ANSI/ASSP Z359.11-2021

Safety Requirements for Full Body Harnesses

AMERICAN SOCIETY OF
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ANSI/ASSP Z359.11 – 2021

American National Standard

Safety Requirements for Full Body Harnesses

Secretariat

American Society of Safety Professionals
520 N. Northwest Highway
Park Ridge, Illinois 60068

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American National Standard

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Foreword

(This Foreword is not a part of American National Standard Z359.11-2021.)

This standard, national in scope, was developed by the Z359 Standards Committee functioning under the procedures of the American National Standards Institute, with the American Society of Safety Professionals (ASSP) as secretariat. It is intended that every employer whose operations fall within the scope and purpose of the standard will adopt the guidelines and requirements detailed in this standard.

History:

While the full body harness is synonymous with an active fall protection system now, the history of the full body harness began over 100 years ago. You may recall images and films of the Hoover Dam “High Scalers” working hundreds of feet in the air clearing rock and setting explosives on a rock face. There is even a monument to pay tribute to those workers. Or, you may have seen the utility pole climber scale the pole with ease with just a belt and a lanyard. That equipment was used by the worker as a tool for access.

Even then, the humble body belt with rope lanyard was a rare sight to see during the construction of many of America’s most iconic buildings during the early 1900’s through the latter part of the century. This simple fall arrest system, which was not required by law, had many issues. The worker had to “fall correctly” in order for the belt not to slip off the body or cause injure to the spleen, liver and spine. Body belts distributed forces in some cases to the soft tissue organs of the abdomen, which could result in severe internal shock and damage to organs and skeletal structure. This type of personal protective equipment (PPE), approved by the advent of OSHA in 1970, remained the most common and available means of fall protection until full body harness became more popular in the 1990s.

The full body harness, which was inspired from military parachuting equipment, first appeared on the safety scene during the 1940s. This alternative PPE meant that the worker did not have to fall in an ideal manner. The full body harness better distributed forces across the body during a fall event to the more substantial parts, namely the pelvic girdle, shoulders, chest and thighs. As material selection improved, and overall design became more form fitting, the full body harness became more accepted by workers. A major milestone occurred in 1992 when ANSI/ASSP Z359.1 was released and became one of the first major North American standards to require the use of the full body harness in a fall arrest system. OSHA soon followed suit outlawing the use of body belts in January of 1998 as a suitable means of body wear for fall protection.

Today, harness designs continue to evolve. There are now harnesses for almost all conceivable work environments and applications. From welding to rigging and general construction, the right tool for the job is now accessible. Comfort and compliance continue to be major themes for harness design by manufacturers and safety professionals. The future of the fall protection harness will continue to evolve as questions around worker fitness and capacity, body habitus, not only between genders but within genders, and deeper understanding of applications and their effect are taken into harness design.

Standard Perspective: The Z359 Committee acknowledges the critical role of design in influencing the use of proper fall protection equipment. Designs which eliminate fall hazards through the proper application of the hierarchy of safety controls are the preferred method for fall protection. Design deficiencies often increase the risk for employees who may be exposed to fall hazards: examples are 1) lack of rail systems to prevent falls from machines, equipment and structures; 2) failure to provide engineered anchorages where use of personal fall arrest systems are anticipated; 3) no provision for safe access to elevated work areas; 4) installation of

machines or equipment at heights, rather than floor/ground level to preclude access to elevated areas; 5) failure to plan for the use of travel restriction or positioning devices. To that end, this series of standards also provides guidance for design considerations for new buildings and facilities.

Basic fall safety principles have been incorporated into these standards, including hazard survey, hazard elimination and control, and education and training. The primary intent is to ensure a proactive approach to fall protection. However, the reactive process of accident investigation is also addressed to ensure that adequate attention is given to causation of falls.

Normative Requirements: This standard uses the single column format. The normative requirements appear aligned to the left margin. To meet the requirements of this standard, machinery, equipment and process suppliers and users must conform to these normative requirements. These requirements typically use the verb “shall.”

> *NOTE: The informative or explanatory notes in this standard appear indented, in italics, in a reduced font size, which is an effort to provide a visual signal to the reader that this is an informative note, not normative text, and is not to be considered part of the requirements of this standard; this text is advisory in nature only. The suppliers and users are not required to conform to the informative note. The informative note is presented in this manner in an attempt to enhance readability and to provide explanation or guidance to the sections they follow.*

Figures: Figures provided in the standard are used to show basic concepts of testing, types of products, examples of labels or other information from the standard. These figures are not to scale. They are for educational and informational purposes to explain content within a standard.

Suggestions for Improvements: Suggestions for improvements to this standard are welcome. They should be sent to: American Society of Safety Professionals (ASSP), 520 N. Northwest Highway, Park Ridge, IL 60068, Attention: Z359 Secretariat.

Revisions: The Z359 Committee welcomes proposals for revisions to this standard. Revisions are made to the standard periodically (usually every five years from the date of the standard) to incorporate changes that appear necessary or desirable, as demonstrated by experience gained from the application of the standard. Proposals should be as specific as possible, citing the relevant section number(s), the proposed wording, and the reason for the proposal. Pertinent documentation would enable the Z359 Committee to process the changes in a timely manner.

Interpretations: Upon a request in writing to the Secretariat, the Z359 Committee will render an interpretation of any requirement of the standard. The request for interpretation should be clear, citing the relevant section number(s) and phrased as a request for a clarification of a specific requirement. Oral interpretations are not provided.

Only the Z359 Committee (through the Z359 Secretariat) is authorized to provide any interpretation of this standard.

Approval: Neither the Z359 Committee nor the American National Standards Institute (ANSI) approves, certifies, rates or endorses any item, construction, proprietary device or activity.

Appendices: Appendices are included in most standards to provide the user with additional information related to the subject of the standard. Appendices are not part of the approved standard.

Committee Meetings: The Z359 Committee meets on a regular basis. Persons wishing to attend a meeting should contact the Secretariat for information.

Standard Approval: This standard was developed and approved for submittal to ANSI by the Z359 Secretariat. Committee approval of the standard does not necessarily imply (nor is it required) that all members voted for its approval. At the time this standard was approved, the Z359 Committee had the following members:

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AMERICAN NATIONAL STANDARD Z359.11
SAFETY REQUIREMENTS FOR
FULL BODY HARNESSES

1. Scope, Purpose, Application, Exceptions and Interpretations

NOTE: It is expected that products be compliant to the requirements of this standard within 12 months after the publication of this standard.

1.1 Scope

This standard establishes requirements for the performance, design, marking, qualification, instruction, training, test methods, inspection, use, maintenance and removal from service of full body harnesses (FBH). FBHs are used for fall arrest, positioning, travel restraint, suspension and/or rescue applications for users within the capacity range of 130 to 310 pounds (59 to 140kg).

NOTE: See Figures 1a through 1e for five basic examples of full body harnesses covered under this standard.

At the time of this standard's development, insufficient scientific data existed regarding the human response related to use of FBHs outside of the weight capacity defined. While there are methods that can demonstrate the efficacy of the FBH's load bearing components, such as the webbing, sewn webbing terminations, buckles and other connectors, the ability of the human body is more nuanced. Therefore, the committee believes more research is needed to determine an individual's physical attributes needed to withstand an impact and suspension for a period of time to be determined before a rescue is completed.