



SLOVENSKI STANDARD SIST EN ISO 14122-4:2016

01-november-2016

Nadomešča:

SIST EN ISO 14122-4:2005

SIST EN ISO 14122-4:2005/A1:2010

Varnost strojev - Stalni dostopi do strojev - 4. del: Fiksne lestve (ISO 14122-4:2016)

Safety of machinery - Permanent means of access to machinery - Part 4: Fixed ladders (ISO 14122-4:2016)

Sicherheit von Maschinen - Ortsfeste Zugänge zu maschinellen Anlagen - Teil 4: Ortsfeste Steigleitern (ISO 14122-4:2016)

Sécurité des machines - Moyens d'accès permanents aux machines - Partie 4: Échelles fixes (ISO 14122-4:2016)

Ta slovenski standard je istoveten z: **EN ISO 14122-4:2016**

ICS:

13.100	Varnost pri delu. Industrijska higiena	Occupational safety. Industrial hygiene
13.110	Varnost strojev	Safety of machinery
97.145	Lestve	Ladders

SIST EN ISO 14122-4:2016

en,de

iTeh STANDARD PREVIEW
(standards.iteh.ai)

SIST EN ISO 14122-4:2016

<https://standards.iteh.ai/catalog/standards/sist/a465c526-4d3c-4538-98e3-d57fc8ce312d/sist-en-iso-14122-4-2016>

EUROPEAN STANDARD

EN ISO 14122-4

NORME EUROPÉENNE

EUROPÄISCHE NORM

June 2016

ICS 13.110

Supersedes EN ISO 14122-4:2004

English Version

Safety of machinery - Permanent means of access to machinery - Part 4: Fixed ladders (ISO 14122-4:2016)

Sécurité des machines - Moyens d'accès permanents
aux machines - Partie 4: Échelles fixes (ISO 14122-
4:2016)

Sicherheit von Maschinen - Ortsfeste Zugänge zu
maschinellen Anlagen - Teil 4: Ortsfeste Steigleiter (ISO
14122-4:2016)

This European Standard was approved by CEN on 29 April 2016.

CEN members are bound to comply with the CEN/CENELEC Internal Regulations which stipulate the conditions for giving this European Standard the status of a national standard without any alteration. Up-to-date lists and bibliographical references concerning such national standards may be obtained on application to the CEN-CENELEC Management Centre or to any CEN member.

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-CENELEC Management Centre has the same status as the official versions.

CEN members are the national standards bodies of Austria, Belgium, Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, Former Yugoslav Republic of Macedonia, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey and United Kingdom.



EUROPEAN COMMITTEE FOR STANDARDIZATION
COMITÉ EUROPÉEN DE NORMALISATION
EUROPÄISCHES KOMITEE FÜR NORMUNG

CEN-CENELEC Management Centre: Avenue Marnix 17, B-1000 Brussels

Contents	Page
European foreword.....	3
Annex ZA (informative) Relationship between this European Standard and the essential requirements of Directive 2006/42/EC machinery, and amending Directive 95/16/EC (recast) [2006 L157] aimed to be covered.....	4

iTeh STANDARD PREVIEW
(standards.iteh.ai)

SIST EN ISO 14122-4:2016
<https://standards.iteh.ai/catalog/standards/sist/a465c526-4d3c-4538-98e3-d57fc8ce312d/sist-en-iso-14122-4-2016>

European foreword

This document (EN ISO 14122-4:2016) 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 December 2016, and conflicting national standards shall be withdrawn at the latest by December 2016.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. CEN [and/or CENELEC] shall not be held responsible for identifying any or all such patent rights.

This document supersedes EN ISO 14122-4:2004.

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).

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

According to the CEN-CENELEC Internal Regulations, the national standards organizations of the following countries are bound to implement this European Standard: Austria, Belgium, Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, Former Yugoslav Republic of Macedonia, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey and the United Kingdom.

Endorsement notice

The text of ISO 14122-4:2016 has been approved by CEN as EN ISO 14122-4:2016 without any modification.

Annex ZA (informative)

Relationship between this European Standard and the essential requirements of Directive 2006/42/EC machinery, and amending Directive 95/16/EC (recast) [2006 L157] aimed to be covered

This European Standard has been prepared under a Commission's standardization request M/396 to provide one voluntary means of conforming to essential requirements of Directive 2006/42/EC of the European Parliament and of the Council of 17 May 2006 on machinery, and amending Directive 95/16/EC (recast) [2006 L157].

Once this standard is cited in the Official Journal of the European Union under that Directive, compliance with the normative clauses of this standard given in Table ZA.1 confers, within the limits of the scope of this standard, a presumption of conformity with the corresponding essential requirements of that Directive, and associated EFTA regulations.

Table ZA.1 — Correspondence between this European Standard and Directive 2006/42/EC [2006 L157]

Essential Requirements of Directive 2006/42/EC	Clause(s) / subclause(s) of this EN	Remarks / Notes
1.5.15 "Risks of slipping, tripping or falling"	All	
1.6.2 "Access to operating position and service points"	All	

WARNING 1 — Presumption of conformity stays valid only as long as a reference to this European Standard is maintained in the list published in the Official Journal of the European Union. Users of this standard should consult frequently the latest list published in the Official Journal of the European Union.

WARNING 2 — Other Union legislation may be applicable to the product(s) falling within the scope of this standard.

IMPORTANT: Compliance with the requirements of EN ISO 14122-1 and a relevant access-specific part of EN ISO 14122 is necessary to achieve presumption of conformity.

INTERNATIONAL
STANDARD

ISO
14122-4

Second edition
2016-06-01

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

**Part 4:
Fixed ladders**

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

iTeh STANDARD PREVIEW
Partie 4: Échelles fixes
(standards.iteh.ai)

SIST EN ISO 14122-4:2016

<https://standards.iteh.ai/catalog/standards/sist/a465c526-4d3c-4538-98e3-d57fc8ce312d/sist-en-iso-14122-4-2016>



Reference number
ISO 14122-4:2016(E)

© ISO 2016

iTeh STANDARD PREVIEW (standards.iteh.ai)

SIST EN ISO 14122-4:2016

<https://standards.iteh.ai/catalog/standards/sist/a465c526-4d3c-4538-98e3-d57fc8ce312d/sist-en-iso-14122-4-2016>



COPYRIGHT PROTECTED DOCUMENT

© ISO 2016, Published in Switzerland

All rights reserved. Unless otherwise specified, no part of this publication may be reproduced or utilized otherwise in any form or by any means, electronic or mechanical, including photocopying, or posting on the internet or an intranet, without prior written permission. Permission can be requested from either ISO at the address below or ISO's member body in the country of the requester.

ISO copyright office
Ch. de Blandonnet 8 • CP 401
CH-1214 Vernier, Geneva, Switzerland
Tel. +41 22 749 01 11
Fax +41 22 749 09 47
copyright@iso.org
www.iso.org

Contents

	Page
Foreword	v
Introduction	vi
1 Scope	1
2 Normative references	1
3 Terms and definitions	2
4 Selection and design of ladder systems	6
4.1 General.....	6
4.1.1 Design and construction.....	6
4.1.2 Choice depending on available space.....	6
4.1.3 Spacing between the ladder and any permanent obstruction.....	6
4.2 Choice of a type fall protection device.....	7
4.2.1 Necessity of a fall protection device.....	7
4.2.2 Types of fall protection devices.....	7
4.2.3 Guidance for a risk assessment.....	8
4.3 Height of ladder flights and fall protection device.....	8
4.3.1 Limits of space.....	8
4.3.2 Ladder systems >3 000 mm and ≤10 000 mm total height, <i>H</i>	8
4.3.3 Ladder systems >10 000 mm total height, <i>H</i>	9
4.4 Platforms and landings.....	9
4.4.1 Installation of platforms at arrival and departure areas.....	9
4.4.2 Arrangement of platforms and landings for ladders with a total height, <i>H</i> >10 000 mm.....	9
5 Specific requirements of ladder systems	10
5.1 General requirements.....	10
5.1.1 Permanent action (dead load).....	10
5.1.2 Variable action (rated load).....	11
5.1.3 Additional loading.....	13
5.1.4 Design.....	14
5.2 Ladder with two stiles.....	14
5.2.1 Strength.....	14
5.2.2 Rungs.....	14
5.2.3 Connection of ladder and guard-rail.....	17
5.3 Ladder with one stile.....	17
5.3.1 Strength.....	17
5.3.2 Rungs.....	18
5.4 Departure and arrival areas.....	19
5.4.1 General requirements.....	19
5.4.2 Departure area (entrance).....	19
5.4.3 Arrival area (exit).....	19
5.4.4 Access opening.....	19
5.4.5 Trap doors.....	21
5.5 Fall protection device.....	22
5.5.1 Safety cage.....	22
5.5.2 Fall arrester.....	26
5.6 Platforms and landings.....	26
5.6.1 Access platforms.....	26
5.6.2 Intermediate and rest platforms.....	26
5.6.3 Intermediate landings.....	27
5.6.4 Moveable rest landings.....	29
5.7 Requirements on moveable parts of fixed ladders.....	30
6 Verification of safety requirements	30
6.1 General.....	30

ISO 14122-4:2016(E)

6.1.1	General requirements.....	30
6.1.2	Verification of stability by calculation.....	31
6.1.3	Verification of stability by testing.....	31
6.2	Tests of fixed ladders with two stiles.....	31
6.2.1	Strength and bending of a ladder element.....	31
6.2.2	Test for safety cage.....	32
6.3	Test of ladders with one stile.....	33
6.3.1	Test of ladder elements.....	33
6.4	Test of extensions of guard-rails.....	35
7	Information for use for fixed ladders.....	36
7.1	Instruction handbook.....	36
7.1.1	General.....	36
7.1.2	Ladder systems with fall arrester.....	36
7.2	Marking of ladder systems with fall arrester.....	37
Annex A (normative) Requirements for the design of anti-climb devices.....		38
Annex B (informative) Summary of main dimensions of a fixed ladder equipped with a safety cage.....		42
Annex C (informative) Significant technical changes between this part of ISO 14122 and the previous edition.....		44
Bibliography.....		47

iTeh STANDARD PREVIEW
(standards.iteh.ai)

[SIST EN ISO 14122-4:2016](https://standards.iteh.ai/catalog/standards/sist/a465c526-4d3c-4538-98e3-d57fc8ce312d/sist-en-iso-14122-4-2016)

<https://standards.iteh.ai/catalog/standards/sist/a465c526-4d3c-4538-98e3-d57fc8ce312d/sist-en-iso-14122-4-2016>

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.

The procedures used to develop this document and those intended for its further maintenance are described in the ISO/IEC Directives, Part 1. In particular the different approval criteria needed for the different types of ISO documents should be noted. This document was drafted in accordance with the editorial rules of the ISO/IEC Directives, Part 2 (see www.iso.org/directives).

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. Details of any patent rights identified during the development of the document will be in the Introduction and/or on the ISO list of patent declarations received (see www.iso.org/patents).

Any trade name used in this document is information given for the convenience of users and does not constitute an endorsement.

For an explanation on the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the WTO principles in the Technical Barriers to Trade (TBT) see the following URL: [Foreword - Supplementary information](#)

The committee responsible for this document is ISO/TC 199, *Safety of machinery*.

This second edition cancels and replaces the first edition (ISO 14122-4:2004), which has been technically revised. It also incorporates the Amendment ISO 14122-4:2004/Amd 1:2010.

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 and general requirements of access*
- *Part 2: Working platforms and walkways*
- *Part 3: Stairs, stepladders and guard-rails*
- *Part 4: Fixed ladders*

An additional part, dealing with mobile machinery, is under preparation.

ISO 14122-4:2016(E)

Introduction

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

This International Standard 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 organizations, market surveillance, etc.);

Others can be affected by the level of machinery safety achieved with the means of the International Standard 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 International Standard.

In addition, this International Standard is intended for standardization bodies elaborating type-C standards.

The requirements of this International Standard 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 International Standard is to define the general requirements for safe access to machines. ISO 14122-1 gives guidance 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 or platform.

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

Safety of machinery — Permanent means of access to machinery —

Part 4: Fixed ladders

1 Scope

This part of ISO 14122 gives requirements for fixed ladders which are a part of a stationary machine, and to the non-powered adjustable parts (e.g. foldable, slidable) and movable parts of fixed ladder systems.

NOTE 1 “Fixed” means of access are those mounted in such a manner (for example, by screws, nuts, welding) that they can only be removed by the use of tools.

This part of ISO 14122 specifies minimum requirements that also apply when the same means of access is required as the part of the building or civil construction (e.g. fixed ladders) where the machine is installed, on condition that the main function of that part of the construction is to provide a means of access to the machine.

NOTE 2 Where no local regulation or standards exists, this part of ISO 14122 may be used also for means of access which are outside the scope of the standard.

It is intended that this part of ISO 14122 be used with ISO 14122-1 to give the requirements for fixed ladder systems.

The ISO 14122 series as a whole is applicable to both stationary and mobile machinery where fixed means of access are necessary. It is not applicable to powered means of access such as lifts, escalators, or other devices specially designed to lift persons between two levels.

This part of ISO 14122 is not applicable to machinery manufactured before the date of its publication.

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, *Safety of machinery — General principles for design — Risk assessment and risk reduction*

ISO 14122-1:2016, *Safety of machinery — Permanent means of access to machinery — Part 1: Choice of fixed means and general requirements of access*

ISO 14122-2:2016, *Safety of machinery — Permanent means of access to machinery — Part 2: Working platforms and walkways*

ISO 14122-3:2016, *Safety of machinery — Permanent means of access to machinery — Part 3: Stairs, stepladders and guard-rails*

EN 353-1:2014, *Personal protective equipment against falls from a height — Part 1: Guided type fall arresters including a rigid anchor line*

EN 795, *Personal fall protection equipment — Anchor devices*

ISO 14122-4:2016(E)

3 Terms and definitions

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

3.1

fixed ladder system

ladder system

fixed ladder

installation of at least one *ladder flight* (3.4), *fall protection* (3.7), where appropriate, as well as landing(s) and/or platform(s)

Note 1 to entry: In the following text, the abbreviation “ladder” and “ladder flight” is used for fixed ladders and fixed ladder flights, respectively.

3.2

ladder with two stiles

ladder, according to ISO 14122-1:2016, 3.1, which is stationary and where the rungs are arranged between and attached to the stiles

Note 1 to entry: The stiles carry the load (see [Figure 1](#)).

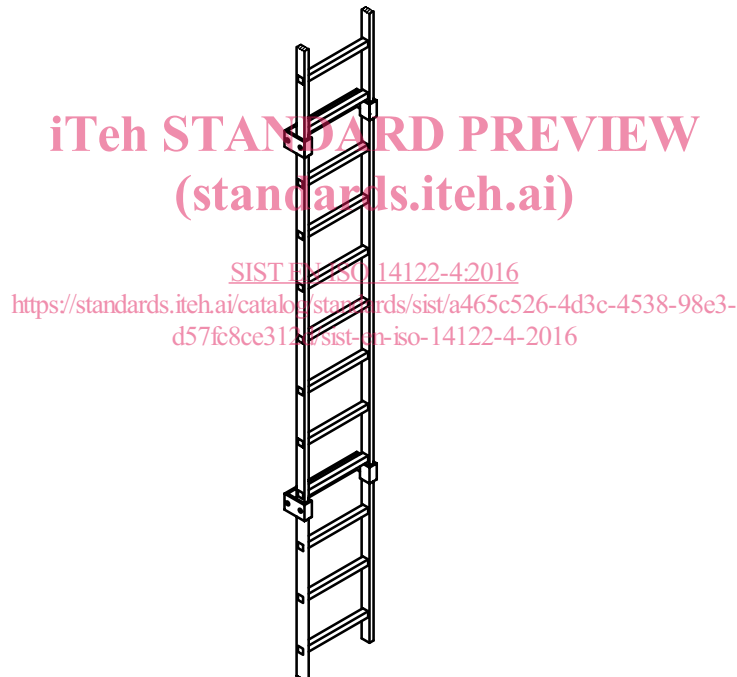


Figure 1 — Ladder with two stiles

3.3

ladder with one stile

ladder, according to ISO 14122-1:2016, 3.1, which is stationary and where the rungs are attached to both sides of the stile

Note 1 to entry: The stile carries the load alone (see [Figure 2](#)).

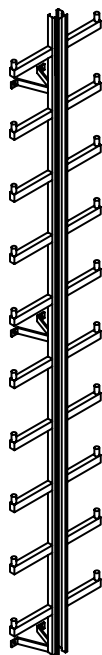


Figure 2 — Ladder with one stile

3.4 ladder flight

continuous part of the *fixed ladder* (3.1)

- between the *departure area* (3.8) and *arrival area* (3.9), in the case of ladders without platforms, or
- between the *departure area* (3.8) or *arrival area* (3.9) and the nearest platform, or
- sequentially between landings or *rest platforms* (3.12)

Note 1 to entry: See [Figures 3a](#) and [3b](#).

3.5 climbing height of ladder system total height

H

vertical distance between the departure area on the ground and the *arrival area* (3.9) at the top of a *ladder system* (3.1)

Note 1 to entry: See [Figure 3 a](#)).

Note 2 to entry: In case of staggered *ladder flights* (3.4), the vertical distance between *departure area* (3.8) of the first flight and the arrival area at the top of the last flight.

3.6 height of ladder flight

h

vertical distance of each staggered *ladder flight* (3.4)

Note 1 to entry: See [Figure 3 b](#)).