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## **Safety of machinery — General principles for design — Risk assessment and risk reduction**

*Sécurité des machines — Principes généraux de conception —  
Appréciation du risque et réduction du risque*



Reference number  
ISO 12100:2010(E)

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## Contents

Page

Foreword .....	v
Introduction.....	vi
1 Scope.....	1
2 Normative references.....	1
3 Terms and definitions .....	1
4 Strategy for risk assessment and risk reduction.....	9
5 Risk assessment .....	12
5.1 General .....	12
5.2 Information for risk assessment.....	12
5.3 Determination of limits of machinery .....	13
5.3.1 General .....	13
5.3.2 Use limits.....	13
5.3.3 Space limits.....	14
5.3.4 Time limits.....	14
5.3.5 Other limits.....	14
5.4 Hazard identification .....	14
5.5 Risk estimation .....	16
5.5.1 General .....	16
5.5.2 Elements of risk.....	17
5.5.3 Aspects to be considered during risk estimation.....	19
5.6 Risk evaluation .....	21
5.6.1 General .....	21
5.6.2 Adequate risk reduction .....	21
5.6.3 Comparison of risks.....	21
6 Risk reduction.....	22
6.1 General .....	22
6.2 Inherently safe design measures.....	23
6.2.1 General .....	23
6.2.2 Consideration of geometrical factors and physical aspects .....	23
6.2.3 Taking into account general technical knowledge of machine design .....	24
6.2.4 Choice of appropriate technology .....	25
6.2.5 Applying principle of positive mechanical action.....	25
6.2.6 Provisions for stability.....	25
6.2.7 Provisions for maintainability .....	26
6.2.8 Observing ergonomic principles .....	26
6.2.9 Electrical hazards .....	27
6.2.10 Pneumatic and hydraulic hazards .....	27
6.2.11 Applying inherently safe design measures to control systems .....	28
6.2.12 Minimizing probability of failure of safety functions .....	33
6.2.13 Limiting exposure to hazards through reliability of equipment .....	33
6.2.14 Limiting exposure to hazards through mechanization or automation of loading (feeding)/ unloading (removal) operations.....	34
6.2.15 Limiting exposure to hazards through location of setting and maintenance points outside danger zones .....	34
6.3 Safeguarding and complementary protective measures .....	34
6.3.1 General .....	34
6.3.2 Selection and implementation of guards and protective devices.....	35
6.3.3 Requirements for design of guards and protective devices.....	40
6.3.4 Safeguarding to reduce emissions.....	43

This is a preview of "ISO 12100:2010". [Click here to purchase the full version from the ANSI store.](#)

6.3.5	Complementary protective measures.....	44
6.4	Information for use .....	46
6.4.1	General requirements.....	46
6.4.2	Location and nature of information for use .....	46
6.4.3	Signals and warning devices.....	46
6.4.4	Markings, signs (pictograms) and written warnings.....	47
6.4.5	Accompanying documents (in particular — instruction handbook).....	48
7	Documentation of risk assessment and risk reduction.....	51
Annex A (informative)	Schematic representation of a machine.....	52
Annex B (informative)	Examples of hazards, hazardous situations and hazardous events .....	53
Annex C (informative)	Trilingual lookup and index of specific terms and expressions used in ISO 12100.....	63
Bibliography	.....	75

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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.

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

This first edition of ISO 12100 cancels and replaces ISO 12100-1:2003, ISO 12100-2:2003 and ISO 14121-1:2007, of which it constitutes a consolidation without technical change. It also incorporates the Amendments ISO 12100-1:2003/Amd.1:2009 and ISO 12100-2:2003/Amd.1:2009. Documentation (e.g. risk assessment, type-C standards) based on these replaced documents need not be updated or revised.

## Introduction

The primary purpose of this International Standard is to provide designers with an overall framework and guidance for decisions during the development of machinery to enable them to design machines that are safe for their intended use. It also provides a strategy for standards developers and will assist in the preparation of consistent and appropriate type-B and type-C standards.

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

This International 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 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 (for example, safety distances, surface temperature, noise);
  - type-B2 standards on safeguards (for example, 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 International Standard is a type-A standard.

When a type-C standard deviates from one or more technical provisions dealt with by this International Standard or by a type-B standard, the type-C standard takes precedence.

It is desirable that this International Standard be referred to in training courses and manuals to convey basic terminology and general design methods to designers.

ISO/IEC Guide 51 has been taken into account as far as practicable at the time of drafting of this International Standard.