
Personal fall-arrest systems —

**Part 1:
Full-body harnesses**

Systèmes individuels d'arrêt de chute —

Partie 1: Harnais complet

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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 the member bodies casting a vote.

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

International Standard ISO 10333-1 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 which incorporate a sliding-type fall arrester*
- *Part 5: Connectors*

The system performance tests will be the subject of a future part 6 to 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.

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 (all parts), *Quality management and quality assurance standards*.

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Personal fall-arrest systems —

Part 1: Full-body harnesses

1 Scope

This part of ISO 10333 specifies the requirements, test methods, instructions for general use, marking, packaging and maintenance for full-body harnesses (FBH).

The main purpose of a FBH is to allow the user to connect into a personal fall-arrest system (PFAS), which will be specified in a future International Standard (see ISO 10333-6 in the Bibliography), such that if an arrest takes place, the arresting force will not exceed 6 kN.

For the purposes of this part of ISO 10333, FBH may have attachment elements that allow the user to connect into other types of safety or access system, for example a work-positioning system, a controlled descent/ascent system or a confined-space access system. This part of ISO 10333 includes requirements for such attachment elements.

This part of ISO 10333 is applicable only to FBH limited to single-person use of a total mass not exceeding 100 kg.

NOTE Users of fall-protection equipment whose total mass (including tools and equipment) exceeds 100 kg are advised to seek advice from the equipment manufacturer regarding the suitability of the equipment, which may need additional testing.

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

- a) waist belts or chest harnesses: such equipment is not considered as safe to use in personal fall-arrest systems (PFAS);
- b) all other types of harnesses that are not designed primarily for use in PFAS;
- c) other special requirements for FBH, peculiar to use in a controlled descent/ascent system or a confined-space access system;
- d) any assessment of compatibility or suitability in respect of the performance of FBH in a controlled descent/ascent system or a confined-space access system.

This part of ISO 10333 does not specify those additional requirements that would apply when harnesses 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 and other specifications dealing with relevant physical characteristics and/or the safety of users. In particular, when it is considered necessary to test the corrosion resistance of metallic parts of the equipment, reference should be made to ISO 9227.

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

ISO 10333-5:—¹), *Personal fall-arrest systems — Part 5: Connectors*.

World Medical Association Recommendations Guiding Physicians in Biomedical Research Involving Human Subjects (Helsinki Declaration), adopted by the 18th World Medical Assembly, Helsinki, Finland, June 1964 and amended by the 29th World Medical Assembly, Tokyo, Japan, October 1975, 35th World Medical Assembly, Venice, Italy, October 1983, 41st World Medical Assembly, Hong Kong, September 1989 and the 48th General Assembly, Somerset West, Republic of South Africa, October 1996.

3 Terms and definitions

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

3.1 Full-body harnesses iTeh STANDARD PREVIEW (standards.iteh.ai)

3.1.1 full-body harness FBH

component of the body-holding device which connects a person into a personal fall-arrest system

See Figure 1.

NOTE 1 The FBH may comprise straps, fittings, buckles or other elements suitably arranged and assembled to support the body of a person and to restrain the wearer during a fall and after the arrest of a fall.

NOTE 2 The FBH may incorporate other fittings which permit its connection into other types of safety systems such as a work-positioning system.

3.1.2 primary strap

strap of a full-body harness that is intended by the manufacturer to transmit load, and support the body or exert pressure on the body during a fall of the person and after the arrest of a fall

3.1.3 secondary strap

strap from which the FBH is constructed, other than primary straps

3.1.4 fastening buckle

two-part fitting designed to facilitate the donning and doffing of a FBH

NOTE 1 The two parts can be coupled and uncoupled; each part is incorporated into mating straps, and when coupled together forms a joint between the mating straps.

NOTE 2 A fastening buckle can be an adjusting buckle.

1) To be published.

3.1.5**adjusting buckle**

fitting designed to facilitate the lengthening or shortening of FBH straps, to provide adjustment for different body sizes and shapes

NOTE An adjusting buckle can be a fastening buckle.

3.1.6**fall-arrest attachment element**

mandatory fitting designated as the point of attachment for the connection into a fall-arrest system

3.1.7**work-positioning attachment element**

optional fitting exclusively designated as the point of attachment for the connection into a work-positioning system

3.1.8**controlled descent/ascent attachment element**

optional fitting exclusively designated as the point of attachment for the connection into a controlled descent/ascent system

3.1.9**confined-space access attachment element**

optional fitting exclusively designated as the point of attachment for the connection into a confined-space access system

3.1.10**collector plate**

slotted plate which allows individual straps to intersect one another, and to be held in this position without being joined

NOTE This also allows independent adjustment, i.e. one strap can be adjusted without affecting the other.

3.1.11**cleat**

retainer which when fitted to straps is designed to gather excess strap length after the process of adjustment has taken place

NOTE This prevents the nuisance and danger of flapping straps interfering with the worker's task.

3.1.12**comfort pad**

extra support fitted to any of the primary straps, which in effect locally increases the strap's width and thickness

NOTE This reduces the pressure exerted on the body by the FBH when in normal or emergency use.

3.1.13**work-positioning back support**

rigid or semi-rigid back support which can be incorporated into a FBH

3.1.14**tool loop**

accessory, usually fitted integrally to the waist strap of a FBH used to attach tools temporarily to the harness while a person is working

3.1.15**total mass**

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

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3.2 Systems

3.2.1

personal fall-arrest system

PFAS

system designed to arrest a fall from a height, to minimize the fall-arrest forces, to control the total fall distance in order to prevent collision with the ground or other obstacle, and to maintain the fallen person in a suitable post-fall attitude

3.2.2

work-positioning system

system that enables a person to work supported by personal protective equipment in tension in such a way that a fall is prevented

3.2.3

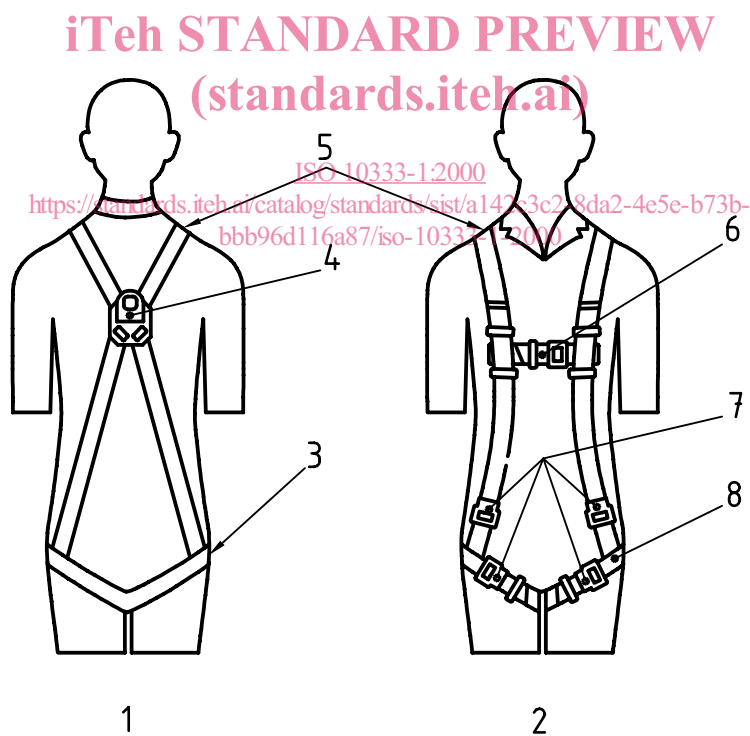
controlled descent system

system whereby a worker can descend from one level to another, by rappelling (abseiling) or other method, whilst suspended in an appropriate harness

3.2.4

confined-space access system

system used in a work situation where the worker has to enter into a narrow or confined space using a ladder or by being suspended in a harness, and where emergency evacuation can only be carried out with the worker in a near upright position



Key

- | | |
|--------------------------|-----------------------------|
| 1 Back | 5 Shoulder straps |
| 2 Front | 6 Shoulder strap restrainer |
| 3 Sub-pelvic strap | 7 Buckles |
| 4 Fall-arrest attachment | 8 Thigh straps |

Figure 1 — Example of a FBH

4 Requirements

4.1 General

To ensure that components assembled into a personal fall-arrest system perform correctly, it is recommended that they be tested in accordance with ISO 10333-6 [1].

FBH may have attachment elements that allow the user to connect into other types of safety or access system, for example a work-positioning system, a controlled descent/ascent system or a confined-space access system.

4.2 Classification

4.2.1 Class identification

This part of ISO 10333 establishes a classification system that specifies the fall-arrest function be mandatory and other functions be optional as follows:

- a) all FBH shall be at least Class A for fall-arrest purposes;
- b) where FBH have optional attachment elements they are classified as follows:
 - 1) Class D for controlled descent/ascent purposes;
 - 2) Class E for confined-space access purposes;
 - 3) Class L for fall-arrest purposes whilst ladder climbing;
 - 4) Class P for work-positioning purposes.

NOTE A FBH may be in more than one class <https://standards.iteh.ai/catalog/standards/sist/a142c3c2-8da2-4e5e-b73b-bbb96d116a87/iso-10333-1-2000>

4.2.2 Class A — Fall arrest

Class A FBH are designed to support the body during and after the arrest of a fall. They shall have at least one fall-arrest attachment element, incorporated as to lie at the back of the wearer and centrally between the upper shoulder blades.

4.2.3 Class D — Controlled descent/ascent

Class D FBH are those which meet the requirements for Class A FBH and which have additional attachment elements that allow the user to connect into a controlled descent system. Class D FBH shall have the controlled descent/ascent attachment elements incorporated in such locations as to enable the user to adopt an approximate seated position whilst in suspension. Controlled descent/ascent attachment elements are not acceptable for connecting into a PFAS.

4.2.4 Class E — Confined-space access

Class E FBH are those which meet the requirements for Class A FBH and which have additional attachment elements that allow the user to connect into a confined-space access system. Class E FBH shall have a sliding attachment element on each shoulder strap, to be used as a pair, i.e. not separately, so as to enable the user to adopt a near upright position whilst in suspension. Confined-space access attachment elements are not acceptable for connecting into a PFAS.