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Maskinsäkerhet – Riskbedömning – Del 1: Principer (ISO 14121-1:2007)

Safety of machinery – Risk assessment – Part 1: Principles (ISO 14121-1:2007)

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Denna standard ersätter SS-EN 1050, utgåva 1.

The European Standard EN ISO 14121-1:2007 has the status of a Swedish Standard. This document contains the official English version of EN ISO 14121-1:2007.

This standard supersedes the Swedish Standard SS-EN 1050, edition 1.

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EUROPEAN STANDARD
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English Version

**Safety of machinery - Risk assessment - Part 1: Principles (ISO
14121-1:2007)**

Sécurité des machines - Appréciation du risque - Partie 1:
Principes (ISO 14121-1:2007)

Sicherheit von Maschinen - Risikobeurteilung - Teil 1:
Leitsätze (ISO 14121-1:2007)

This European Standard was approved by CEN on 4 August 2007.

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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 CEN Management Centre has the same status as the official versions.

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

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Foreword

This document (EN ISO 14121-1:2007) 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of an identical text or by endorsement, at the latest by March 2008, and conflicting national standards shall be withdrawn at the latest by March 2008.

This document supersedes EN 1050:1996.

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).

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

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Endorsement notice

The text of ISO 14121-1:2007 has been approved by CEN as a EN ISO 14121-1:2007 without any modification.

Introduction

The structure of safety standards in the field of machinery is as follows.

- a) Type-A standards (basic standards) give basic concepts, principles for design, and general aspects that can be applied to machinery.
- b) Type-B standards (generic safety standards) deal with one or more safety aspect(s) or one or more type(s) of safeguards 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-hands controls, interlocking devices, pressure sensitive devices, guards).
- c) Type-C standards (machine safety standards) deal with detailed safety requirements for a particular machine or group of machines.

This part of ISO 14121 is a type-A standard as stated in ISO 12100-1.

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

The purpose of this type-A standard is to describe principles for a consistent systematic procedure for risk assessment as stated in ISO 12100-1:2003, Clause 5.

This part of ISO 14121 gives guidance for decisions related to the design of machinery and will assist in the preparation of consistent and appropriate type-B and type-C standards, so that machines can be produced that are safe for their intended use in accordance with the methodology given in ISO 12100.

Annex A gives, in separate tables, examples of hazards, hazardous situations and hazardous events, so as to clarify these concepts and assist the designer in the process of hazard identification.

The practical use of a number of methods for each stage of risk assessment is described ISO/TR 14121-2, which also gives some guidance on how the selection of protective measures (in accordance with ISO 12100) can reduce the different elements of risk in relation to Figure 2 of this part of ISO 14121.

This part of ISO 14121 can be incorporated in training courses and manuals where appropriate to give basic instruction on risk assessment.

Safety of machinery — Risk assessment —

Part 1: Principles

1 Scope

This part of ISO 14121 establishes general principles intended to be used to meet the risk reduction objectives established in ISO 12100-1:2003, Clause 5. These principles of risk assessment bring together knowledge and experience of the design, use, incidents, accidents and harm related to machinery in order to assess the risks posed during the relevant phases of the life cycle of a machine.

This part of ISO 14121 provides guidance on the information that will be required to enable risk assessment to be carried out. Procedures are described for identifying hazards and estimating and evaluating risk.

It also gives guidance on the making of decisions relating to the safety of machinery and on the type of documentation required to verify the risk assessment carried out.

It is not applicable to risks posed 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.

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

ISO 12100-2:2003, *Safety of machinery — Basic concepts, general principles for design — Part 2: Technical principles and specifications*

3 Terms and definitions

For the purposes of this document, the following terms and definitions apply.

3.1

harm

physical injury or damage to health

[ISO 12100-1:2003, definition 3.5]

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3.2

hazard

potential source of harm

NOTE 1 The term “hazard” can be qualified in order to define its origin (e.g. mechanical hazard, electrical hazard) or the nature of the potential harm (e.g. electric shock hazard, cutting hazard, toxic hazard, fire hazard).

NOTE 2 The hazard envisaged in this definition:

- either is permanently present during the intended use of the machine (e.g. motion of hazardous moving elements, electric arc during a welding phase, unhealthy posture, noise emission, high temperature);
- or can appear unexpectedly (e.g. explosion, crushing hazard as a consequence of an unintended / unexpected start-up, ejection as a consequence of a breakage, fall as a consequence of acceleration / deceleration)

[ISO 12100-1:2003, definition 3.6]

3.3

hazard zone

danger zone

any space within and/or around machinery in which a person can be exposed to a hazard

[ISO 12100-1:2003, definition 3.10]

3.4

hazardous event

event that can cause harm

NOTE A hazardous event can occur over a short period of time or over an extended period of time.

3.5

hazardous situation

circumstance in which a person is exposed to at least one hazard

NOTE The exposure can result in harm immediately or over a period of time.

[ISO 12100-1:2003, definition 3.9]

3.6

intended use of a machine

use of a machine in accordance with the information provided in the instructions for use

[ISO 12100-1:2003, definition 3.22]

3.7

machinery

machine

assembly of linked parts or components, at least one of which moves, with the appropriate machine actuators, control and power circuits, joined together for a specific application, in particular for the processing, treatment, moving or packaging of a material

NOTE The term “machinery” also covers an assembly of machines which, in order to achieve the same end, are arranged and controlled so that they function as an integral whole.

[ISO 12100-1:2003, definition 3.1]

3.8

malfunction

failure of a machine to perform an intended function

NOTE For examples, see ISO 12100-1:2003, 5.3 b), item 2).

3.9

protective measure

measure intended to achieve risk reduction

NOTE 1 It is implemented:

- by the designer (inherently safe design, safeguarding and complementary protective measures, information for use);
- or by the user (organization: safe working procedures, supervision, permit-to-work systems; provision and use of additional safeguards; use of personal protective equipment; training).

NOTE 2 See ISO 12100-1:2003, Figure 1.

[ISO 12100-1:2003, definition 3.18]

3.10

reasonably foreseeable misuse

use of a machine in a way not intended by the designer, but which may result from readily predictable human behaviour

[ISO 12100-1:2003, definition 3.23]

3.11

residual risk

risk remaining after protective measures have been taken

NOTE See ISO 12100-1:2003, Figure 1.

[ISO 12100-1:2003, definition 3.12]

3.12

risk

combination of the probability of occurrence of harm and the severity of that harm

[ISO 12100-1:2003, definition 3.11]

3.13

risk analysis

combination of the specification of the limits of the machine, hazard identification and risk estimation

[ISO 12100-1:2003, definition 3.14]

3.14

risk assessment

overall process comprising a risk analysis and a risk evaluation

[ISO 12100-1:2003, definition 3.13]

3.15

risk estimation

definition of likely severity of harm and probability of its occurrence

[ISO 12100-1:2003, definition 3.15]

3.16

risk evaluation

judgement, on the basis of risk analysis, of whether the risk reduction objectives have been achieved

[ISO 12100-1:2003, definition 3.16]