
Varnost strojev - Osnovni pojmi, splošna načela načrtovanja - 2. del: Tehnična načela (ISO 12100-2:2003)

Safety of machinery - Basic concepts, general principles for design - Part 2:
Technical principles (ISO 12100-2:2003)

iTeh STANDARD PREVIEW
(standards.iteh.ai)

[SIST EN ISO 12100-2:2004](https://standards.iteh.ai/catalog/standards/sist/f0e12367-7dd1-45b6-b28a-90e67f259e04/sist-en-iso-12100-2-2004)
<https://standards.iteh.ai/catalog/standards/sist/f0e12367-7dd1-45b6-b28a-90e67f259e04/sist-en-iso-12100-2-2004>

iTeh STANDARD PREVIEW **(standards.iteh.ai)**

SIST EN ISO 12100-2:2004

<https://standards.iteh.ai/catalog/standards/sist/f0e12367-7dd1-45b6-b28a-90e67f259e04/sist-en-iso-12100-2-2004>

English version

Safety of machinery - Basic concepts, general principles for
design - Part 2: Technical principles (ISO 12100-2:2003)

Sécurité des machines - Notions fondamentales, principes
généraux de conception - Partie 2: Principes techniques
(ISO 12100-2:2003)

Sicherheit von Maschinen - Grundbegriffe, allgemeine
Gestaltungsleitsätze - Teil 2: Technische Leitsätze (ISO
12100-2:2003)

This European Standard was approved by CEN on 9 June 2003.

CEN members are bound to comply with the CEN/CENELEC Internal Regulations which stipulate the conditions for giving this European Standard the status of a national standard without any alteration. Up-to-date lists and bibliographical references concerning such national standards may be obtained on application to the Management Centre or to any CEN member.

This European Standard exists in three official versions (English, French, German). A version in any other language made by translation under the responsibility of a CEN member into its own language and notified to the Management Centre has the same status as the official versions.

CEN members are the national standards bodies of Austria, Belgium, Czech Republic, Denmark, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Luxembourg, Malta, Netherlands, Norway, Portugal, Slovakia, Spain, Sweden, Switzerland and United Kingdom.

SIST EN ISO 12100-2:2004

<https://standards.iteh.ai/catalog/standards/sist/f0e12367-7dd1-45b6-b28a-90e67f259e04/sist-en-iso-12100-2-2004>



EUROPEAN COMMITTEE FOR STANDARDIZATION
COMITÉ EUROPÉEN DE NORMALISATION
EUROPÄISCHES KOMITEE FÜR NORMUNG

Management Centre: rue de Stassart, 36 B-1050 Brussels

CORRECTED 2003-12-17

Foreword

This document (EN ISO 12100-2:2003) has been prepared by Technical Committee ISO/TC 199 "Safety of machinery" in collaboration with Technical Committee CEN/TC 114 "Safety of machinery", the secretariat of which is held by DIN.

This European Standard shall be given the status of a national standard, either by publication of an identical text or by endorsement, at the latest by May 2004, and conflicting national standards shall be withdrawn at the latest by May 2004.

This document supersedes EN 292-2:1991.

This document has been prepared under a mandate given to CEN by the European Commission and the European Free Trade Association, and supports essential requirements of EU Directive(s).

For relationship with EU Directive(s), see informative Annex ZB, which is an integral part of this document.

According to the CEN/CENELEC Internal Regulations, the national standards organizations of the following countries are bound to implement this European Standard: Austria, Belgium, Czech Republic, Denmark, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Luxembourg, Malta, Netherlands, Norway, Portugal, Slovakia, Spain, Sweden, Switzerland and the United Kingdom.

[SIST EN ISO 12100-2:2004](https://standards.iteh.ai/catalog/standards/sist/f0e12367-7dd1-45b6-b28a-90e67f259e04/sist-en-iso-12100-2-2004)

<https://standards.iteh.ai/catalog/standards/sist/f0e12367-7dd1-45b6-b28a-90e67f259e04/sist-en-iso-12100-2-2004>

Endorsement notice

The text of ISO 12100-2:2003 has been approved by CEN as EN ISO 12100-2:2003 without any modifications.

NOTE Normative references to International Standards are listed in Annex ZA (normative).

Annex ZA (normative)

Normative references to international publications with their relevant European publications

This European Standard incorporates by dated or undated reference, provisions from other publications. These normative references are cited at the appropriate places in the text and the publications are listed hereafter. For dated references, subsequent amendments to or revisions of any of these publications apply to this European Standard only when incorporated in it by amendment or revision. For undated references the latest edition of the publication referred to applies (including amendments).

NOTE Where an International Publication has been modified by common modifications, indicated by (mod.), the relevant EN/HD applies.

<u>Publication</u>	<u>Year</u>	<u>Title</u>	<u>EN</u>	<u>Year</u>
ISO 12100-1	2003	Safety of machinery - Basic concepts, general principles for design - Part 1: Basic terminology, methodology	EN ISO 12100-1	2003

[SIST EN ISO 12100-2:2004](https://standards.iteh.ai/catalog/standards/sist/f0e12367-7dd1-45b6-b28a-90e67f259e04/sist-en-iso-12100-2-2004)
<https://standards.iteh.ai/catalog/standards/sist/f0e12367-7dd1-45b6-b28a-90e67f259e04/sist-en-iso-12100-2-2004>

Annex ZB
(informative)

Relationship of this document with EC Directives

This document has been prepared under a mandate given to CEN by the European Commission and the European Free Trade Association and supports essential requirements of EC Directive(s) :

Machinery Directive 98/37/EC, amended by Directive 98/79/EC.

Compliance with this document provides one means of conforming with the specific essential requirements of the Directive concerned and associated EFTA regulations.

WARNING: Other requirements and other EC Directives may be applicable to the product(s) falling within the scope of this document.

iTeh STANDARD PREVIEW
(standards.iteh.ai)

SIST EN ISO 12100-2:2004
<https://standards.iteh.ai/catalog/standards/sist/f0e12367-7dd1-45b6-b28a-90e67f259e04/sist-en-iso-12100-2-2004>

**Safety of machinery — Basic concepts,
general principles for design —**

**Part 2:
Technical principles**

*Sécurité des machines — Notions fondamentales, principes généraux
de conception —*

Partie 2: Principes techniques

iTeh STANDARD PREVIEW
(standards.iteh.ai)

SIST EN ISO 12100-2:2004

<https://standards.iteh.ai/catalog/standards/sist/f0e12367-7dd1-45b6-b28a-90e67f259e04/sist-en-iso-12100-2-2004>



PDF disclaimer

This PDF file may contain embedded typefaces. In accordance with Adobe's licensing policy, this file may be printed or viewed but shall not be edited unless the typefaces which are embedded are licensed to and installed on the computer performing the editing. In downloading this file, parties accept therein the responsibility of not infringing Adobe's licensing policy. The ISO Central Secretariat accepts no liability in this area.

Adobe is a trademark of Adobe Systems Incorporated.

Details of the software products used to create this PDF file can be found in the General Info relative to the file; the PDF-creation parameters were optimized for printing. Every care has been taken to ensure that the file is suitable for use by ISO member bodies. In the unlikely event that a problem relating to it is found, please inform the Central Secretariat at the address given below.

iTeh STANDARD PREVIEW
(standards.iteh.ai)

SIST EN ISO 12100-2:2004

<https://standards.iteh.ai/catalog/standards/sist/f0e12367-7dd1-45b6-b28a-90e67f259e04/sist-en-iso-12100-2-2004>

© ISO 2003

All rights reserved. Unless otherwise specified, no part of this publication may be reproduced or utilized in any form or by any means, electronic or mechanical, including photocopying and microfilm, without permission in writing from either ISO at the address below or ISO's member body in the country of the requester.

ISO copyright office
Case postale 56 • CH-1211 Geneva 20
Tel. + 41 22 749 01 11
Fax + 41 22 749 09 47
E-mail copyright@iso.org
Web www.iso.org

Published in Switzerland

Contents

Page

Foreword	iv
Introduction	v
1 Scope	1
2 Normative references	1
3 Terms and definitions	1
4 Inherently safe design measures	1
4.1 General	1
4.2 Consideration of geometrical factors and physical aspects	2
4.3 Taking into account the general technical knowledge regarding machine design	3
4.4 Choice of an appropriate technology	3
4.5 Applying the principle of the positive mechanical action of a component on another component	4
4.6 Provisions for stability	4
4.7 Provisions for maintainability	4
4.8 Observing ergonomic principles	5
4.9 Preventing electrical hazard	6
4.10 Preventing hazards from pneumatic and hydraulic equipment	6
4.11 Applying inherently safe design measures to control system	6
4.12 Minimizing the probability of failure of safety functions	11
4.13 Limiting exposure to hazards through reliability of equipment	12
4.14 Limiting exposure to hazards through mechanization or automation of loading (feeding) /unloading (removal) operations	13
4.15 Limiting exposure to hazards through location of the setting and maintenance points outside of danger zones	13
5 Safeguarding and complementary protective measures	13
5.1 General	13
5.2 Selection and implementation of guards and protective devices	13
5.3 Requirements for the design of guards and protective devices	19
5.4 Safeguarding for reducing emissions	21
5.5 Complementary protective measures	22
6 Information for use	25
6.1 General requirements	25
6.2 Location and nature of the information for use	25
6.3 Signals and warning devices	25
6.4 Markings, signs (pictograms), written warnings	26
6.5 Accompanying documents (in particular, instruction handbook)	27
Bibliography	30

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.

International Standards are drafted in accordance with the rules given in the ISO/IEC Directives, Part 2.

The main task of technical committees is to prepare International Standards. Draft International Standards adopted by the technical committees are circulated to the member bodies for voting. Publication as an International Standard requires approval by at least 75 % of the member bodies casting a vote.

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.

ISO 12100-2 was prepared by Technical Committee ISO/TC 199, *Safety of machinery*.

This edition cancels and replaces ISO/TR 12100-2:1992, which has been technically revised.

ISO 12100 consists of the following parts, under the general title *Safety of machinery — Basic concepts, general principles for design*:

- *Part 1: Basic terminology, methodology*, expressing the basic overall methodology to be followed when designing machinery and when producing safety standards for machinery, together with the basic terminology related to the philosophy underlying this work;
- *Part 2: Technical principles*, giving advice on how this philosophy can be applied using available techniques.

Introduction

The primary purpose of ISO 12100 is to provide designers with an overall framework and guidance to enable them to produce machines that are safe for their intended use. It also provides a strategy for standard makers.

The concept of safety of machinery considers the ability of a machine to perform its intended function(s) during its lifecycle where risk has been adequately reduced.

This standard is the basis for a set of standards which has the following structure:

- **type-A standards** (basic safety standards) giving basic concepts, principles for design, and general aspects that can be applied to all machinery;
- **type-B standards** (generic safety standards) dealing with one safety aspect or one type of safeguard that can be used across a wide range of machinery:
 - type-B1 standards on particular safety aspects (e.g. safety distances, surface temperature, noise);
 - type-B2 standards on safeguards (e.g. two-hand controls, interlocking devices, pressure sensitive devices, guards);
- **type-C standards** (machine safety standards) dealing with detailed safety requirements for a particular machine or group of machines.

This standard is a type-A standard. [SIST EN ISO 12100-2:2004](https://standards.iteh.ai/catalog/standards/sist/f0e12367-7dd1-45b6-b28a-96c671259c04/sist-en-iso-12100-2-2004)

The subject of numerous clauses or subclauses of this standard is also dealt with, in a more detailed manner, in other type-A or B standards.

When a type-C standard deviates from one or more provisions dealt with by Part 2 of this standard or by a type-B standard, the type-C standard takes precedence.

It is recommended that this standard be incorporated in training courses and manuals to convey basic terminology and general design methods to designers.

iTeh STANDARD PREVIEW **(standards.iteh.ai)**

SIST EN ISO 12100-2:2004

<https://standards.iteh.ai/catalog/standards/sist/f0e12367-7dd1-45b6-b28a-90e67f259e04/sist-en-iso-12100-2-2004>

Safety of machinery — Basic concepts, general principles for design — Part 2: Technical principles

1 Scope

This standard defines technical principles to help designers in achieving safety in the design of machinery.

ISO 12100-2 is intended to be used together with ISO 12100-1 when considering the solution to a specific problem. The two parts of ISO 12100 can be used independently of other documents or as a basis for the preparation of other type-A standards or type-B or -C standards.

This standard does not deal with damage to domestic animals, property or the environment.

2 Normative references

The following referenced documents are indispensable for the application 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.

IEC 60204-1:1997, *Safety of machinery — Electrical equipment of machines — Part 1: General requirements*.

ISO 12100-1:2003, *Safety of machinery — Basic concepts, general principles for design — Basic terminology, methodology*.

3 Terms and definitions

For the purposes of this International Standard, the terms and definitions given in ISO 12100-1:2003 apply.

4 Inherently safe design measures

4.1 General

Inherently safe design measures are the first and most important step in the risk reduction process because protective measures inherent to the characteristics of the machine are likely to remain effective, whereas experience has shown that even well-designed safeguarding may fail or be violated and information for use may not be followed.

Inherently safe design measures are achieved by avoiding hazards or reducing risks by a suitable choice of design features of the machine itself and/or interaction between the exposed persons and the machine.

NOTE Clause 5 gives safeguarding and complementary measures to achieve the risk reduction objectives where inherently safe design measures are not sufficient (see 3-step method in ISO 12100-1:2003, clause 5).