



CSA/ANSI C22.2 No. 19085-6:21
(ISO 19085-6:2017, MOD)
National Standard of Canada
American National Standard



CSA/ANSI C22.2 No. 19085-6:21
Woodworking machines — Safety — Part 6: Single spindle vertical moulding machines (“toupies”)
(ISO 19085-6:2017, MOD)



Standards Council of Canada
Conseil canadien des normes

Legal Notice for Standards

Canadian Standards Association (operating as “CSA Group”) develops standards through a consensus standards development process approved by the Standards Council of Canada. This process brings together volunteers representing varied viewpoints and interests to achieve consensus and develop a standard. Although CSA Group administers the process and establishes rules to promote fairness in achieving consensus, it does not independently test, evaluate, or verify the content of standards.

Disclaimer and exclusion of liability

This document is provided without any representations, warranties, or conditions of any kind, express or implied, including, without limitation, implied warranties or conditions concerning this document’s fitness for a particular purpose or use, its merchantability, or its non-infringement of any third party’s intellectual property rights. CSA Group does not warrant the accuracy, completeness, or currency of any of the information published in this document. CSA Group makes no representations or warranties regarding this document’s compliance with any applicable statute, rule, or regulation.

IN NO EVENT SHALL CSA GROUP, ITS VOLUNTEERS, MEMBERS, SUBSIDIARIES, OR AFFILIATED COMPANIES, OR THEIR EMPLOYEES, DIRECTORS, OR OFFICERS, BE LIABLE FOR ANY DIRECT, INDIRECT, OR INCIDENTAL DAMAGES, INJURY, LOSS, COSTS, OR EXPENSES, HOWSOEVER CAUSED, INCLUDING BUT NOT LIMITED TO SPECIAL OR CONSEQUENTIAL DAMAGES, LOST REVENUE, BUSINESS INTERRUPTION, LOST OR DAMAGED DATA, OR ANY OTHER COMMERCIAL OR ECONOMIC LOSS, WHETHER BASED IN CONTRACT, TORT (INCLUDING NEGLIGENCE), OR ANY OTHER THEORY OF LIABILITY, ARISING OUT OF OR RESULTING FROM ACCESS TO OR POSSESSION OR USE OF THIS DOCUMENT, EVEN IF CSA GROUP HAS BEEN ADVISED OF THE POSSIBILITY OF SUCH DAMAGES, INJURY, LOSS, COSTS, OR EXPENSES.

In publishing and making this document available, CSA Group is not undertaking to render professional or other services for or on behalf of any person or entity or to perform any duty owed by any person or entity to another person or entity. The information in this document is directed to those who have the appropriate degree of experience to use and apply its contents, and CSA Group accepts no responsibility whatsoever arising in any way from any and all use of or reliance on the information contained in this document.

CSA Group is a private not-for-profit company that publishes voluntary standards and related documents. CSA Group has no power, nor does it undertake, to enforce compliance with the contents of the standards or other documents it publishes.

Intellectual property rights and ownership

As between CSA Group and the users of this document (whether it be in printed or electronic form), CSA Group is the owner, or the authorized licensee, of all works contained herein that are protected by copyright, all trade-marks (except as otherwise noted to the contrary), and all inventions and trade secrets that may be contained in this document, whether or not such inventions and trade secrets are protected by patents and applications for patents. Without limitation, the unauthorized use, modification, copying, or disclosure of this document may violate laws that protect CSA Group’s and/or others’ intellectual property and may give rise to a right in CSA Group and/or others to seek legal redress for such use, modification, copying, or disclosure. To the extent permitted by treaty or by law, CSA Group reserves all intellectual property rights in this document.

Patent rights

Attention is drawn to the possibility that some of the elements of this standard may be the subject of patent rights. CSA Group shall not be held responsible for identifying any or all such patent rights. Users of this standard are expressly advised that determination of the validity of any such patent rights is entirely their own responsibility.

Authorized use of this document

This document is being provided by CSA Group for informational and non-commercial use only. The user of this document is authorized to do only the following:

If this document is in electronic form:

- load this document onto a computer for the sole purpose of reviewing it;
- search and browse this document; and
- print this document if it is in PDF form.

Limited copies of this document in print or paper form may be distributed only to persons who are authorized by CSA Group to have such copies, and only if this Legal Notice appears on each such copy.

In addition, users may not and may not permit others to

- alter this document in any way, or remove this Legal Notice from the attached standard;
- sell this document without authorization from CSA Group; or
- make an electronic copy of this document.

If you do not agree with any of the terms and conditions contained in this Legal Notice, you may not load or use this document or make any copies of the contents hereof, and if you do make such copies, you are required to destroy them immediately. Use of this document constitutes your acceptance of the terms and conditions of this Legal Notice.



Standards Update Service

CSA/ANSI C22.2 No. 19085-6:21

March 2021

Title: *Woodworking machines — Safety — Part 6: Single spindle vertical moulding machines (“toupies”)*

To register for e-mail notification about any updates to this publication

- go to www.csagroup.org/store/
- click on **Product Updates**

The **List ID** that you will need to register for updates to this publication is **12838**.

If you require assistance, please e-mail techsupport@csagroup.org or call 416-747-2233.

Visit CSA Group’s policy on privacy at www.csagroup.org/legal to find out how we protect your personal information.

Canadian Standards Association (operating as “CSA Group”), under whose auspices this National Standard has been produced, was chartered in 1919 and accredited by the Standards Council of Canada to the National Standards system in 1973. It is a not-for-profit, nonstatutory, voluntary membership association engaged in standards development and certification activities.

CSA Group standards reflect a national consensus of producers and users — including manufacturers, consumers, retailers, unions and professional organizations, and governmental agencies. The standards are used widely by industry and commerce and often adopted by municipal, provincial, and federal governments in their regulations, particularly in the fields of health, safety, building and construction, and the environment.

Individuals, companies, and associations across Canada indicate their support for CSA Group’s standards development by volunteering their time and skills to Committee work and supporting CSA Group’s objectives through sustaining memberships. The more than 7000 committee volunteers and the 2000 sustaining memberships together form CSA Group’s total membership from which its Directors are chosen. Sustaining memberships represent a major source of income for CSA Group’s standards development activities.

CSA Group offers certification and testing services in support of and as an extension to its standards development activities. To ensure the integrity of its certification process, CSA Group regularly and continually audits and inspects products that bear the CSA Group Mark.

In addition to its head office and laboratory complex in Toronto, CSA Group has regional branch offices in major centres across Canada and inspection and testing agencies in eight countries. Since 1919, CSA Group has developed the necessary expertise to meet its corporate mission: CSA Group is an independent service organization whose mission is to provide an open and effective forum for activities facilitating the exchange of goods and services through the use of standards, certification and related services to meet national and international needs.

For further information on CSA Group services, write to
CSA Group
178 Rexdale Boulevard
Toronto, Ontario, M9W 1R3
Canada

A National Standard of Canada is a standard developed by a Standards Council of Canada (SCC) accredited Standards Development Organization, in compliance with requirements and guidance set out by SCC. More information on National Standards of Canada can be found at www.scc.ca.

SCC is a Crown corporation within the portfolio of Innovation, Science and Economic Development (ISED) Canada. With the goal of enhancing Canada’s economic competitiveness and social well-being, SCC leads and facilitates the development and use of national and international standards. SCC also coordinates Canadian participation in standards development, and identifies strategies to advance Canadian standardization efforts.

Accreditation services are provided by SCC to various customers, including product certifiers, testing laboratories, and standards development organizations. A list of SCC programs and accredited bodies is publicly available at www.scc.ca.

Standards Council of Canada
600-55 Metcalfe Street
Ottawa, Ontario, K1P 6L5
Canada



Standards Council of Canada
Conseil canadien des normes

Cette Norme Nationale du Canada est disponible en versions française et anglaise.

Although the intended primary application of this Standard is stated in its Scope, it is important to note that it remains the responsibility of the users to judge its suitability for their particular purpose.

**A trademark of the Canadian Standards Association, operating as “CSA Group”*

CSA Group

The Canadian Standards Association (operating as "CSA Group"), under whose auspices this National Standard has been produced, was chartered in 1919 and accredited by the Standards Council of Canada to the National Standards system in 1973. It is a not-for-profit, nonstatutory, voluntary membership association engaged in standards development and certification activities.

CSA Group standards reflect a national consensus of producers and users including manufacturers, consumers, retailers, unions and professional organizations, and governmental agencies. The standards are used widely by industry and commerce and often adopted by municipal, provincial, and federal governments in their regulations, particularly in the fields of health, safety, building and construction, and the environment.

Individuals, companies, and associations across Canada indicate their support for CSA Group's standards development by volunteering their time and skills to Committee work and supporting CSA Group's objectives through sustaining memberships. The more than 7000 committee volunteers and the 2000 sustaining memberships together form CSA Group's total membership from which its Directors are chosen. Sustaining memberships represent a major source of income for CSA Group's standards development activities.

CSA Group offers certification and testing services in support of and as an extension to its standards development activities. To ensure the integrity of its certification process, CSA Group regularly and continually audits and inspects product that bear the CSA Group Mark.

In addition to its head office and laboratory complex in Toronto, CSA Group has regional branch offices in major centres across Canada and inspection and testing agencies in eight countries. Since 1919, CSA Group has developed the necessary expertise to meet its corporate mission: CSA Group is an independent service organization whose mission is to provide an open and effective forum for activities facilitating the exchange of goods and services through the use of standards, certification and related services to meet national and international needs.

For further information on CSA Group services, write to
CSA Group
178 Rexdale Boulevard, Toronto, Ontario,
Canada M9W 1R3

American National Standards Institute

The American National Standards Institute (ANSI), Inc. is the nationally recognized coordinator of voluntary standards development in the United States through which voluntary organizations, representing virtually every technical discipline and every facet of trade and commerce, organized labor and consumer interests, establish and improve the some 10,000 national consensus standards currently approved as American National Standards.

ANSI provides that the interests of the public may have appropriate participation and representation in standardization activity, and cooperates with departments and agencies of U.S. Federal, State and local governments in achieving compatibility between government codes and standards and the voluntary standards of industry and commerce.

ANSI represents the interests of the United States in international nontreaty organizations such as the International Organization for Standardization (ISO) and the International Electrotechnical Commission (IEC). The Institute maintains close ties with regional organizations such as the Pacific Area Standards Congress (PASC) and the Pan American Standards Commission (COPANT). As such, ANSI coordinates the activities involved in the U.S. participation in these groups.

ANSI approval of standards is intended to verify that the principles of openness and due process have been followed in the approval procedure and that a consensus of those directly and materially affected by the standards has been achieved. ANSI coordination is intended to assist the voluntary system to ensure that national standards needs are identified and met with a set of standards that are without conflict or unnecessary duplication in their requirements.

Responsibility of approving American standards rests
with the
American National Standards Institute, Inc.
25 West 43rd Street, Fourth floor
New York, NY 10036

*National Standard of Canada
American National Standard*

CSA/ANSI C22.2 No. 19085-6:21

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

*Prepared by
International Organization for Standardization*



Reviewed by



*CSA Group is a trademark of the Canadian Standards Association,
operating as "CSA Group"*



*Approved on January 25, 2021 by ANSI
Published in March 2021 by CSA Group
A not-for-profit private sector organization
178 Rexdale Boulevard, Toronto, Ontario, Canada M9W 1R3*

*To purchase standards and related publications, visit our Online Store at www.csagroup.org/store/
or call toll-free 1-800-463-6727 or 416-747-4044.*

*ICS 13.110; 79.120.10
ISBN 978-1-4883-3311-8*

*© 2021 Canadian Standards Association
All rights reserved. No part of this publication may be reproduced in any form whatsoever
without the prior permission of the publisher.*

CSA/ANSI C22.2 No. 19085-6:21

Woodworking machines — Safety — Part 6: Single spindle vertical moulding machines (“toupies”)

(ISO 19085-6:2017, MOD)

CSA Preface

This is the first edition of CSA/ANSI C22.2 No. 19085-6, *Woodworking machines — Safety — Part 6: Single spindle vertical moulding machines (“toupies”)*, which is an adoption, with North American deviations, of the identically titled ISO (International Organization for Standardization) Standard 19085-6 (first edition, 2017-11). It is one in a series of Standards issued by CSA Group under Part II of the *Canadian Electrical Code*.

For brevity, this Standard will be referred to as “CSA/ANSI C22.2 No. 19085-6” throughout.

This Standard covers the safety requirements and measures for stationary and displaceable hand-fed single spindle vertical moulding machines.

The North American deviations are intended to meet product requirements and to align with the *Canadian Electrical Code, Part I* (Canada) and the *National Electrical Code* (United States).

This Standard is intended to be used in conjunction with CSA/ANSI C22.2 No. 19085-1:19, *Woodworking machines — Safety — Part 1: Common requirements* (adopted ISO 19085-1:2017, with North American deviations).

This Standard is considered suitable for use for conformity assessment within the stated scope of the Standard.

This Standard was reviewed for North American adoption by the CSA Subcommittee on Electrical Equipment for Woodworking Machinery, under the jurisdiction of the CSA Technical Committee on Industrial Products, and the CSA Strategic Steering Committee on Requirements for Electrical Safety, and has been formally approved by the Technical Committee.

This Standard has been developed in compliance with Standards Council of Canada requirements for National Standards of Canada. It has been published as a National Standard of Canada by CSA Group.

This Standard has been approved by the American National Standards Institute (ANSI) as an American National Standard.

Interpretations: The Strategic Steering Committee on Requirements for Electrical Safety has provided the following direction for the interpretations of standards under its jurisdiction: “The literal text shall be used in judging compliance of products with the safety requirements of this Standard. When the literal text cannot be applied to the product, such as for new materials or construction, and when a

relevant CSA committee interpretation has not already been published, CSA Group’s procedures for interpretation shall be followed to determine the intended safety principle.”

© 2021 Canadian Standards Association

All rights reserved. No part of this publication may be reproduced in any form whatsoever without the prior permission of the publisher. ISO material is reprinted with permission. Where the words “this International Standard” appear in the text, they should be interpreted as “this American National Standard” and “this National Standard of Canada”.

Inquiries regarding this American National Standard/National Standard of Canada should be addressed to

CSA Group
178 Rexdale Boulevard, Toronto, Ontario, Canada M9W 1R3
1-800-463-6727 • 416-747-4000
www.csagroup.org

To purchase standards and related publications, visit our Online Store at www.csagroup.org/store/ or call toll-free 1-800-463-6727 or 416-747-4044.

This Standard is subject to review within five years from the date of publication, and suggestions for its improvement will be referred to the appropriate committee. The technical content of IEC and ISO publications is kept under constant review by IEC and ISO. To submit a proposal for change, please send the following information to inquiries@csagroup.org and include “Proposal for change” in the subject line:

- a) Standard designation (number);
- b) relevant clause, table, and/or figure number;
- c) wording of the proposed change; and
- d) rationale for the change.

Woodworking machines — Safety —

**Part 6:
Single spindle vertical moulding
machines ("toupies")**

Machines à bois — Sécurité —

Partie 6: Toupies monobranche à arbre vertical





COPYRIGHT PROTECTED DOCUMENT

© ISO 2017

All rights reserved. Unless otherwise specified, no part of this publication may be reproduced or utilized otherwise in any form or by any means, electronic or mechanical, including photocopying, or posting on the internet or an intranet, without prior written permission. Permission can be requested from either ISO at the address below or ISO's member body in the country of the requester.

ISO copyright office
Ch. de Blandonnet 8 • CP 401
CH-1214 Vernier, Geneva, Switzerland
Tel. +41 22 749 01 11
Fax +41 22 749 09 47
copyright@iso.org
www.iso.org

Contents

Page

Foreword	vi
Introduction	vii
1 Scope	1
2 Normative references	2
3 Terms and definitions	3
4 List of significant hazards	9
5 Safety requirements and measures for controls	11
5.1 Safety and reliability of control systems	11
5.2 Control devices	11
5.3 Start	12
5.4 Safe stops	12
5.4.1 General	12
5.4.2 Normal stop	12
5.4.3 Operational stop	12
5.4.4 Emergency stop	13
5.5 Braking function of tool spindles	13
5.6 Mode selection	13
5.7 Spindle speed changing	13
5.7.1 Spindle speed changing by changing belts on the pulleys	13
5.7.2 Spindle speed changing by incremental speed change motor	13
5.7.3 Infinitely variable speed by frequency inverter	13
5.7.4 Spindle speed limiting device for tenoning	13
5.7.5 Changing of the direction of spindle rotation	13
5.8 Failure of any power supply	14
5.9 Manual reset control	14
5.10 Enabling control	14
5.11 Machine moving parts speed monitoring	14
5.12 Time delay	15
5.13 Power driven adjustment of arbor, demountable power feed unit, fences and table insert	15
6 Safety requirements and measures for protection against mechanical hazards	16
6.1 Stability	16
6.1.1 Stationary machines	16
6.1.2 Displaceable machines	16
6.2 Risk of break-up during operation	16
6.3 Tool holder and tool design	16
6.3.1 General	16
6.3.2 Spindle locking	18
6.3.3 Circular saw blade fixing device	19
6.3.4 Flange dimension for circular saw blades	19
6.3.5 Arbor rings	19
6.3.6 Quick tool/arbor change system	19
6.3.7 Manual adjustment of arbor height	19
6.3.8 Manual adjustment of arbor inclination	20
6.4 Braking	20
6.4.1 Braking of tool spindles	20
6.4.2 Maximum run-down time	20
6.4.3 Brake release	20
6.5 Safeguards	21
6.5.1 Fixed guards	21
6.5.2 Interlocking movable guards	21
6.5.3 Hold-to-run control	21

6.5.4	Two-hand control.....	21
6.5.5	Electro-sensitive protective equipment (ESPE).....	21
6.5.6	Pressure-sensitive protective equipment (PSPE).....	21
6.6	Prevention of access to moving parts.....	21
6.6.1	General.....	21
6.6.2	Guarding of tools.....	21
6.6.3	Guarding of drives.....	25
6.6.4	Guarding of shearing and/or crushing zones.....	25
6.7	Impact hazard.....	25
6.8	Clamping devices.....	25
6.9	Measures against ejection.....	25
6.9.1	General.....	25
6.9.2	Guards materials and characteristics.....	26
6.9.3	Anti-kickback devices.....	26
6.10	Work-piece supports and guides.....	28
6.10.1	Table.....	28
6.10.2	Work-piece guiding for straight work.....	31
6.10.3	Work-piece guiding for curved work.....	31
6.11	Safety appliances.....	32
7	Safety requirements and measures for protection against other hazards.....	33
7.1	Fire.....	33
7.2	Noise.....	33
7.2.1	Noise reduction at the design stage.....	33
7.2.2	Noise emission measurement.....	33
7.3	Emission of chips and dust.....	33
7.4	Electricity.....	34
7.4.1	General.....	34
7.4.2	Displaceable machines.....	34
7.5	Ergonomics and handling.....	34
7.6	Lighting.....	34
7.7	Pneumatics.....	34
7.8	Hydraulics.....	34
7.9	Electromagnetic compatibility.....	34
7.10	Laser.....	34
7.11	Static electricity.....	34
7.12	Errors of fitting.....	35
7.13	Isolation.....	35
7.14	Maintenance.....	35
8	Information for use.....	35
8.1	Warning devices.....	35
8.2	Marking.....	35
8.2.1	General.....	35
8.2.2	Additional markings.....	35
8.3	Instruction handbook.....	35
8.3.1	General.....	35
8.3.2	Additional information.....	35
	Annex A (informative) Performance level required.....	38
	Annex B (normative) Test for braking function.....	40
	Annex C (normative) Stability test for displaceable machines.....	41
	Annex D (normative) Impact test for guards.....	42
	Annex E (normative) Noise emission measurement for machines not in ISO 7960:1995.....	43
	Annex F (informative) Determination of maximum spindle speeds for single piece arbors.....	44
	Annex G (normative) Rigidity test for pressure pads, hand protectors and guiding steadies.....	48

Bibliography..... 53

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 on 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 the following URL: www.iso.org/iso/foreword.html.

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

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

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

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

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

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

As far as possible, in 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:

- “This subclause of ISO 19085-1:2017 applies.”;
- “This subclause of ISO 19085-1:2017 applies with the following additions.”, or “This subclause of ISO 19085-1:2017 applies with the following additions, subdivided into further specific subclauses.”;
- “This subclause of ISO 19085-1:2017 does not apply.”;
- “This subclause of ISO 19085-1:2017 is replaced by the following text.”, or “This subclause of ISO 19085-1:2017 is replaced by the following text, subdivided into further specific subclauses.”.

Specific subclauses and annexes in this part of ISO 19085 without correspondent in ISO 19085-1:2017 are indicated by the introductory sentence: “Subclause (or annex) specific to this part of ISO 19085.”

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 847-1:2013 and EN 847-2:2013.

ISO 19085-6:2017(E)

DV.1 *Replace all references to “ISO 12100” and “ISO 12100:2010” with “ANSI/ISO 12100” throughout this Standard.*

DV.2 *Replace all references to “ISO 19085-1” with “CSA/ANSI C22.2 No. 19085-1” throughout this Standard.*

Woodworking machines — Safety — Part 6: Single spindle vertical moulding machines (“toupies”)

1 Scope

This document gives the safety requirements and measures for stationary and displaceable hand-fed single spindle vertical moulding machines, hereinafter referred to as “machines”, designed to cut wood and materials 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 the 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 12100:2010.

It is also applicable to machines fitted with one or more of the following devices/additional working units, whose hazards have been dealt with:

- a) device for the arbor to be vertically adjustable relative to the table;
- b) device to tilt the arbor;
- c) device to fit a manually operated tenoning sliding table;
- d) glass bead saw unit;
- e) adjustable table insert;
- f) device for changing the direction of rotation of the spindle;
- g) device for fixing shank mounted tools on the arbor;
- h) interchangeable arbor;
- i) quick tool/arbor change system;
- j) demountable power feed unit;
- k) support for the demountable power feed unit with power driven adjustments.

This document does not apply to

- 1) machines equipped with outboard bearings,
- 2) machines equipped with powered movements of a front extension table and/or a tenoning sliding table, and
- 3) machines with an intended maximum tool diameter of less than or equal to 180 mm.