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Woodworking machines — Safety —

Part 11: Combined machines

Machines à bois — Sécurité —

Partie 11: Machines combinées

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Foreword

ISO (the International Organization for Standardization) is a worldwide federation of national standards bodies (ISO member bodies). The work of preparing International Standards is normally carried out through ISO technical committees. Each member body interested in a subject for which a technical committee has been established has the right to be represented on that committee. International organizations, governmental and non-governmental, in liaison with ISO, also take part in the work. ISO collaborates closely with the International Electrotechnical Commission (IEC) on all matters of electrotechnical standardization.

The procedures used to develop this document and those intended for its further maintenance are described in the ISO/IEC Directives, Part 1. In particular, the different approval criteria needed for the different types of ISO documents should be noted. This document was drafted in accordance with the editorial rules of the ISO/IEC Directives, Part 2 (see www.iso.org/directives).

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. ISO shall not be held responsible for identifying any or all such patent rights. Details of any patent rights identified during the development of the document will be in the Introduction and/or on the ISO list of patent declarations received (see www.iso.org/patents).

Any trade name used in this document is information given for the convenience of users and does not constitute an endorsement.

For an explanation of the voluntary nature of standards, the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the World Trade Organization (WTO) principles in the Technical Barriers to Trade (TBT) see www.iso.org/iso/foreword.html.

This document was prepared by Technical Committee ISO/TC 39, *Machine tools*, Subcommittee SC 4, *Woodworking machines*.

Any feedback or questions on this document should be directed to the user's national standards body. A complete listing of these bodies can be found at www.iso.org/members.html.

This document is intended to be used in conjunction with ISO 19085-1:2017, which gives requirements common to different machine types and with ISO 19085-5:2017, ISO 19085-6:2017, ISO 19085-7:2019 and ISO 19085-9:2019, which give requirements specific for the integrated working units.

A list of all parts in the ISO 19085 series can be found on the ISO website.

Introduction

The ISO 19085 series of International Standards provides technical safety requirements for the design and construction of woodworking machinery. It concerns designers, manufacturers, suppliers and importers of the machines specified in the Scope. It also includes a list of informative items that the manufacturer will need to give to the user.

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

The machinery concerned and the extent to which hazards, hazardous situations or hazardous events are covered are indicated in the Scope of this document.

When requirements of this type-C standard are different from those which are stated in type-A or type-B standards, the requirements of this type-C standard take precedence over the requirements of the other standards for machines that have been designed and built according to the requirements of this type-C standard.

The full set of requirements for a particular type of woodworking machine are those given in the part of ISO 19085 applicable to that type, together with the relevant requirements from ISO 19085-1:2017, to the extent specified in the Scope of the applicable part of ISO 19085.

As far as possible, in this document, safety requirements are referenced to the relevant sections of ISO 19085-1:2017, ISO 19085-5:2017, ISO 19085-6:2017, ISO 19085-7:2019 and ISO 19085-9:2019 to avoid repetition and reduce their length.

Specific subclauses and annexes in this document without correspondent in ISO 19085-1, ISO 19085-5, ISO 19085-6, ISO 19085-7 or ISO 19085-9 are indicated by the introductory sentence: “Subclause (or annex) specific to this document.”

Clauses 1, 2, 4 replace the correspondent clauses of ISO 19085-1:2017, with no need for indication since they are specific to each part of the series.

NOTE Requirements for tools are given in EN 847-1:2017 and EN 847-2:2017.

Woodworking machines — Safety —

Part 11: Combined machines

1 Scope

This document gives the safety requirements and measures for stationary and displaceable combined woodworking machines, having at least two separately usable working units and with manual loading and unloading of the workpiece, hereinafter referred to as "machines". The integrated working units can be of these types only:

— a sawing unit;

— a moulding unit;

— a planing unit.

The machines are designed to cut solid wood and material with similar physical characteristics to wood.

NOTE 1 For the definitions of stationary and displaceable machines, see ISO 19085-1:2017, 3.4 and 3.5.

This document deals with all significant hazards, hazardous situations and events as listed in Clause 4, relevant to the machines, when operated, adjusted and maintained as intended and under the conditions foreseen by the manufacturer including reasonably foreseeable misuse. Also, transport, assembly, dismantling, disabling and scrapping phases have been taken into account.

NOTE 2 For relevant but not significant hazards, e.g. sharp edges of the machine frame, see ISO 12100:2010.

This document does apply to machines also equipped with the devices/additional working units listed in the Scopes of ISO 19085-5:2017, ISO 19085-6:2017, ISO 19085-7:2019 and ISO 19085-9:2019.

This document does not apply to:

a) machines incorporating only a planing unit and a mortising device;

NOTE 3 Such machines are dealt with in ISO 19085-7:2019.

b) combined machines incorporating a band saw unit;

c) machines with a mortising unit with a separate drive other than the planing unit drive;

d) machines intended for use in potentially explosive atmosphere;

e) machines manufactured before the date of its publication as an International Standard.

2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

ISO 7960:1995, *Airborne noise emitted by machine tools — Operating conditions for woodworking machines*

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

ISO 13849-1:2015, *Safety of machinery — Safety-related parts of control systems — Part 1: General principles for design*

ISO 19085-1:2017, *Woodworking machines — Safety — Part 1: Common requirements*

ISO 19085-5:2017, *Woodworking machines — Safety — Part 5: Dimension saws*

ISO 19085-6:2017, *Woodworking machines — Safety — Part 6: Single spindle vertical moulding machines ("toupies")*

ISO 19085-7:2019, *Woodworking machines — Safety — Part 7: Surface planing, thickness planing, combined surface/thickness planing machines*

ISO 19085-9:2019, *Woodworking machines — Safety — Part 9: Circular saw benches (with and without sliding table)*

IEC 61800-5-2:2016, *Adjustable speed electrical power drive systems — Part 5-2: Safety requirements — Functional*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in ISO 12100:2010, ISO 13849-1:2015, ISO 19085-1:2017, ISO 19085-5:2017, ISO 19085-6:2017, ISO 19085-7:2019, ISO 19085-9:2019 and the following apply.

ISO and IEC maintain terminological databases for use in standardization at the following addresses:

— ISO Online browsing platform: available at https://www.iso.org/obp

— IEC Electropedia: available at http://www.electropedia.org/

3.1
combined machine
machine incorporating two or more separately usable working units, i.e. a *sawing unit* (3.2), a *moulding unit* (3.5) and/or a *planing unit* (3.6)

Note 1 to entry: Workpiece feed is primarily by hand but the machine can also have devices for connection of demountable power feed units.

Note 2 to entry: The sawing unit and the moulding unit can work simultaneously.

Note 3 to entry: See examples of such machines in Figures 2, 3, 4 and 5.

3.2
sawing unit
dimension saw unit (3.3), or *table saw unit* (3.4), incorporated in a *combined machine* (3.1)

3.3
dimension saw unit
dimension saw incorporated in a *combined machine* (3.1)

Note 1 to entry: For the definition of dimension saws, see ISO 19085-5:2017, 3.1.

3.4
table saw unit
table saw incorporated in a *combined machine* (3.1)

Note 1 to entry: For the definition of table saws, also called circular saw benches, see ISO 19085-9:2019, 3.1.

3.5
moulding unit
single spindle vertical moulding machine incorporated in a *combined machine* (3.1)

Note 1 to entry: For the definition of single spindle vertical moulding machines, see ISO 19085-6:2017, 3.1.

3.6
planing unit
combined surface/thickness planing machine incorporated in a *combined machine* (3.1)

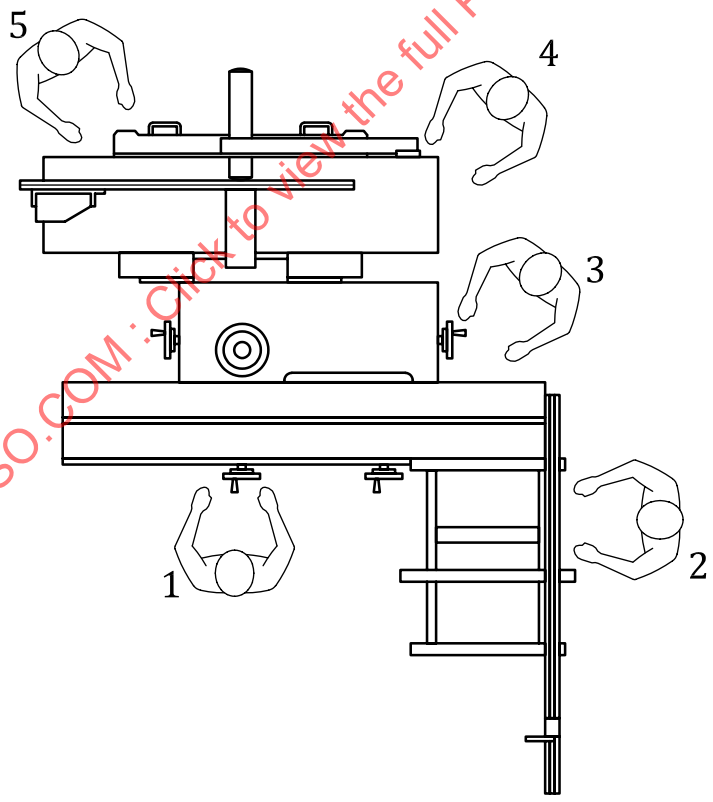
Note 1 to entry: For the definition of combined surface/thickness planing machines, see ISO 19085-7:2019, 3.4.

3.7
tenoning-sawing mode
use of the *sawing unit* (3.2) and *moulding unit* (3.5) simultaneously to produce tenons

Note 1 to entry: For workpiece support, these machines are equipped with a movable workpiece support, e.g. sliding table, with workpiece clamping arrangements.

3.8
workstation position
position to operate a working unit

Note 1 to entry: Combined machines (3.1) have more than one workstation position depending on the number of integrated working units (see Figure 1).



Key
1 workstation position during moulding
2 workstation position during sawing
3 alternative workstation position during sawing
4 workstation position during thickness planing
5 workstation position during surface planing

Figure 1 — Typical workstation positions

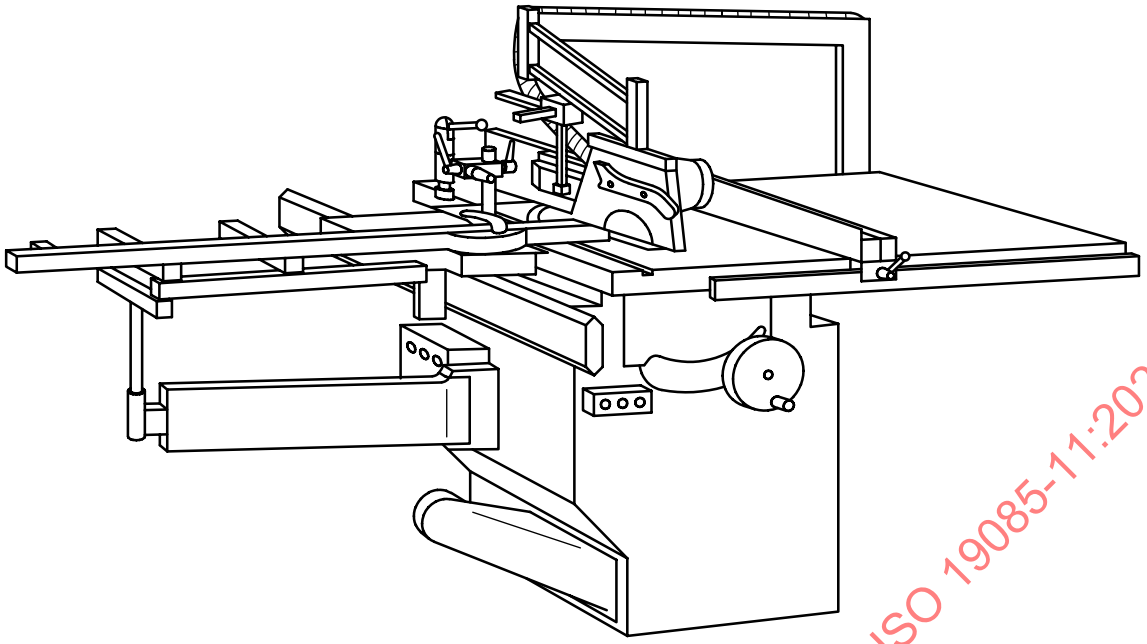


Figure 2 — Example of a machine with table saw and moulding units, fitted with a sliding table

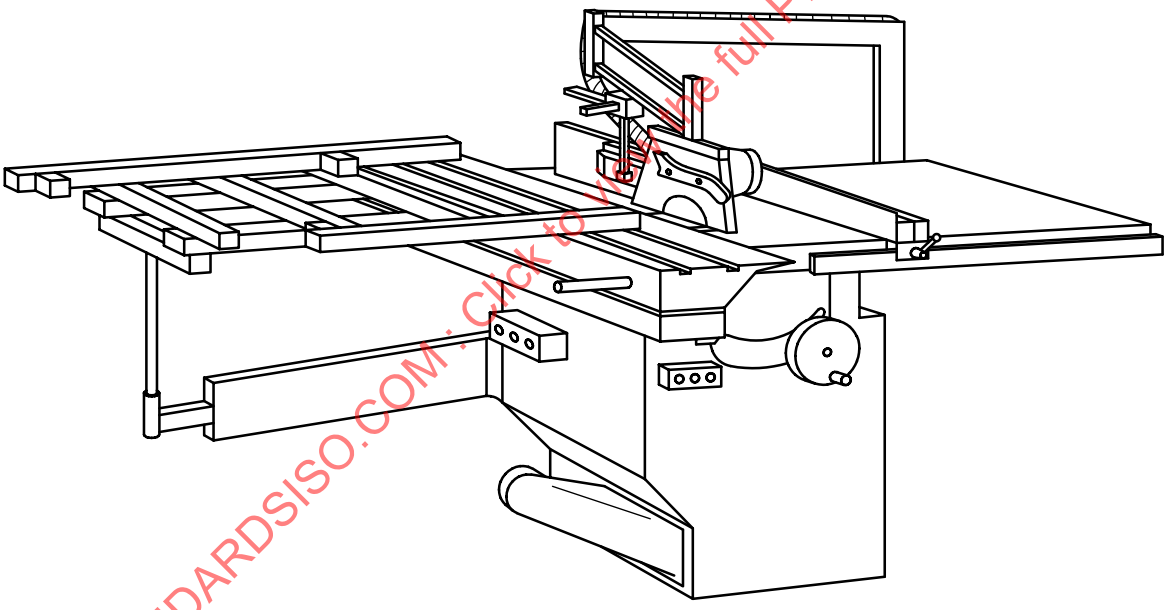


Figure 3 — Example of a machine with dimension saw and moulding units

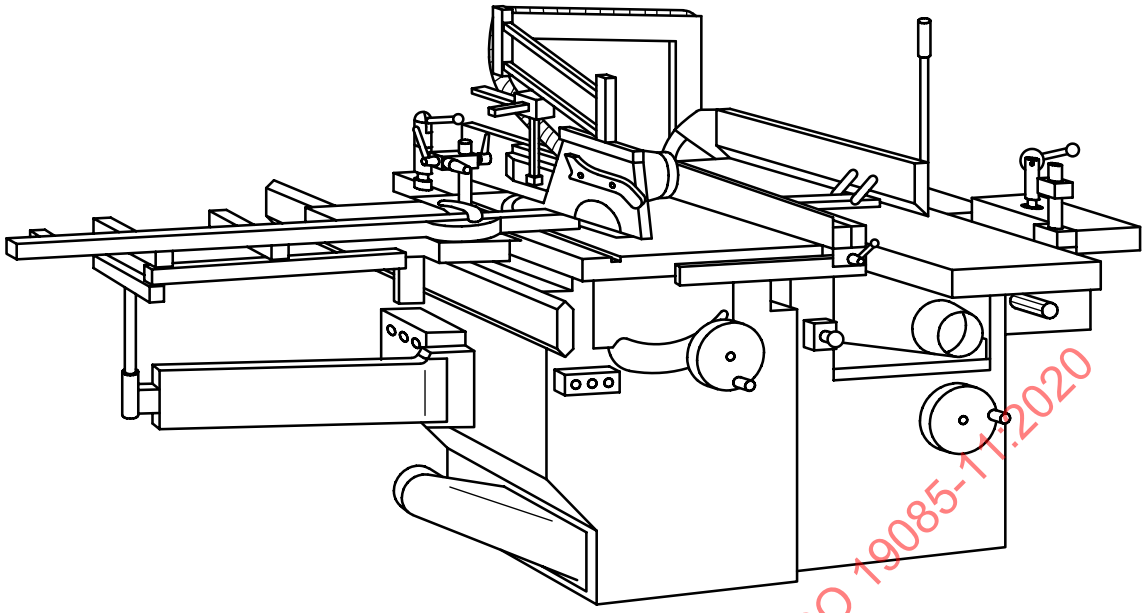


Figure 4 — Example of a machine with table saw, moulding and planing units, with a mortising device, fitted with a sliding table

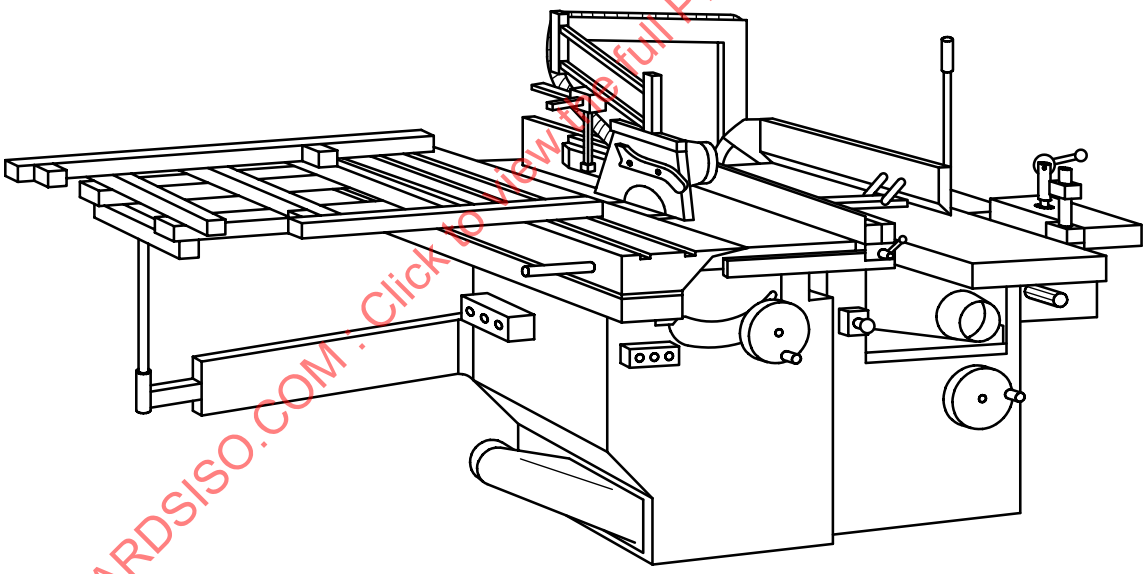


Figure 5 — Example of a machine with dimension saw, moulding and planing units, with a mortising device

4 List of significant hazards

This clause contains all significant hazards, hazardous situations and events (see ISO 12100:2010), identified by risk assessment as significant for the machines as defined in Clause 1 and which require action to eliminate or reduce the risk. This document deals with these significant hazards by defining safety requirements and/or measures or by reference to relevant standards.

These hazards are listed in Table 1.

Table 1 — List of significant hazards

No.	Hazards, hazardous situations and hazardous events	ISO 12100:2010	Relevant section of this document
1	**Mechanical hazards** related to — Machine parts or workpieces due to		
	a) shape	6.2.2.1, 6.2.2.2, 6.3	6.3, 6.9.2, 6.10, 6.6, 6.8, 7.5, 7.14
	b) relative location		5.2, 6.9.2, 6.10, 6.6, 6.8
	e) mechanical strength		6.2, 6.3, 6.4, 6.9.2, 6.10, 6.6, 6.9, Annex A, Annex E, Annex F, Annex H, Annex I
	— Accumulation of energy inside the machinery due to		
	f) elastic elements (springs)	6.2.10, 6.3.5.4	6.3
1.1	Crushing hazard		5.3, 5.4.2, 5.4.4, 6.4, 6.9.2, 6.6, 6.8, 6.11, 7.13, 8.3
1.2	Shearing hazard		5.3, 5.4.2, 5.4.4, 6.4, 6.9.2, 6.6, 6.8, 6.11, 7.13, 8.3
1.3	Cutting or severing hazard		5.3, 5.4.2, 5.4.4, 6.4, 6.6, 6.11, 7.13, 8.3
1.4	Entanglement hazard		5.3, 5.4.2, 5.4.4, 6.4, 6.6, 7.13, 8.3
1.5	Drawing-in or trapping hazard		5.3, 5.4.2, 5.4.4, 6.4, 6.6, 7.13, 8.3
1.8	Friction or abrasion hazard		5.3, 5.4.2, 5.4.4, 6.4, 6.6, 7.13, 8.3
2	**Electrical hazards** due to		
2.1	Contact of persons with live parts (direct contact)	6.2.9, 6.3.5.4	7.4, 7.12
2.2	Contact of persons with parts which have become live under faulty conditions (indirect contact)	6.2.9	7.4, 7.12
4	**Hazards generated by noise, resulting in**		
4.1	Hearing loss (deafness), other physiological disorders (loss of balance, loss of awareness)	6.2.2.2, 6.3	7.2, 8.3
4.2	Accidents due to interference with speech communication, acoustic signals		
7	**Hazards generated by materials and substances** (and their constituent elements) processed or used by the machinery		
7.1	Hazards from contact with or inhalation of harmful fluids and dusts	6.2.3, 6.2.4	7.3, 8.3
7.2	Fire hazard	6.2.4	7.1
8	**Hazards generated by neglecting ergonomic principles** in machinery design		
8.1	Unhealthy postures or excessive effort	6.2.7, 6.2.8, 6.2.11.12, 6.3.5.5, 6.3.5.6	5.2, 7.5
8.2	Hand-arm or foot-leg anatomy	6.2.8.3	7.5
8.4	Local lighting	6.2.8.6	8.3
8.5	Mental overload and underload, stress	6.2.8.5	8.3
8.6	Human error, human behaviour	6.2.8, 6.2.11.8, 6.2.11.10, 6.3.5.2, 6.4	8.3
8.7	Design, location or identification of manual controls	6.2.8.f, 6.2.11.8	5.2

Table 1 *(continued)*

No.	Hazards, hazardous situations and hazardous events	ISO 12100:2010	Relevant section of this document
8.8	Design or location of visual display units	6.2.8, 6.4.2	5.2
10	**Unexpected start up, unexpected overrun/overspeed** (or any similar malfunction) from		
10.1	Failure/disorder of the control system	6.2.11, 6.3.5.4	5.1, 7.13
10.2	Restoration of energy supply after an interruption	6.2.11.4	5.9, 7.7
10.3	External influences on electrical equipment	6.2.11.11	7.9
10.6	Errors made by the operator (due to mismatch of machinery with human characteristics and abilities, see 8.6)	6.2.8, 6.2.11.8, 6.2.11.10, 6.3.5.2, 6.4	8.3
11	**Impossibility of stopping the machine in the best possible conditions**	6.2.11.1, 6.2.11.3, 6.3.5.2	5.4.2, 5.4.4, 7.12
13	**Failure of the power supply**	6.2.11.1, 6.2.11.4	5.9
14	**Failure of the control circuit**	6.2.11, 6.3.5.4	5.1
15	**Errors of fitting**	6.2.7, 6.4.5	7.12
16	**Break-up during operation**	6.2.3	6.2
17	**Falling or ejected objects or fluids**	6.2.3, 6.2.10	6.9.2
18	**Loss of stability/overturning of machinery**	6.3.2.6	6.1, 8.3

5 Safety requirements and measures for controls

5.1 Safety and reliability of control systems

ISO 19085-1:2017, 5.1, applies.

5.2 Control devices

For machines incorporating a dimension saw unit, ISO 19085-5:2017, 5.2, applies.

For machines incorporating a table saw unit, ISO 19085-9:2019, 5.2, applies.

For machines incorporating a moulding unit, ISO 19085-6:2017, 5.2, applies.

For machines incorporating a planing unit, ISO 19085-7:2019, 5.2, applies.

As an exception, if the machine is fitted with a single start control device for all drive motors, it shall be positioned together with either:

— the unit selection switch (see 5.3) at a location on the machine body from which the operator has a good view over the whole machine; or

— the unit selection switch on a moveable control panel.

Where it is not possible to meet the height requirement of minimum 600 mm, the height for all hand-operated control devices except start, normal stop and emergency stop, may be reduced to at least 500 mm from the floor level.

Verification: By checking the relevant drawings and/or circuit diagrams, inspection of the machine and relevant functional testing of the machine.

5.3 Start

For machines incorporating a dimension saw unit, ISO 19085-5:2017, 5.3, applies.

For machines incorporating a table saw unit, ISO 19085-9:2019, 5.3, applies.

For machines incorporating a moulding unit, ISO 19085-6:2017, 5.3, applies.

For machines incorporating a planing unit, ISO 19085-7:2019, 5.3, applies.

In addition, the following requirements apply.

Each unit shall be capable of being started only from its dedicated working position (see Figure 1) or from the single start control device.

Operation of more than one working unit at the same time shall be prevented. As an exception, the sawing unit and the moulding unit may be simultaneously operated in tenoning-sawing mode (see 5.6).

NOTE Prevention of starting of more than one working unit at the same time can be achieved for example by a selector or by an interlocking in the control system of the working unit start.

When a selector is used, indication of the selected working unit shall be provided (e.g. the position of a mode selector, the provision of an indicating light, a visual display indication).

The SRP/CS for the prevention of simultaneous operation of more than one working unit shall achieve PL_r = c.

Changing the selected unit by a unit selection switch shall:

a) initiate a safe stop;

b) not initiate any movement.

Verification: By checking the relevant drawings and/or circuit diagrams, inspection of the machine and relevant functional testing of the machine.

5.4 Safe stops

5.4.1 General

ISO 19085-1:2017, 5.4.1, applies.

5.4.2 Normal stop

ISO 19085-1:2017, 5.4.2, applies with the following additions.

Activation of any normal stop device, regardless of its position, shall stop all machines actuators.

5.4.3 Operational stop

ISO 19085-1:2017, 5.4.3, does not apply.

5.4.4 Emergency stop

ISO 19085-1:2017, 5.4.4, applies with the following additions.

As an exception, machines with more than one tool actuator, without a socket for a demountable power feed and without tenoning-sawing mode, need no emergency stop control.

5.5 Braking function of tool spindles

ISO 19085-1:2017, 5.5, applies.

5.6 Mode selection

ISO 19085-1:2017, 5.6, is replaced by the following text.

Machines where the sawing unit and the moulding unit can be operated simultaneously (see also 5.3) shall be fitted with a tenoning-sawing mode selection switch.

This mode selection shall be in accordance with the following requirements:

a) its control system shall override all other control systems except the emergency stop;

b) changing the mode shall not initiate any movement and the machine shall be brought to a safe stop according to 5.4;

c) the mode selector shall be lockable in any position, e.g. by a key-operated switch.

Indication of the tenoning-sawing mode selection shall be provided, e.g. by the position of the mode selector, by an indicating light, or by a visual display indication.

For machines incorporating a dimension saw unit which includes a post-formed edge pre-cutting saw unit, ISO 19085-5:2017, 5.6, applies.

The SRP/CS for the tenoning-sawing mode selection shall achieve PL_r = c.

Verification: By checking the relevant drawings, inspection of the machine and relevant functional testing of the machine.

5.7 Spindle speed changing

5.7.1 Spindle speed changing by changing belts on the pulleys

ISO 19085-1:2017, 5.7.1, applies.

5.7.2 Spindle speed changing by incremental speed change motor

ISO 19085-1:2017, 5.7.2, applies.

5.7.3 Infinitely variable speed by frequency inverter

ISO 19085-1:2017, 5.7.3, applies.

5.7.4 Spindle speed limiting device for tenoning

For machines incorporating a moulding unit, ISO 19085-6:2017, 5.7.4, applies.

5.7.5 Changing of the direction of spindle rotation

For machines incorporating a moulding unit, ISO 19085-6:2017, 5.7.5, applies.

5.8 Failure of any power supply

ISO 19085-1:2017, 5.8, applies with the following additions.

For machines incorporating a dimension saw unit which includes a post-forming edge pre-cutting saw unit, ISO 19085-5:2017, 5.8, applies.

5.9 Manual reset control

ISO 19085-1:2017, 5.9, does not apply.

5.10 Enabling control

ISO 19085-1:2017, 5.10, applies.

5.11 Machine moving parts speed monitoring

ISO 19085-1:2017, 5.11, is replaced by the following text.

The control for speed monitoring shall ensure that, as soon as the real speed exceeds the speed limit, the drive is automatically stopped in category 0 according to IEC 60204-1:2005, 9.2.2.

For limited speed monitoring of PDS(SR) (power drive system, safety-related), IEC 61800-5-2:2016, 4.2.4.5 (safely limited speed, SLS) applies.

The SRP/CS for limited speed monitoring of machine moving parts (except tools) shall achieve PL_r = b.

Verification: By checking the relevant drawings and/or circuit diagrams, inspection of the machine and relevant functional testing of the machine.

5.12 Time delay

ISO 19085-1:2017, 5.12, applies.

5.13 Power-operated adjustments

For machines incorporating a dimension saw unit and with power-operated adjustment of the saw blade and/or fences, ISO 19085-5:2017, 5.13, applies.

For machines incorporating a table saw unit and with power-operated adjustment of the saw blade and/or fences, ISO 19085-9:2019, 5.13, applies.

For machines incorporating a moulding unit and with power-operated adjustment of arbor, demountable power feed unit, fences and/or table insert, ISO 19085-6:2017, 5.13, applies.

For machines incorporating a planing unit and with power operated adjustment of the tables, ISO 19085-7:2019, 5.13, applies.

6 Safety requirements and measures for protection against mechanical hazards

6.1 Stability

6.1.1 Stationary machines

ISO 19085-1:2017, 6.1.1, applies with the following additions.

For machines incorporating a planing unit, ISO 19085-7:2019, 6.1.1, applies.

6.1.2 Displaceable machines

ISO 19085-1:2017, 6.1.2, applies.

6.2 Risk of break-up during operation

For machines incorporating a dimension saw unit, ISO 19085-5:2017, 6.2, applies.

For machines incorporating a table saw unit, ISO 19085-9:2019, 6.2, applies.

For machines incorporating a moulding unit, ISO 19085-6:2017, 6.2, applies, and the stated exception also applies to the part of the table insert not close to the tool.

For machines incorporating a planing unit, ISO 19085-7:2019, 6.2, applies.

6.3 Tool holder and tool design

6.3.1 General

For machines incorporating a dimension saw unit, ISO 19085-5:2017, 6.3.1, applies.

For machines incorporating a table saw unit, of ISO 19085-9:2019, 6.3.1, applies.

For machines incorporating a moulding unit, ISO 19085-6:2017, 6.3.1 and Annex F, apply. As an exception, the maximum usable dimensions stated in ISO 19085-6:2017, Table 2, for arbor diameter not less than 20 mm and less than 30 mm apply also to arbor diameters not less than 19,05 mm (i.e. ¾”), and the maximum diameters of tools for tenoning when using these arbor diameters increases from 240 mm to 275 mm.

For machines incorporating a planing unit, ISO 19085-7:2019, 6.3.1, applies.

6.3.2 Spindle locking

For machines incorporating a dimension saw unit, ISO 19085-5:2017, 6.3.2, applies.

For machines incorporating a table saw unit, ISO 19085-9:2019, 6.3.2, applies.

For machines incorporating a moulding unit, ISO 19085-6:2017, 6.3.2, applies.

6.3.3 Circular saw blade fixing device

For machines incorporating a dimension saw unit, ISO 19085-5:2017, 6.3.3, applies.

For machines incorporating a table saw unit, ISO 19085-9:2019, 6.3.3, applies.

For machines incorporating a moulding unit equipped with a glass bead saw unit, ISO 19085-6:2017, 6.3.3, applies.

6.3.4 Flange dimensions for circular saw blades

For machines incorporating a dimension saw unit, ISO 19085-5:2017, 6.3.4, applies.

For machines incorporating a table saw unit, ISO 19085-9:2019, 6.3.4, applies.

For machines incorporating a moulding unit equipped with a glass bead saw unit, ISO 19085-6:2017, 6.3.4, applies.

6.3.5 Arbor rings/fixing device for milling tools

For machines incorporating a dimension saw unit, ISO 19085-5:2017, 6.3.5, applies.

For machines incorporating a table saw unit, ISO 19085-9:2019, 6.3.5, applies.

For machines incorporating a moulding unit, ISO 19085-6:2017, 6.3.5, applies.

6.3.6 Quick tool/arbor change system

For machines incorporating a moulding unit, ISO 19085-6:2017, 6.3.6, applies.

6.3.7 Manual adjustment of arbor height

For machines incorporating a moulding unit, ISO 19085-6:2017, 6.3.7, applies.

6.3.8 Manual adjustment of arbor inclination

For machines incorporating a moulding unit, ISO 19085-6:2017, 6.3.8, applies.

6.4 Braking

6.4.1 Braking of tool spindles

ISO 19085-1:2017, 6.4.1, applies.

6.4.2 Maximum run-down time

ISO 19085-1:2017, 6.4.2, applies with the following additions:

NOTE For machines with a sawing unit and fitted with a device for grooving with a milling tool, the greatest kinetic energy, as required by the test in ISO 19085-1:2017, Annex B, can be achieved either with a saw blade or a milling tool.

6.4.3 Brake release

ISO 19085-1:2017, 6.4.3, applies.

6.5 Safeguards

6.5.1 Fixed guards

ISO 19085-1:2017, 6.5.1, applies.

6.5.2 Interlocking movable guards

6.5.2.1 General

ISO 19085-1:2017, 6.5.2.1, applies.

6.5.2.2 Movable guards with interlocking without guard locking

ISO 19085-1:2017, 6.5.2.2, applies.

6.5.2.3 Movable guards with interlocking and guard locking

ISO 19085-1:2017, 6.5.2.3, does not apply.

6.5.3 Hold-to-run control

ISO 19085-1:2017, 6.5.3, applies with the following additions.

As an exception, the requirements for the SRP/CS for hold-to-run may be reduced to PL_r = b. In this case, an emergency stop control device shall be positioned in the vicinity of the hold-to-run control device.

Verification: By checking the relevant drawings and/or circuit diagrams, inspection of the machine and relevant functional testing of the machine.

6.5.4 Two hand control

ISO 19085-1:2017, 6.5.4, applies.

6.5.5 Electro-sensitive protection equipment (ESPE)

ISO 19085-1:2017, 6.5.5, does not apply.

6.5.6 Pressure sensitive protection equipment (PSPE)

ISO 19085-1:2017, 6.5.6, applies.

6.6 Prevention of access to moving parts

6.6.1 General

ISO 19085-1:2017, 6.6.1, does not apply.

6.6.2 Guarding of tools

For machines incorporating a dimension saw unit, ISO 19085-5:2017, 6.6.2, applies.

For machines incorporating a table saw unit, ISO 19085-9:2019, 6.6.2, applies.

In addition, the following requirements apply:

As an exception, machines incorporating a moulding, a planing and a sawing unit may have a saw blade guard mounted to the riving knife also if:

— they have a maximum saw blade diameter >315 mm and ≤350 mm; or

— they are fitted with a device for grooving with milling tools on the saw spindle.

In this case, the following requirement applies in addition: On machines with the facility to adjust the saw blade height, coverage of the saw blade or the milling tool during grooving shall be made possible by providing mountings for fixing a protective device (see 6.11 and 8.3.2).

For machines incorporating a moulding unit, ISO 19085-6:2017, 6.6.2, applies.

For machines incorporating a planing unit, ISO 19085-7:2019, 6.6.2, applies with the following additions.

If it is necessary to move the bridge type guard to a position beside or below the level of the surface planing table to enable the use of a different working unit (e.g. to position the fence of the saw unit), it shall be movable without the aid of a tool and shall remain attached to the machine.

Verification: By checking the relevant drawings, inspection of the machine and relevant functional testing of the machine.

6.6.3 Guarding of drives

For machines incorporating a dimension saw unit, ISO 19085-5:2017, 6.6.3, applies.

For machines incorporating a table saw unit, ISO 19085-9:2019, 6.6.3, applies.

For machines incorporating a moulding unit, ISO 19085-6:2017, 6.6.3, applies.

For machines incorporating a planing unit, ISO 19085-7:2019, 6.6.3, applies.

6.6.4 Guarding of shearing and/or crushing zones

For machines incorporating a dimension saw unit, ISO 19085-5:2017, 6.6.4, applies.

For machines incorporating a table saw unit, ISO 19085-9:2019, 6.6.4, applies.

For machines incorporating a moulding unit ISO 19085-6:2017, 6.6.4, applies.

6.7 Impact hazard

For machines incorporating a dimension saw unit, ISO 19085-5:2017, 6.7, applies.

For machines incorporating a table saw unit, ISO 19085-9:2019, 6.7, applies.

6.8 Clamping devices

For machines incorporating a dimension saw unit, ISO 19085-5:2017, 6.8, applies.

For machines incorporating a table saw unit, ISO 19085-9:2019, 6.8, applies.

For machines incorporating a moulding unit, ISO 19085-6:2017, 6.8, applies.

For machines incorporating a planing unit, ISO 19085-7:2019, 6.8, applies.

6.9 Measures against ejection

6.9.1 General

ISO 19085-1:2017, 6.9.1, applies with the following additions.

Anti-splinter devices are not relevant.

6.9.2 Guards material and characteristics

6.9.2.1 Choice of class of guards

ISO 19085-1:2017, 6.9.2.1, applies with the following additions.

Guards used to prevent ejection shall be of class B.

6.9.2.2 Guards of class A

ISO 19085-1:2017, 6.9.2.2, does not apply.

6.9.2.3 Guards of class B

ISO 19085-1:2017, 6.9.2.3, applies.

6.9.3 Anti-kickback devices

For machines incorporating a dimension saw unit, ISO 19085-5:2017, 6.9.3, applies.

For machines incorporating a table saw unit, ISO 19085-9:2019, 6.9.3, applies.

For machines incorporating a moulding unit, ISO 19085-6:2017, 6.9.3, applies.

For machines incorporating a planing unit, ISO 19085-7:2019, 6.9.3, applies.

6.10 Workpiece supports and guides

For machines incorporating a dimension saw unit, ISO 19085-5:2017, 6.10, applies, except 6.10.4, 6.10.5 and Annex G.

For machines incorporating a table saw unit, ISO 19085-9:2019, 6.10, applies, except 6.10.3, 6.10.4 and Annex G.

For machines incorporating a moulding unit, ISO 19085-6:2017, 6.10, applies, except 6.10.1.1 and Table 3. This exception does not include the requirements for the diameter ranges of the table rings in ISO 19085-6:2017, Table 3.

The minimum table dimensions for the sawing and moulding units given in Table F.1 shall be achieved.

For machines incorporating a planing unit, ISO 19085-7:2019, 6.10, applies.

If the manufacturer provides a rip fence for the sawing unit which can also be used as a fence for surface planing, it shall meet all requirements of ISO 19085-5:2017, 6.10.1, or ISO 19085-9:2019, 6.10.1 during sawing, as well as ISO 19085-7:2019, 6.10.5 during surface planing.

A slot between the table for the sawing and moulding units and the surface planing table may be provided.

Verification: By checking the relevant drawings, measurements, inspection of the machine and relevant functional testing of the machine.

6.11 Safety appliances

For machines incorporating a dimension saw unit, ISO 19085-5:2017, 6.11, applies.

For machines incorporating a table saw unit, ISO 19085-9:2019, 6.11, applies.

For machines incorporating a moulding unit, ISO 19085-6:2017, 6.11, applies.

For machines incorporating a planing unit, ISO 19085-7:2019, 6.11, applies.

6.12 Elements not in use

Subclause specific to this document.

On machines incorporating a sawing unit and a moulding unit, it shall be possible to vertically adjust the moulding spindle (without milling tool) and the largest saw blade for which the machine is designed, together with its riving knife, completely below the table.

A cover to close the table bore for the moulding spindle shall be provided.

The fence plates for straight work moulding (see ISO 19085-6:2017, 6.10.2) shall be removable from the machine without the aid of a tool.

Verification: By checking the relevant drawings, inspection of the machine and relevant functional testing of the machine.

6.13 Adjustments in tenoning-sawing mode

Subclause specific to this document.

Machines equipped with tenoning-sawing mode shall be provided with:

a) a saw blade mounting adjustable in axial direction;

b) a means for positioning the table inserts, so that any slot in the table for the saw blade and any gap to permit positioning of the table inserts does not exceed 12 mm.

Verification: By checking the relevant drawings, inspection of the machine and relevant functional testing of the machine.

7 Safety requirements and measures for protection against other hazards

7.1 Fire

ISO 19085-1:2017, 7.1, applies.

7.2 Noise

7.2.1 Noise reduction at the design stage

ISO 19085-1:2017, 7.2.1, applies.

7.2.2 Noise emission measurement

ISO 19085-1:2017, 7.2.2, applies with the following additions.

For machines incorporating a sawing unit, the operating conditions for noise measurement shall comply with ISO 7960:1995, Annex A.

For machines incorporating a moulding unit, the operating conditions for noise measurement shall comply with ISO 7960:1995, Annex D.

For machines including tenoning-sawing mode, the operating conditions for noise measurement shall comply with ISO 7960:1995, Annex K.

For machines incorporating a planing unit, the operating conditions for noise measurement shall comply with ISO 7960:1995, Annex B for surface planing and Annex C for thickness planing.

NOTE There is no need to measure the noise emission during mortising separately, since it is equal, in idle mode, to the noise emission in planing mode and it is most probably lower during operation.

The emission sound pressure level at the workstations shall be measured at the typical workstation positions as shown in Figure 1.

7.3 Emission of chips and dust

For machines incorporating a dimension saw unit, ISO 19085-5:2017, 7.3, applies.

For machines incorporating a table saw unit, ISO 19085-9:2019, 7.3, applies.

For machines incorporating a moulding unit, ISO 19085-6:2017, 7.3, applies.

For machines incorporating a planing unit, ISO 19085-7: 2019, 7.3, applies.

7.4 Electricity

7.4.1 General

ISO 19085-1:2017, 7.4.1, applies.

7.4.2 Displaceable machines

ISO 19085-1:2017, 7.4.2, applies.

7.5 Ergonomics and handling

For machines incorporating a dimension saw unit, ISO 19085-5:2017, 7.5, applies.

For machines incorporating a table saw unit, ISO 19085-9:2019, 7.5, applies.

For machines incorporating a moulding unit, ISO 19085-6:2017, 7.5, applies.

For machines incorporating a planing unit, ISO 19085-7:2019, 7.5, applies.

7.6 Lighting

ISO 19085-1:2017, 7.6, does not apply.

7.7 Pneumatics

ISO 19085-1:2017, 7.7, applies.

7.8 Hydraulics

ISO 19085-1:2017, 7.8, applies.

7.9 Electromagnetic compatibility

ISO 19085-1:2017, 7.9, applies.

7.10 Laser

ISO 19085-1:2017, 7.10, applies.

7.11 Static electricity

ISO 19085-1:2017, 7.11, applies.

7.12 Errors of fitting

ISO 19085-1:2017, 7.12, applies with the following additions.

For machines incorporating a dimension saw unit, ISO 19085-5:2017, 7.12, applies.

For machines incorporating a table saw unit, ISO 19085-9:2019, 7.12, applies.

7.13 Isolation

ISO 19085-1:2017, 7.13, applies.

7.14 Maintenance

ISO 19085-1:2017, 7.14, applies.

8 Information for use

8.1 Warning devices

ISO 19085-1:2017, 8.1, applies with the following additions.

For machines incorporating a dimension saw unit which includes a post-forming edge pre-cutting saw unit, ISO 19085-5:2017, 8.1, applies.

For machines incorporating a moulding unit, ISO 19085-6:2017, 8.1, applies.

8.2 Markings

8.2.1 General

ISO 19085-1:2017, 8.2.1, applies.

8.2.2 Additional markings

For machines incorporating a dimension saw unit, ISO 19085-5:2017, 8.2.2, applies.

For machines incorporating a table saw unit, ISO 19085-9:2019, 8.2.2, applies.

For machines incorporating a moulding unit, ISO 19085-6:2017, 8.2.2, applies.

For machines incorporating a planing unit, ISO 19085-7:2019, 8.2.2, applies.

8.3 Instruction handbook

8.3.1 General

ISO 19085-1:2017, 8.3.1, applies with the following additions.

The requirement in ISO 19085-1:2017, 8.3.1 o) (i.e. noise declaration), applies to each working unit and, if applicable, to operation in tenoning-sawing mode (for an example of noise declaration for combined machines see Annex G).

8.3.2 Additional information

For machines incorporating a dimension saw unit, ISO 19085-5:2017, 8.3.2, applies with the following additions.

— The requirement in ISO 19085-5:2017, 8.3.2 j), related to the design specifications for manufacturing the protective device for grooving with the saw blade in machines with riving knife mounted saw blade guard also applies to grooving with milling tools.

For machines incorporating a table saw unit, ISO 19085-9:2019, 8.3.2, applies with the following additions.

— The requirement in ISO 19085-9:2019, 8.3.2 i), related to the design specifications for manufacturing the protective device for grooving with the saw blade in machines with riving knife mounted saw blade guard also applies to grooving with milling tools.

For machines incorporating a moulding unit, ISO 19085-6:2017, 8.3.2, applies.

For machines incorporating a planing unit, ISO 19085-7:2019, 8.3.2, applies.

Annex A
(informative)

Performance level required

For machines incorporating a dimension saw unit, ISO 19085-5:2017, Annex A, applies.

For machines incorporating a table saw unit, ISO 19085-9:2019, Annex A, applies.

For machines incorporating a moulding unit, ISO 19085-6:2017, Annex A, applies.

For machines incorporating a planing unit, ISO 19085-7:2019, Annex A, applies.

Table A.1 gives a quick-view summary of the performance level required (PL_r) for those safety functions which are added specific to this document.

Table A.1 — Safety functions and performance level (PL) required

Area	No.	Safety function/device	PL_r	Subclause of this document
Start	1	Prevention of simultaneous operation of more than one working unit	c	5.3
Mode	2	Tenoning-sawing mode selection	c	5.6
Controls	3	Limited speed monitoring of machine moving parts (except tools)	b	5.11
Safeguards	4	Hold-to-run	b/c	6.5.3

Annex B
(normative)

Test for braking function

ISO 19085-1:2017, Annex B, applies.

Annex C
(normative)

Stability test for displaceable machines

For machines incorporating a dimension saw unit, ISO 19085-5:2017, Annex C, applies.

For machines incorporating a table saw unit, ISO 19085-9:2019, Annex C, applies.

For machines incorporating a moulding unit, ISO 19085-6:2017, Annex C, applies.

For machines incorporating a planing unit, ISO 19085-7:2019, Annex C, applies.