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**Safety of machinery — Permanent means  
of access to machinery —**

**Part 2:  
Working platforms and walkways**

*Sécurité des machines — Moyens d'accès permanents aux machines —  
Partie 2: Plates-formes de travail et passerelles*



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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 3.

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 member bodies casting a vote.

Attention is drawn to the possibility that some of the elements of this part of ISO 14122 may be the subject of patent rights. ISO shall not be held responsible for identifying any or all such patent rights.

International Standard ISO 14122-2 was prepared by the European Committee for Standardization (CEN) in collaboration with ISO Technical Committee TC 199, *Safety of machinery*, in accordance with the Agreement on technical cooperation between ISO and CEN (Vienna Agreement).

Throughout the text of this standard, read "...this European Standard..." to mean "...this International Standard...".

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 between two levels*
- *Part 2: Working platforms and walkways*
- *Part 3: Stairs, stepladders and guard-rails*
- *Part 4: Fixed ladders*

Annex A of this part of ISO 14122 is for information only.

For the purposes of this part of ISO 14122, the CEN annex regarding fulfilment of European Council Directives has been removed.

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## Foreword

The text of EN ISO 14122-2:2001 has been prepared by Technical Committee CEN/TC 114 "Safety of machinery", the secretariat of which is held by DIN, in collaboration with Technical Committee ISO/TC 199 "Safety of machinery".

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 October 2001, and conflicting national standards shall be withdrawn at the latest by October 2001.

This European Standard has been prepared under a mandate given to CEN by the European Commission and the European Free Trade Association, and supports essential requirements of EU Directive(s).

According to the CEN/CENELEC Internal Regulations, the national standards organizations of the following countries are bound to implement this European Standard: Austria, Belgium, Czech Republic, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Luxembourg, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland and the United Kingdom.

## Introduction

It is the second part of this document "Safety of machinery - Permanent means of access to machinery". The parts of the standard are :

Part 1 : Choice of a fixed means of access between two levels

Part 2 : Working platforms and walkways

Part 3 : Stairs, stepladders and guard-rails

Part 4 : Fixed ladders.

This document is a type B standard as stated in EN 1070.

This standard is to be read in conjunction with clause 1.6.2 "Access to operating position and servicing points" and 1.5.15 "Risk of slipping, tripping or falling" of the essential safety requirements expressed in annex A of EN 292-2:1991/A1:1995. See also 6.2.4 "Provision for safe access to machinery" of EN 292-2:1991.

The provisions of this document may be supplemented or modified by a type C standard.

**NOTE 1** For machines which are covered by the scope of a type C standard and which have been designed and built according to the provisions of that standard, the provisions of that type C standard take precedence over the provisions of this type B standard.

The purpose of this standard is to define the general requirements for safe access to machines mentioned in EN 292-2. Part 1 of EN 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 EN 547-3 "Safety of machinery - Human body dimensions – Part 3 : Anthropometric data".

**NOTE 2** The use of materials other than metals (composite materials, so-called "advanced" materials, etc.) does not alter the application of the present standard.

Annex A is informative and contains "Different methods of determining levels of slip-resistance",

This standard contains a Bibliography.

## 1 Scope

This standard applies to all machinery (stationary and mobile) where fixed means of access are necessary.

This standard applies to working platforms and walkways which are a part of a machine.

This standard may also apply to working platforms and walkways to that part of the building where the machine is installed, providing the main function of that part of the building is to provide a means of access to the machine.

**NOTE** This standard may be used also for means of access which are outside the scope of this standard. In those cases the possible relevant national or other regulations should be taken into account.

This standard applies also to working platforms and walkways specific to the machine which are not permanently fixed to the machine and which may be removed or moved to the side for some operations of the machine (e.g. changing tools in a large press).

This standard does not apply to lifts, to moveable elevating platforms or other devices specially designed to lift persons between two levels.

For the significant hazards covered by this standard, see clause 4 of EN ISO 14122-1.

## 2 Normative references

The following normative documents contain provisions which, through reference in this text, constitute provisions of this part of ISO 14122. For dated references, subsequent amendments to, or revisions of, any of these publications do not apply. However, parties to agreements based on this part of ISO 14122 are encouraged to investigate the possibility of applying the most recent editions of the normative documents indicated below. For undated references, the latest edition of the normative document referred to applies. Members of ISO and IEC maintain registers of currently valid International Standards.

EN 292—1 (ISO/TR 12100-1), *Safety of machinery — Basic concepts, general principles for design — Part 1 : Basic terminology, methodology*

EN 292-2/A1 (ISO/TR 12100-2), *Safety of machinery — Basic concepts, general principles for design — Part 2 : Technical principles and specifications*

EN 294 (ISO 13852), *Safety of machinery — Safety distances to prevent danger zones being reached by the upper limbs*

EN 547-1, *Safety of machinery — Human body dimensions — Part 1 : Principles for determining the dimensions required for openings for whole body access into machinery*

EN 547-2, *Safety of machinery — Human body dimensions — Part 2 : Principles for determining the dimensions required for access openings*

EN 547-3, *Safety of machinery — Human body dimensions — Part 3 : Anthropometric data*

EN 1070, *Safety of machinery — Terminology*

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

EN ISO 14122-3:2001, *Safety of machinery — Permanent means of access to machinery — Part 3 : Stairs, stepladders and guard-rails*

### 3 Terms and definitions

For the purposes of this part of EN ISO 14122, the terms and definitions stated in EN 1070 "Safety of machinery - Terminology" and of EN ISO 14122-1 apply.

The following additional definitions particularly required for this standard apply :

#### 3.1

##### **flooring**

assembly of elements making up the floor of a walkway or a working platform and being in direct contact with footwear

#### 3.2

##### **walkway**

level surface used for moving from one point to another

#### 3.3

##### **working platform**

level surface used for the operation, maintenance, inspection, repair, sampling and other phases of work in connection with the machinery

#### 3.4

##### **slip resistant surface**

flooring surface designed for improving the grip of footwear

### 4 General requirements

Walkways and working platforms shall comply with the following general safety requirements:

#### 4.1 General

The working platforms and walkways shall be designed, constructed, located and where necessary protected so that the operators are safe when having access to the working platforms and when they are on them for the operation, setting, monitoring, repairing or any other work involved with the machinery.

##### 4.1.1 Construction and materials

Working platforms and walkways shall be designed and constructed and the materials selected so that they withstand the foreseeable conditions of use. In particular, at least the following details shall be considered:

- a) dimensioning and selection of components (including fixings, connections, supports and foundations) to ensure sufficient rigidity and stability;
- b) resistance of all parts to environmental effects (such as climate, chemical agents, corrosive gases) e.g. by the use of a corrosion resistant material or with the aid of a suitable protective coating;
- c) positioning of constructional elements so that water cannot be accumulated e.g. in the joints;
- d) use of compatible materials e.g. to minimise galvanic action or differential thermal expansion;
- e) dimension of walkways and working platforms shall be according to available anthropometric data (see 4.2.2 of this standard, see also EN 547-1 and EN 547-3);



- f) walkways and working platforms shall be designed and constructed to prevent the hazards due to falling objects. For guard-rails and toe plates, see clause 7 of EN ISO 14122-3:2001 and for openings in the flooring, see 4.2.4.4 of this standard;
- g) the removal of any part of the machine shall, as far as practicable, be possible without removing guard-rails, pieces of flooring or other permanent protective barriers.

#### 4.1.2 Safety of operators

Walkways and working platforms shall be designed and constructed so that they are safe to use. In particular, the following details shall at least be considered:

- a) all parts likely to be in contact with operators shall be designed and built in such a way that the operator is safe-guarded against injuries;
- b) walkways and working platforms shall be designed and built in such a way that the walking surfaces have durable slip resistant properties;
- c) the parts of machinery which operators have to walk or stand on shall be designed and fitted out to prevent persons falling from them (see EN ISO 14122-3);
- d) working platforms and access to working platforms shall be laid out in such a way that operators can quickly leave their workplace in the event of a hazard or can be quickly helped and easily evacuated when necessary;
- e) handrails and other supports shall be designed, built and laid out in such a way that they are used instinctively.

### 4.2 Specific requirements

#### 4.2.1 Location

As far as possible, walkways and working platforms shall be located away from the emission of harmful materials or substances. The walkways and walking platforms shall also be located away from the accumulation of material, such as earth, which is likely to cause slipping.

Where there are moving objects, non protected hot surfaces, unprotected live electrical equipment, etc., safety distances shall be applied in accordance with EN 294.

Working platforms shall be located in such a way as to allow people to work in an ergonomic position, if possible, between 500 mm and 1700 mm, above the surface of the working platform.

#### 4.2.2 Dimensions

The clear length and width of walkways and working platforms intended for operation and maintenance shall be determined by:

- a) the demands of the task e.g. positions, nature and speed of movement, application of force, etc.;
- b) whether or not tools, spare parts etc. are being carried;
- c) frequency and duration of task and use;
- d) number of operators on walkways or working platforms at the same time ;
- e) possibility of operators meeting ;

- f) whether or not additional equipment such as safety clothing is being worn or personal protective equipment is being carried ;
- g) the presence of isolated obstacles ;
- h) the evacuation of an injured person ;
- i) walkway ending in a dead end ;
- j) walls likely to damage or mark operators' clothing ;
- k) the need for unrestricted work-movements, and the need for space when using foreseeable tools.

In accordance with the values mentioned in EN 547-1 and EN 547-3 standards, unless exceptional circumstances exist the minimum headroom over working platforms and walkways shall be 2100 mm.

**NOTE 1** When justified by the risk assessment and restrictions due to the machinery or environment, the clear height may be reduced to no less than 1900 mm if:

- the working platform or walkway is used only occasionally, or
- the reduction is made only for a short distance.

Unless there are exceptional circumstances, the clear width of a walkway shall be minimum 600 mm but preferably 800 mm. When the walkway is usually subject to passage or crossing of several persons simultaneously, the width shall be increased to 1000 mm. The width of the walkway, when designated as an escape way shall meet the requirements of appropriate regulations.

**NOTE 2** When justified by the risk assessment and restrictions due to the machinery or environment, the free width may be reduced to no less than 500 mm if:

- the working platform or walkway is used only occasionally, and
- the reduction is made only for a short distance.

If there are isolated obstacles on a wall or under a ceiling that restrict the required width or height, guarding shall be provided. Moreover, safety measures, e.g. padding, shall be fitted to prevent injuries. Warning signs should also be considered.

### **4.2.3 Facilities or equipment**

Guard-rails in accordance with EN ISO 14122-3 shall be provided if there is a risk of falling from walkways or working platforms from a height of 500 mm or more.

Guard-rails are also required at places where there is a risk of sinking or collapsing (e.g. walkway to access to an extraction machine on a roof).

Appropriate facilities shall be provided for handling heavy objects without rolling or placing them on working platforms.

### **4.2.4 Floorings**

#### **4.2.4.1 Hazards due to stagnation and/or accumulation of liquid**

Floorings shall be designed such that any liquids spilled on them are drained away. If this requirement is not possible to fulfil for some special reasons, slipping and other hazards caused by the liquid shall be prevented or minimized in some other suitable way.

#### 4.2.4.2 Hazards due to accumulated substances

Floorings shall be made in such a way that neither dirt, snow, ice, etc. nor other substances may accumulate. Therefore, permeable floorings such as gratings or cold formed planks are an advantage. If this is not possible and permeable floorings are not used, facilities for removing the accumulated substances shall be provided where necessary.

#### 4.2.4.3 Trip hazards

To avoid trip hazards, the greatest difference between the tops of neighbouring flooring surfaces shall not exceed 4 mm in height.

#### 4.2.4.4 Hazards generated by falling objects

##### a) Flooring

Generally, the risk assessment effects the choice of open floorings to working platforms or walkways:

- the flooring of a working platform or walkway shall only have such maximum openings that a ball with a diameter of 35 mm cannot fall through;
- floorings above a place where people are working, as opposed to occasional passage, shall have such maximum openings that a ball with a diameter of 20 mm cannot fall through unless the same safety is guaranteed by other suitable means.

In cases where the risk assessment concludes that hazards caused by objects or other materials falling or passing through the flooring are more significant than the slipping, falling, etc. hazards, the flooring shall have no opening.

##### b) Joints

Between the edges of floorings and adjacent construction elements or opening edges required to suit elements fitted in the openings e.g. piping, bins or supports, a toe plate is necessary if the distance between flooring and element exceeds 30 mm.

#### 4.2.4.5 Falling through flooring hazard

If flooring is made of detachable elements, i.e. removable, e.g. where required for maintenance of auxiliary equipment mounted below flooring:

- any hazardous movement of these elements shall be prevented e.g. by fasteners;
- it shall be possible to inspect fixings in order to detect any corrosion or any hazardous loosening or change of position of clamps.

#### 4.2.4.6 Slip hazards

Floorings shall have a surface finish which is designed to reduce the risk of slipping. Whilst waiting for the European standards on enhanced slip resistance, see informative annex A.

#### 4.2.5 Design loads

The schedule of specifications for the working platforms and walkways shall state the load for which it is designed.

The minimum operating loads to take into account for the landing, walkways and working platforms are:

- 2 kN/m<sup>2</sup> under distributed load for the structure;
- 1,5 kN concentrated load applied in the most unfavourable position over a concentrated load area of 200 mm x 200 mm for the flooring.

When loaded with the design load, the deflection of the flooring shall not exceed 1/200<sup>th</sup> of the span and the difference between the loaded and a neighbouring unloaded flooring shall not exceed 4 mm in height.

The safe strength design of the walkways and working platforms shall be verified either by calculation or by tests.

### 5 Assembly instructions

All information on the proper assembly shall be contained in the assembly instructions. In particular, information on the method of fixing shall be included.

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## **Annex A**

### **(informative)**

## **Different methods of determining levels of slip-resistance**

No European Standards exist for the moment, but in the meantime, any of the following national documents are available for consultation:

### **France**

Exigences pour une norme de mesure de la glissance des sols – Étude documentaire et discussion - ND 1987-159-95 – INRS

Sols anti-dérapants – Critère d'évaluation de la résistance au glissement – Application aux sols des industries de l'alimentation - ND 1853-145-91

Normalisation de la glissance des sols et des chaussures - ND 1936-152-93

Glissance des sols et coefficients de frottement - Cahier 2484 (avril 1991) - CSTB

### **Germany**

Merkblatt für Fußböden in Arbeitsräumen und Arbeitsbereichen mit Rutschgefahr - ZH 1/571 - (Oktober 1993) - HVBG.

### **United Kingdom**

BS 7188:1998 - Impact absorbing playground surfacing Performance requirements and test methods - - Clause 5 "Slip resistance"

BS 8204-3 : 1993 - In-situ floorings Part 3. Code of practice for polymer modified cementitious wearing surfaces Annex C "Determination of slip resistance value SRV".

## Bibliography

In compiling this standard, the following have been taken into account :

EN 131-2:1993<sup>1</sup> *Ladders — Requirements, Tests, Markings*

EN 349 (ISO 13854) *Safety of machinery — Minimum gaps to avoid crushing of parts of the human body*

EN 353-1 *Personal protective equipment against falls from a height — Guided type fall arresters on a rigid anchorage line*

EN 364 *Personal protective equipment against falls from a height — Test methods*

EN 795 *Protection against falls from a height — Anchorage devices — Requirements and testing*

EN 811 (ISO 13853) *Safety of machinery — Safety distances to prevent danger zones being reached by the lower limbs*

EN 1050 (ISO 14121) *Safety of machinery — Principles for risk assessment*

prEN ISO 14122-4:1996 *Safety of machinery — Permanent means of access to machinery — Part 4 : Fixed ladders*

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<sup>1</sup> Under revision.



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