INTERNATIONAL STANDARD

ISO 10333-4

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Personal fall-arrest systems —

Part 4: Vertical rails and vertical lifelines incorporating a sliding-type fall arrester

Systèmes individuels d'arrêt de chute —
Partie 4: Rails et cordes d'assurance verticaux incorporant un dispositif d'arrêt de type coulissant

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ISO copyright office
Case postale 56 • CH-1211 Geneva 20
Tel. + 41 22 749 01 11
Fax + 41 22 749 09 47
E-mail copyright@iso.ch
Web www.iso.ch

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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.

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 part of ISO 10333 may be the subject of patent rights. ISO shall not be held responsible for identifying any or all such patent rights.

ISO 10333-4 was prepared by Technical Committee ISO/TC 94, *Personal safety — Protective clothing and equipment*, Subcommittee SC 4, *Personal equipment for protection against falls*.

ISO 10333 consists of the following parts, under the general title *Personal fall-arrest systems*:

— *Part 1: Full-body harnesses*

— *Part 2: Lanyards and energy absorbers*

— *Part 3: Self-retracting lifelines*

— *Part 4: Vertical rails and vertical lifelines incorporating a sliding-type fall arrester*

— *Part 5: Connectors with self-closing and self-locking gates*

Systems performance tests will be the subject of a future part 6 to ISO 10333.

Annex A forms a normative part of this part of ISO 10333.

Introduction

In cases where the hazard of falling from a height exists and where, for technical reasons or for work of very short duration, safe access cannot be otherwise provided, it is necessary to consider the use of personal fall-arrest systems (PFAS). Such use should never be improvised and its adoption should be specifically provided for in the appropriate formal provisions for safety in the work place.

PFAS complying with this part of ISO 10333 should satisfy ergonomic requirements and should only be used if the work allows means of connection to a suitable anchor device of demonstrated strength and if it can be implemented without compromising the safety of the user. Personnel should be trained and instructed in the safe use of the equipment and be observant of such training and instruction.

This part of ISO 10333 is based on current knowledge and practice concerning the use of PFAS that incorporate a full-body harness as specified in ISO 10333-1.

This part of ISO 10333 presumes that the manufacturer of the PFAS, subsystems or components will, for the sake of consistency and traceability, operate a quality management system which will comply with national and regional regulations in force at the time. Guidance on the form this quality management system may take can be found in ISO 9000, *Quality management systems — Fundamentals and vocabulary*.

Personal fall-arrest systems —

Part 4:
Vertical rails and vertical lifelines incorporating a sliding-type fall arrester

1 Scope

This part of ISO 10333 specifies requirements, test methods, instructions for use and maintenance, marking, labelling and packaging, as appropriate, for vertical rails and vertical lifelines which incorporate a sliding-type fall arrester.

When connected to a full-body harness as specified in ISO 10333-1, vertical rails and vertical lifelines which incorporate a sliding-type fall arrester constitute a personal fall-arrest system (PFAS), which will be specified in a future International Standard.

Vertical rails and vertical lifelines which incorporate a sliding-type fall arrester in accordance with this part of ISO 10333 are limited to use by a single person of total mass not exceeding 100 kg.

NOTE 1 Users of PFAS whose total mass (which includes attached tools and equipment) exceeds 100 kg are advised to seek advice from the equipment manufacturers regarding the suitability of the equipment, which may need additional testing.

NOTE 2 PFAS using vertical rails and permanent vertical lifelines inherently limit the user's horizontal movement, whereas PFAS using a temporary vertical lifeline permit significant horizontal movement by the user. Special notice should be given to the requirements which accommodate this difference.

The scope of this part of ISO 10333 does not extend to:

a) inclined rails and lifelines, i.e. those which are installed at an angle between the true vertical and the lifeline or rail of more than 15° when viewed from the side elevation;

b) the horizontally installed elements of compound rails or lifelines, i.e. those which have both vertically and horizontally installed elements linked by junctions.

This part of ISO 10333 does not specify those additional requirements that would apply when PFAS are subjected to special conditions of use (where, for example, there exist unusual limitations concerning access to the place of work and/or particular environmental factors). Thus treatments to ensure the durability of the materials of construction (such as heat treatment, anti-corrosion treatment, protection against physical and chemical hazards) are not specified in this part of ISO 10333, but should comply with appropriate International Standards or, failing that, with national standards or other specifications dealing with relevant physical characteristics and/or the safety of users.

2 Normative references

The following normative documents contain provisions which, through reference in this text, constitute provisions of this part of ISO 10333. 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 10333 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.

ISO 1140:1990, *Ropes — Polyamide — Specification*

ISO 1141:1990, *Ropes — Polyester — Specification*

ISO 9227:1990, *Corrosion tests in artificial atmospheres — Salt spray tests*

ISO 10333-1:2000, *Personal fall-arrest systems — Part 1: Full-body harnesses*

ISO 10333-5:2001, *Personal fall-arrest systems — Part 5: Connectors with self-closing and self-locking gates*

ISO 14567:1999, *Personal protective equipment for protection against falls from a height — Single-point anchor devices*

EN 892:1996, *Mountaineering equipment — Dynamic mountaineering ropes — Safety requirements and test methods*

EN 1891:1998, *Personal protective equipment for prevention of falls from a height — Low stretch kernmantel ropes*

3 Terms and definitions

For the purposes of this part of ISO 10333, the following terms and definitions apply.

3.1
vertical rail
rigid track which is permanently fastened by a number of brackets at intervals along its length to a fixed ladder or other structure, and to which a sliding-type fall arrester can be attached

See Figure 1.

NOTE The rail may consist of a number of sections held together by joining plates.

3.2 Vertical lifelines

3.2.1
vertical lifeline
flexible line which is either permanently or temporarily installed

3.2.2
permanent vertical lifeline
tensioned line which is permanently fastened to at least one position at its upper end, to act as a reliable anchor point

See Figure 2.

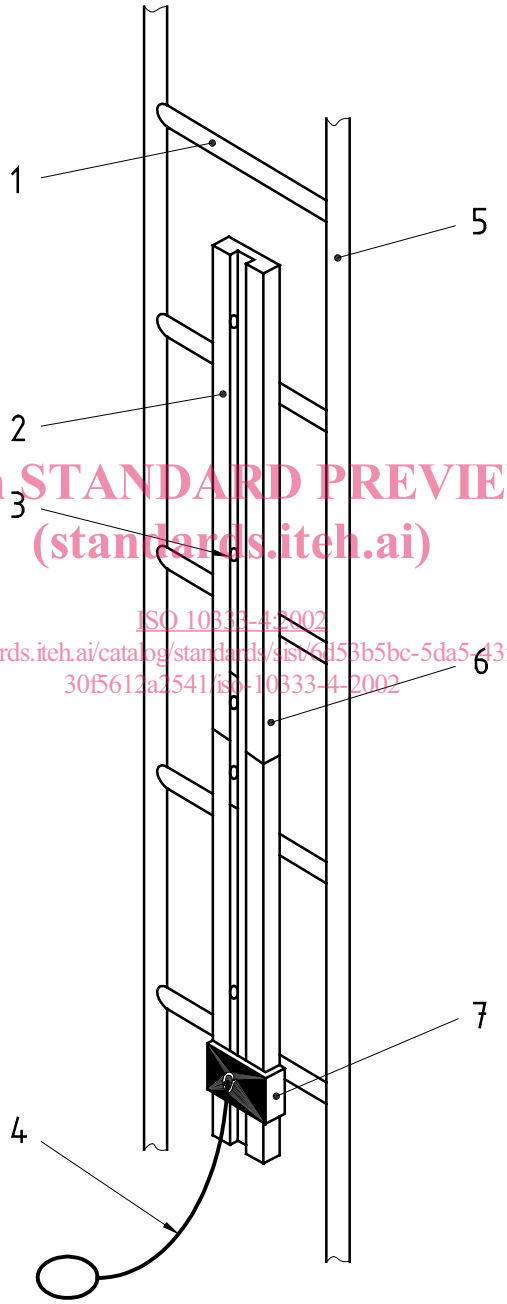
NOTE 1 It is permanently fastened to a position at its lower extremity to a fixed ladder or other structure, to which a sliding-type fall arrester can be attached.

NOTE 2 The permanent vertical lifeline may additionally be attached to the fixed ladder or other structure at a number of locations at intervals along its length.

3.2.3
temporary vertical lifeline
suspended line, which is temporarily fastened at its upper extremity to an overhead anchoring point, to which a sliding-type fall arrester can be attached

See Figure 3.

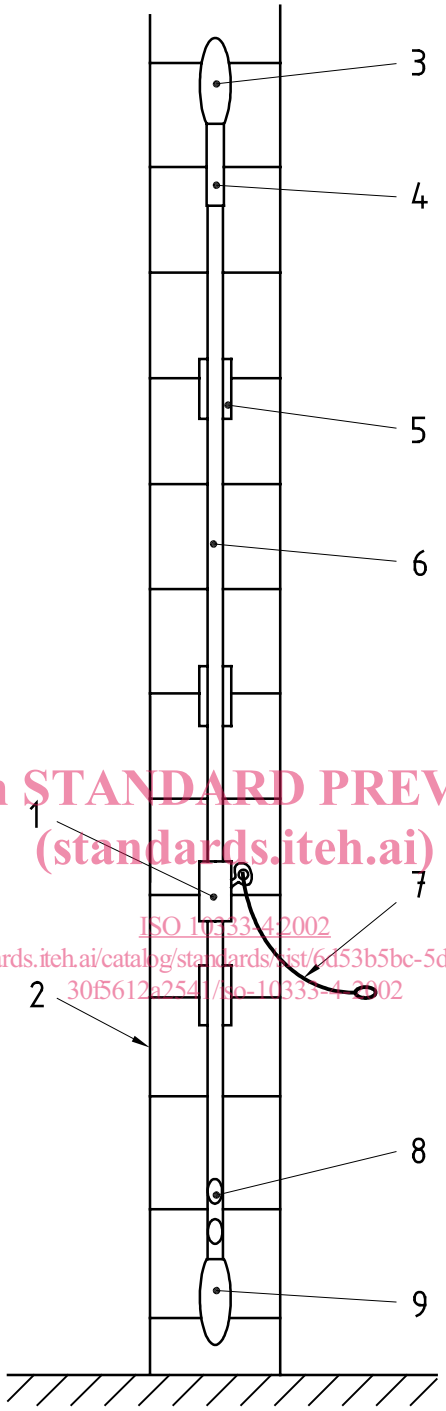
NOTE The temporary vertical lifeline may have a small weight fitted to the lower extremity to keep a nominal amount of tension in the line.



Key

1 Rung
2 Rail
3 Intermediate fastening to rung
4 Connecting line
5 Permanently installed ladder
6 Joint between rail sections
7 Sliding-type fall arrester

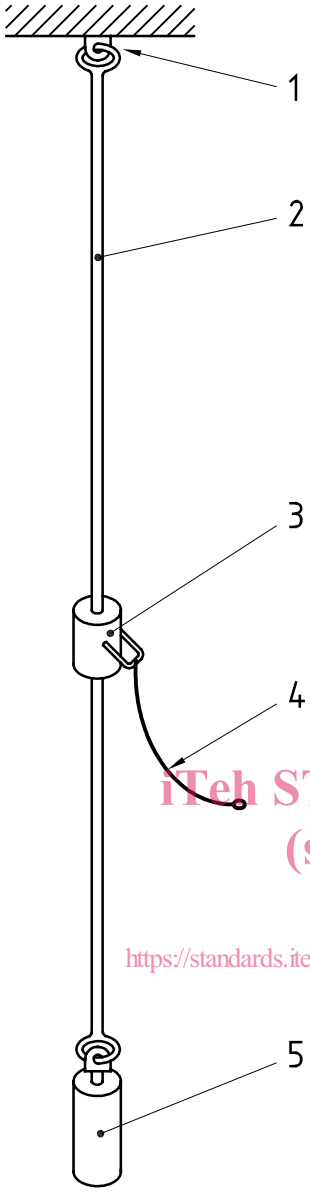
Figure 1 — Example of a vertical rail



Key

1 Sliding-type fall arrester
2 Permanently installed ladder
3 Upper fastening
4 Vertical-lifeline energy absorber
5 Intermediate fastening to rung
6 Lifeline
7 Connecting line
8 Tensioning device
9 Lower fastening

Figure 2 — Example of a permanent vertical lifeline



Key

1 Overhead anchoring point
2 Lifeline
3 Sliding-type fall arrester
4 Connecting line
5 Tensioning mass

Figure 3 — Example of a temporary vertical lifeline

3.3
sliding-type fall arrester
device which is designed to be attached to and to slide up and down the vertical rail or vertical lifeline in response to climbing movements, but locks automatically onto the vertical rail or vertical lifeline in response to the sudden motion of a fall

3.4 Connecting-line definitions

3.4.1
connecting line
line, attached to the sliding-type fall arrester, which is designed to link the sliding-type fall arrester to a fall-arrest attachment point on the full-body harness

NOTE The connecting line may be a lanyard, an energy absorber, a connector, or any combination of lanyard, energy absorber and connector.

3.4.2
connecting-line length
shortest distance measured between the bearing point of one connecting-line extremity to the other, with the connecting line held taut

3.4.3
lanyard
finished length of flexible material which may be utilized as a part or the whole of the connecting line

3.4.4
connecting-line energy absorber
component which may be utilized as a part or the whole of the connecting line, which is designed to dissipate the kinetic energy generated during a fall, and which limits the arresting forces exerted on the vertical rail or vertical lifeline and faller

3.4.5
connector
component which may be utilized as a part or the whole of the connecting line, and which is used to link the connecting line to the fall-arrest attachment point on the full-body harness

3.5
anchor connector
component which is used to connect a temporary vertical lifeline directly to an overhead anchoring point

3.6
vertical-lifeline energy absorber
component which may or may not be included at the upper fastening point of a permanent vertical lifeline, or at the overhead anchoring point of a temporary vertical lifeline, designed to dissipate the kinetic energy generated during a fall and limit the arresting forces exerted on the lifeline, upper fastening/anchoring point and faller

3.7
opening point
specially designed point on a vertical rail or permanent vertical lifeline, other than the extremities, where a sliding-type fall arrester may be attached or detached

3.8
opening device
device on a sliding-type fall arrester which allows the arrester to be attached and detached at any intermediate point on a vertical rail or vertical lifeline

3.9
post-fall arrest suspension
state in which, after having being brought to a complete stop by a fall-arresting means, the faller remains suspended in the full-body harness

3.10
total mass
sum of the user's mass and all attached clothing and equipment

3.11
minimum locking-test mass
smallest mass, to the nearest whole kilogram, which, when attached to the raised free end of the connecting line and then released, will cause the fall arrester to lock on to the vertical rail or vertical lifeline and stay locked