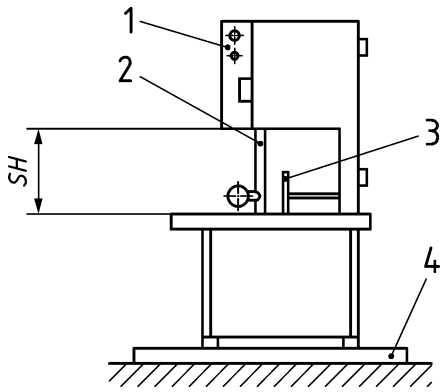
Maximum cutting height SH ≤ 250 mm.



Key

1 ON-/OFF-switch
2 product pusher
3 portioning plate
4 table

Figure 1 — Band saw machine type A with product pusher – Location: table top



Key

1 ON-/OFF-switch
2 product pusher
3 portioning plate
4 base

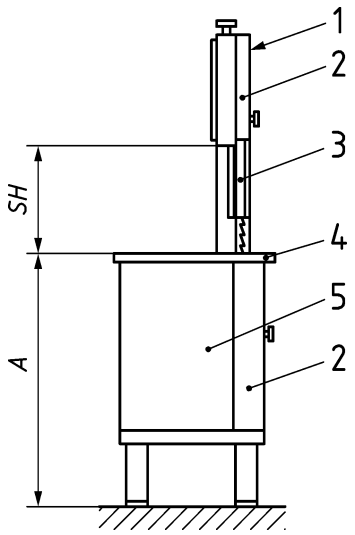
Figure 2 — Band saw machine type A with product pusher – Location: base

1.2.3 Type B

Band saw machine with a fixed feed table, a protective rail and a maximum cutting height < 420 mm.

1.2.4 Type C

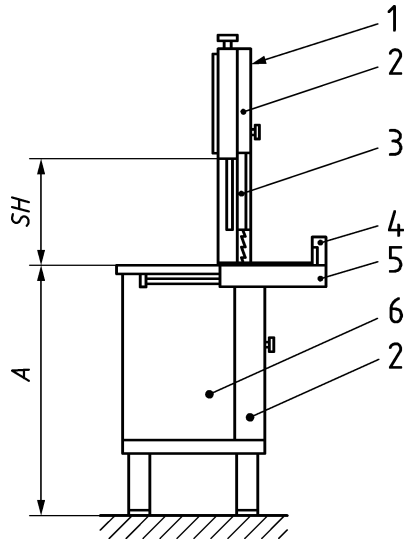
Band saw machine with a sliding feed table, a protective rail and a maximum cutting height ≤ 420 mm.



Key

1 ON-/OFF-switch
2 door
3 protective rail
4 fixed feed table
5 machine rack

Figure 3 — Band saw machine type B with fixed feed table and protective rail



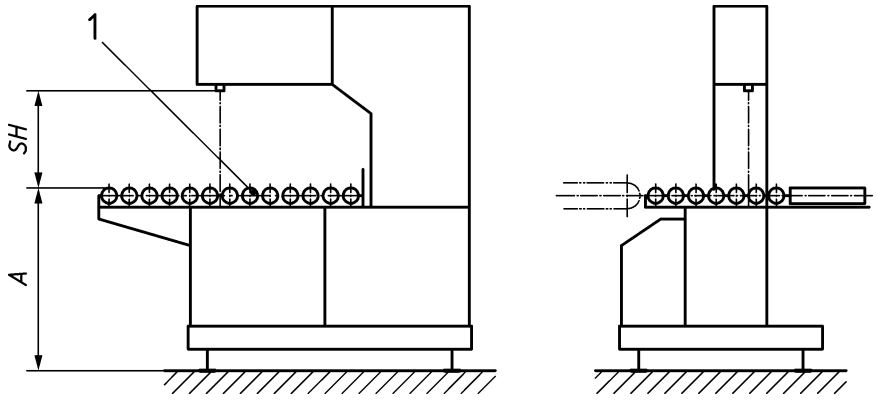
Key

1 ON-/OFF-switch
2 door
3 protective rail
4 finger protection bar
5 sliding feed table
6 machine rack

Figure 4 — Band saw machine type C with sliding feed table and protective rail

1.2.5 Type D

Band saw machine with non-automatic feed and removal unit (e.g. roller conveyor, conveyor belt); maximum cutting height SH ≤ 550 mm.



Key

1 roller conveyor or transport conveyor

Figure 5 — Band saw machine type D with feed and removal unit

2 Normative references

The following documents, in whole or in part, are normatively referenced in this document and are indispensable for its application. 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 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 1672-2:2005+A1:2009, *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)*

EN ISO 3744, *Acoustics — Determination of sound power levels and sound energy levels of noise sources using sound pressure — Engineering methods for an essentially free field over a reflecting plane (ISO 3744)*

EN ISO 4871, *Acoustics — Declaration and verification of noise emission values of machinery and equipment (ISO 4871)*

EN ISO 11204:2010, *Acoustics — Noise emitted by machinery and equipment — Determination of emission sound pressure levels at a work station and at other specified positions applying accurate environmental corrections (ISO 11204:2010)*

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

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

EN ISO 13849-1:2008, *Safety of machinery — Safety-related parts of control systems — Part 1: General principles for design (ISO 13849-1:2006)*

EN ISO 14119:2013, *Safety of machinery — Interlocking devices associated with guards — Principles for design and selection (ISO 14119:2013)*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in EN ISO 12100:2010 and the following apply.

3.1
portioning plate
plate parallel to the saw blade and adjustable to the required slice thickness

3.2
bottom wheel
wheel below the table for driving the saw blade

3.3
blade guide
component for guiding the saw blade

3.4
blade tensioning device
component for tensioning and releasing the tension of a saw blade

3.5
finger protection bar
safeguard on the table rear wall to prevent fingers from reaching the cutting zone

3.6
product pusher
movable device for manually pushing the product towards the cutting zone

3.7
last slice device
plate for feeding the last part of the product

3.8
saw blade
cutting tool in the form of a continuous toothed band

3.9
protective rail
safeguard for covering the unused portion of the saw blade above the cutting zone

3.10
cutting height
thickness of product that can be processed by the machines

3.11
table rear wall
device on the sliding feed table to hold the product and to push it towards the cutting zone

3.12
top wheel
pulley wheel for reversing the saw blade above the table

3.13
cutting line
system for automatic product processing

3.14
fixed feed table
table surface for manual product supply

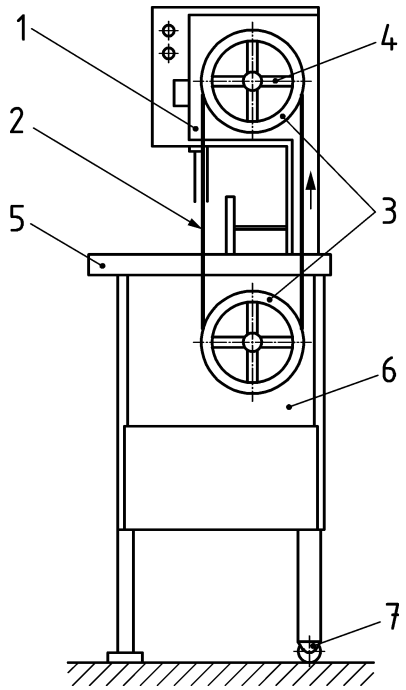
3.15
sliding feed table
movable table surface with table rear wall for product supply

4 List of hazards

This clause contains all the significant hazards, hazardous situations and events, identified by risk assessment as significant for this type of machine (see Figure 6) and which require measures to eliminate or reduce the risk associated with the identified hazards (see Table 1).

Table 1 — List of significant hazards

Hazards, hazardous situations and hazardous events	**Location or cause**	**Clause/subclause in this European Standard**
Hazards	**General**	5.1
Mechanical hazards	**General**	5.2.1
— crushing; — severing; — shearing; — trapping; — cutting; — drawing in	zone 1: area of saw blade outside the cutting zone	5.2.2
	zone 2: cutting zone	5.2.3
	zone 3 and zone 4: bottom and top wheels	5.2.4
	zone 5: sliding feed table	5.2.5
	zone 6: drive units	5.2.6
Electrical hazards	electric shock from direct or indirect contact with live components external influences on electrical equipment (e.g. cleaning with water)	5.3
Hazards generated by loss of stability	the complete machine	5.4
Hazards generated by noise	machines generate noise that can lead to damage of hearing	5.5
Hazard generated by neglecting ergonomic principles	unhealthy body posture or excessive physical effort; inadequate consideration of human hand/arm or foot/leg anatomy by design of machines; no respect of the working area.	5.6
Hazard generated by neglecting hygienic design principles	e.g. contamination by microbial growth or foreign materials	5.7



Key

1 zone 1

2 zone 2

3 zone 3

4 zone 4

5 zone 5

6 zone 6

7 zone 7

Figure 6 — Band saw machine – Danger zones

5 Safety requirements and/or measures

5.1 General

Band-saw machines shall comply with the safety requirements and/or protective measures of this clause.

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 document.

Where the means of reducing the risk is by the physical arrangement or positioning of the installed band-saw 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.

The safety related parts of the control system shall present at least a performance level “c” in accordance with EN ISO 13849-1:2008.

For specific intended use and/or applications some examples for work aid tools with a protective function are given in Annex C.

5.2 Mechanical hazards

5.2.1 General

Saw blades shall be removed periodically. Saw blades 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.

The interlocking system for movable guards shall be built inside of the machine housing and shall comply with EN ISO 14119:2013, 4.2 and Clause 7.

In general band saw machines do not require an emergency stop device. If no emergency stop device is fitted, the normal OFF-switch shall be easily reachable from the operator position (see Figure 1 and Figure 2) and shall be protected against unintentional switch-on (e.g. by a protective collar).

Cutting tool handling: cutting tools shall 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.

5.2.2 Saw blade protection outside of the cutting zone – Zone 1

Access to the saw blade outside the cutting zone shall be prevented. This can be achieved e.g. by the following measures:

A closed machine casing shall be provided. The doors of the casing and the removable or tiltable feed table shall be interlocked.

Fixing systems for fixed guards or for demountable parts of the machine casing (i.e. designed as fixed guards) shall remain attached to the guards or to the machine when the guards are removed.

For requirements relating to the interlocking system of doors and the feeding table, see 5.2.1.

After opening the door or the feed table more than 10 mm, the blade shall come to a standstill as soon as is possible, but the time taken shall not exceed 4 s.

5.2.3 Protection at the cutting zone – Zone 2

5.2.3.1 Type A

Access to the cutting zone of the saw blade shall be prevented. This can be achieved e.g. by the following measures:

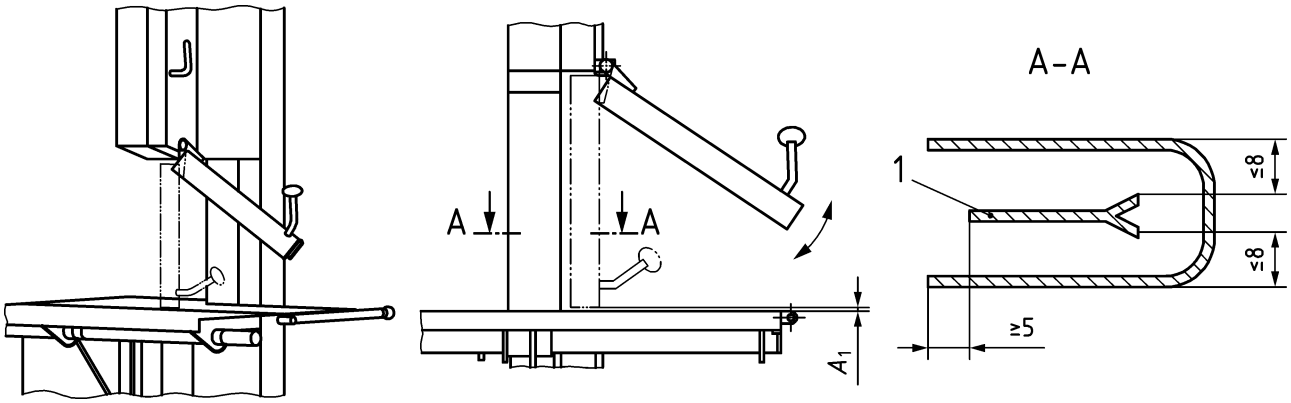
A non-detachable, movable product pusher shall be provided. The product pusher shall be designed so as to automatically revert to its protective position by its own weight. Distance A1 between the product pusher and the non-detachable feed table shall be ≤ 6 mm. Design example, see section A – A, Figure 7.

A horizontal adjustable portioning plate of a height > 60 mm shall be provided. The portioning plate may be designed to be tiltable and removable.

It shall be possible to change the saw blade without removing the product pusher.

In case of having a combination of rail and pusher the requirements of type B shall be considered.

Dimensions in millimetres



Key

1 saw blade

A_1 distance between the product pusher in its protective position and the non-detachable feed table

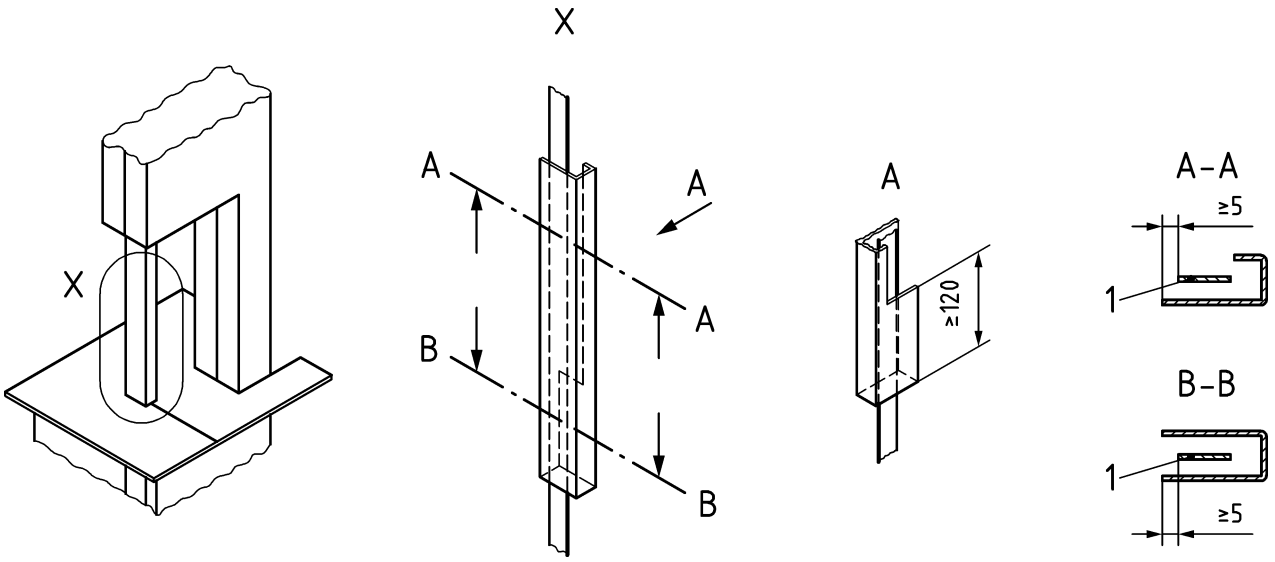
Figure 7 — Schematic design of a product pusher

5.2.3.2 Type B

Access to that portion of the cutting zone of the saw blade which is not used for cutting shall be prevented. This can be achieved e.g. by the following measures:

A non-detachable blade guide and a height adjustable protective rail shall be provided (see Figures 3, 4 and 8). A maximum distance of 6 mm shall be installed, either between product pusher and table or between blade guide and table. It shall be self-blocking or capable of being blocked in position. When unblocking the height adjustable protective rail, an abrupt lowering to < 25 mm shall be avoided. The vertical force needed to move the guard shall not exceed 20 N ± 2 N.

Dimensions in millimetres



Key

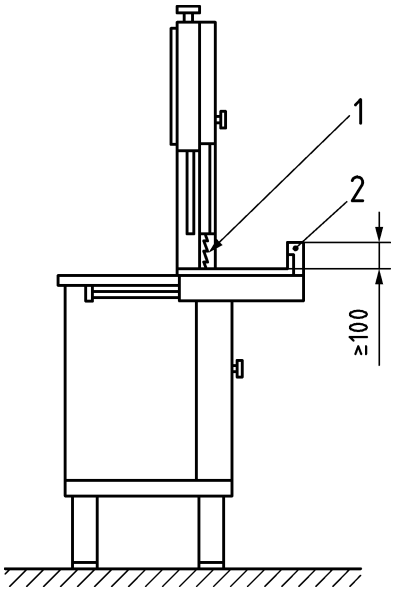
1 saw blade

Figure 8 — Schematic design of a protective rail

5.2.3.3 Type C

The sliding feed table shall be provided with a system that ensures the safe handling of the product so that access to the saw blade is prevented by a table rear wall with a finger protection bar. The height of the table rear wall shall be > 60 mm, and the finger protection bar shall be > 100 mm high and > 50 mm wide. Tapering towards the top to 25 mm is admissible. The finger protection bar shall overlap the saw blade in the position of maximum forward travel of the sliding feed table by > 10 mm (see Figure 9 and Figure 10). The blade shall be protected on 2 faces and in any case, it shall be possible to adjust the protective rail to a distance ≤ 6 mm from the table.

Dimensions in millimetres



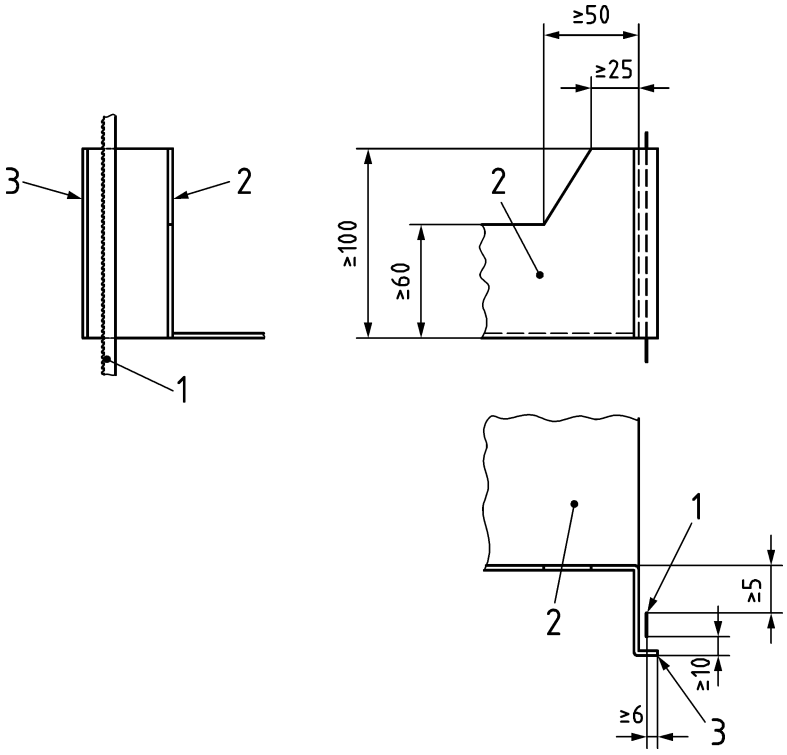
Key

1 saw blade

2 table rear wall

3 finger protection bar (in maximum forward position)

Figure 9 — Band saw machine type C with protective rail and sliding feed table



Key

1 saw blade

2 table rear wall

3 finger protection bar (in maximum forward position)

Figure 10 — Schematic design of a finger protection bar

When the sliding feed table is locked or tilted down, it shall be possible to establish a continuous table surface or this shall be present. In the case of a locked sliding feed table, it shall be possible to tilt down the table rear wall with the finger protection bar. If the finger protection bar is tilted down, the sliding feed table shall be prevented from being moved.

A horizontal adjustable portioning plate of a height ≥ 60 mm shall be provided. The portioning plate may be tiltable and detachable.

A last slice device of a height ≥ 150 mm shall be provided. The last slice device may be provided with spikes on the side facing the saw blade. The last slice device may be removable.

A removable product pusher may be provided.

5.2.3.4 Type D

For requirements relating to the protective rail, see 5.2.3.2.

A product pusher and a portioning plate are not required.

5.2.4 Bottom and top wheels – Zone 3 and Zone 4

Access to spokes and the in-running nips on the bottom and top wheels shall be prevented. This can be achieved e.g. by the following measures:

A closed machine casing shall be provided, see 5.2.2.

5.2.5 Sliding feed table – Zone 5

The sliding feed table at type C machines shall be designed so as to prevent any jumping out or sliding out from the slide and guide rails.

A product pusher can be fitted on the machine to help on specific cuts. The product pusher shall not interfere with the use of the protective rail.

5.2.6 Drive system – Zone 6

Access to the danger points on the drive system shall be prevented. This can be achieved e.g. by the following measures:

A fixed guard or moveable interlocked guard shall be provided on the drive mechanism.

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

Movable guards (e.g. for changing the operating process or for cleaning purposes) shall be interlocked.

For requirements relating to the interlocking systems of guards, see 5.2.1.

5.3 Electrical hazards

5.3.1 General

The electrical equipment shall comply with EN 60204-1.

5.3.2 Stopping function of switching devices

The stop function of switching devices shall be in accordance with Category 0, EN 60204-1:2006, 9.2.2.

5.3.3 Protection against water ingress

5.3.3.1 IP degrees of protection

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 on the machine,

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

b) IP X3 Internal electrical operating components:

1) in the machine with enclosed housing with the degree of protection IP X5 and open lower surface. Protection against direct and indirect impact of a water jet shall be ensured;

c) IP X2 Internal electrical operating components:

1) in a machine with completely enclosed housing with the degree of protection IP X5. Protection against condensate water shall be provided,

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

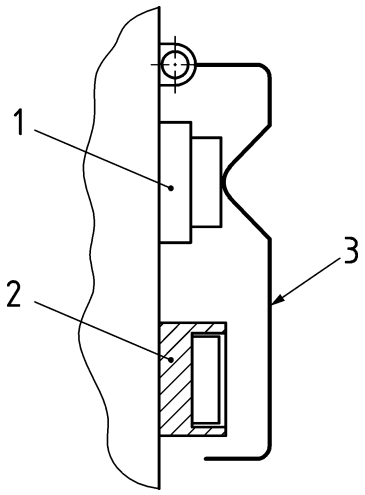
5.3.3.2 Hoods

Band saw machines which are intended to be cleaned by means of pressurized water shall include measures to prevent ingress of water into the external electrical operating components. This can be achieved e.g. by the following measures:

— the electrical operating components fitted to the band-saw shall be covered by hoods, and,

— the Instruction handbook shall include advice to this effect for those operating components to be provided as part of the installation.

Hoods covering the external operating components may be lifted for actuating ON- and OFF-switches. Hoods shall not, when closed, restrict the use of the OFF-switch (see Figure 11). When using membrane switches or similar systems, no hoods are needed if the membrane switch or similar systems are suitable for cleaning with pressurized water.



Key

1 Off

2 On

3 protection hood (Off)

Figure 11 — ON-/OFF-switch with hood

5.3.4 ON- and OFF-switch

On band saw machines, ON- and OFF-switches shall be provided. The switches shall be arranged on the operator side of machines (see Figure 1 and Figure 3). The ON-switch shall be protected against unintentional switch-on (e.g. protective collar).

5.3.5 Safety requirements related to electromagnetic phenomena

The machines shall have sufficient immunity from 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 instructions of the suppliers of these sub-assemblies.

5.3.6 Wheel-mounted band saw machines

For wheel-mounted band saw machines, the manufacturer shall specify in the instruction handbook that:

— the machine shall be switched off and the mains plug pulled before being moved,

— the electrical supply cable shall not be damaged when the machine is moved, and

— the machine shall be held firmly at suitable locations e.g. by handles when being moved.

5.4 Hazard from loss of stability

Band saw machines shall be designed not to slip, tilt, or roll over under all foreseeable operating conditions. Band saw machines for floor mounting may be wheel-mounted.

When floor-type band saw machines are not fixed to the floor, sufficient inherent tilt stability e.g. by the design of the machine, the position of the centre of gravity (wheels and base position) shall be ensured. Wheel-mounted machines shall be equipped with e.g. 2 support rollers (or 2 legs) and 2 pivot castors with locking devices to prevent turning and rolling.

The manufacturer shall give in the instruction handbook information on mounting e.g. relating to the use of the locking device and to the surface quality of the floor.

The machine shall not slip, tilt, or roll over when tested in accordance with Clause 6, Table 1, line 5.3.

5.5 Noise hazard – Noise reduction at the design stage

When designing band saw machines for food processing, the information and technical measures to control noise at source given in EN ISO 11688-1 shall be taken into account.

The most important causes for generation of airborne sound at these machines are

— vibration of moving parts;

— air current at saw blade;

— condition of saw blade.

The success of the applied noise reduction measures is assessed on the basis of the actual noise emission values (see Clause 6 and Annex A) in relation to other machines of the same family.

5.6 Ergonomic requirements

The distance A (see Figures 1, 3 to 5) from the floor to the top surface of the feed table shall be between 800 mm and 1 050 mm.

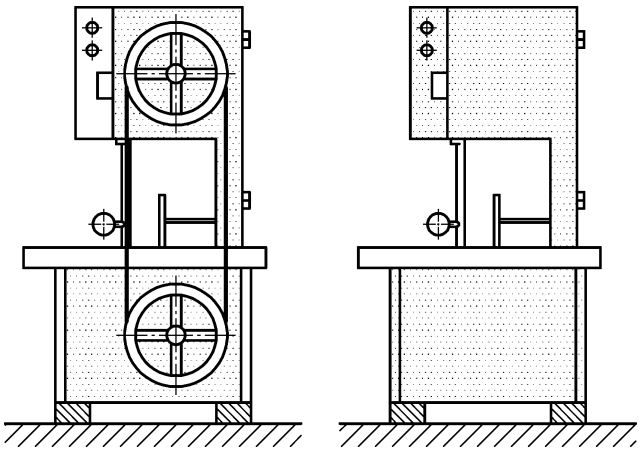
Attention shall be paid to the ergonomic requirement described in EN ISO 12100:2010, 6.2.8, as well as in EN 614-1 and EN 1005-1, EN 1005-2 and EN 1005-3. Any information for the user which is relevant for achieving the ergonomic objectives shall be contained in the instruction handbook.

5.7 Hygiene and cleaning

5.7.1 General

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

Hygiene areas see Figure 12.



Key

food area

splash area

non-food area

Figure 12 — Hygiene areas on band saw machines

5.7.2 Food area

The following components are defined according to EN 1672-2 and regarded as food area (see Figure 12):

— the saw blade;

— the protective rail;

— the fixed feed table and/or sliding feed table (upper surface);

— the roller conveyor;

— the product pusher;

— the last slice device;

— the slice thickness plate;

— the machine casing, with respect to the path of the saw blade;

— the bottom and top wheels;

— the chip pan.

5.7.3 Splash area

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

— the fixed feed table and/or sliding feed table, lower surface;

— the machine casing, outside and inside.

5.7.4 Non-food area

The non-food area comprises all other surfaces.

5.7.5 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.

5.7.6 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.

Information shall be included in the Instructions for use on the methods recommended for cleaning surfaces in the food areas, particularly for protective hoods, the product pusher, and the saw blade. Information shall also be given on general cleaning methods and the adequate removal of cleaning and disinfecting agents and of any cleaning materials that are unsuitable.

NOTE Cleaning by pressurized water can contaminate the surroundings.

6 Verification of safety requirements and/or measures

Verification of the requirements defined in Clause 5 and Clause 7 shall be made by means of inspection, calculation, or testing. These shall be applied to a machine in a fully commissioned condition but partial dismantling may be necessary for the purpose of some checks. Such partial dismantling shall not invalidate the result of the verification. The criteria for acceptance should follow the detailed requirements set out in Clause 5 and Clause 7 or in this clause.

Table 2 — Verification list

Subclause	Testing method
5.2.1	Visual inspection of the machine and its documentation Visual inspection of interlocking systems on doors of casing and on feed table Functional test with ON-/OFF-switch
5.2.2	Verification of cutting zone and machine casing Measurement of dimensions Measurement of stopping time Verification of electrical circuit diagram.
5.2.3	Measurement of dimensions Functional test with protective rail Functional test with product pusher Functional test on feed table Visual inspection
5.2.4	Verification of machine casing Measurement of dimensions Measurement of stopping time
5.2.5	Visual inspection of the feed table, protective rail and product pusher
5.2.6	Verification of machine casing Measurement of dimensions Measurement of stopping time
5.3	The tests according to EN 60204–1:2006, Clause 18, shall be carried out on each machine Functional test with hood Verification of IP-degrees Functional test of emc performance, or, examination of documentation concerning use and application of components and sub- assemblies.
5.4	Calculation or standing test on a plane with an inclination of 10°. The wheels shall be locked and have an unfavourable wheel position. In this position, there shall be: - functional test by loading product of the maximum size pushed onto the saw blade; - visual inspection.
5.5	Noise emission measurement according to Annex A
5.6	By visual inspection and measurement
5.7	Measurement of surface roughness, radii and grooves Visual inspection especially of welding seams
7.2	Verification of data

7 Information for use

7.1 General

The user information shall fulfil the requirements of EN ISO 12100:2010, 6.4. An instruction handbook shall be provided.

7.2 Instruction handbook

The instruction handbook shall at least contain the following information:

a) information relating to transport, installation and storage:

   1) of the machine;

   2) of the saw blade;

   3) use of personal protective equipment (see 7.2 d);

   4) adequate space at the location;

   5) adequate light at the location;

b) information relating to commissioning and dismantling:

   1) mounting and installation conditions, e.g. the surface quality of the floor (see 5.1 and 5.4);

   2) conditions of dismantling and disposing;

c) information relating to the machine:

   1) description of the machine, guards and safety devices;

   2) description of hazards e.g. at cutting zones which could not be fully eliminated by safety devices, e.g. hazards at not protected saw-zones, generation of noise;

   3) description of adjustment of cutting thickness on portioning plate;

   4) description of use of sliding feed table and last slice device;

   5) description of use of product pusher and adjustable protective rail, of product size as well as warning on prohibited use: Sawing is not allowed without using the product pusher;

   6) description of electrical installation (see EN 60204-1:2006, Clause 17) and circuit diagram;

   7) declaration of noise emission values (according to Annex A);

d) information relating to normal operating conditions:

   1) recommended saw blades and applications for each product (type of blades);

   2) description of the use of operating elements which will effect standstill of the machine and that after use the OFF-switch shall be switched immediately;

3) description of the use of electrical supply cable and that before moving the machine it shall be switched of and the electrical plug shall be disconnected and that while moving the electrical supply cable shall not be damaged;

4) information on attainment of ergonomic targets (see 5.6);

5) description of use of product pusher, product guidance as well as product size and shape (e.g. < 50 mm length not allowed). Warning on prohibited use: Sawing is not allowed without using the product pusher;

6) description of prohibited use, e.g. sawing of wood;

7) indication of the need for regular verification of the interlocking devices, and for the user to determine the frequency of verification;

8) recommendation of wearing personal protective equipment, e.g. hearing protection;

9) recommendation of wearing gloves only in connection with scalloped saw band;

10) prohibition of wearing chain mail gloves;

e) information relating to cleaning:

1) description of the:

i) cleaning method,

ii) cleaning agent with reference to the safety data sheet of manufacturer,

iii) disinfection method,

iv) disinfection agent with reference to the safety data sheet of manufacturer,

v) rinsing agent and application time to avoid toxic hazards,

vi) agents not recommended for cleaning and disinfection;

2) description of rules of action during cleaning and disinfection operations and wearing of personal protective equipment;

3) description of use of hoods over external electrical operating components (e.g. ON-/OFF-switch) when the machine is cleaned with pressurized water, and how the operating components underneath the hood shall be cleaned (see 5.3.3.2);

4) description of removal and installation of movable guards for cleaning purposes (see 5.2.6);

5) description of use of auxiliary devices, e.g. tensioning device, closed feed pipe;

f) information relating to maintenance:

1) description of installation and removal of saw blade and saw blade stripper including use of personal protective equipment;

2) description of execution and frequency of inspections and maintenance actions, taking account of rules of action;

3) description of lubricants used and of lubricating points;

4) drawings, used for these tasks;

5) the specifications of the spare parts to be used, when these affect the health and safety of operators;

6) circuit diagram;

g) the instruction handbook shall contain the information that the operator shall be trained and specifies the elements of training.

7.3 Marking

Band saw machines shall be marked permanently and legibly with at least the following:

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

— designation of the machinery;

— designation of series or type;

— serial number;

— mandatory marking[1)];

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

— rating information, including supply voltage and frequency, power rating.

1) 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.

Annex A
(normative)

Noise test code for band saw machines (grade 2)

A.1 Emission sound pressure level determination

The A-weighted emission sound pressure level at the workstation shall be determined according to EN ISO 11204 following the requirements for grade 2.

To determine the emission sound pressure level the microphone shall be placed in front of the band saw at the typical operator's position and orientated to the machine. It shall be positioned at a height of 1,5 m above the floor, with a distance of 0,4 m from the saw blade's front edge and in a plane which is at a distance of 0,2 m to the left side of the plane of the blade.

A.2 Sound power level determination

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

A.3 Installation and mounting conditions

The machines to be tested shall be installed on a reflecting floor in a test environment following the requirements for grade 2 measurements according to EN ISO 11204:2010 and EN ISO 3744.

Table top machines (see Figure 1) shall be placed on the test table described in EN ISO 11204:2010, Annex B.

The installation and mounting conditions shall be identical for the determination of both, the emission sound pressure level and the sound power level.

A.4 Operating conditions

The machine shall be tested under load and no load conditions. The noise levels under no load condition are measured under maximum speed when the machine is running, ready for load test.

To simulate a practical load condition a piece of chip board 600 mm × 600 mm × 19 mm shall be sawn horizontally on the machine by cutting off approximately 10 mm wide strips across the full length of the chipboard. The feed force shall be just sufficient to cut at brisk pace.

The operating conditions shall be identical for the determination of both the emission sound pressure level and the sound power level.

A.5 Measurement

The measurement instruments shall be in compliance with EN ISO 11204:2010, Clause 5 or 10.2.1.

The measurement time under no load is at least 15 s.

As the noise emission under load tends to vary the load measurement shall be repeated at least three times, with each measurement time being determined by the duration of sawing a chipboard strip. The measurement result is the average of this series of sawing processes.

A.6 Information to be recorded

The information to be recorded covers all of the technical requirements of this noise test code. Any deviations from the noise test code and/or from the basic noise emission measurement standards used are to be recorded together with the technical justification for such deviations.

A.7 Information to be reported

The information to be included in the test report is that which the manufacturer requires to prepare a noise declaration or the user requires to verify the declared values.

As a minimum, the following information shall be included:

— identification of the manufacturing company, of the machine type, model, serial number and year of manufacture;

— reference to the basic noise emission measurement standards used;

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

— location of the microphone positions;

— noise emission values obtained;

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

A.8 Declaration and verification of the noise emission values

The declaration of the noise emission values L (L_{pA} and L_{WA}), determined under load and no load operating condition, and the respective uncertainty K shall be made as a dual number noise emission declaration according to EN ISO 4871. The uncertainties K_{pA} and K_{WA} are expected to have a value of 3 dB for both operating conditions.

The noise emission value shall be rounded to the nearest 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 and EN ISO 3744. If this statement is not true, the noise declaration shall indicate clearly what the deviations are from this noise code and/or from the basic standards.

If undertaken, verification shall be done according to EN ISO 4871 by using the same mounting, installation and operating conditions as those used for the initial determination of noise emission values.

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

Annex B
(normative)

Design principles to ensure cleanability of band saw machines

B.1 Definitions

B.1.1 General

For the purpose of this annex, the following definitions shall apply.

B.1.2 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 Figure 12).

B.1.3 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 Figure 12).

B.1.4 Non-food area

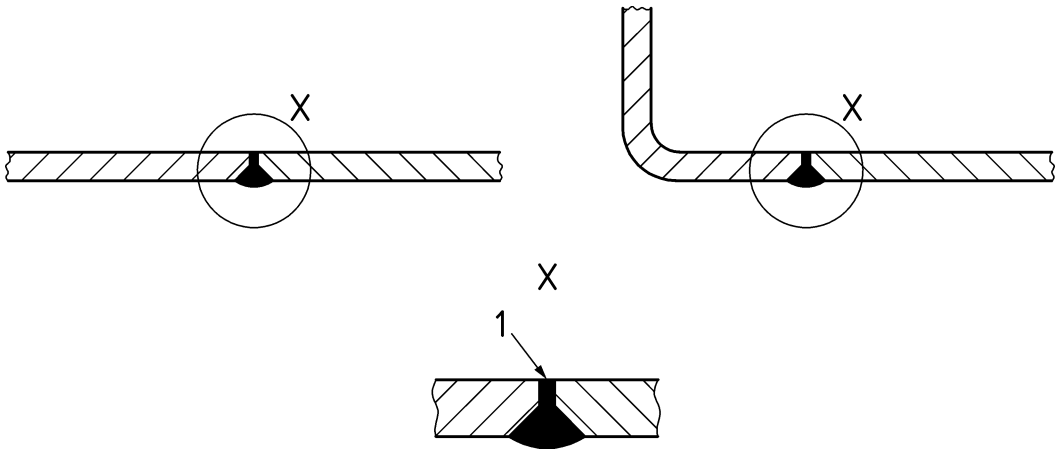
All other areas not specified above (see Figure 12).

B.1.5 Joined surfaces

Surfaces are joined such that product particles cannot be trapped, can be easily removed and do not cause a contamination hazard (see Figure B.1).

B.1.6 Easy to clean

Designed and constructed such that it is possible to remove dirt with a simple cleaning method, e.g. cleaning agent and pressurized water.



Key

1 smooth surfaces

Figure B.1 — Joined surfaces – food area

B.2 Materials of construction

B.2.1 General

Materials of construction shall comply with EN 1672-2:2005+A1:2009, 5.2.

B.2.2 Type of materials

B.2.2.1 Materials for food area

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.

B.2.2.2 Materials for splash area

See EN 1672-2:2005+A1:2009, 5.3.2.

B.2.2.3 Non-food area

See EN 1672-2:2005+A1:2009, 5.3.3.

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 Surface

The surfaces in the food area shall be smooth and free of 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 R of ≥ 3 mm (see Figure B.2).

Dimensions in millimetres

Key

R Radius

a) Machining operations, bent plate **b) Welding seam**

Figure B.2 — Corners and radii in food area

Parts of machines, e.g. saw blade, top and bottom wheels, saw blade stripper and saw blade guide can have recesses, grooves and corners with smaller radii due to product manufacturing necessities. The components 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).

Dimensions in millimetres

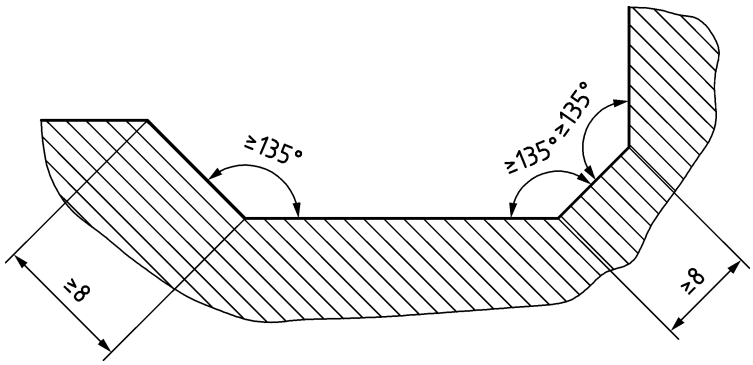
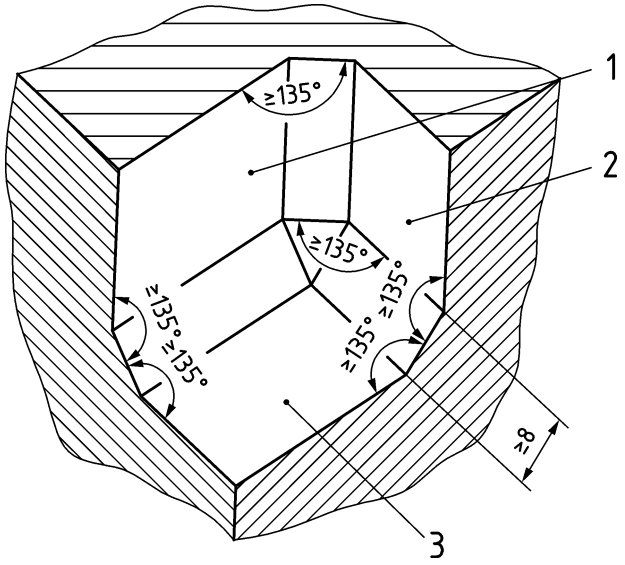


Figure B.3 — Corners in food area

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

Dimensions in millimetres



Key

1 surface 1

2 surface 2

3 surface 3

Figure B.4 — Intersecting surfaces in food area

B.3.2.3 Grooves

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

B.3.2.4 Joints and seams

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

B.3.2.5 Surface roughness

Surface roughness R_z shall be ≤ 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 General

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 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 mm. No requirements apply to the radius for the joining points of the third surface.

Angles ≥ 110° without radii are admissible (see Figure B.3).

B.3.3.3 Grooves

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

B.3.3.4 Openings

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

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+A1:2009, Annex B.

B.3.3.6 Fastening methods

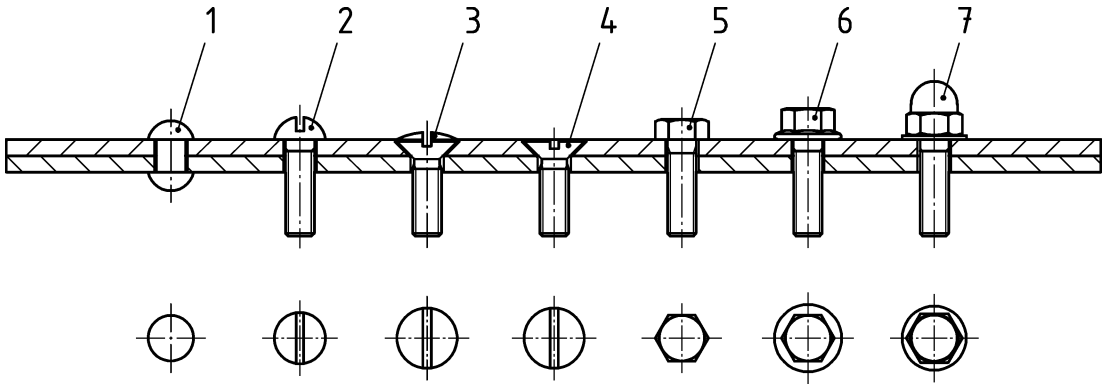
Screws, bolts and rivets with a low profile heads and of the types shown in Figure B.5 may be used only when other fastening methods are impracticable and they are easy to clean (see Figure B.5).

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

Figure B.5 — Admissible fasteners – head profiles

B.3.3.7 Surface roughness

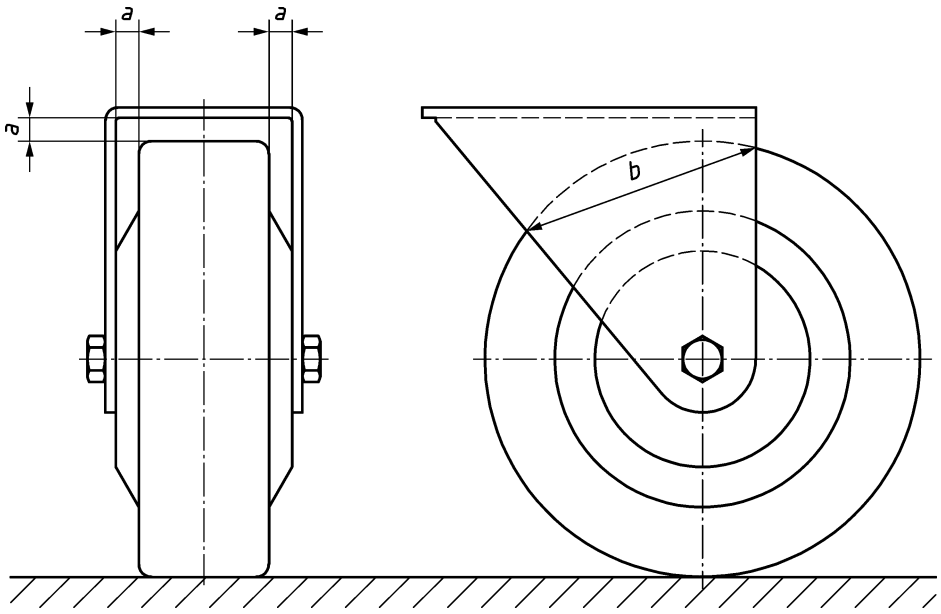
Surface roughness shall comply with the requirements of B.3.2.5.

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.

B.3.5 Machines standing on a floor – mobile machines

Castors shall be cleanable (example see Figure B.6).



Key

b < 25 mm a ≥ 3,5 mm

b > 25 mm a ≥ 6 mm

b is the largest dimension of coverage on the circumference of the castor.

Figure B.6 — Castors – Dimensions examples

Annex C
(informative)

Examples of work aid tools having a protective function

C.1 General

In specific applications (slicing, cutting…) state of the art devices are available to assist the operator in carrying out this task while contributing to the operator's safety.

The following examples show the desirable functions.

C.2 Example of a pusher to saw small parts (chicken legs, wings…)

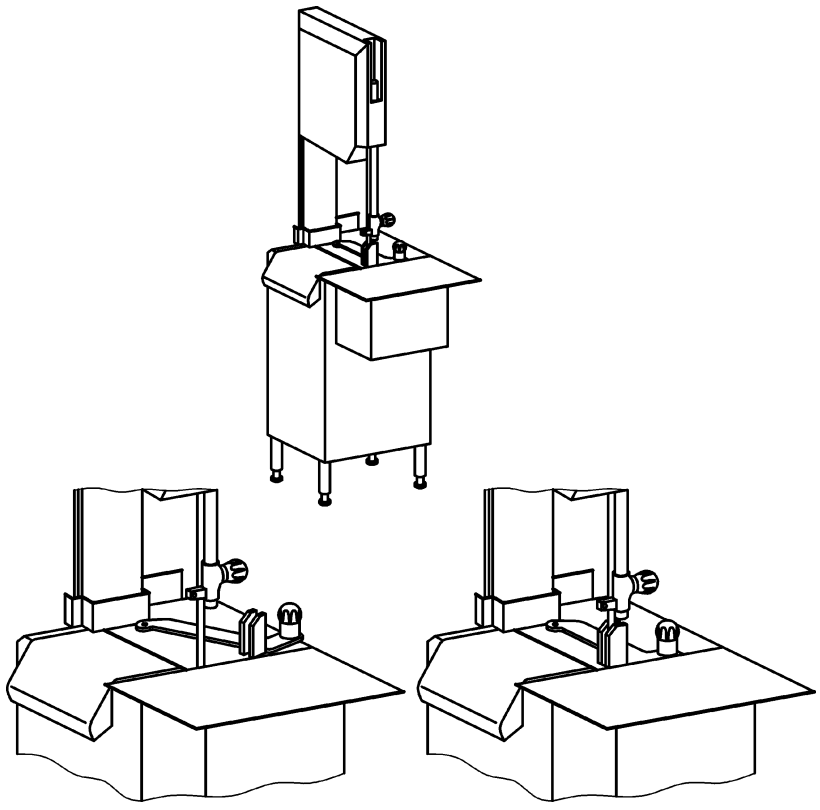


Figure C.1 — Example of a pusher to saw small parts

Use:

— cutting small products into several parts. Chicken legs, wings,…

— type of products: deep frozen or fresh.

Added value:

— taking the hands away from the part of the saw blade that is used for cutting

— prevention of access to the blade at the end of the cutting phase

— safe discharge of waste and of the product after sawing

— limiting the pushing effort

— better calibration of the cut parts

— easy installation, use and cleaning.

C.3 Example of a device for cutting pork knuckles, shoulders and chest bones…

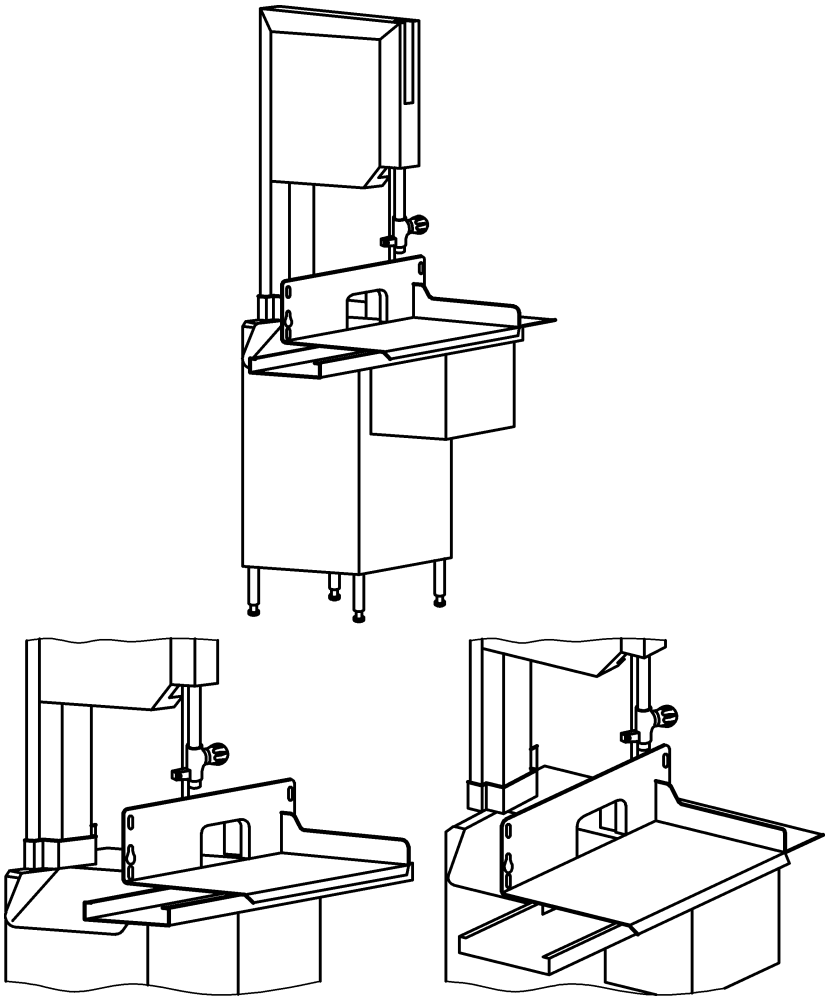


Figure C.2 — Example of a device for cutting pork knuckles, shoulders and chest bones

Use:

— taking apart of pork knuckle and shoulder, sawing the shoulder into two parts, cutting chest bones;

— type of products: deep frozen or fresh.

Added value:

— taking the hands away from the part of the saw blade that is used for cutting

— prevention of access to the blade at the end of the cutting phase

— safe discharge of waste and of the product after sawing

— limiting the pushing effort

— better calibration of the cut parts

— easy installation, use and cleaning.

The design can be adapted to other cutting types provided that the device opening is adjusted to the size of the product to be cut.

C.4 Example of a device for cutting of feet, long products…

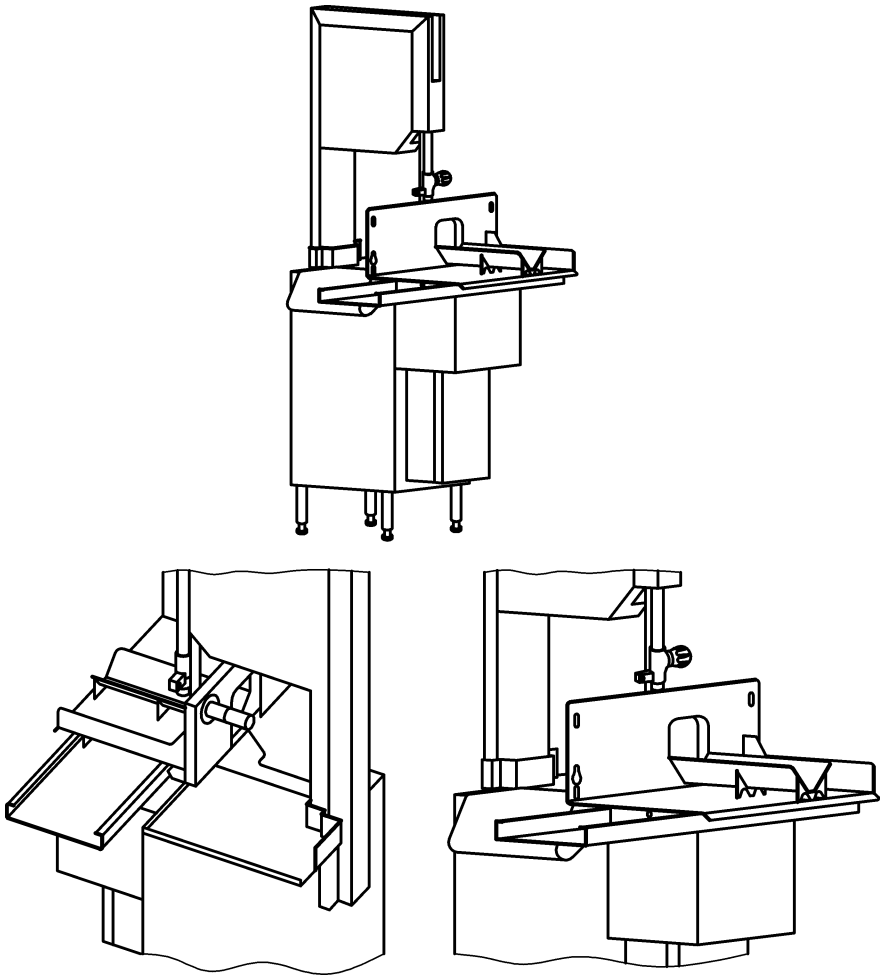


Figure C.3 — Example of a device for cutting of feet, long products

Use:

— sawing the ends of ox feet, cutting cylindrical products (roast beef…);

— type of products: deep frozen, fresh or cooked.

Added value:

— taking the hands away from the part of the saw blade that is used for cutting;

— prevention of access to the blade at the end of the cutting phase;

— good stability of the product to be cut;

— safe discharge of waste and of the product after sawing;

— limiting the pushing effort;

— better calibration of the cut parts;

— easy installation, use and cleaning.

The design can be adapted to other cutting types provided that the device opening is adjusted to the size of the product to be cut.

C.5 Example of a device for cutting frozen plates

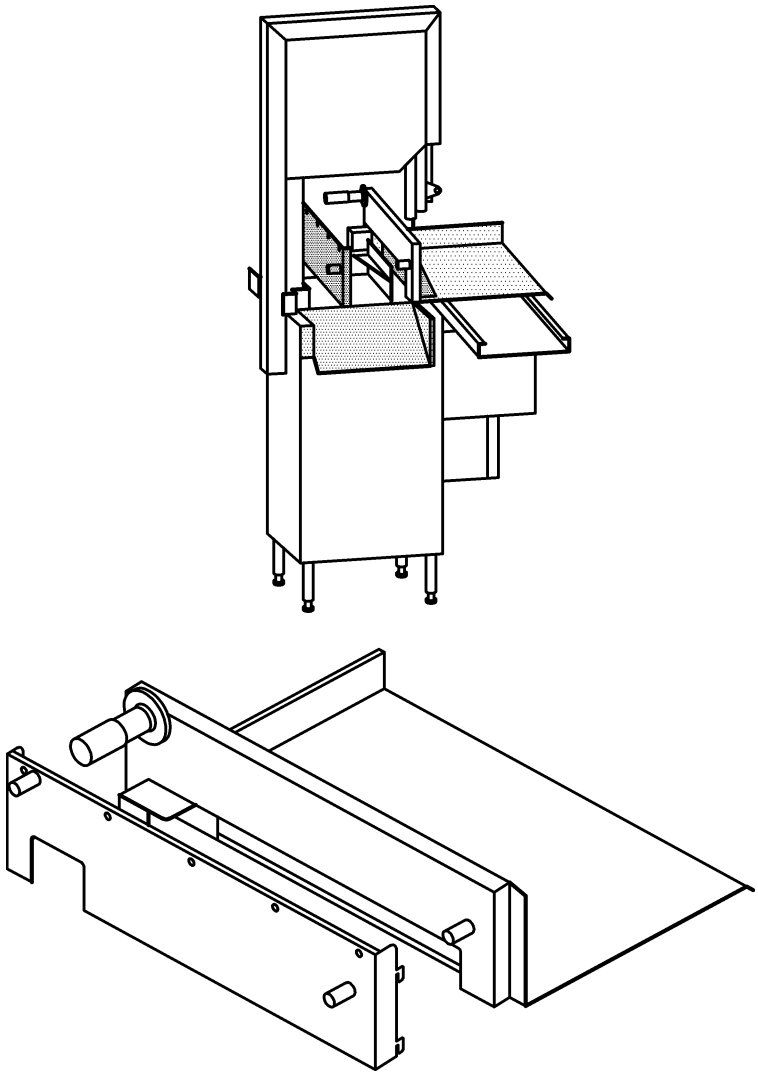


Figure C.4 — Example of a device for cutting frozen plates

Use:

— cutting fish, meat, or vegetable plates;

— type of products: deep frozen.

Added value:

— taking the hands away from the part of the saw blade that is used for cutting;

— prevention of access to the blade at the end of the cutting phase;

— safe discharge of waste and of the product after sawing;

— limiting the pushing effort;

— better calibration of the cut parts;

— easy installation, use and cleaning.

The device opening shall be adapted to the size of the product to be cut (thickness, length).

C.6 Example of a pusher that is not an integral part of the machine and that slides in the table groove

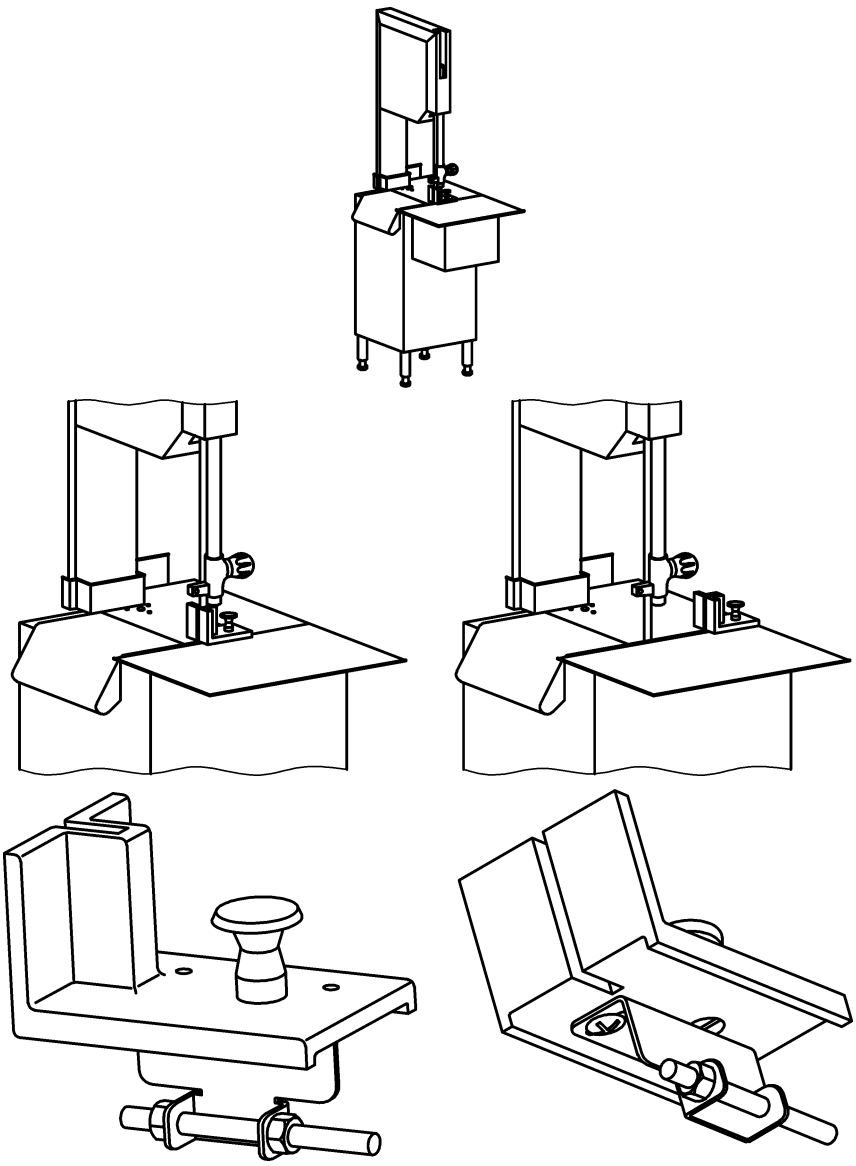


Figure C.5 — Example of a pusher that is not an integral part of the machine and that slides in the table groove

Use:

— cutting small parts of small height such as fish fillets, fixed weight portions;

— type of products: deep frozen or fresh.

Added value:

— Taking the hands away from the part of the saw blade that is used for cutting without any modification of the usual gestures or of the machine and with a good visibility. The table groove intended for blade changing is used as a guiding element.

Prevention of access to the blade at the end of the cutting phase.

— Safe discharge of waste and of the product after sawing.

— Limiting the pushing effort.

— Better calibration of the cut parts.

— Easy installation, use and cleaning.

The device opening shall be adapted to the size of the product to be cut (thickness, length).

C.7 Example of a device for slicing parts

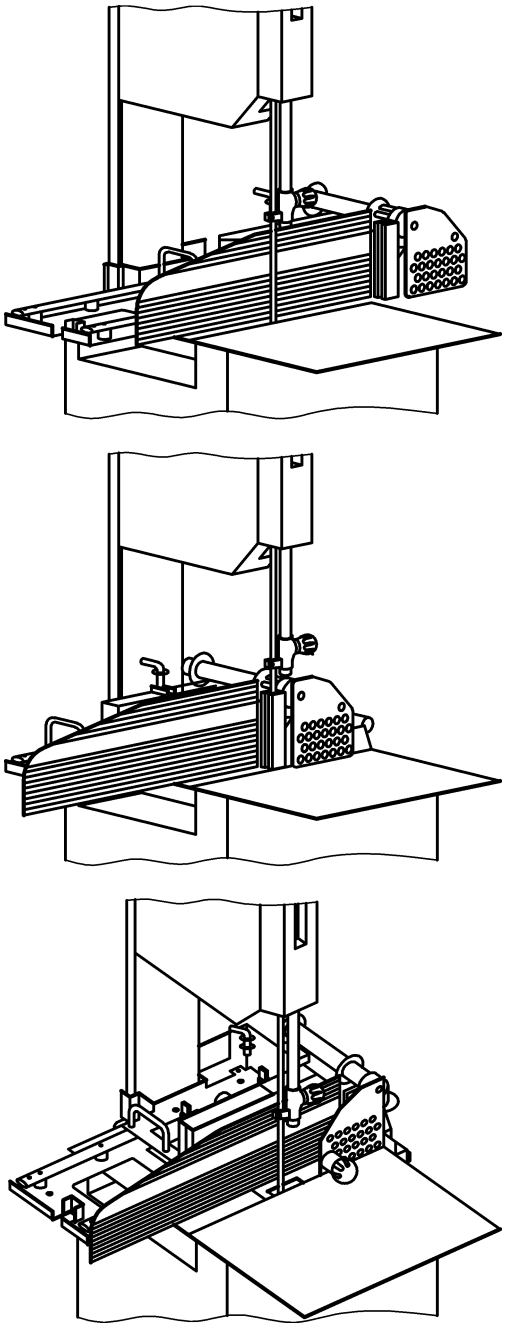


Figure C.6 — Example of a device for slicing parts

Use:

— production of sliced parts of loin;

— type of products: deep frozen or cooked, compacted.

Added value:

— taking the hands away from the part of the saw blade that is used for cutting;

— prevention of access to the blade at the end of the cutting phase;

— safe discharge of waste and of the product after sawing;

— limiting the pushing effort;

— better calibration of the cut parts;

— safe holding of the last parts to be cut;

— cleaning is made easier because several parts can be dismounted without a tool.

Annex ZA
(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 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.

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