- **Part Number:** 1910
- **Part Number Title:** Occupational Safety and Health Standards
- **Subpart:** 1910 Subpart I
- **Subpart Title:** Personal Protective Equipment
- **Standard Number:** 1910.140
- **Title:** Personal fall protection systems.
- **Purpose:** This section establishes performance, care, and use criteria for all personal fall protection systems. This includes anchor points, lifelines, lanyards and other active fall protection devices.

1910.140(a)
Scope and application. This section establishes performance, care, and use criteria for all personal fall protection systems. The employer must ensure that each personal fall protection system used to comply with this part must meet the requirements of this section.

1910.140(b)
Definitions. The following definitions apply to this section:

Anchorage means a secure point of attachment for equipment such as lifelines, lanyards, or deceleration devices.

Beltterminal means an end attachment of a window cleaner's positioning system used for securing the belt or harness to a window cleaner's belt anchor.

Body belt means a strap with means both for securing about the waist and for attaching to other components such as a lanyard used with positioning systems, travel restraint systems, or ladder safety systems.

Body harness means straps that secure about the employee in a manner to distribute the fall arrest forces over at least the thighs, pelvis, waist, chest, and shoulders, with a means for attaching the harness to other components of a personal fall protection system.

Carabiner means a connector generally comprised of a trapezoidal or oval shaped body with a closed gate or similar arrangement that may be opened to attach another object and, when released, automatically closes to retain the object.

Competent person means a person who is capable of identifying existing and predictable hazards in any personal fall protection system or any component of it, as well as in their application and uses with related equipment, and who has authorization to take prompt, corrective action to eliminate the identified hazards.

Connector means a device used to couple (connect) parts of the fall protection system together.

D-ring means a connector used:

(i) In a harness as an integral attachment element or fall arrest attachment;

(ii) In a lanyard, energy absorber, lifeline, or anchorage connector as an integral connector; or

(iii) In a positioning or travel restraint system as an attachment element.

Deceleration device means any mechanism that serves to dissipate energy during a fall.

Deceleration distance means the vertical distance a falling employee travels from the point at which the deceleration device begins to operate, excluding lifeline elongation and free fall distance, until stopping. It is measured as the distance between the location of an employee's body harness attachment point at the moment of activation (at the onset of fall arrest forces) of the deceleration device during a fall, and the location of that attachment point after the employee comes to a full stop.

Equivalent means alternative designs, equipment, materials, or methods that the employer can demonstrate will provide an equal or greater degree of safety for employees compared to the designs, equipment, materials, or methods specified in the standard.

Free fall means the act of falling before the personal fall arrest system begins to apply force to arrest the fall.

Free fall distance means the vertical displacement of the fall arrest attachment point on the employee's body belt or body harness between onset of the fall and just before the system begins to apply force to arrest the fall. This distance excludes deceleration distance, lifeline and lanyard elongation, but includes any deceleration device slide distance or self-retracting lifeline/lanyard extension before the devices operate and fall arrest forces occur.

Lanyard means a flexible line of rope, wire rope, or strap that generally has a connector at each end for connecting the body belt or body harness to a deceleration device, lifeline, or anchorage.

Lifeline means a component of a personal fall protection system consisting of a flexible line for connection to an anchorage at one end so as to hang vertically (vertical lifeline), or for connection to anchorages at both ends so as to stretch horizontally (horizontal lifeline), and serves as a means for connecting other components of the system to the anchorage.

Personal fall arrest system means a system used to arrest an employee in a fall from a walking-working surface. It consists of a body harness, anchorage, and connector. The means of connection may include a lanyard, deceleration device, lifeline, or a suitable combination of these.

Personal fall protection system means a system (including all components) an employer uses to provide protection from falling or to safely arrest an employee's fall if one occurs. Examples of personal fall protection systems include personal fall arrest systems, positioning systems, and travel restraint systems.

Positioning system (work-positioning system) means a system of equipment and connectors that, when used with a body harness or body belt, allows an employee to be supported on an elevated vertical surface, such as a wall or window sill, and work with both hands free. Positioning systems also are called "positioning system devices" and "work-positioning equipment."

Qualified describes a person who, by possession of a recognized degree, certificate, or professional standing, or who by extensive knowledge, training, and experience has successfully demonstrated the ability to solve or resolve problems relating to the subject matter, the work, or the project.

Rope grab means a deceleration device that travels on a lifeline and automatically, by friction, engages the lifeline and locks so as to arrest the fall of an employee. A rope grab usually employs the principle of inertial locking, cam/lever locking, or both.

Safety factor means the ratio of the design load and the ultimate strength of the material.

Self-retracting lifeline/lanyard means a deceleration device containing a drum-wound line that can be slowly extracted from, or retracted onto, the drum under slight tension during normal movement by the employee. At the onset of a fall, the device automatically locks the drum and arrests the fall.

Snaphook means a connector comprised of a hook-shaped body with a normally closed gate, or similar arrangement that may be manually opened to permit the hook to receive an object. When released, the snaphook automatically closes to retain the object. Opening a snaphook requires two separate actions. Snaphooks are generally one of two types:

(i) Automatic-locking type (permitted) with a self-closing and self-locking gate that remains closed and locked until intentionally unlocked and opened for connection or disconnection; and

(ii) Non-locking type (prohibited) with a self-closing gate that remains closed, but not locked, until intentionally opened for connection or disconnection.

Travel restraint (tether) line means a rope or wire rope used to transfer forces from a body support to an anchorage or anchorage connector in a travel restraint system.

Travel restraint system means a combination of an anchorage, anchorage connector, lanyard (or other means of connection), and body support that an employer uses to eliminate the possibility of an employee going over the edge of a walking-working surface.

Window cleaner's belt means a positioning belt that consists of a waist belt, an integral terminal runner or strap, and belt terminals.

Window cleaner's belt anchor (window anchor) means specifically designed fall-preventing attachment points permanently affixed to a window frame or to a building part immediately adjacent to the window frame, for direct attachment of the terminal portion of a window cleaner's belt.

Window cleaner's positioning system means a system which consists of a window cleaner's belt secured to window anchors.

Work-positioning system (see *Positioning system* in this paragraph (b)).

1910.140(c)
General requirements. The employer must ensure that personal fall protection systems meet the following requirements. Additional requirements for personal fall arrest systems and positioning systems are contained in paragraphs (d) and (e) of this section, respectively.

1910.140(c)(1)
Connectors must be drop forged, pressed or formed steel, or made of equivalent materials.

1910.140(c)(2)
Connectors must have a corrosion-resistant finish, and all surfaces and edges must be smooth to prevent damage to interfacing parts of the system.

1910.140(c)(3)
When vertical lifelines are used, each employee must be attached to a separate lifeline.

1910.140(c)(4)
Lanyards and vertical lifelines must have a minimum breaking strength of 5,000 pounds (22.2 kN).

1910.140(c)(5)
Self-retracting lifelines and lanyards that automatically limit free fall distance to 2 feet (0.61 m) or less must have components capable of sustaining a minimum tensile load of 3,000 pounds (13.3 kN) applied to the device with the lifeline or lanyard in the fully extended position.

1910.140(c)(6)
A competent person or qualified person must inspect each knot in a lanyard or vertical lifeline to ensure that it meets the requirements of paragraphs (c)(4) and (5) of this section before any employee uses the lanyard or lifeline.

1910.140(c)(7)
D-rings, snaphooks, and carabiners must be capable of sustaining a minimum tensile load of 5,000 pounds (22.2 kN).

1910.140(c)(8)
D-rings, snaphooks, and carabiners must be proof tested to a minimum tensile load of 3,600 pounds (16 kN) without cracking, breaking, or incurring permanent deformation. The gate strength of snaphooks and carabiners must be capable of withstanding a minimum load of 3,600 pounds (16 kN) without the gate separating from the nose of the snaphook or carabiner body by more than 0.125 inches (3.175 mm).

1910.140(c)(9)
Snaphooks and carabiners must be the automatic locking type that require at least two separate, consecutive movements to open.

1910.140(c)(10)
Snaphooks and carabiners must not be connected to any of the following unless they are designed for such connections:

1910.140(c)(10)(i)
Directly to webbing, rope, or wire rope;

1910.140(c)(10)(ii)
To each other;

1910.140(c)(10)(iii)
To a D-ring to which another snaphook, carabiner, or connector is attached;

1910.140(c)(10)(iv)
To a horizontal life line; or

1910.140(c)(10)(v)
To any object that is incompatibly shaped or dimensioned in relation to the snaphook or carabiner such that unintentional disengagement could occur when the connected object depresses the snaphook or carabiner gate, allowing the components to separate.

1910.140(c)(11)
The employer must ensure that each horizontal lifeline:

1910.140(c)(11)(i)
Is designed, installed, and used under the supervision of a qualified person; and

1910.140(c)(11)(ii)
Is part of a complete personal fall arrest system that maintains a safety factor of at least two.

1910.140(c)(12)
Anchorages used to attach to personal fall protection equipment must be independent of any anchorage used to suspend employees or platforms on which employees work. Anchorages used to attach to personal fall protection equipment on mobile work platforms on powered industrial trucks must be attached to an overhead member of the platform, at a point located above and near the center of the platform.

1910.140(c)(13)
Anchorages, except window cleaners' belt anchors covered by paragraph (e) of this section, must be:

1910.140(c)(13)(i)
Capable of supporting at least 5,000 pounds (22.2 kN) for each employee attached; or

1910.140(c)(13)(ii)
Designed, installed, and used, under the supervision of qualified person, as part of a complete personal fall protection system that maintains a safety factor of at least two.

1910.140(c)(14)
Travel restraint lines must be capable of sustaining a tensile load of at least 5,000 pounds (22.2 kN).

1910.140(c)(15)
Lifelines must not be made of natural fiber rope. Polypropylene rope must contain an ultraviolet (UV) light inhibitor.

1910.140(c)(16)
Personal fall protection systems and their components must be used exclusively for employee fall protection and not for any other purpose, such as hoisting equipment or materials.

1910.140(c)(17)
A personal fall protection system or its components subjected to impact loading must be removed from service immediately and not used again until a competent person inspects the system or components and determines that it is not damaged and safe for use for employee personal fall protection.

1910.140(c)(18)
Personal fall protection systems must be inspected before initial use during each workshift for mildew, wear, damage, and other deterioration, and defective components must be removed from service.

1910.140(c)(19)
Ropes, belts, lanyards, and harnesses used for personal fall protection must be compatible with all connectors used.

1910.140(c)(20)
Ropes, belts, lanyards, lifelines, and harnesses used for personal fall protection must be protected from being cut, abraded, melted, or otherwise damaged.

1910.140(c)(21)
The employer must provide for prompt rescue of each employee in the event of a fall.

1910.140(c)(22)
Personal fall protection systems must be worn with the attachment point of the body harness located in the center of the employee's back near shoulder level. The attachment point may be located in the pre-sternal position if the free fall distance is limited to 2 feet (0.6 m) or less.

1910.140(d)
Personal fall arrest systems—

1910.140(d)(1)
System performance criteria. In addition to the general requirements in paragraph (c) of this section, the employer must ensure that personal fall arrest systems:

1910.140(d)(1)(i)
Limit the maximum arresting force on the employee to 1,800 pounds (8 kN);

1910.140(d)(1)(ii)
Bring the employee to a complete stop and limit the maximum deceleration distance the employee travels to 3.5 feet (1.1 m);

1910.140(d)(1)(iii)
Have sufficient strength to withstand twice the potential impact energy of the employee free falling a distance of 6 feet (1.8 m), or the free fall distance permitted by the system; and

1910.140(d)(1)(iv)
Sustain the employee within the system/strap configuration without making contact with the employee's neck and chin area.

1910.140(d)(1)(v)
If the personal fall arrest system meets the criteria and protocols in appendix D of this subpart, and is being used by an employee having a combined body and tool weight of less than 310 pounds (140 kg), the system is considered to be in compliance with the provisions of paragraphs (d)(1)(i) through (iii) of this section. If the system is used by an employee having a combined body and tool weight of 310 pounds (140kg) or more and the employer has appropriately modified the criteria and protocols in appendix D, then the system will be deemed to be in compliance with the requirements of paragraphs (d)(1)(i) through (iii).

1910.140(d)(2)
System use criteria. The employer must ensure that:

1910.140(d)(2)(i)
On any horizontal lifeline that may become a vertical lifeline, the device used to connect to the horizontal lifeline is capable of locking in both directions on the lifeline.

1910.140(d)(2)(ii)
Personal fall arrest systems are rigged in such a manner that the employee cannot free fall more than 6 feet (1.8 m) or contact a lower level. A free fall may be more than 6 feet (1.8 m) provided the employer can demonstrate the manufacturer designed the system to allow a free fall of more than 6 feet and tested the system to ensure a maximum arresting force of 1,800 pounds (8 kN) is not exceeded.

1910.140(d)(3)
Body belts. Body belts are prohibited as part of a personal fall arrest system.

1910.140(e)
Positioning systems—

1910.140(e)(1)
System performance requirements. The employer must ensure that each positioning system meets the following requirements:

1910.140(e)(1)(i)
General. All positioning systems, except window cleaners' positioning systems, are capable of withstanding, without failure, a drop test consisting of a 4-foot (1.2-m) drop of a 250-pound (113-kg) weight;

1910.140(e)(1)(ii)
Window cleaners' positioning systems. All window cleaners' positioning systems must:

1910.140(e)(1)(ii)(A)
Be capable of withstanding without failure a drop test consisting of a 6-foot (1.8-m) drop of a 250-pound (113-kg) weight; and

1910.140(e)(1)(ii)(B)
Limit the initial arresting force on the falling employee to not more than 2,000 pounds (8.9 kN), with a duration not exceeding 2 milliseconds and any subsequent arresting forces to not more than 1,000 pounds (4.5 kN).

1910.140(e)(1)(iii)
Positioning systems, including window cleaners' positioning systems, that meet the test methods and procedures in appendix D of this subpart are considered to be in compliance with paragraphs (e)(1)(i) and (ii).

1910.140(e)(1)(iv)
Lineman's body belt and pole strap systems. Lineman's body belt and pole strap systems must meet the following tests:

1910.140(e)(1)(iv)(A)
A dielectric test of 819.7 volts, AC, per centimeter (25,000 volts per foot) for 3 minutes without visible deterioration;

1910.140(e)(1)(iv)(B)
A leakage test of 98.4 volts, AC, per centimeter (3,000 volts per foot) with a leakage current of no more than 1 mA; and

1910.140(e)(1)(iv)(C)
A flammability test in accordance with Table I-7 of this section.

Table I-7 - Flammability Test

Test Method	**Criteria for Passing Test**
1. Vertically suspend a 19.7-inch (500-mm) length of strapping supporting a 220.5-lb (100-kg) weight;	Any flames on the positioning strap must self-extinguish The positioning strap must continue to support the 220.5-lb. (100kg) mass.
2. Use a butane or propane burner with a 3-inch (76-mm) flame;	
3. Direct the flame to an edge of the strapping at a distance of 1 inch (25mm);	
4. Remove the flame after 5 seconds; and	
5. Wait for any flames on the positioning strap to stop burning.	

1910.140(e)(2)
System use criteria for window cleaners' positioning systems. The employer must ensure that window cleaners' positioning systems meet and are used in accordance with the following:

1910.140(e)(2)(i)
Window cleaners' belts are designed and constructed so that:

1910.140(e)(2)(i)(A)
Belt terminals will not pass through their fastenings on the belt or harness if a terminal comes loose from the window anchor; and

1910.140(e)(2)(i)(B)
The length of the runner from terminal tip to terminal tip is 8 feet (2.44 m) or less;

1910.140(e)(2)(ii)
Window anchors to which belts are fastened are installed in the side frames or mullions of the window at a point not less than 42 inches (106.7 cm) and not more than 51 inches (129.5 cm) above the window sill;

1910.140(e)(2)(iii)
Each window anchor is capable of supporting a minimum load of 6,000 pounds (26.5 kN);

1910.140(e)(2)(iv)
Use of installed window anchors for any purpose other than attaching the window cleaner's belt is prohibited;

1910.140(e)(2)(v)
A window anchor that has damaged or deteriorated fastenings or supports is removed, or the window anchor head is detached so the anchor cannot be used;

1910.140(e)(2)(vi)
Rope that has wear or deterioration that affects its strength is not used;

1910.140(e)(2)(vii)
Both terminals of the window cleaner's belt are attached to separate window anchors during any cleaning operation;

1910.140(e)(2)(viii)
No employee works on a window sill or ledge on which there is snow, ice, or any other slippery condition, or one that is weakened or rotted;

1910.140(e)(2)(ix)
No employee works on a window sill or ledge unless:

1910.140(e)(2)(ix)(A)
The window sill or ledge is a minimum of 4 inches (10 cm) wide and slopes no more than 15 degrees below horizontal; or

1910.140(e)(2)(ix)(B)
The 4-inch minimum width of the window sill or ledge is increased 0.4 inches (1 cm) for every degree the sill or ledge slopes beyond 15 degrees, up to a maximum of 30 degrees;

1910.140(e)(2)(x)
The employee attaches at least one belt terminal to a window anchor before climbing through the window opening, and keeps at least one terminal attached until completely back inside the window opening;

1910.140(e)(2)(xi)
Except as provided in paragraph (e)(2)(xii) of this section, the employee travels from one window to another by returning inside the window opening and repeating the belt terminal attachment procedure at each window in accordance with paragraph (e)(2)(x) of this section;

1910.140(e)(2)(xii)
An employee using a window cleaner's positioning system may travel from one window to another while outside of the building, provided:

1910.140(e)(2)(xii)(A)
At least one belt terminal is attached to a window anchor at all times;

1910.140(e)(2)(xii)(B)
The distance between window anchors does not exceed 4 feet (1.2 m) horizontally. The distance between windows may be increased up to 6 feet (1.8 m) horizontally if the window sill or ledge is at least 1 foot (0.31 m) wide and the slope is less than 5 degrees;

1910.140(e)(2)(xii)(C)
The sill or ledge between windows is continuous; and

1910.140(e)(2)(xii)(D)
The width of the window sill or ledge in front of the mullions is at least 6 inches (15.2 cm) wide.