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Woodworking machines — Safety —

Part 1: Common requirements

Machines à bois — Sécurité —

Partie 1: Exigences communes

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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,* in collaboration with the European Committee for Standardization (CEN) Technical Committee CEN/TC 142, *Woodworking machines - Safety,* in accordance with the Agreement on technical cooperation between ISO and CEN (Vienna Agreement).

This second edition replaces the first edition (ISO 19085-1:2017), which has been technically revised.

The main technical changes compared to the previous edition are as follows:

— in the Scope, “intended for continuous production use” has been added, referring to machines;

— in Clause 3, definitions of “stationary” and “displaceable” machines have been deleted, as well as these terms throughout the document; subclause 5.1 was unified, as well as Annex C;

— in 4.3, the start via control power-on, used on integrated fed machines, has been added;

— Subclause 4.5 has been reordered and clarified;

— in 4.7.3, for software parametrization, reference to the relevant B-standard has been added;

— new Subclause 4.13 has been added (taken from some specific parts);

— Subclause 5.6 has been unified and simplified to better adapt to the different needs of specific parts of the ISO 19085 series;

— in 5.9.2.3, light alloy characteristics have been changed, to discern from the other class of guards;

— in 5.10, requirements on roller table have been added (taken from some specific parts);

— Subclause 6.2 has been updated and a new full noise test code has been added in Annex F.

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

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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.

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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 items that the manufacturer need to give to the user.

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

This document is of relevance, in particular, for the following stakeholder groups representing the market players with regard to machinery safety:

— machine manufacturers (small, medium and large enterprises);

— health and safety bodies (regulators, accident prevention organizations, market surveillance etc.)

Others can be affected by the level of machinery safety achieved with the means of the document by the above-mentioned stakeholder groups:

— machine users/employers (small, medium and large enterprises);

— machine users/employees (e.g. trade unions, organizations for people with special needs);

— service providers, e. g. for maintenance (small, medium and large enterprises);

— consumers (in case of machinery intended for use by consumers).

The above-mentioned stakeholder groups have been given the possibility to participate in the drafting process of this document.

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 the ISO 19085 series applicable to that type, together with the relevant requirements from this document, to the extent specified in the Scope of the applicable part of the ISO 19085 series.

For woodworking machines not covered by a specific applicable part, this document can be used as a guide. However, the designer then needs to perform a full risk assessment according to ISO 12100 and design the means for reducing the risks arising from relevant hazards.

As far as possible, in other parts of the ISO 19085 series, safety requirements have been treated by way of reference to the relevant clauses of this document, to avoid repetition and reduce their length. The other parts contain replacements and additions to the common requirements given in this document.

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Woodworking machines — Safety —

Part 1: Common requirements

1 Scope

This document gives the safety requirements and measures to reduce risks arising during operation, adjustment, maintenance, transport, assembly, dismantling, disabling and scrapping, related to woodworking machines capable of continuous production use, hereinafter referred as "machines". These safety requirements and measures are those common to most of the machines, when they are used as intended and under the conditions foreseen by the manufacturer; reasonably foreseeable misuse has been considered too.

The machines are designed to process solid wood and material with similar physical characteristics to wood, with hand feed or integrated feed.

This document is intended to be used in conjunction with the other parts of the ISO 19085 series, applicable to specific machine types. The extent to which all significant hazards of a specific machine type are covered is indicated in the specific part of the ISO 19085 series relevant to that machine type. The hazards covered, at least partly, by the requirements of this document, are listed in Annex A.

It is not applicable to machines intended for use in potential explosive atmospheres or to machines manufactured prior to the date of its publication.

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 3744:2010, *Acoustics — Determination of sound power levels and sound energy levels of noise sources using sound pressure — Engineering methods for an essentially free field over a reflecting plane*

ISO 3746:2010, *Acoustics — Determination of sound power levels and sound energy levels of noise sources using sound pressure — Survey method using an enveloping measurement surface over a reflecting plane*

ISO 4413:2010, *Hydraulic fluid power — General rules and safety requirements for systems and their components*

ISO 4414:2010, *Pneumatic fluid power — General rules and safety requirements for systems and their components*

ISO 4871:1996, *Acoustics — Declaration and verification of noise emission values of machinery and equipment*

ISO 11201:2010, *Acoustics — Noise emitted by machinery and equipment — Determination of emission sound pressure levels at a work station and at other specified positions in an essentially free field over a reflecting plane with negligible environmental corrections*

ISO 11202:2010, *Acoustics — Noise emitted by machinery and equipment — Determination of emission sound pressure levels at a work station and at other specified positions applying approximate environmental corrections*

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

ISO 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 13850:2015, *Safety of machinery — Emergency stop function — Principles for design*

ISO 13851:2019, *Safety of machinery — Two-hand control devices — Principles for design and selection*

ISO 13856-1:2013, *Safety of machinery — Pressure-sensitive protective devices — Part 1: General principles for design and testing of pressure-sensitive mats and pressure-sensitive floors*

ISO 13856-2:2013, *Safety of machinery — Pressure-sensitive protective devices — Part 2: General principles for design and testing of pressure-sensitive edges and pressure-sensitive bars*

ISO 13856-3:2013, *Safety of machinery — Pressure-sensitive protective devices — Part 3: General principles for design and testing of pressure-sensitive bumpers, plates, wires and similar devices*

ISO 14118:2017, *Safety of machinery — Prevention of unexpected start-up*

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

ISO 14120:2015, *Safety of machinery — Guards — General requirements for the design and construction of fixed and movable guards*

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

IEC 60204-1:2016, *Safety of machinery — Electrical equipment of machines — Part 1: General requirements*

IEC 60529:1989+A1:1999, *CSV, Degrees of protection provided by enclosures (IP Code)*

IEC 60825-1:2014, *Safety of laser products — Part 1: Equipment classification and requirements*

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

IEC 61439-1:2011, *Low-voltage switchgear and controlgear assemblies — Part 1: General rules*

IEC 61496-1:2012+Cor.1:2015, *Safety of machinery — Electro-sensitive protective equipment — Part 1: General requirements and tests*

IEC 61496-2:2013, *Safety of machinery — Electro-sensitive protective equipment — Part 2: Particular requirements for equipment using active opto-electronic protective devices (AOPDs)*

IEC 61496-3:2018, *Safety of machinery — Electro-sensitive protective equipment — Part 3: Particular requirements for Active Opto-electronic Protective Devices responsive to Diffuse Reflection (AOPDDR)*

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

IEC 62477-1:2012+A1:2016, *Safety requirements for power electronic converter systems and equipment — Part 1: General*

EN 847-1:2017, *Tools for woodworking — Safety requirements — Part 1: Milling tools, circular saw blades*

EN 847-2:2017, *Tools for woodworking — Safety requirements — Part 2: Requirements for the shank of shank mounted milling tools/circular saw blades*

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EN 847-3:2013, *Tools for woodworking — Safety requirements — Part 3: Clamping devices*

EN 1837:1999+A1:2009, *Safety of machinery — Integral lighting of machines*

EN 50370-1:2005, *Electromagnetic compatibility (EMC) — Product family standard for machine tools — Part 1: Emission*

EN 50370-2:2003, *Electromagnetic compatibility (EMC) — Product family standard for machine tools — Part 2: Immunity*

EN 50525-2-21:2011, *Electric cables — Low voltage energy cables of rated voltages up to and including 450/750 V (U0/U) — Part 2-21: Cables for general applications — Flexible cables with crosslinked elastomeric insulation*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in ISO 12100:2010, ISO 13849-1:2015 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
woodworking machine
machine designed to machine and/or process wood and *material with similar physical characteristics to wood* (3.2)

3.2
material with similar physical characteristics to wood
wood-based material such as chipboard, fibreboard and plywood, including when composed with plastic or light alloy laminates/edges/profiles, and solid wood composed with plastic or light alloy profiles or laminates or edges, as well as cork, bone, rigid rubber or plastics

Note 1 to entry: Examples for plastics are thermoplastic materials and thermoplastic resins, thermosetting resins, expanded plastic materials, polyurethane, phenol and polyvinylchloride (PVC).

3.3
easily machinable material
material, which, upon unexpected contact with a running tool, does not mechanically generate sparks and does not result in a damage of the tool

EXAMPLE Material with similar physical characteristics to wood or light alloy.

3.4
control power-on
control that does not directly start any movement, but, after activation, enables providing power to *machine actuators* (3.5)

3.5
drive
machine actuator
power mechanism used to effect motion on the machine

3.6
operational stop
stop for operational reasons without cutting off the energy supply to the actuators where the stop condition is monitored and maintained

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3.7
run-up time
time elapsed from the actuation of the start control device until the spindle or machine part reaches the intended speed

3.8
run-down time
time elapsed from the actuation of the stop control device up to spindle or machine part standstill

3.9
normal processing mode
MODE 1
condition with all safeguards in place and functional, typically used for normal processing but not limited to it

3.10
feed
relative movement between workpiece and tools during machining

3.11
hand feed
manual feed
manual holding and/or guiding of the workpiece or machine element with incorporated tool during machining

Note 1 to entry: Hand feed includes the use of a hand-operated support on which the workpiece is placed manually or clamped and the use of a *demountable power feed unit* (3.13).

3.12
integrated feed
mechanical feed
powered *feed* (3.10) mechanism for the workpiece or tool which is integrated with the machine and where the workpiece or machine element with incorporated tool is held and guided mechanically during the machining operation

3.13
demountable power feed unit
adjustable powered *feed* (3.10) mechanism, which can be mounted onto the machine by the user

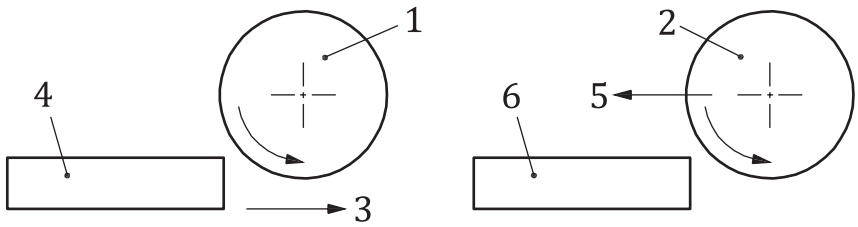
3.14
climb cutting
cutting where the projection of the movement of the cutting knife in direction of the *feed* (3.10) movement shows in the same direction as the relative movement of the workpiece against the tool

Note 1 to entry: See Figure 1 a).

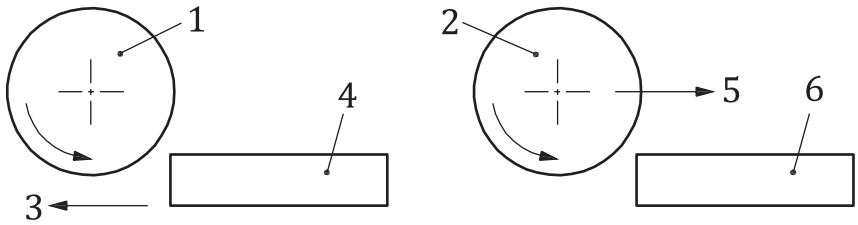
3.15
cutting against the feed
cutting where the projection of the movement of the cutting knife in direction of the *feed* (3.10) movement shows in the opposite direction as the relative movement of the workpiece against the tool

Note 1 to entry: See Figure 1 b).

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a) Climb cutting



b) Cutting against the feed

Key

1	tool, fixed axis	4	work-piece (moving)
2	tool, moving axis	5	feed direction (tool)
3	feed direction (work-piece)	6	work-piece (fixed)

Figure 1 — Climb cutting and cutting against the feed

3.16
boring tool
tool whose *feed* (3.10) movement during machining is only in direction of its axis of rotation

3.17
ejection
uncontrolled movement of the workpiece or parts of it or part of the tool from the machine during processing

3.18
kickback
particular form of *ejection* (3.17) describing the unexpected movement of the workpiece or parts of it opposite to the direction of the *feed* (3.10) during processing

3.19
anti-kickback device
device which either reduces the possibility of a *kickback* (3.18) or stops the movement of the workpiece or parts of it during the kickback

3.20
electro-sensitive protective equipment
ESPE
assembly of devices and/or components working together for protective tripping or presence-sensing purposes, and comprising at a minimum:

— a sensing device,

— controlling/monitoring devices,

— output signal switching devices

Note 1 to entry: Safety-related control systems associated with the ESPE or the ESPE itself can include a secondary switching device, muting functions, stopping performance monitor, start interlock, etc.

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EXAMPLE Light beam (AOPD), laser scanner (AOPDDR), capacitive, active infrared, ultra-sonic and image monitoring equipment.

[SOURCE: ISO 13855:2010, 3.1.4, modified — The abbreviated term, examples and Note 1 to entry have been added.]

3.21
pressure-sensitive protective equipment
PSPE
assembly of devices and components triggered using the “mechanical activated trip” method to provide protection under hazardous situations

EXAMPLE Pressure-sensitive mats, bumpers, pressure-sensitive edges.

Note 1 to entry: PSPE generate a stopping signal by the use of different techniques, e.g. mechanical contacts, fibre-optic sensors, pneumatic sensors.

[SOURCE: ISO 13482:2014, 3.30, modified — In the example, "and bars" and "and floors" have been removed.]

3.22
teleservice
machine diagnosis (including trouble-shooting), software update and *telecontrol* (3.23) from a remote service site

3.23
telecontrol
control of the machine movements from a remote service site

4 Safety requirements and measures for controls

4.1 Safety and reliability of control systems

For the design and implementation of any safety function, either realized in electric, pneumatic, hydraulic or mechanic technology, the appropriate requirements of ISO 13849-1:2015 apply.

Machines safety functions are implemented and assured through safety-related parts of the control system (SRP/CS) that shall achieve a required performance level (PL_r). This requirement is given for each safety function in the relevant subclauses of Clause 4 and Clause 5.

Annex B summarizes PL_r for each safety function. However, the provisions of Clause 4 and Clause 5 remain the sole and complete normative set of requirements and explanations.

Specific parts of the ISO 19085 series can introduce further safety functions not considered in this document or a PL_r different from that given in this document for the same safety function, depending on the risk assessment according to ISO 12100:2010. For machines for which no specific part of the ISO 19085 series exists, and where the risk assessment results in a PL_r higher than that of this document, the higher PL_r applies.

Wherever a performance level (PL) is mentioned in the ISO 19085 series, the requirements for the performance level refer to ISO 13849-1:2015.

The safety-related embedded software (SRESW) of the SRP/CS shall be in accordance with ISO 13849-1:2015, 4.6.1 and 4.6.2.

The safety-related application software (SRASW) of the SRP/CS shall be in accordance with ISO 13849-1:2015, 4.6.1 and 4.6.3.

SRP/CS shall be validated according to ISO 13849-1:2015, Clause 8 (see also ISO 13849-2:2012).

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