DRAFT INTERNATIONAL STANDARD

ISO/DIS 14122-3

ISO/TC **199** Secretariat: **DIN**

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Safety of machinery — Permanent means of access to machinery —

Part 3: Stairs, stepladders and guard-rails

Sécurité des machines — Moyens d'accès permanents aux machines —

Partie 3: Escaliers, échelles à marches et garde-corps

[Revision of first edition (ISO 14122-3:2001) and the first edition ISO 14122-3:2001/Amd 1:2010]

ICS: 13.110

ISO/CEN PARALLEL PROCESSING

This draft has been developed within the European Committee for Standardization (CEN), and processed under the **CEN 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.

To expedite distribution, this document is circulated as received from the committee secretariat. ISO Central Secretariat work of editing and text composition will be undertaken at publication stage.

Reference number
ISO/DIS 14122-3:2013(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.

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 14122-3 was prepared by Technical Committee ISO/TC 199, *Safety of machinery*.

This second edition cancels and replaces the first edition which has been technically revised.

ISO 14122 consists of the following parts, under the general title *Safety of machinery — Permanent means of access to machinery*:

Part 1: Choice of fixed means of access

Part 2: Working platforms and walkways

Part 3: Stairs, stepladders and guards-rails

Part 4: Fixed ladders

Introduction

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

This document is of relevance, in particular, for the following stakeholder groups representing the market players with regard to machinery safety:

— machine manufacturers (small, medium and large enterprises);

— health and safety bodies (regulators, accident prevention organisations, market surveillance etc.);

Others can be affected by the level of machinery safety achieved with the means of the document by the above-mentioned stakeholder groups:

— machine users/employers (small, medium and large enterprises);

— machine users/employees (e. g. trade unions, organizations for peoples with special needs);

— service providers, e. g. for maintenance (small, medium and large enterprises);

— consumers (in case of machinery intended for use by consumers).

The above mentioned stakeholder groups have been given the possibility to participate at the drafting process of this document.

In addition this document is intended for standardisation bodies elaborating type-C standards.

The requirements of this document can be supplemented or modified by a type-C standard.

For machines which are covered by the scope of a type-C standard and which have been designed and built according to the requirements of that standard, the requirements of that type-C standard take precedence.

The purpose of this standard is to define the general requirements for safe access to machines. This part of ISO 14122 gives advice about the correct choice of access means when the necessary access to the machine is not possible directly from the ground level or from a floor.

The dimensions specified are consistent with established ergonomic data given in ISO 15534-3.

Safety of machinery — Permanent means of access to machinery — Part 3: Stairs, stepladders and guards-rails

1 Scope

This International Standard applies to stationary machinery where fixed means of access are necessary.

This part of ISO 14122 applies to stairs, step ladders and guard-rails which are a part of a machine.

NOTE 1 If no national standard or regulation is applicable this standard may be used also for means of access which are outside the scope of this standard.

This International Standard is applicable also to non-powered adjustable parts (e. g. foldable, slidable) and to the movable parts of fixed means of access.

This International Standard is not applicable to machinery manufactured before the date of its publication.

NOTE 2 For mobile machinery, due to their dimensions and particular conditions of use, specific requirements deviating from this standard can be applied. Therefore it is intended to develop a standard for mobile machinery excluding mobile machinery used in rough terrain. For access to mobile machinery used in rough terrain such earth moving machinery see ISO 2867 and for agriculture machinery see ISO 4254-1.

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.

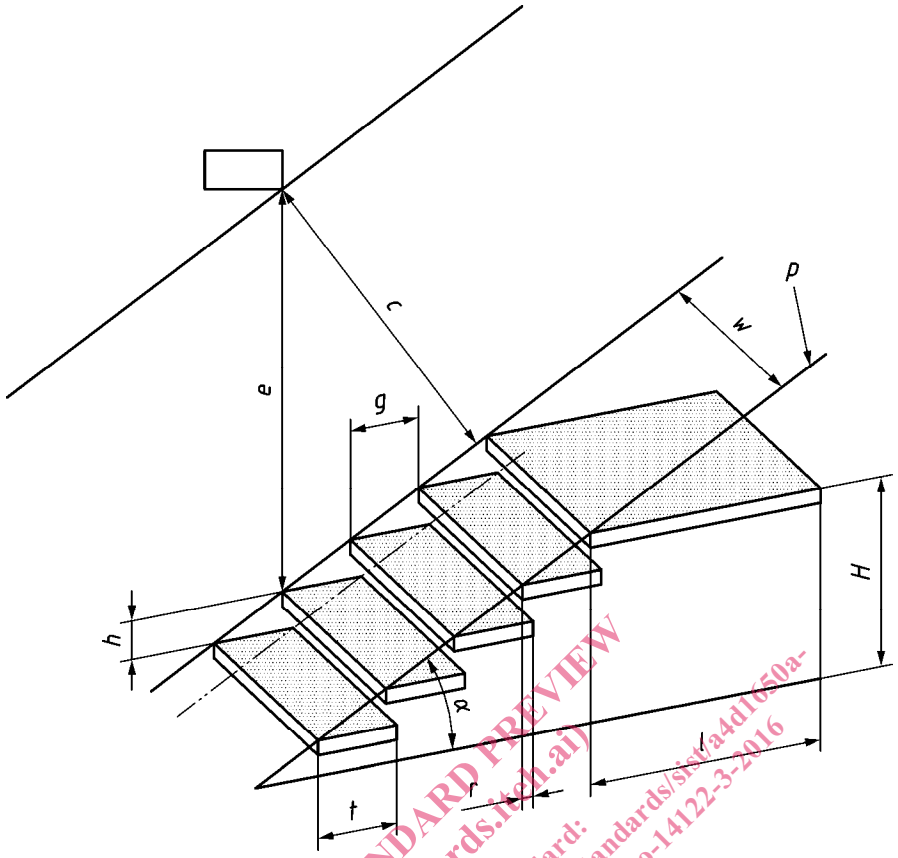
ISO 12100, *Safety of machinery - General principles for design, risk assessment and risk reduction*

ISO/DIS 14122-1:2013, *Safety of machinery - Permanent means of access to machinery - Part 1: Choice of fixed means of access between two levels*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in ISO 12100, ISO/DIS 14122-1:2013 and the following apply.

3.1
stairs and step ladders
Succession of horizontal levels (steps or landings) allowing passage on foot from one level to another composed of the following elements, shown in Figure 1 and explained from 3.1.1 to 3.1.16.



Key

H	Climbing height
g	Going
e	Headroom
h	Rise
l	Length of landing
r	Overlap
α	Angle of pitch
w	Width
p	Pitch line
t	Depth of step
c	Clearance

Figure 1 — Parts of stairs and step ladders

3.1.1
climbing height
vertical distance between the reference level and the landing (*H* in Figure 1)

3.1.2
flight
uninterrupted sequence of steps between two landings

3.1.3
going
horizontal distance between the step nosing of two consecutive steps (*g* in Figure 1)

3.1.4
headroom
minimum vertical distance, clear of all obstacles (such as beams, ducts, etc.) above the pitch line (*e* in Figure 1)

3.1.5
landing
horizontal resting area situated at the end of a flight (*l* in Figure 1)

3.1.6
walking line
theoretical line indicating the average path of the users.

3.1.7
overlap
difference between the depth of the step and the going (*r* in Figure 1)

3.1.8
pitch line
a notional line connecting the leading edge of the nosing of successive steps taken on the walking line and which extends down to the landing at the bottom of the flight from the nosing on the landing at the top of the flight (*p* in Figure 1)

3.1.9
angle of pitch of the stair or step ladder
angle between the pitch line and its projection on the horizontal level (α in Figure 1)

3.1.10
rise
height between two consecutive steps measured from the tread surface of one to the tread surface of the next (*h* in Figure 1)

3.1.11
step
horizontal surface on which one places the foot to go up or down the stair or step ladder

3.1.12
nosing
top edge at the front of the step or landing

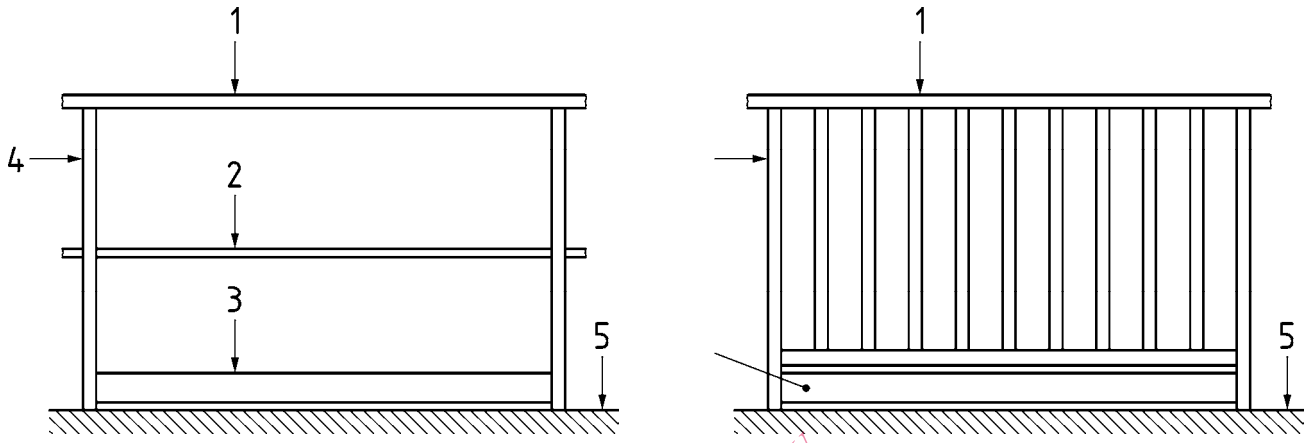
3.1.13
string
flanking framework element supporting the steps

3.1.14
width
clear distance over the outside faces of the step (*w* in Figure 1)

3.1.15
depth of step
clear distance from the leading edge or the nosing to the rear of the step (*t* in Figure 1)

3.1.16
clearance
absolute minimum clear distance between any obstacle and the pitch line (*c* in Figure 1) measured at an angle of 90° from the pitch line

3.2
guard-rail
device for protection against accidental fall with which stairs, step ladders or landings, platforms and walkways may be equipped. Typical parts of a guard-rail are shown in Figure 2 and defined in 3.2.1 to 3.2.5



a) guard-rail with kneerail **b) guard-rail with vertical uprights**

Key

1 Handrail
2 Kneerail
3 Toe plate
4 Stanchion
5 Walking level

Figure 2 — Examples of the parts of a typical structure of a guard-rail

3.2.1
handrail
rigid top element designed to be grasped by the hand for body support which can be used individually or as the upper part of a guard-rail (1 in Figure 2)

3.2.2
kneerail
rigid element of the guard-rail placed parallel with the handrail, giving extra protection against the passage of a body (2 in Figure 2)

3.2.3
stanchion
vertical structural element of the guard-rail to anchor the guard-rail to the platform or stair. (4 in Figure 2)

3.2.4
toe-plate
rigid lower part of a guard-rail or upstand on a landing to prevent the fall of objects from a floor level (3 in Figure 2)

NOTE A toe-plate also reduces the free space between the floor and kneerail to prevent the passage of a body.

3.2.5
selfclosing gate
pivoting part of the guard-rail which enables the access through the guard-rail (example for selfclosing gate without toe-plate see Figure 7)