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

**Part 4:  
Fixed ladders**

*Sécurité des machines — Moyens d'accès permanents aux  
machines —*  
*Partie 4: Échelles fixes*

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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 14122-4 was prepared by the European Committee for Standardization (CEN) in collaboration with Technical Committee ISO/TC 199, *Safety of machinery*, in accordance with the Agreement on technical cooperation between ISO and CEN (Vienna Agreement).

Throughout the text of this document, 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*:  
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- *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*

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

This document (EN ISO 14122-4:2004) 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 June 2005, and conflicting national standards shall be withdrawn at the latest by June 2005.

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 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, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Portugal, Slovakia, Slovenia, Spain, Poland, Sweden, Switzerland and the United Kingdom.

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## Introduction

This is the fourth part of the standard "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 European standard is a type B standard as stated in EN ISO 12100.

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 5.5.6 "Measures for safe access to machinery" of EN ISO 12100-2:2003 which supersedes EN 292-2.

The provisions of this document can 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 will take precedence over the provisions of this type B standard.

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.

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## 1 Scope

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

The purpose of this standard is to define the general requirements for safe access to machines mentioned in EN ISO 12100-2. EN ISO 14122-1 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.

This standard applies to fixed ladders, which are a part of a machine.

This standard may also be applied to fixed ladders 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 ladders which are not permanently fixed to the machine and which may be removed, moved to the side or pivoted (swivel-mounted) for some operations of the machine (e. g. changing tools in a large press).

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

This standard is not applicable to machinery which are manufactured before the date of publication of this standard by CEN.

## 2 Normative references

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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.

EN 131-2:1993, *Ladders — Requirements, tests, markings*.

EN 353-1, *Personal protective equipment against falls from a height — Part 1: Guided type fall arresters including a rigid anchorage line*.

EN 363, *Personal protective equipment against falls from a height — Fall arrest systems*.

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

EN ISO 12100-2:2003, *Safety of machinery — Basic concepts, general principles for design — Part 2: Technical principles (ISO 12100-2:2003)*.

EN ISO 14122-1, *Safety of machinery — Permanent means of access to machinery — Part 1: Choice of a fixed means of access between two levels (ISO 14122-1:2001)*.

EN ISO 14122-2, *Safety of machinery — Permanent means of access to machinery — Part 2: Working platforms and walkways (ISO 14122-2:2001)*.

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

## 3 Terms and definitions

For the purposes of this European Standard, the terms and definitions given in EN ISO 12100-1:2003, EN ISO 14122-1:2001 and the following apply.

The main terms used in the present standard are given as an example in Figures 1, 2, 3 and 4.

### 3.1

#### **fixed ladder with two stiles**

ladder, according to 3.1 of EN ISO 14122-1, which is stationary and where the rungs are arranged between and attached to the stiles. The stiles carry the load (see Figure 2)

### 3.2

#### **fixed ladder with one stile**

ladder, according to 3.1 of EN ISO 14122-1, which is stationary and where the rungs are attached to both sides of the stile. The stile carries the load alone (see Figure 3)

### 3.3

#### **ladder flight**

continuous part of the fixed ladder (see Figure 1):

- between arrival and departure area, in the case of ladders without platforms; or
- between the arrival area respectively departure area and the nearest platform; or
- between rest platforms following each other

### 3.4

#### **climbing height $H$ of a fixed ladder**

total vertical distance between the walking surface of the arrival area at the top of the ladder(s) and the walking surface of the departure area at the base of the ladder(s) (see Figure 1)

### 3.5

#### **height $h$ of the ladder flight**

vertical distance between the level at the beginning and the level at the end of each flight (see Figure 1)

### 3.6

#### **fall protection**

technical measure to prevent or reduce the risk of people falling from fixed ladders

NOTE Commonly used fall protection devices are defined in 3.6.1 and 3.6.2.

#### 3.6.1

##### **safety cage**

assembly which serves to limit the risk of people falling from the ladder (see Figure 2)

#### 3.6.2

##### **guided type fall arrester on a rigid anchorage line**

##### **fall arrester**

protective equipment fixed to ladder used in combination with personal protective equipment that everyone has available before being allowed to use the ladder. (See also definition in EN 353-1 and EN 363)

In the following text the abbreviation "fall arrester" will also be used for this type of fall protection device.

### 3.7

#### **arrival level**

upper level of the surroundings or of the intermediate platform to which, the person steps after the ascent (see Figure 1)

### 3.8

#### **departure level**

lower level of the surroundings or of the intermediate platform from which the person starts to climb the fixed ladder (see Figure 1)



**3.9**

**intermediate platform**

horizontal structure (platform) between two consecutive flights of a ladder (used with ladders having staggered flights) (see Figure 1 and 4b)

**3.10**

**rest platform**

area equipped with the required protective means designed so that the user of the ladder can have a physical rest (See Figures 1b, 10, 11 and 12)

**3.11**

**access platform**

horizontal structure at the arrival or departure area used by a person for means of access

**3.12**

**trap door**

normally closed device which can be opened to give access through a platform or through other similar horizontal structures

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Position of the rest platforms

Dimensions in millimetres

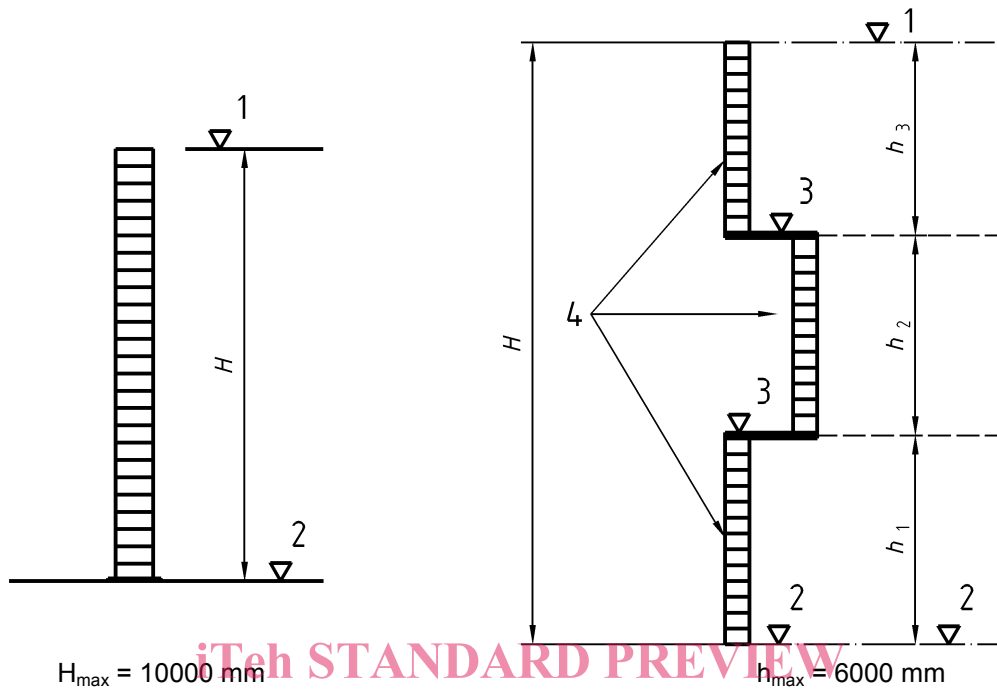


Figure 1.a : Ladder without rest platform (single flight)

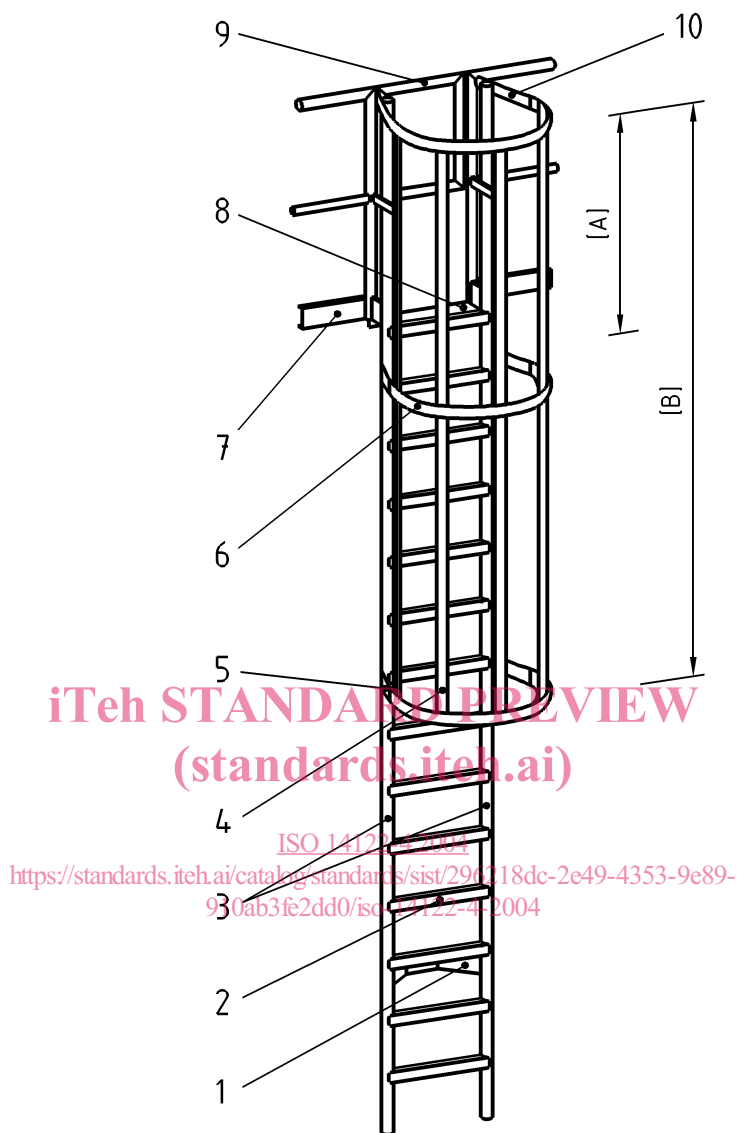
Figure 1.b : Ladder with staggered flights

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Key

- 1 Arrival area
- 2 Departure area
- 3 Intermediate platform or rest platform
- 4 Ladder flight

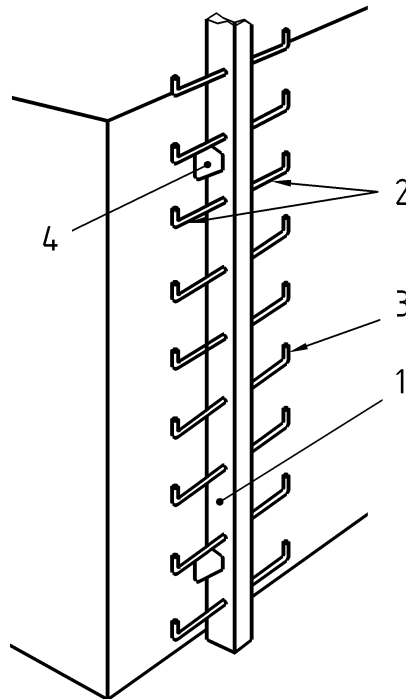
Figure 1 — Height of flights and location of platforms



**Key**

- 1 Anchor bracket
- 2 Rung
- 3 Ladder stile
- 4 Safety cage vertical members
- 5 Lowest hoop
- 6 Intermediate hoop
- 7 Toe plate
- 8 Platform step
- 9 Gate
- 10 Upper hoop
- [A] Exit section
- [B] Safety cage

**Figure 2 — Terminology**



**Key**

- 1 Stile
- 2 Rung
- 3 Protective device against slipping-off
- 4 Anchor point

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**Figure 3 — Example of a ladder less than 3000 mm with one stile**

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**4 Safety requirements**

**4.1 General requirements**

The materials, dimensions of constituent elements and construction mode used shall meet the safety objectives of this standard.

Ladders shall be designed to meet the same installation requirements as the machine, taking into consideration where necessary, conditions such as harsh environment, vibrations, etc.

As far as possible, fixed ladders should be designed with two stiles. In exceptional circumstances (e. g. a continuous ladder with a varying angle of pitch or insufficient space to provide two stiles), fixed ladders may be provided with only one stile.

All parts likely to be in contact with users shall be designed so as not to catch, hurt or hinder i. e. sharp corners, welds with burrs, or rough edges, etc. should be avoided. Opening or closing the mobile parts (gate) shall not cause further hazards (e. g. shearing or accidental falling) for persons using the ladder and those in the vicinity.

Fittings, hinges, anchor points, supports and mounting points shall hold the assembly sufficiently rigid and stable to ensure the safety of users under normal conditions of use.

**4.2 Strength of fixed ladders**

**4.2.1 General requirements**

A ladder, platform and safety cage (when installed) shall meet the following design requirements: