

TECHNICAL REPORT

**ISO/TR
12100-1**

First edition
1992-12-15

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

Part 1 : Basic terminology, methodology

*Sécurité des machines — Notions fondamentales, principes généraux de conception —
Partie 1 : Terminologie de base, méthodologie*



Reference number
ISO/TR 12100-1 : 1992 (E)

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 main task of ISO technical committees is to prepare International Standards. In exceptional circumstances a technical committee may propose the publication of a Technical Report of one of the following types:

- type 1, when the required support cannot be obtained for the publication of an International Standard, despite repeated efforts;
- type 2, when the subject is still under technical development or where for any other reason there is the future but not immediate possibility of an agreement on an International Standard;
- type 3, when a technical committee has collected data of a different kind from that which is normally published as an International Standard ("state of the art", for example).

Technical Reports of types 1 and 2 are subject to review within three years of publication, to decide whether they can be transformed into International Standards. Technical Reports of type 3 do not necessarily have to be reviewed until the data they provide are considered to be no longer valid or useful.

© ISO 1992

All rights reserved. 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 the publisher.

International Organization for Standardization

Case postale 56 • CH-1211 Genève 20 • Switzerland

Printed in Switzerland

In its resolution 6 (November 1991), Technical Committee ISO/TC 199, *Safety of machinery*, endorsed the contents of European Standard EN 292-1 : 1991 prepared by Technical Committee CEN/TC 114, *Safety of machinery*. It recommended further that this European Standard be published as an ISO Technical Report of type 2 and be implemented with the highest priority throughout ISO/IEC and publicized as widely as possible.

This document is being issued in the type 2 Technical Report series of publications (according to part 1 of the ISO/IEC Directives) as a "prospective standard for provisional application" in the field of safety of machinery because there is an urgent need for guidance on how standards in this field should be used to meet an identified need.

This document is not to be regarded as an "International Standard". It is proposed for provisional application so that information and experience of its use in practice may be gathered. Comments on the content of this document should be sent to the ISO Central Secretariat.

A review of this type 2 Technical Report will be carried out not later than three years after its publication with the options of: extension for another three years; conversion into an International Standard; or withdrawal.

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

- *Part 1: Basic terminology, methodology*
- *Part 2: Technical principles and specifications*

Annexes A and B of this part of ISO/TR 12100 are for information only.

TECHNICAL REPORT

ISO/TR 12100-1 : 1992 (E)

EUROPEAN STANDARD

EN 292-1:1991

NORME EUROPEENNE

EUROPAISCHE NORM

September 1991

UDC 62-78:614.8:331.454:001.4

Descriptors: Safety of machines, design, definitions, hazards,
safety measures, categories

English version

Safety of machinery - Basic concepts, general
principles for design - Part 1: Basic terminology,
methodology

Sécurité des machines - Notions
fondamentales, principes généraux de
conception - Partie 1: Terminologie de
base, méthodologie

Sicherheit von Maschinen -
Grundbegriffe, allgemeine
Gestaltungsleitsätze - Teil 1:
Grundsätzliche Terminologie,
Methodologie

This European Standard was approved by CEN on 1991-09-20
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 Central Secretariat 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
Central Secretariat has the same status as the official versions.

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

CEN

European Committee for Standardization
Comité Européen de Normalisation
Europäisches Komitee für Normung

Central Secretariat: rue de Stassart 36, B-1050 Brussels

(c) CEN 1991 Copyright reserved to all CEN members

ISO/TR 12100-1:1991 E

This is a preview. Click here to purchase the full publication.

	Page
Contents list	
Foreword	4
0 Introduction	4
1 Scope	5
2 Normative references	5
3 Basic concepts	6
3.1 Machinery (machine)	6
3.2 Reliability of a machine	6
3.3 Maintainability of a machine	6
3.4 Safety of a machine	6
3.5 Hazard	6
3.6 Hazardous situation	7
3.7 Risk	7
3.8 Risk assessment	7
3.9 Hazardous machine function	7
3.10 Danger zone	7
3.11 Design of a machine	7
3.12 Intended use of a machine	8
3.13 Safety functions	8
3.14 Automatic monitoring	9
3.15 Unexpected (or unintended) start-up	9
3.16 Failure to danger	9
3.17 Fail-safe condition (minimized failure to danger)	9
3.18 Risk reduction by design	10
3.19 Safeguarding	10
3.20 Information for use	10
3.21 Operator	10
3.22 Guard	10
3.23 Safety device	12
3.24 Deterring/impeding device	13
4 Description of hazards generated by machinery	13
4.1 General	13
4.2 Mechanical hazard	13
4.3 Electrical hazard	14
4.4 Thermal hazard	15
4.5 Hazards generated by noise	15
4.6 Hazards generated by vibration	15
4.7 Hazards generated by radiation	15
4.8 Hazards generated by materials and substances	15
4.9 Hazards generated by neglecting ergonomic principles in machine design	16
4.10 Hazard combinations	16