

DRAFT INTERNATIONAL STANDARD

ISO/DIS 14120

ISO/TC 199

Secretariat: DIN

Voting begins on:
2013-08-22

Voting terminates on:
2014-01-22

Safety of machinery — Guards — General requirements for the design and construction of fixed and movable guards

Sécurité des machines — Protecteurs — Prescriptions générales pour la conception et la construction des protecteurs fixes et mobiles

[Revision of first edition (ISO 14120:2002)]

ICS: 13.110

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ISO/CEN PARALLEL PROCESSING

This draft has been developed within the International Organization for Standardization (ISO), and processed under the **ISO lead** mode of collaboration as defined in the Vienna Agreement.

This draft is hereby submitted to the ISO member bodies and to the CEN member bodies for a parallel five month enquiry.

Should this draft be accepted, a final draft, established on the basis of comments received, will be submitted to a parallel two-month approval vote in ISO and formal vote in CEN.

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ISO/DIS 14120:2013(E)

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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.

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ISO 14120 was prepared by Technical Committee ISO/TC 199, *Safety of machinery*, and by CEN/TC 114, *Safety of machinery*, in collaboration.

This second edition cancels and replaces the first edition (ISO 14120:2002) and ISO 14120 AMD 1:2009, which has been technically revised.

Annexes A, B and C are for information only.

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Introduction

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

- a) **type-A standards** (basic safety standards) giving basic concepts, principles for design, and general aspects that can be applied to all machinery;
- b) **type-B standards** (generic safety standards) dealing with one safety aspect or one or more type(s) 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);
- c) **type-C standards** (machine safety standards) dealing with detailed safety requirements for a particular machine or group of machines.

This document is a type-B2 standard as stated in ISO 12100.

Guards provide a risk reduction for both protection against unintended access and against ejected parts and substances and also e.g. against fire hazards.

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Safety of machinery — Guards — General requirements for the design, construction and selection of fixed and movable guards

1 Scope

This International Standard specifies general requirements for the design, construction and selection of guards provided to protect persons from mechanical hazards.

This International Standard indicates other hazards that can influence the design and construction of guards.

This International Standard applies primarily to machines which will be manufactured after it is published.

The requirements are applicable if fixed and movable guards are used. This International Standard does not cover interlocking devices. These are covered in ISO 14119.

This International Standard does not provide requirements for special systems relating specifically to mobility or to the ability to lift loads such as rollover protective structures (ROPS) and falling-object protective structures (FOPS).

2 Normative references

The following documents, in whole or in part, are normatively referenced in this document and are indispensable for its application. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

ISO 12100:2010, *Safety of machinery — General principles for design — Risk assessment and risk reduction*

ISO 13857, *Safety of machinery — Safety distances to prevent hazard zones being reached by upper and lower limbs*

ISO 14119, *Safety of machinery — Interlocking devices associated with guards — Principles for design and selection*

ISO 14123-1, *Safety of machinery — Reduction of risks to health from hazardous substances emitted by machinery — Part 1: Principles and specifications for machinery manufacturers*

IEC 60204-1:2005, *Safety of machinery — Electrical equipment of machines — Part 1: General requirements*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in ISO 12100 and the following apply.

3.1

guard

physical barrier, designed as part of the machine, to provide protection

Note 1 to entry: A guard may act:

- alone; it is then only effective when it is "closed" for a movable guard or "securely held in place" for a fixed guard;
- in conjunction with an interlocking device with or without guard locking; in this case, protection is ensured whatever the position of the guard.

Note 2 to entry: Depending on its design, a guard may be called e.g. casing, shield, cover, screen, door, enclosing guard.

[SOURCE: ISO 12100:2010, 3.27]

**3.2
fixed guard**

guard affixed in such a manner (for example, by screws, nuts, welding) that it can only be opened or removed by the use of tools or by destruction of the means by which the guard is affixed

[SOURCE: ISO 12100:2010, 3.27.1]

**3.2.1
enclosing guard**

guard which prevents access to the hazard zone from all sides

Note to entry: See Figure 1.

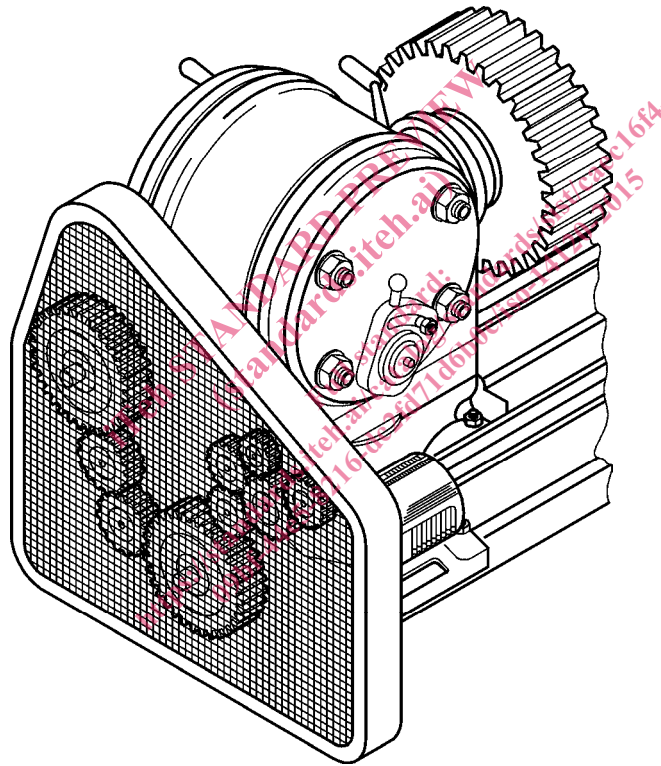


Figure 1 — Example of an enclosing guard totally preventing access to transmission machinery

**3.2.2
distance guard**

guard which does not completely enclose a hazard zone, but which prevents or reduces access by virtue of its dimensions and its distance from the hazard zone, for example perimeter fence or tunnel guard

Note 1 to entry: A distance guard can be partially or fully surrounding.

Note 2 to entry: See Figures 2 and 3.

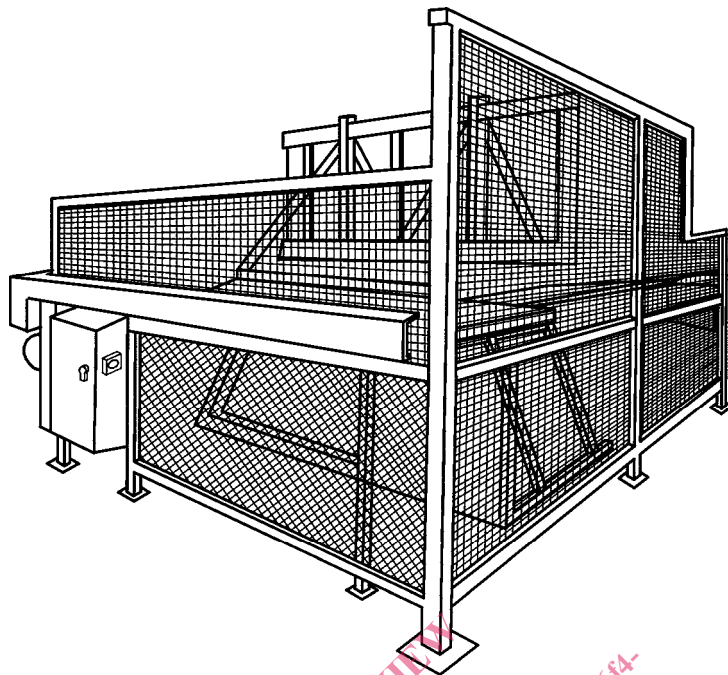


Figure 2 — Example of a distance guard

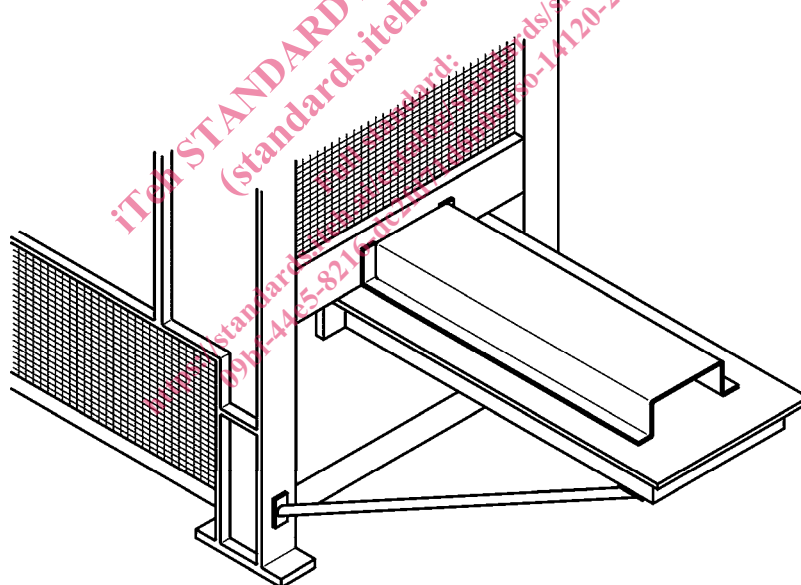


Figure 3 — Example of a distance guard: tunnel guard providing protection at machine feed or discharge area

3.3

movable guard

guard which can be opened without the use of tools

[SOURCE: ISO 12100:2010, 3.27.2]

3.3.1

power-operated guard

movable guard that is operated with the assistance of power from a source other than persons or gravity

3.4 adjustable guard
movable guard operated by a machine element (for example a moving table) or by the workpiece or a part of the machining jig, so that it allows the workpiece (and the jig) to pass and then automatically returns (by means of gravity, a spring, other external power, etc.) to the closed position as soon as the workpiece has vacated the opening through which it has been allowed to pass

[SOURCE: ISO 12100:2010, 3.27.3]

- Note 1 to entry: Adjustable guards can be manually or automatically adjusted.
- Note 2 to entry: A self-closing guard can be an automatically adjustable guard, see Figure 4.
- Note 3 to entry: For manually adjustable guards, see also Figure 5.

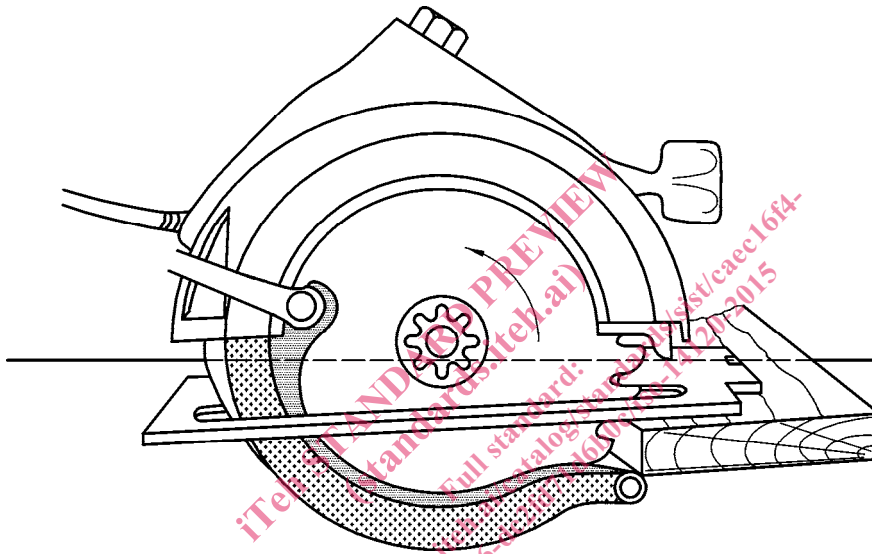


Figure 4 — Example of a self-closing guard