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Woodworking machines — Safety —

Part 1:
Common requirements

Machines à bois — Sécurité —

Partie 1: Exigences communes

ICS: 13.110; 79.120.10

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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.

The committee responsible for this document is ISO/TC 39, *Machine tools*, Subcommittee SC 4, *Woodworking machines*.

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 Scope, machines are intended for continuous production use, and all stationary – so words and definitions “stationary” and “displaceable” have been deleted; hence, 6.1 was unified, like Annex C.

— in 5.3, Start, added the start via control power-on, used on automatic fed machines.

— In 5.7.3, measures against data loss have been specified (taken from EN 848-1:2013)

— 5.13 on Teleservice added (taken from some specific parts)

— in 6.9.2.3, new light alloy characteristics, to differentiate from the other class of guards

— requirements on roller table added in 6.10 (taken from some specific parts)

— 7.2 new and new updated full Noise Test Code in Annex E

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

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.

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 this document, to the extent specified in the Scope of the applicable part of ISO 19085.

For woodworking machines not covered by an applicable part, this document can be used as a guide. However, the designer will then need 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 parts of ISO 19085 other than this document, safety requirements have been treated by way of reference to the relevant sections 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.

Woodworking machines — Safety —

Part 1:
Common requirements

1 Scope

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

It is intended to be used in conjunction with the other parts of ISO 19085, applicable to specific machine types.

NOTE For woodworking machines not covered by a specific applicable part, this document can be used as a guide.

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*

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 13855:2010, *Safety of machinery — Positioning of safeguards with respect to the approach speeds of parts of the human body*

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, *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, *Safety of machinery — Electro-sensitive protective equipment — Part 1: General requirements and tests. Corrected by Cor. 1:2015*

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+AMD 1:2016, *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*

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

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
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, will not mechanically generate sparks and will not result in a damage of the tool

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

3.4
restart
start without intervention of the operator

Note 1 to entry: restart can be caused e.g. by return of an interrupted power supply or by the programmable control system of the machine.

3.5
control power-on
control that after activation enables providing power to machines actuators, also on a lower control level, e.g. by the PLC (Programmed Logic Control)

3.6
drive
machine actuator
power mechanism used to effect motion on the machine

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
automatic machine
machine, which, after initiation of start by the operator, is capable of autonomously running and/or repeating machining cycles, whereby the workpiece can be manually loaded and/or unloaded

3.10
cutting area
area where the tools are involved in the cutting process

3.11
non-cutting area
area where the tools are not involved in the cutting process

3.12
feed
relative movement between workpiece and tools during machining

3.13
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* (3.15).

3.14
integrated feed
mechanical feed
powered *feed* (3.12) 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

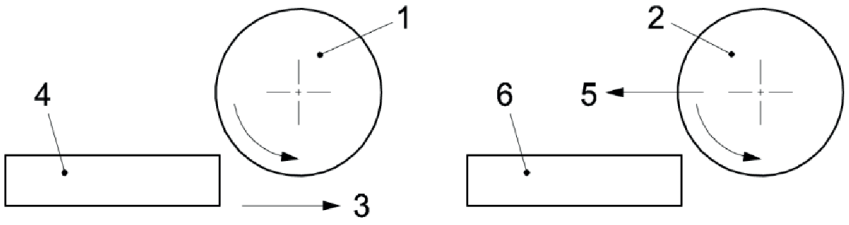
3.15
demountable power feed unit
adjustable powered *feed* (3.12) mechanism, which can be mounted onto the machine by the user

3.16
climb cutting
cutting where the projection of the movement of the cutting knife in direction of the *feed* (3.12) movement shows in the same direction as the relative movement of the workpiece against the tool

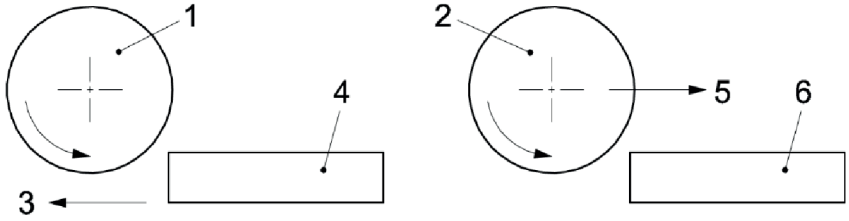
Note 1 to entry: See Figure 1 a).

3.17
cutting against the feed
cutting where the projection of the movement of the cutting knife in direction of the *feed* (3.12) movement shows in the opposite direction as the relative movement of the workpiece against the tool

Note 1 to entry: See Figure 1 b).



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

3.18
boring tool
tool whose *feed* (3.12) movement during machining is only in direction of its axis of rotation

3.19
scoring
pre-cutting of a surface with a tool

3.20
scoring saw blade
saw blade mounted in front of the main saw blade which is used for *scoring* (3.19)

3.21
sanding wheel
tool where the active part is made of coated abrasive

3.22
grinding wheel
tool where the active part is made of bounded abrasive

3.23
ejection
uncontrolled movement of the workpiece or parts of it or part of the tool from the machine during processing

3.24
kickback
particular form of *ejection* (3.23) describing the unexpected movement of the workpiece or parts of it opposite to the direction of *feed* (3.12) during processing

3.25
anti-kickback device
device which either reduces the possibility of a *kickback* (3.24) or stops the movement of the workpiece or parts of it during the kickback

3.26
operational stop
stop for operational reasons without cutting off the energy supply to the actuators where the stop condition is monitored and maintained

3.27
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

[SOURCE: ISO 13855:2010, 3.1.4, modified — abbreviation, examples and note have been added.]

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

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/re-start interlock, etc.

3.28
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 and floors, bumpers, pressure-sensitive edges and bars.

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]

3.29
teleservice
machine diagnosis (including trouble-shooting), software update and telecontrol from a remote service site

3.30
telecontrol
control of the machine movements from a remote service site

4 List of significant hazards

This clause contains the correlation between hazards, their origin and potential consequences common to woodworking machines as defined in the Scope and the relevant clauses of this document, to be taken into consideration during risk assessment. The extent to which all significant hazards are covered is indicated in the relevant specific parts of ISO 19085.

These hazards are listed in Table 1 as a guide for the full risk analysis to be done when specific part of ISO 19085 does not exist.

Table 1 — List of significant hazards

No.	Type or group	Examples of hazards		ISO 12100:2010	Relevant section of ISO 19085-1c
		Origin[a]	Potential consequences[b]		
1	Mechanical hazards	Acceleration, deceleration (kinetic energy) Angular parts Approach of a moving element to a fixed part Cutting parts Elastic elements Falling objects Gravity (stored energy) Height from the ground High pressure Machinery mobility Moving elements Rotating elements Rough, slippery surface Stability Vacuum	Being thrown Crushing Cutting or severing Drawing-in or trapping Entanglement Friction or abrasion Impact Injection Shearing Stabbing or puncture	6.2.2.1 6.2.2.2 6.2.10 6.3 6.3.5.4	6.1 6.2 6.3 6.4 6.5 6.6 6.7 6.8 6.9 6.10 7.7 7.8 7.12 7.13 7.14
2	Electrical hazards	Arc Electromagnetic phenomena Electrostatic phenomena Live parts Not enough distance to live parts under high voltage Overload Parts which have become live under fault conditions Short-circuit Thermal radiation	Burn Chemical effects Effects on medical implants Electrocution Falling, being thrown Fire Projection of molten particles Shock	6.2.9 6.3.5.4	7.4 7.11 7.13
3	Thermal hazards	Fire Flame Objects or materials with a high or low temperature Radiation from heat sources	Burn Dehydration Discomfort Injuries by the radiation of heat sources Scald		7.1 7.3 7.4

