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ISO 19085-7

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Woodworking machines — Safety —

Part 7: Surface planing, thickness planing, combined surface/thickness planing machines

Machines à bois — Sécurité —

Partie 7: Machines à dégauchir, à raboter et machines combinées à dégauchir/raboter

Reference number
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ISO copyright office
CP 401 • Ch. de Blandonnet 8
CH-1214 Vernier, Geneva
Phone: +41 22 749 01 11
Fax: +41 22 749 09 47
Email: copyright@iso.org
Website: www.iso.org

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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.

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

Introduction

The ISO 19085 series 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 to be provided to the user by the manufacturer.

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 parts of ISO 19085 other than ISO 19085-1:2017, safety requirements are referenced to the relevant sections of ISO 19085-1:2017, to avoid repetition and reduce their length. The other parts contain replacements and additions to the common requirements given in ISO 19085-1:2017.

Thus, Clauses 5, 6, 7 and 8 with their subclauses and the annexes of this document can either

— confirm as a whole,

— confirm with additions,

— exclude in total, or

— replace with specific text

the corresponding subclauses or annexes of ISO 19085-1:2017.

This interrelation is indicated in the first paragraph of each subclause or annex right after the title by one of the following statements:

— “ISO 19085-1:2017, [subclause/Annex], applies.”;

— “ISO 19085-1:2017, [subclause/Annex], applies with the following additions.” or “ISO 19085-1:2017, [subclause/Annex], applies with the following additions, subdivided into further specific subclauses.”;

— “ISO 19085-1:2017, [subclause/Annex], does not apply.”;

— “ISO 19085-1:2017, [subclause/Annex], is replaced by the following text.” or “ISO 19085-1:2017, [subclause/Annex], is replaced by the following text, subdivided into further specific subclauses.”.

Specific subclauses and annexes in this document without correspondent in ISO 19085-1:2017 are indicated by the introductory sentence: “Subclause/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.

Woodworking machines — Safety —

Part 7: Surface planing, thickness planing, combined surface/ thickness planing machines

1 Scope

This document gives the safety requirements and measures for stationary and displaceable

— surface planing machines, also called jointers,

— thickness planing machines, also called planers or single surface planers,

— combined surface/thickness planing machines

with fixed cutterblock position, with an integrated feed in thicknessing mode, with or without demountable power feed device in planing mode and with manual loading and unloading of the work-piece, hereinafter referred to as "machines". 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.

It deals with all significant hazards, hazardous situations and events as listed in Clause 4 relevant to these machines when they are 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 are taken into account.

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

It is also applicable to surface planing machines and combined surface/thickness planing machines fitted with an optional mortising device, whose hazards have been dealt with.

This document does not apply to:

a) machines with more than one cutterblock;

b) machines with mortising unit driven by a separate motor;

c) machines where the cutterblock is adjustable for depth of cut setting in thicknessing mode;

d) machines where the conversion from planing to thicknessing mode or vice versa is achieved by mounting or demounting parts/units;

e) machines where surfacing and thicknessing can be performed on the same section of the cutterblock at the same time;

f) machines intended for use in potentially explosive atmosphere;

g) machines manufactured before the date of its publication as an international standard;

h) displaceable machines with a maximum planing width of ≤330 mm.

NOTE 3 Transportable motor-operated electric tools are dealt with in IEC 62841-1:2014 and IEC 61029-2-3:1993.

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

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

EN 847-1:2013, *Tools for woodworking — Safety requirements — Part 1: Milling tools, circular saw blades*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in ISO 12100:2010, ISO 13849-1:2015 and ISO 19085-1:2017 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
cutterblock
cylindrical shaped complex tool equipped with blades or inserts

Note 1 to entry: See also EN 847-1:2017 for a description of the complex tool.

3.2
surface planing machine
jointer
machine designed for cutting off layers of the lower surface of a work-piece by a *cutterblock* (3.1) rotating around a horizontal axis, mounted at right angles to the feed direction between two tables designed to position and support the work-piece that is fed into the machine against the direction of the cut

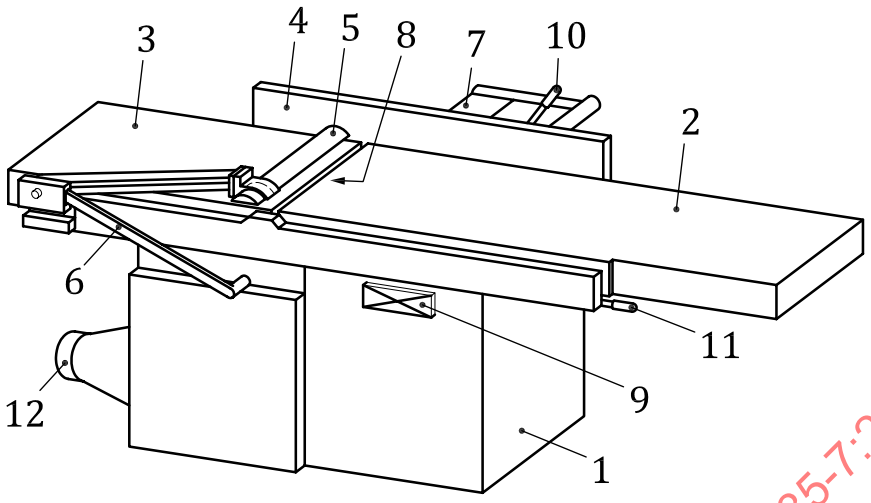
Note 1 to entry: See Figure 1.

Note 2 to entry: Typical working operations with surface planing machine are shown in Figure 4.

3.3
thickness planing machine
single surface planer
machine designed for cutting off layers of the upper surface of a work-piece by a *cutterblock* (3.1) rotating around a horizontal axis, mounted at right angles to the feed direction above the table designed to position and support the work-piece that is fed into the machine against the direction of the cut

Note 1 to entry: See Figure 2.

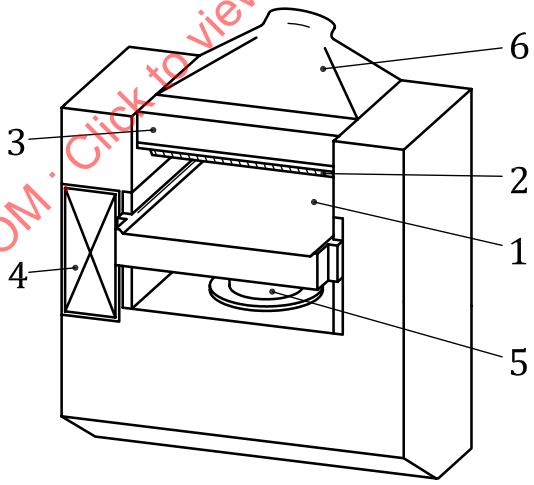
Note 2 to entry: The internal structure of a thickness planing machine is shown in Figure 5.



Key

1	main frame	7	guard behind the fence
2	infeed table	8	cutterblock
3	outfeed table	9	controls
4	tiltable fence	10	fence tilting adjustment
5	bridge-type guard	11	lever for table height adjustment
6	lever for bridge-type guard adjustment	12	dust extraction outlet

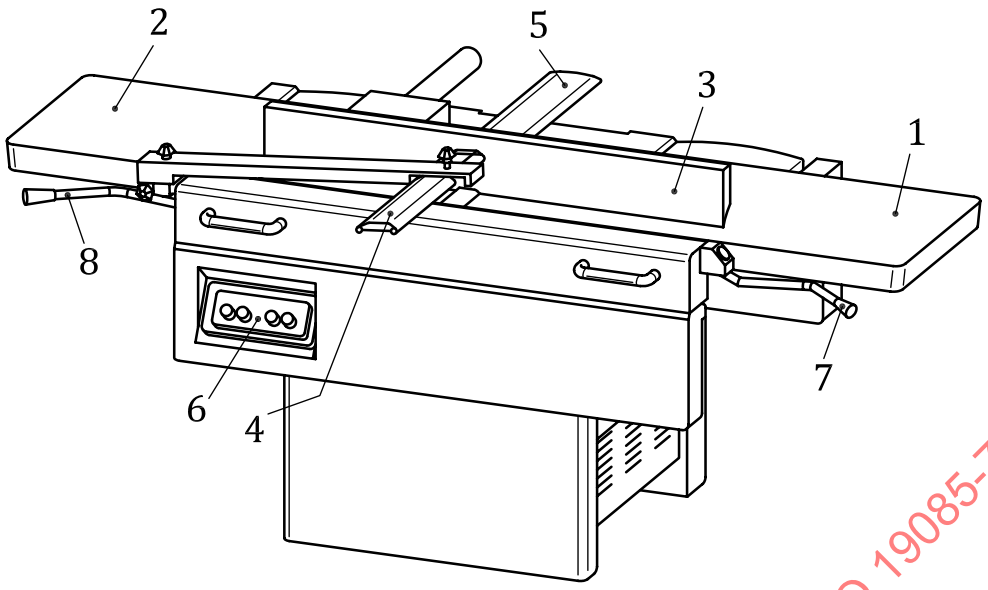
Figure 1 — Example of a surface planing machine



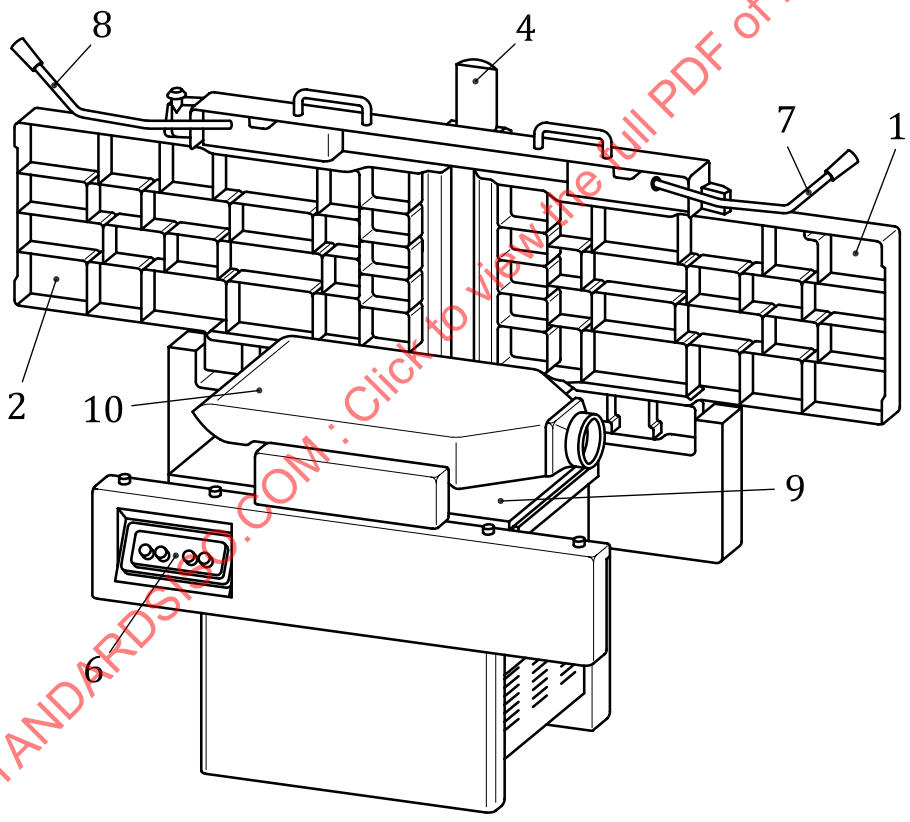
Key

1	thicknessing table	4	controls
2	anti-kickback fingers	5	table lifting system
3	upper guard	6	extraction hood

Figure 2 — Example of a thickness planing machine



a) Example of combined surface/thickness planing machine (set up for surface planing)



b) Example of combined surface/thickness planing machine (set up for thicknessing)

Key

1	infeed table	6	controls
2	outfeed table	7	infeed table height adjustment
3	tiltable fence	8	bridge-type guard adjustment
4	bridge-type guard	9	thicknessing table
5	guard behind the fence	10	guard for thicknessing mode

Figure 3 — Example of combined surface/thickness planing machine

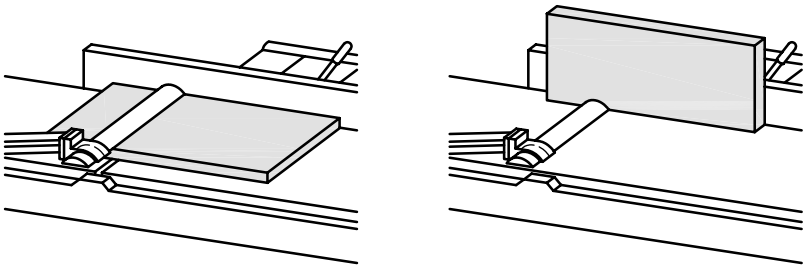


Figure 4 — Typical surface planing operations: planing (left) and edging (right)

3.4
combined surface/thickness planing machine
combined jointer/single surface planer
combined machine that allows surface planing as well as thickness planing

Note 1 to entry: Example is given in Figure 3.

Note 2 to entry: The work-piece is fed into the machine against the direction of the cut.

Note 3 to entry: Combined surface/thickness planing machines may also be fitted with an optional *mortising device* (3.7).

Note 4 to entry: When surfacing, the work-piece is passed over the *cutterblock* (3.1) located between two tables which are used to position and support the work-piece and the lower surface is planed. The infeed table of the surface planing unit is adjustable in height.

Note 5 to entry: For thicknessing, both of the *surface planing tables* (3.5) can be raised. The work-piece rests on the *thicknessing table* (3.6); the distance between it and the cutting circle diameter is adjustable. The upper surface of the work-piece is planed.

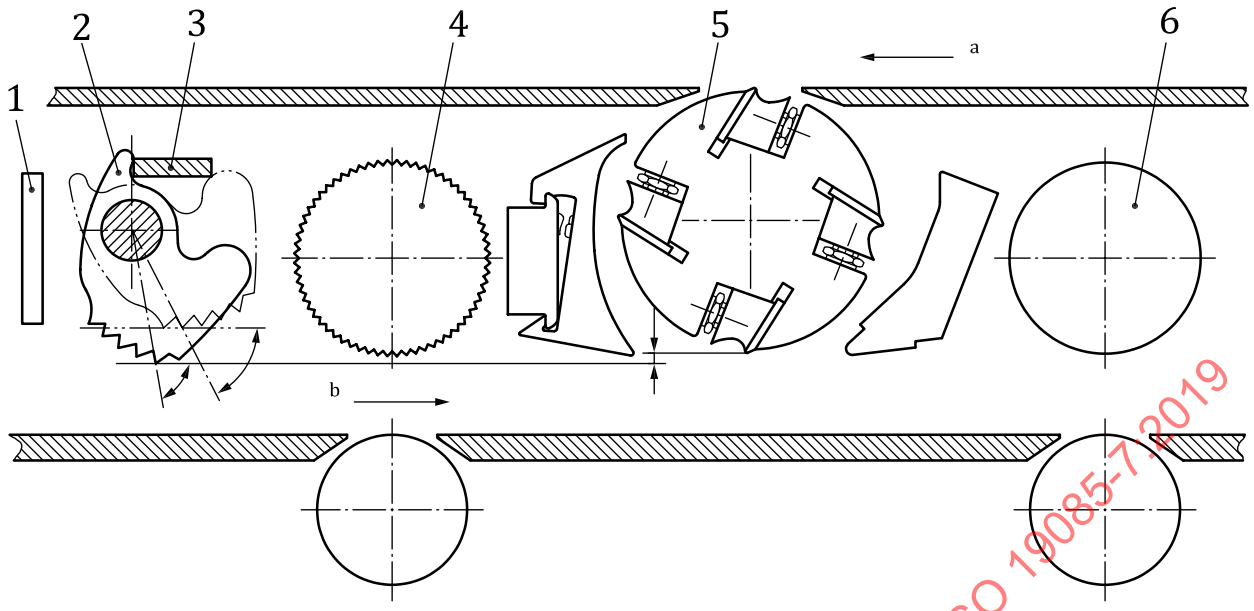
3.5
surface planing table
table in front and behind the *cutterblock* (3.1) used to support the work-piece during planing of the lower surface

3.6
thicknessing table
table used to support the work-piece during thicknessing at the machine which can comprise an assembly of rollers, belts or other fixed or moving mechanical elements

3.7
mortising device
fixed or detachable element of a machine which is designed for slot boring (mortising) or boring by means of a single rotating tool and a moveable table

Note 1 to entry: The tool holding device, e.g. chuck, is mounted on one end of the *cutterblock* (3.1) (see Figure 6).

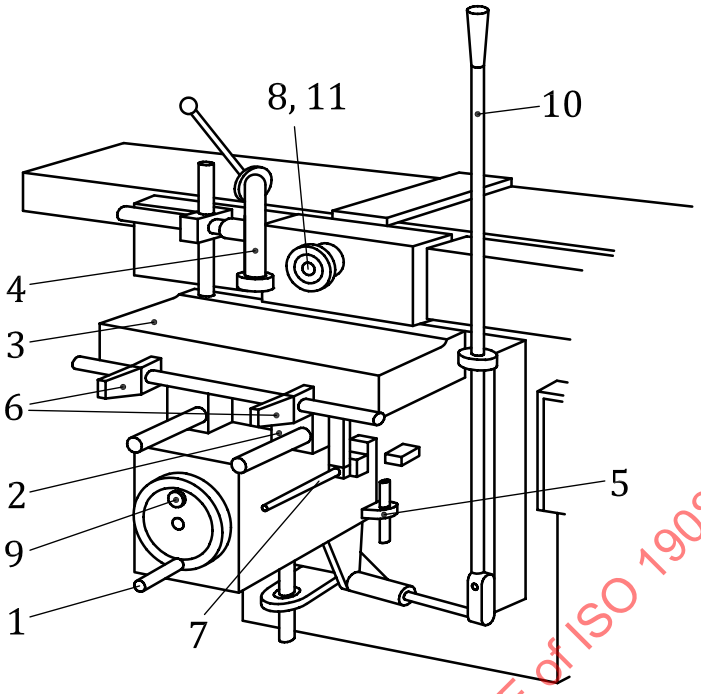
3.8
initiation control
control which after actuation enables providing power to specific machine actuators, e.g. by a programmable logic control



Key

1	limiting device for the depth of cut	5	cutterblock
2	anti-kickback fingers	6	outfeed roller
3	mechanical end stop for the rotation of the finger	a	Feed direction during surface planing.
4	infeed roller	b	Feed direction during thickness planing.

Figure 5 — Example of internal of a combined surface/thickness planing machine



Key

1 vertical adjustment
2 infeed slide
3 table
4 work-piece clamp
5 height stop
6 horizontal length stops
7 horizontal depth stop
8 chuck
9 vertical adjustment lock
10 table movement control lever
11 chuck guard

Figure 6 — Example of 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 the scope 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 work-pieces due to		
	a) shape		6.3, 6.6, 6.9.2, 6.10, 6.11
	b) relative location	6.2.2.1, 6.2.2.2, 6.3	5.2, 6.6, 7.5
	c) mass and stability (potential energy of elements which may move under effect of gravity)		6.1, 6.6, 6.10
	d) mass and velocity (kinetic energy of elements in controlled or uncontrolled motion)		5.13, 6.4, 6.6

Table 1 *(continued)*

No.	Hazards, hazardous situations and hazardous events	ISO 12100:2010	Relevant section of this document
	e) mechanical strength		6.2, 6.3, 6.4, 6.6, 6.9, 6.10, Annex D, Annex F, Annex G, Annex H
	— Accumulation of energy inside the machinery		
	f) elastic elements (springs)	6.2.10, 6.3.5.4	6.6, 6.10, 7.5
	g) liquids and gases under pressure		7.7, 7.8
1.1	Crushing hazard		6.6.4
1.2	Shearing hazard		6.6.4
1.3	Cutting or severing hazard		6.3, 6.6, 8.3.2
1.4	Entanglement hazard		6.6, 8.3.2
1.5	Drawing-in or trapping hazard		6.6, 8.3.2
1.6	Impact hazard		6.10, 8.3.2
1.9	High pressure fluid injection or ejection hazard		7.8
2	**Electrical hazards** due to		
2.1	Contact of persons with live parts (direct contact)	6.2.9, 6.3.5.4	7.4
2.2	Contact of persons with parts which have become live under faulty conditions (indirect contact)	6.2.9	7.4
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
4.2	Interference with speech communication, acoustic signals		7.2, 8.3
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, 8.3
8.2	Hand-arm or foot-leg anatomy	6.2.8.3	5.2, 6.6, 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, 7.5
8.8	Design or location of visual display units	6.2.8, 6.4.2	5.2, 7.5
9	**Combination of hazards**	6.3.2.1	5.1, 6.6, 7.13, 7.14
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	5.8, 7.7
10.3	External influences on electrical equipment	6.2.11.11	5.1, 7.9
10.5	Errors in the software	6.2.11.7	5.1

Table 1 *(continued)*

No.	Hazards, hazardous situations and hazardous events	ISO 12100:2010	Relevant section of this document
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	7.5, 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, 7.12
13	**Failure of the power supply**	6.2.11.1, 6.2.11.4	5.8
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, 8.2
16	**Break-up during operation**	6.2.3	6.2, 6.9, Annex G, Annex H
17	**Falling or ejected objects or fluids**	6.2.3, 6.2.10	6.9
18	**Loss of stability/overturning of machinery**	6.3.2.6	6.1, 8.3, Annex C

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

ISO 19085-1:2017, 5.2, applies with the following additions.

On **surface planing machines**, the control devices for start, normal stop, emergency stop and powered table adjustment, if fitted, shall be located in area A or B shown in Figure 7.

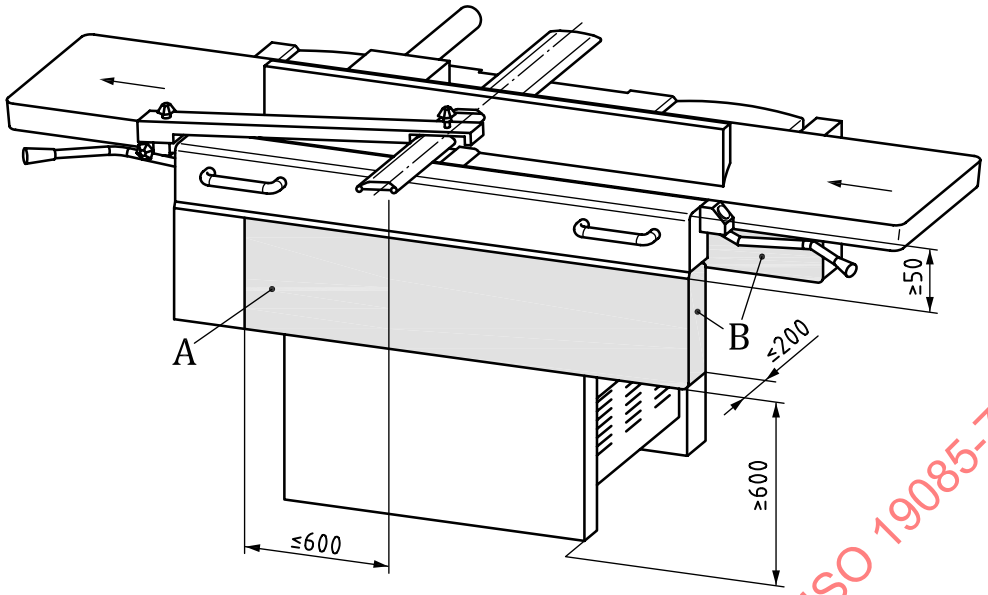
On **thickness planing machines**, the control devices for start, normal stop, emergency stop and powered table adjustment, if fitted, shall be located at the infeed side in area E or F shown in Figure 8.

On **combined surface/thickness planing machines**, the control devices for start, normal stop, emergency stop and powered table adjustment, if fitted, shall be either (see Figures 7 and 9):

— in area A or B and in area C or D, or

— in the overlapping area of A and C.

Dimensions in millimetres

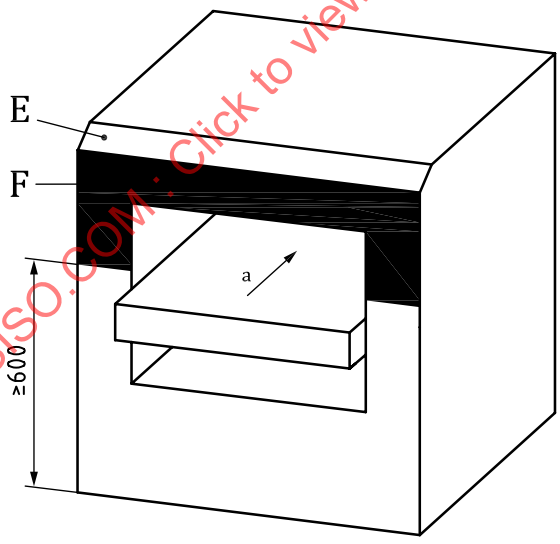


Key

A, B possible locations of control devices for start, normal stop, emergency stop and powered table adjustment

Figure 7 — Position of control devices on surface planing and combined surface/thickness planing machines

Dimensions in millimetres



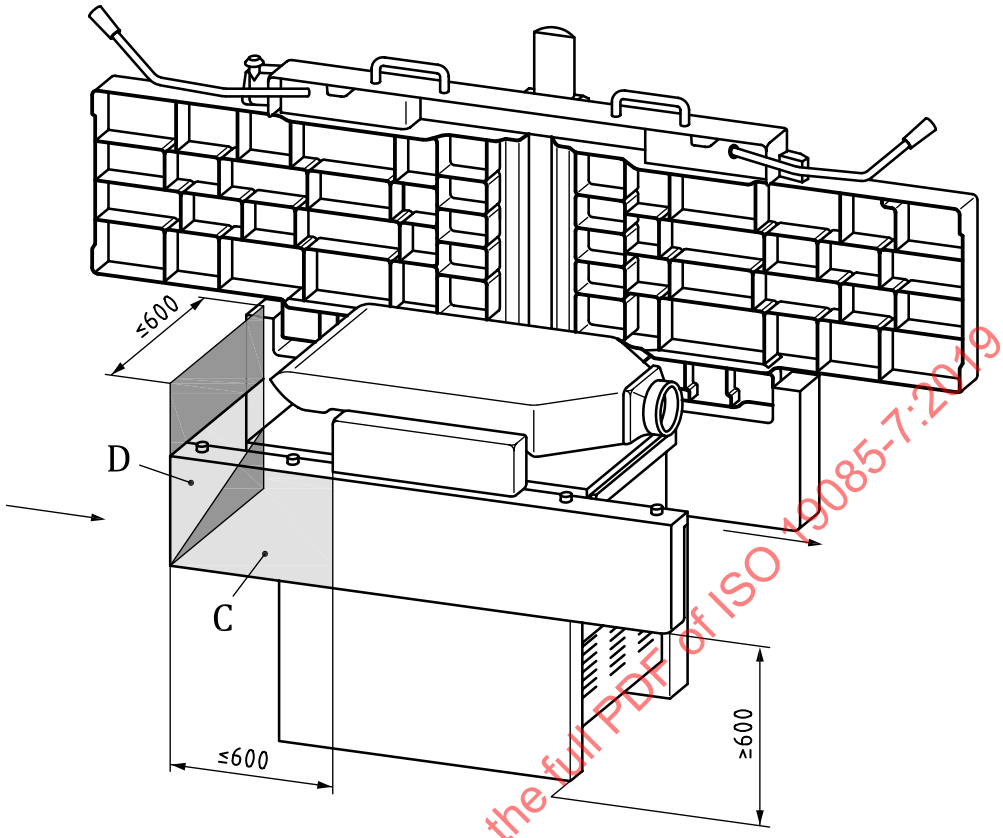
Key

E, F possible locations of control devices for starting, normal stop, emergency stop and powered table adjustment

a Feed direction.

Figure 8 — Position of control devices on thickness planing machines

Dimensions in millimetres



Key

C, D possible locations of control devices for start, normal stop, emergency stop and powered table adjustment

Figure 9 — Position of control devices on combined surface/thickness planing machines

As an exception, the control devices for start, normal stop, emergency stop and powered table adjustment, if fitted, may be located on a separate control panel. This control panel shall fulfil the following requirements:

— it shall be fitted to the machine;

— from either loading position, the control devices shall not be further away than 650 mm, measured in horizontal direction.

In addition, for thickness planing machines and combined surface/thickness planing machines with either one of the following features:

— a separate drive for the feed, besides the cutterblock drive,

— working width greater than 500 mm, or

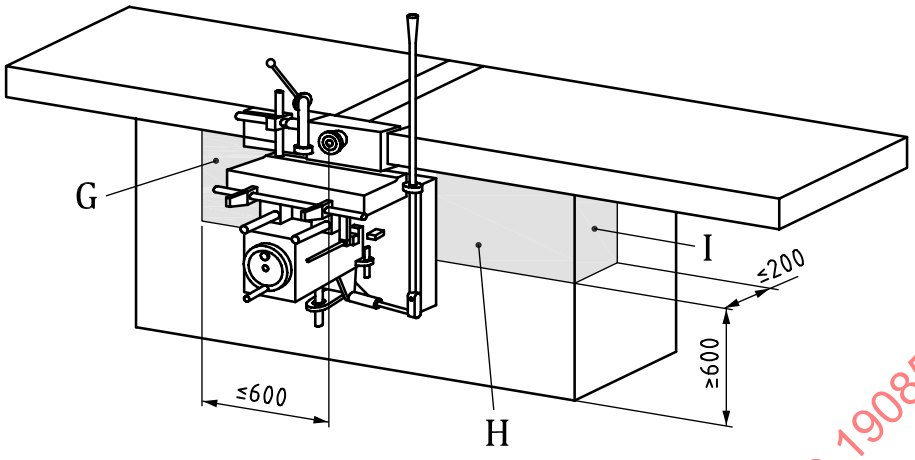
— pre-set electronic control for adjusting the height of the thicknessing table,

an emergency stop device shall be provided at the out-feed side.

For surface planing machines and combined surface/thickness planing machines fitted with a mortising device at the rear side of the machine, an emergency stop device shall be provided at the mortising side in the area G or H or I, shown in Figure 10, or on a fixed or moveable control panel above the areas G and H, fitted to the machine, where its front face is at a maximum of 650 mm from the vertical projection of the edge of the mortising device close to operator position. The front face of the panel shall not protrude beyond the mortising device at the side of the operator position. As an alternative to the emergency stop device on machines where emergency stop is not required, a normal stop device, located in the

same areas described above, may be provided. The normal stop control device shall protrude and have no shroud.

Dimensions in millimetres



Key

G, H, I possible locations of control devices for start, normal stop, emergency stop and powered table adjustment

Figure 10 — Position of control devices on surface planing machines and combined surface/ thickness planing machines with mortising device

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

5.3 Start

ISO 19085-1:2017, 5.3, applies.

5.4 Safe stops

5.4.1 General

ISO 19085-1:2017, 5.4.1, applies with the following additions.

Any stop of the cutterblock drive shall cause immediate stop of the feed drive regardless whether it is integrated or demountable.

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

5.4.2 Normal stop

ISO 19085-1:2017, 5.4.2, applies.

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.

5.5 Braking function of tool spindles

ISO 19085-1:2017, 5.5, applies.

5.6 Mode selection

ISO 19085-1:2017, 5.6, does not apply.

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 change by frequency inverter

ISO 19085-1:2017, 5.7.3, applies.

5.8 Failure of any power supply

ISO 19085-1:2017, 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 part speed monitoring

ISO 19085-1:2017, 5.11, applies.

5.12 Time delay

ISO 19085-1:2017, 5.12, applies.

5.13 Power-operated adjustment of tables

Subclause specific to this document.

Power-operated movements for adjusting the tables of surface planing and/or thickness planing machines shall only be possible after actuation of either an initiation control device or a hold-to-run control device.

The SRP/CS for initiation control shall achieve PL_r = c.

Unexpected start of power-operated movements under pre-set electronic control shall be prevented, e.g. by using a time delay device cutting power to the actuators with a time delay set to the maximum adjustment time.

The SRP/CS for prevention of unexpected start of movements under pre-set electronic control shall achieve PL_r = c.

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

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.

In combined surface/thickness planing machines, surface planing tables set-up for thicknessing shall be held in the raised position without the need for an action by the operator, e.g. by springs or automatic mechanical locking devices or the opened position shall be at least 15° behind the plumb line.

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

6.1.2 Displaceable machines

ISO 19085-1:2017, 6.1.2, applies.

6.2 Risk of break-up during operation

ISO 19085-1:2017, 6.2, is replaced by the following text.

To reduce the probability of break-up during operation, the requirements of 6.3 apply. To reduce the effect of break-up during operation, the requirements of 6.9, 6.5.1 and 6.5.2 apply.

6.3 Tool holder and tool design

6.3.1 General

ISO 19085-1:2017, 6.3.1, is replaced by the following text.

The cutterblock shall be a round form tool and shall fulfil the requirements of EN 847-1:2017. The cutterblock in surface planing and combined surface/thickness planing machines shall, in addition, fulfil the requirements for tools for hand-fed machines according to EN 847-1:2017, 5.2.1.

For machines equipped with a cutterblock where the knives are not automatically positioned, a gauge for the correct positioning of the knives shall be provided.

On machines fitted with a mortising device, loosening the chuck during start up, running, run-down or braking shall be prevented, for example, by a positive-locking connection.

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

6.3.2 Spindle locking

ISO 19085-1:2017, 6.3.2, does not apply.

6.3.3 Circular saw blade fixing device

ISO 19085-1:2017, 6.3.3, does not apply.

6.3.4 Flange dimension for circular saw blades

ISO 19085-1:2017, 6.3.4, does not apply.

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.

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 moveable guards

6.5.2.1 General

ISO 19085-1:2017, 6.5.2.1, applies.

6.5.2.2 Moveable guards with interlocking without guard locking

ISO 19085-1:2017, 6.5.2.2, applies.

6.5.2.3 Moveable guards with interlocking and guard locking

ISO 19085-1:2017, 6.5.2.3, applies.

6.5.3 Hold-to-run control

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

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

6.5.4 Two-hand control

ISO 19085-1:2017, 6.5.4, applies.

6.5.5 Electro-sensitive protective equipment (ESPE)

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

6.5.6 Pressure sensitive protective equipment (PSPE)

ISO 19085-1:2017, 6.5.6, does not apply.

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

ISO 19085-1:2017, 6.6.2, is replaced by the following text, subdivided into further specific subclauses.

6.6.2.1 Cutterblock guarding during surface planing

6.6.2.1.1 General

The guards in front and behind the fence shall be designed so that they cannot be removed from the machine without the aid of a tool.

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

6.6.2.1.2 Guarding above the surface planing tables

6.6.2.1.2.1 Guarding at the front side of the fence

Access to the cutterblock shall be prevented by a bridge-type guard being manually or automatically adjustable (see Figure 11) and being fixed to the machine, e.g. to the machine frame on the outfeed table side.

The bridge-type guard, consisting of a holder fixed to the machine and a bridge, shall satisfy the following requirements:

a) it shall be adjustable without the aid of a tool;

b) it shall allow a gap of not more than 6 mm between the fence and the guard and it shall cover the total length of the cutterblock in front of the fence, regardless of the position of the fence and tables (see 7.5);

c) the bridge shall be convex or flat in shape, have no sharp infeed edge, and be so designed that contact of a part of the hand with the work-piece is maintained during planing (e.g. see Figure 11). Its upper surface shall be smooth and without projecting parts;

d) the bridge shall be manufactured from an easily machineable material (see ISO 19085-1:2017, 3.3) and it shall not touch the cutterblock when it rests on the surface planing table;

e) its design shall allow for blade/insert changing without dismounting the bridge or its holder;

f) it shall pass the test of Annex F;

g) it shall be possible to lock horizontal adjustment of the bridge in any position without the aid of a tool and the bridge shall remain in its locked position when a horizontal force of 80 N is applied towards the fence;

h) it shall be adjustable in height from 0 mm to 75 mm maximum above the outfeed table and this adjustment shall be stepless and it shall return automatically to its pre-set position (for example, by spring loading);

i) the bridge over the whole range of adjustment shall cover the area between two vertical planes tangent to the table lips when they are set to the maximum width apart taking account also the possible deflection (see Figure 11);

j) the bridge in the lowest position shall cover the area between the table lips plus at least 5 mm at the infeed and outfeed side;

k) the gap between the bridge and the work-piece shall be less than 2 mm at infeed side and less than 4 mm at outfeed side over the whole range of adjustment (see Figure 11);

l) the lever for guard adjustment shall be accessible from the operator position and within 1 m from the cutterblock axis;

m) the lower surface of the bridge shall be so designed that there is no obstruction to the passage of the work-piece through the machine;

n) it shall not protrude from the machine table by more than 550 mm;

Dimensions in millimetres

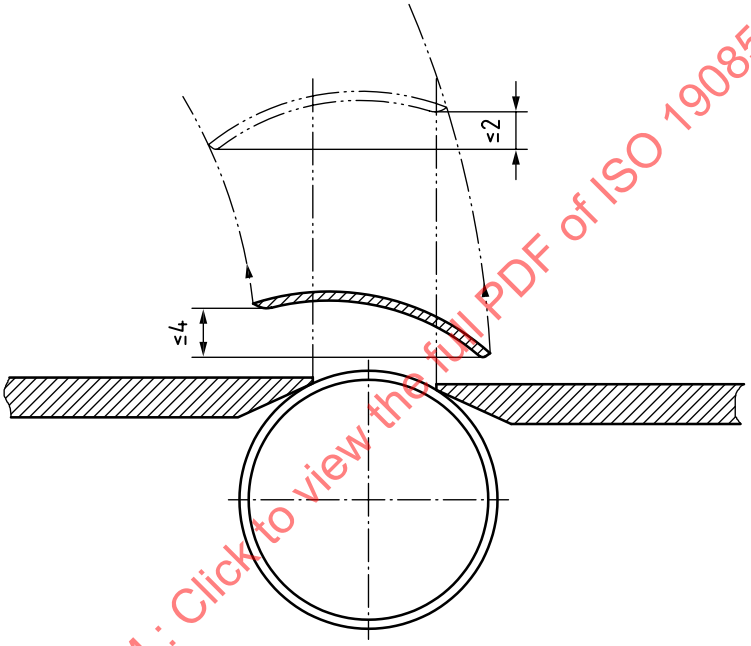


Figure 11 — Example of bridge-type guard

o) maximum width of the bridge shall be:

1) 100 mm for a cutterblock length up to and including 350 mm;

2) 120 mm for a cutterblock length exceeding 350 mm.

p) the automatic adjustable bridge-type guards shall be equipped at the infeed side with a leading-in device. During operation in the self-adjusted position, a horizontal force (for edging) or a vertical force (for planing) between 15 N and 40 N shall be applied to the work-piece.

q) when automatic adjustment capability is limited to a value lower than cutterblock length, a manual adjustment capability shall be provided;

r) leading-in devices in automatically adjustable bridge-type guard shall:

1) be fixed to the bridge-type guard;

2) allow a self-adjustment of minimum 50 mm (see Figure 12).

Dimensions in millimetres

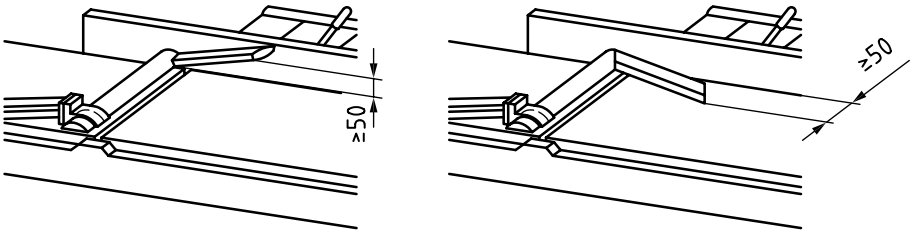


Figure 12 — Examples of leading in devices

Other requirements relevant for ergonomic aspects of the bridge-type guard are given in 7.5.

Verification: By checking the relevant drawings, measurement, inspection of the machine and relevant functional testing of the machine. The relevant tests F.1, F.2 and F.3 described in Annex F shall be performed.

6.6.2.1.2.2 Guarding at the rear of the fence

Access to the cutterblock at the rear of the fence shall be prevented by a guard attached to the fence or the support of the fence, e.g. by a hinge to allow tilting of the fence.

The guard shall be designed:

a) to move with the fence;

b) to be capable of covering the full length and diameter of the cutterblock;

c) not to come into contact with the blades;

d) gaps at the rear between the fence and the fixed guard, e.g. created by the tilting of the fence, shall be in accordance with the requirements of ISO 13857:2008, Table 4.

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

6.6.2.1.3 Guarding below the surface planing tables

Access to the cutterblock below the surface planing tables shall be prevented by fixed guards.

In addition, for combined surface/thickness planing machines, the following requirements shall be fulfilled:

a) access to the cutterblock below the surface planing tables shall be prevented by one or more moveable guards interlocked with cutterblock and feed;

b) the tables to be raised for the conversion from surface planing to thickness planing shall be interlocked with cutterblock and feed. When opening the tables for such conversion, the interlock shall be activated before any opening becomes wider than 50 mm in vertical direction.

The SRP/CS for the interlocking of the cutterblock and the feed with the table position shall achieve PL_r = c.

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

6.6.2.2 Guarding the cutterblock and the feed mechanism during thickness planing

For thickness planing machines access to the cutterblock and the feed mechanism from any direction other than through the openings for infeed and outfeed shall be prevented by fixed guards and moveable

guards with interlocking and guard locking providing access for the change of blades or inserts. If the access time is longer than the overall system stopping performance, no guard locking is required.

For combined surface/thickness planing machines access to the cutterblock and the feed mechanism from any direction other than through the openings for infeed and outfeed shall be prevented by a moveable guard interlocked with cutterblock and feed, which can be opened for conversion from thickness planing to surface planing. When opening, the interlock with cutterblock and feed shall be activated before any opening becomes wider than 50 mm in vertical direction.

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

6.6.2.3 Guarding during mortising

During use of the mortising device, guarding of the cutterblock shall be possible by the guarding system according to 6.6.2.1.

Access to the mortising chuck shall be prevented by a fixed guard with the exception of the opening on the front side necessary for fixing the drilling tool. Where necessary, an opening shall be provided for the chuck key. Alternatively, also a cover integrated in the mortising chuck can be used to avoid entanglement hazards.

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

6.6.3 Guarding of drives

ISO 19085-1:2017, 6.6.3, applies with the following additions.

For combined surface/thickness planing machines when raising the surface planing tables for conversion from surface planing to thickness planing, or when opening the cutterblock/feed guard for conversion from thickness planing to surface planing, the interlock shall be activated before any opening becomes wider than 50 mm. No guard locking is required.

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

6.6.4 Guarding of shearing and/or crushing zones

ISO 19085-1:2017, 6.6.4, does not apply.

6.7 Impact hazard

ISO 19085-1:2017, 6.7, does not apply.

6.8 Clamping devices

ISO 19085-1:2017, 6.8, applies with the following additions.

For a mortising device, work-piece clamping shall be provided. The clamping system shall be capable of exerting a minimum clamping force of 500 N.

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

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.

Anti-kickback devices are relevant only for thickness planing and combined surface/thickness planing machines.

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

Subclause specific to this document.

Thickness planing and combined surface/thickness planing machines shall be fitted with an anti-kickback device consisting of separately moveable fingers over the full working width of the machine.

The anti-kickback device shall be designed, manufactured and set according to the following requirements:

a) it shall be located before the infeed roller and be situated inside the table when seen from above;

b) the fingers shall have a resilience of at least 15 J cm^{-2} and a surface hardness of at least 100 HB;

c) the fingers thickness shall be between 8 mm and 15 mm for machines with a useable working width equal to or more than 260 mm and between 3 mm and 8 mm for machines with a useable working width less than 260 mm;

d) the tip radius of the fingers shall not exceed 0,3 mm;

e) the angle α shall conform to the values given in Figure 13 for any cutting depth for which the machine is designed, the angle β shall be more than 32° and less than 45°;

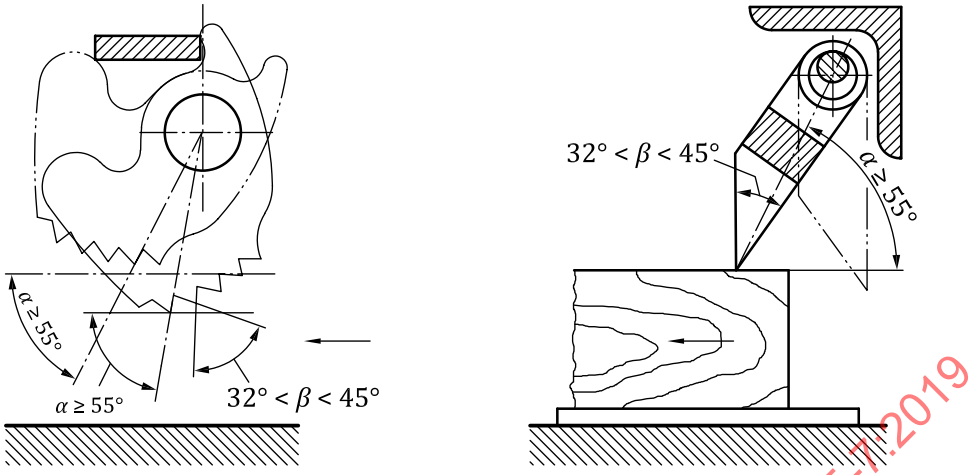


Figure 13 — Anti-kickback fingers (arrows indicate feed direction)

f) the space in between fingers shall not be wider than half the width of the fingers;

g) the total lateral movement of the fingers that can move freely shall not exceed 1 % of the machine's useable working width;

h) the fingers shall return to their rest position due to their own weight. Mechanical end stops shall be provided preventing their rotation around the shaft except for an angular sector corresponding to the minimum and maximum thicknessing capacity;

i) in rest position of the fingers, the tips shall be at least 2 mm below the horizontal tangent to the cutting circle outside diameter;

j) locking devices which render the anti-kickback device ineffective are not permitted.

k) it shall pass the kickback test of Annex H.

Verification: By checking the relevant drawings, measurement, inspection of the machine and relevant functional testing of the machine. The test in Annex H shall be performed.

NOTE For the components' resilience and hardness, a confirmation from the components' manufacturers can be useful.

6.10 Work-piece supports and guides

ISO 19085-1:2017, 6.10, is replaced by the following text, subdivided into further specific subclauses.

6.10.1 General

For combined surface/thickness planing machines, the following requirements shall be fulfilled:

a) moveable tables shall be lockable in position (for thickness planing and surface planing) unless the movement mechanism is self-locking;

b) the conversion from surface planing to thickness planing (and the reverse) shall be possible without dismantling and without the aid of a tool (e.g. a spanner);

c) when the set-up movements of the surface planing tables for conversion from surface planing to thickness planing and vice-versa are powered the rotational speed shall be limited to 20°/s. The movements shall be controlled by an enabling device on the machine frame combined with a hold-to-run control device on the moveable tables.

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

6.10.2 Surface planing tables

The design of surface planing and combined surface/thickness planing machines shall be such that rebating at the cutterblock end is not possible.

The surface planing tables shall be in accordance with the following requirements:

a) adjustment of the machine outfeed table in the vertical direction shall be limited to 1,1 mm below the cutting circle diameter;

b) machines designed to have a depth of cut exceeding 1 mm shall be provided with vertical infeed table adjustment;

c) both infeed and outfeed tables shall be flat, plane-parallel and horizontal;

d) where the infeed table is provided with vertical adjustment, its plane shall remain plane-parallel to the outfeed table throughout the full range of adjustment. The range of adjustment shall be limited such that the depth of cut cannot exceed 8 mm;

e) Tables shall be made of light alloy, cast iron or steel having a minimum ultimate tensile strength of 150 N mm^{-2};

f) table lips shall pass the resistance test in Annex G;

g) the distance between the table lips and the cutting circle diameter shall be 3 mm ± 2 mm, whatever height the tables are set at (see Figure 14);

Dimensions in millimetres

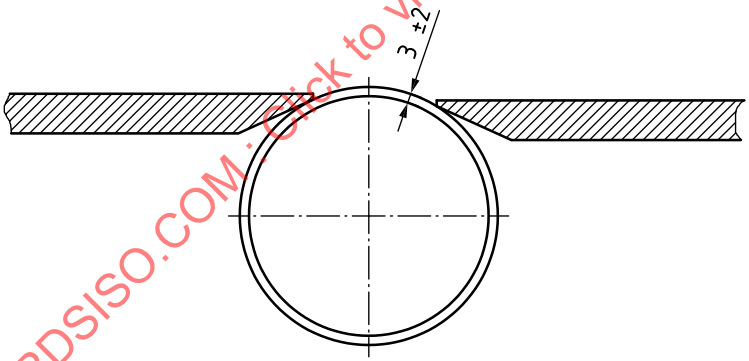


Figure 14 — Distance between table lips and cutting circle diameter

h) where the table or table lips are slotted (for the purpose of noise reduction), the slots shall not exceed 6 mm in width. The minimum tooth thickness shall be 1,5 mm at the tip (see Figure 15);

Dimensions in millimetres

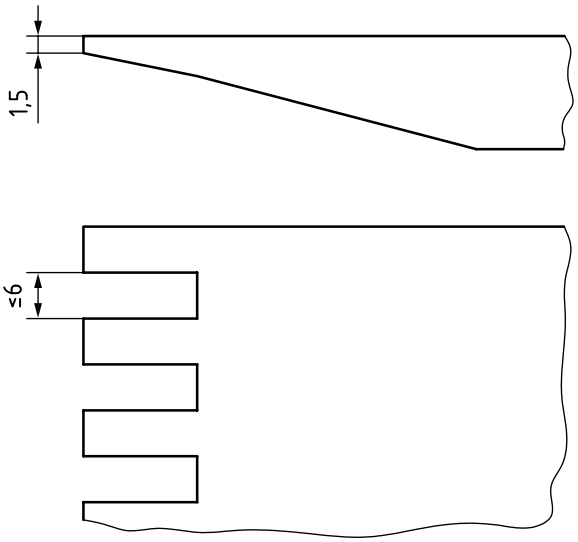


Figure 15 — Example of slots in table lips

i) where the table or table lips are perforated (for the purpose of noise reduction), the bores shall not allow for the passage of a 6 mm in diameter cylindrical pin;

j) table dimensions shall be such that the requirements given in Table 2 are met.

Table 2 — Table dimensions

Cutting width W mm	Minimum distance, L, in mm, (infeed and outfeed) between each table end and the vertical plane containing the cutterblock rotational axis
$W \leq 600$	$2 \times W$
$W > 600$	1 200

Verification: By checking the relevant drawings, measurement, inspection of the machine, relevant functional testing of the machine and by performing the resistance tests in Annex G.

NOTE For the ultimate tensile strength, a confirmation from the material manufacturer can be useful.

6.10.3 Thicknessing table

The thicknessing table shall be flat.

A mechanical end stop shall be provided to prevent contact between the table and the anti-kickback device or the cutterblock.

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

6.10.4 Mortising table

The mortising device shall be provided with a work-piece support (table), which shall be adjustable in height, in depth and laterally.

The dimensions of the mortising table and its maximum movement shall ensure that the mortising tool axis always remains within the mortising table width.

The movements of the table during machining shall be controlled by levers.

The mortising table shall be capable of being held at any height.

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

6.10.5 Work-piece guiding during surface planing

Surface planing and combined surface/thickness planing machines shall be equipped with a fence for use during surface planing which complies with the following requirements.

a) It shall be attached to the machine and shall, on machines with a useable working width above 160 mm, be laterally adjustable over the whole cutterblock length without the aid of a tool.

b) If a tiltable fence is fitted, its normal position shall be at 90° to the face of the table and limited by a mechanical end stop. It shall be lockable in any possible position. Its movement shall be limited to 45° in a clockwise direction from its normal position when viewed from the infeed end of the machine. No movement in an anti-clockwise direction from normal position when viewed from the infeed end of the machine shall be possible.

c) The minimum fence height and length, related to the useable working width, is given in Table 3.

Table 3 — Minimum fence dimensions

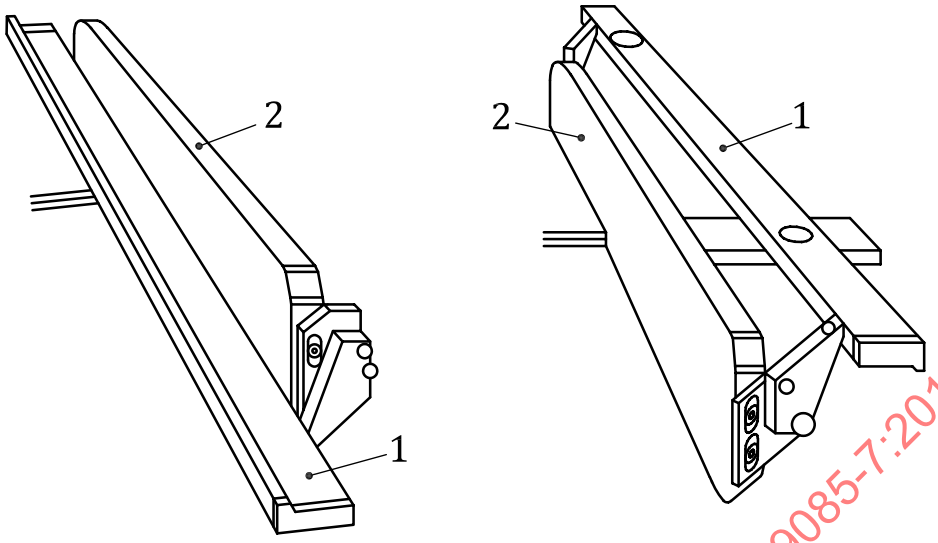
Useable working width W **mm**	**Minimum fence length**[a] **on each side of the spindle axis** b **mm**	**Fence height** c **mm**
$W \leq 260$	$b \geq 1{,}15 \times W$	$c \geq 120$
$W > 260$	550	$c \geq 150$
[a] The length of the fence shall not exceed the length of the machine table.		

d) In vertical position of the fence, the gap between the outfeed table and the lower edge of the fence shall not exceed 5 mm. In any other position of the fence, it shall not exceed 10 mm.

e) If an auxiliary fence is provided for planing of narrow work-pieces, e.g. hinged to the fence (see Figure 16), its height shall not be less than 20 mm and not greater than 25 mm, its width shall exceed 55 mm and its length shall be equal at least to the length of the fence. If it is hinged to the fence, provision shall be made that it cannot fall from its rest position inadvertently into the working position e.g. by fitting a locking device or by gravity. The auxiliary fence shall not be able to come into contact in any position with the cutterblock.

If the machine is designed to be used with a demountable power feed device, its fixing shall not limit the fence adjustment over the whole fence adjustment range and shall be located at the rear side of the machines.

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



Key

1 auxiliary fence

2 main fence

Figure 16 — Example of an auxiliary fence

6.10.6 Work-piece guiding during thickness planing

The table shall be provided on both sides with lateral guides to limit the dimension of the work-piece.

The width of the table between the lateral guides shall be less than or equal to the cutting width and its length shall at least extend from the cut limiting device to the outfeed roller.

The design of the table and the housing on the out-feed side of the machine shall avoid any shearing or crushing zones with the constraint-guided work-piece.

A device to limit the depth of cut shall be located at the infeed side of the machine in order to prevent the feeding of oversized (too thick) work-pieces (see Figure 5, Key 1)

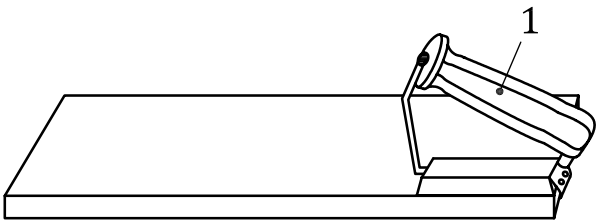
Verification: By checking the relevant drawings, measurement, inspection of the machine and relevant functional testing of the machine.

6.11 Safety appliances

Subclause specific to this document.

For surface planing and combined surface/thickness planing machines, a push block handle (see Figure 17) shall be provided.

Provision shall be made for storing push block handle on the machine.



Key

1 push block handle

Figure 17 — Example of push block handle

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

7 Safety requirements and measures for protection against other hazards

7.1 Fire

ISO 19085-1:2017, 7.1, applies with the following additions.

On surface planing and combined surface/thickness planing machines, requirements in 6.10.2 g) apply for avoiding sparks as result of contact between cutting blades and the table lips.

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

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.

The operating conditions for noise measurement shall comply with ISO 7960:1995, Annex B for surface planing unit and Annex C for thickness planing unit.

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

7.3 Emission of chips and dust

ISO 19085-1:2017, 7.3, applies with the following additions.

Provision shall be made for the extraction of chips and dust from the machine by providing a chip and dust extraction hood for the cutterblock and mortising device (if provided) to allow the machine to be connected to an external chip and dust collection system.

Unintended access to the tool through any dust extraction outlet with disconnected exhaust system shall be impeded.

NOTE 1 The requirements of ISO 13857 cannot be applied on the access through the dust extraction outlet due to the negative impact on the extraction of chips and dust.

NOTE 2 A proper chips and dust extraction can be obtained with the following recommended air flow rates:

Cutterblock length *l* mm	Recommended air flow rate m^3h^{-1}
$l < 400$	≥800
$400 \leq l < 600$	≥1 100
$l \geq 600$	≥1 400

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

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

ISO 19085-1:2017, 7.5, applies with the following additions.

Where opening of the surface planing tables is done manually, grips or handle(s) shall be provided. The maximum force to open or close shall be 300 N. Counterbalancing by spring/air cushion or by distribution of the weight shall be provided, if necessary, to respect the limit value.

The force to adjust the surface table height at the lever (see Figure 1, Key 11) shall not exceed 150 N.

The machine shall be fitted with a scale for indicating the work-piece thickness for thicknessing or the cut-off dimension for surface planing. The scale shall be designed and positioned so that the adjusted value is indicated directly and easily legible, e.g. by fitting a magnifying glass.

The height of the tables of the surface planing machine shall be between 750 mm and 950 mm above the floor level.

The force necessary to move the bridge-type guard in its support when unlocked for adjustment shall be less than or equal to 5 N.

The force necessary to move the bridge up and down shall be less than or equal to 35 N.

Handles, levers and latches or mechanically adjustable units shall be reachable from the operator's position and not be located at the rear side of the machine (no minimum height requirement to be fulfilled).

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

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, does not apply.

7.9 Electromagnetic compatibility

ISO 19085-1:2017, 7.9, applies.

7.10 Laser

ISO 19085-1:2017, 7.10, does not apply.

7.11 Static electricity

ISO 19085-1:2017, 7.11, applies.

7.12 Errors of fitting

ISO 19085-1:2017, 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.

8.2 Marking

8.2.1 General

ISO 19085-1:2017, 8.2.1, applies.

8.2.2 Additional markings

ISO 19085-1:2017, 8.2.2, applies.

8.3 Instruction handbook

8.3.1 General

ISO 19085-1:2017, 8.3.1, applies.

8.3.2 Additional information

ISO 19085-1:2017, 8.3.2, is replaced by the following text.

The following additional information shall also be provided in the instruction handbook:

a) reasonably foreseeable misuse includes working without the bridge-type guard in surface planing and combined surface/thickness planing machines;

b) warning regarding residual risk shall also include:

   1) contact with cutterblock from infeed and outfeed openings during thicknessing and from above during planing;

   2) kickback;

   3) ejection;

c) instruction for:

   1) proper setting of thicknessing mode in combined surface/thickness planing machine;

   2) safe handling of work-piece during machining;

   3) proper use and blocking of the fence during surface planing;

   4) proper use of push-block and adapting the shape of push-block for surface planing and combined surface/thickness planing machines set in surface planing mode;

   5) use of appropriate jigs for special work-pieces;

   6) use of auxiliary fence for machining of narrow work-pieces and for its preparation in case it is not provided;

d) instructions about safety devices tests, method and frequency shall also include: anti-kickback fingers mounted in thickness planing and combined surface/thickness planing machines - by inspection at least once every working shift that they are in good working condition, e.g. the contact face for impact damage and that the fingers return to their rest position by gravity;

e) information that before changing the cutterblock, the machine shall be isolated;

f) for mortising device:

   1) a warning against the use of grinding tools;

   2) a warning that the mortising tool shall be clamped over the complete clamping length of the chuck;

   3) a warning that the work-piece shall be clamped during mortising;

   4) the instruction to cover completely the cutterblock when mortising;

   5) a warning to remove the mortising tool when the mortising device is not in use;

   6) for mortising devices with only one rotation direction, indication of the direction of rotation;

g) for mortising device, the airborne noise emission values can be assumed being the same as those of surface planing unit idle running;

h) for thickness planing machines and combined surface/thickness planing machines, a warning that the length of the work-piece to be machined shall not exceed the free space at the outfeed end of the machine minus 500 mm;

i) information that only a cutterblock conforming to EN 847-1:2017 marked MAN shall be used in surface planing and combined surface/thickness planing machines;

j) information that only a cutterblock conforming to EN 847-1:2017 marked MAN or MEC shall be used in thickness planing machines.

Annex A
(informative)

Performance levels required

This annex replaces ISO 19085-1:2017, Annex A and gives a quick-view summary of the performance level required (PL_r) for each safety function (see Table A.1). However, for full requirements and detailed explanations, refer to Clauses 5 and 6.

Table A.1 — Safety functions and their PL_r

Area	No.	Safety function	PL_r	Subclause of ISO 19085-1:2017	Subclause of this document
Start	1	Prevention of unexpected start/restart	c	5.3, 5.8	
	2	Interlocking of start with safeguards	c	5.3	
	3	Prevention of powered feed with tool spindle rotation	c	5.3	
Stop	4	Normal stop (braking function excluded)	c	5.4.2	
	5	Emergency stop (braking function excluded)	c	5.4.4	
Braking	6	Braking function	b/c	5.5	
	7	Interlocking of brake release	c	6.4.3	
Spindle speed control	8	Speed indication	b	5.7.1	
	9	Incremental speed changing	c	5.7.2	
	10	Infinitely variable speed monitoring	c	5.7.3	
Controls	11	Enabling	c	5.10	
	12	Machine moving parts speed monitoring	c	5.11	
	13	Time delay	c	5.12	
Power-operated adjustments of tables	14	Initiation control	c		5.13
	15	Prevention of unexpected start of movements	c		5.13
Safeguards	16	Interlocking of moveable guards	c	6.5.2.2	
	17	Interlocking with guard locking of movable guards	c	6.5.2.3	
	18	Hold-to-run	b/c	6.5.3	6.5.3
	19	Two-hand control	c	6.5.4	
	20	Interlocking of cutterblock and feed with tables position during surface planing	c		6.6.2.1.3

Annex B
(normative)

Test for braking function

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

Annex C
(normative)

Stability test for displaceable machines

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

C.1 Stability test for surface planing machine and combined surface/thickness planing machine in surface planing mode

The surface planing machine and the combined surface/thickness planing machine set in the surface planing mode shall be placed on a chipboard fixed on the floor and the brakes for the wheels applied (where fitted) or the wheels retracted from the floor (if a device for retracting them is fitted). A horizontal force, F_1 = 500 N, shall be applied in the centre of the cutterblock in the direction as shown in Figure C.1.

The mortising device, if fitted, shall be fixed in the central position.

Subsequently, a horizontal force, F_2 = 500 N, shall be applied at the middle of the front face of the infeed surface planing table and a vertical force, F_3 = 500 N, shall be applied at the middle of the infeed surface planing table within a maximum distance, d = 30 mm, of the edge in the direction as shown in Figure C.1.

In any cases, the machine shall not move or tilt.

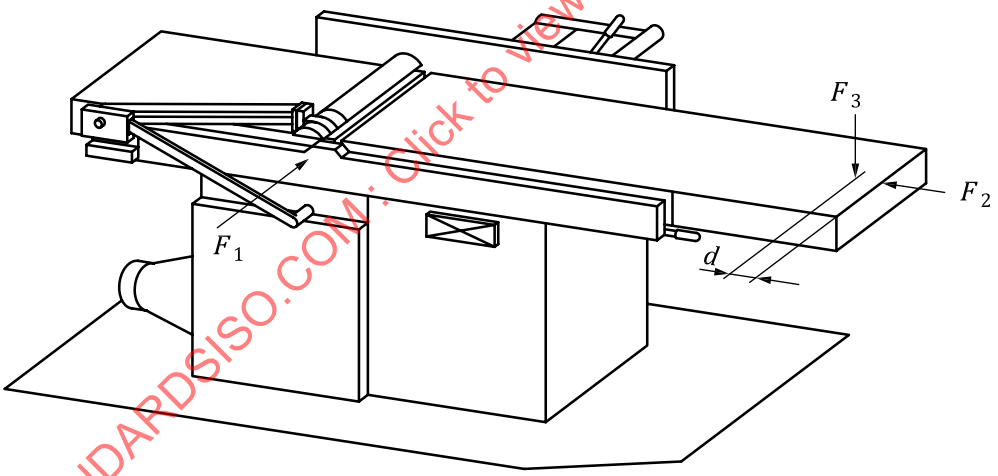


Figure C.1 — Stability test for displaceable machines (in surface planing setting)

C.2 Stability test for combined surface/thickness planing machine in thicknessing mode

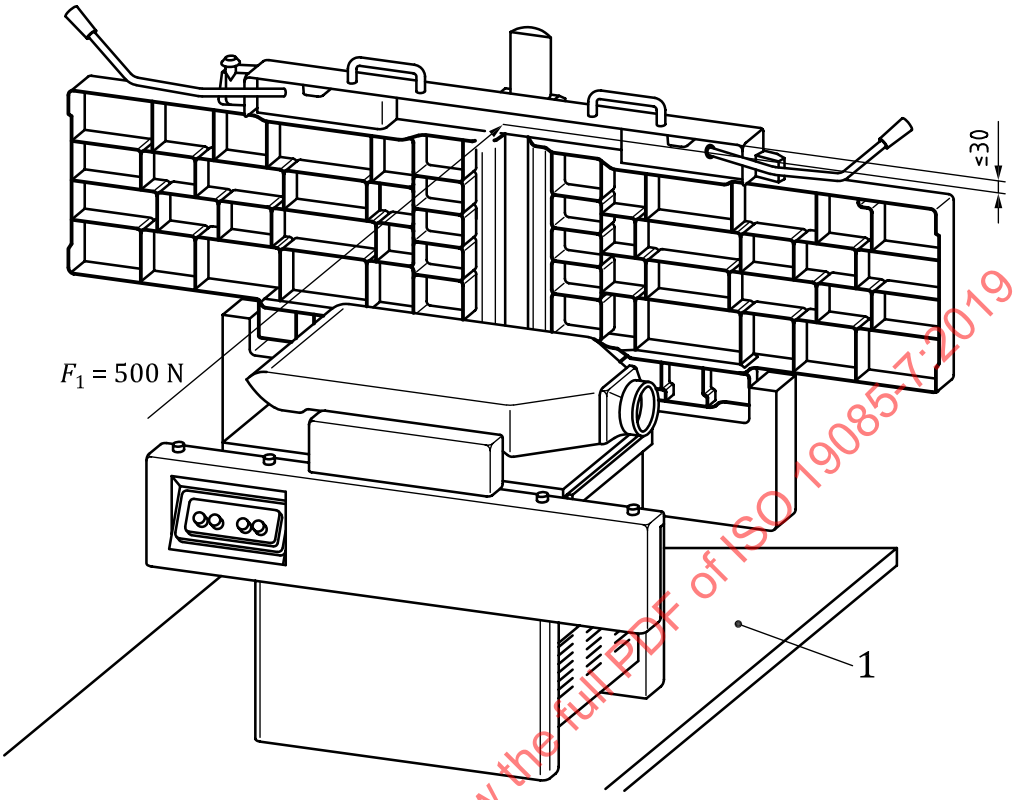
The combined surface/thickness planing machine set in its thicknessing mode shall be placed on a chipboard fixed on the floor and the brakes for the wheels applied (where fitted), or the wheels retracted from the floor (if a device for retracting them is fitted).

The mortising device, if fitted, shall be fixed in the central position.

A horizontal force, F_1 = 500 N, shall be applied in the middle and within 30 mm of the uppermost edge of the infeed surface planing table in the direction as shown in Figure C.2.

In any cases, the machine shall not move or tilt.

Dimensions in millimetres



Key

1 chipboard

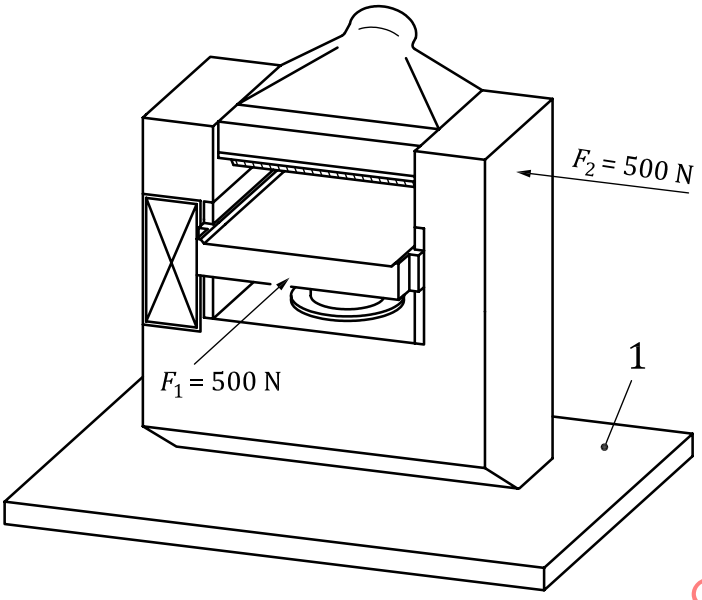
Figure C.2 — Stability test for displaceable machines (in thickness planing setting)

C.3 Stability test for thickness planing machine

The machine shall be set in its working position on a chipboard fixed on the floor and the brakes for the wheels applied (where fitted) or the wheels retracted from the floor (if a device for retracting them is fitted). A horizontal force, F_1 = 500 N, shall be applied in the middle of the front face of the thicknessing table set in its highest position in the direction as shown in Figure C.3.

Subsequently, a horizontal force, F_2 = 500 N, shall be applied at the middle of the lateral face of the fixed guard covering the cutterblock and corresponding to the centre of it in the direction as shown in Figure C.3.

In both cases, the machine shall not move or tilt.



Key

1 chipboard

Figure C.3 — Stability test for displaceable thickness planing machines