ANSI/ASSP Z359.12-2019
Connecting Components for Personal Fall Arrest Systems
Part of the Fall Protection Code
The information and materials contained in this publication have been developed from sources believed to be reliable. However, the American Society of Safety Professionals (ASSP) as secretariat of the ANSI accredited Z359 committee or individual committee members accept no legal responsibility for the correctness or completeness of this material or its application to specific factual situations. By publication of this standard, ASSP or the Z359 committee does not ensure that adherence to these recommendations will protect the safety or health of any persons or preserve property.
ANSI®
ANSI/ASSP Z359.12 – 2019

American National Standard

Connecting Components for Personal Fall Arrest Systems

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

Approved June 5, 2019
Effective July 6, 2020

American National Standards Institute
Approval of an American National Standard requires verification by ANSI that the requirements for due process, consensus and other criteria for approval have been met by the standards developer. Consensus is established when, in the judgment of the ANSI Board of Standards Review, substantial agreement has been reached by directly and materially affected interests. Substantial agreement means much more than a simple majority, but not necessarily unanimity. Consensus requires that all views and objections be considered, and that a concerted effort be made toward their resolution. The use of American National Standards is completely voluntary; their existence does not in any respect preclude anyone, whether he/she has approved the standards or not, from manufacturing, marketing, purchasing, or using products, processes, or procedures not conforming to the standards. The American National Standards Institute does not develop standards and will in no circumstance give an interpretation of any American National Standard. Moreover, no person shall have the right or authority to issue an interpretation of an American National Standard in the name of the American National Standards Institute. Requests for interpretation should be addressed to the secretariat or sponsor whose name appears on the title page of this standard.

Caution Notice: This American National Standard may be revised or withdrawn at any time. The procedures of the American National Standards Institute require that action be taken periodically to reaffirm, revise or withdraw this standard. Purchasers of American National Standards may receive current information on all standards by calling or writing the American National Standards Institute.
Foreword

(This Foreword is not a part of American National Standard Z359.12-2019.)

This standard, national in scope, was developed by the Z359 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.

The need for this standards activity grew out of the continuing development of a series of fall protection-related standards. The focus is to tie the elements of those standards together and provide the tools with which employers may develop the programs that incorporate those elements. This standard also brings together the administrative requirements of those fall protection standards. It should be noted, as in all Z359-series standards, that this standard applies to occupational activities. It does not apply to sports activities such as mountaineering.

Neither the standards committee, nor the secretariat, states that this standard is perfect or in its ultimate form. It is recognized that new developments are to be expected, and that revisions of the standard will be necessary as the state-of-the-art progresses and further experience is gained. It is felt, however, that uniform guidelines for fall protection programs are very much needed and that the standard in its present form provides for the minimum criteria necessary to develop and implement a comprehensive managed fall protection program.

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 work 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 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 illustrated to show basic concepts of testing, types of products, examples of labels or other information from the standard. These figures are not to scale, nor do they represent absolute systems and requirements. 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 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.

No one but 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
Persons wishing to attend a meeting or join the committee should contact the secretariat for information.

Standard Approval
This standard was processed and approved for submittal to ANSI by the Z359 Secretariat. Approval of the standard does not necessarily imply (nor is it required) that all committee members voted for its approval. At the time this standard was approved, the Z359 Committee had the following members:
<table>
<thead>
<tr>
<th>Organization Represented</th>
<th>Name of Representative</th>
</tr>
</thead>
<tbody>
<tr>
<td>3M</td>
<td>Raymond Mann</td>
</tr>
<tr>
<td></td>
<td>Mike Boraas</td>
</tr>
<tr>
<td>American Society of Safety Professionals</td>
<td>Jubal Hamernik, Ph.D., P.E.</td>
</tr>
<tr>
<td></td>
<td>John Frost, CSP</td>
</tr>
<tr>
<td>Bashlin Industries, Inc.</td>
<td>Bradley McGill</td>
</tr>
<tr>
<td></td>
<td>Caleb Williams</td>
</tr>
<tr>
<td>Bayer AG</td>
<td>Adam Chapin</td>
</tr>
<tr>
<td></td>
<td>Chad McDanel</td>
</tr>
<tr>
<td>Boeing</td>
<td>Joey Junio, P.E.</td>
</tr>
<tr>
<td></td>
<td>Segis Wright</td>
</tr>
<tr>
<td>Buckingham Manufacturing Company</td>
<td>James Rullo</td>
</tr>
<tr>
<td></td>
<td>DeForest Canfield</td>
</tr>
<tr>
<td>Certified Access</td>
<td>Dave Pasco</td>
</tr>
<tr>
<td>ClimbTech</td>
<td>Karl Guthrie</td>
</tr>
<tr>
<td>Elk River, Inc.</td>
<td>Daniel Aleksovski</td>
</tr>
<tr>
<td></td>
<td>Mark Conover</td>
</tr>
<tr>
<td></td>
<td>Delisa Calhoun</td>
</tr>
<tr>
<td>Ellis Fall Safety Solutions, LLC</td>
<td>J. Nigel Ellis, Ph.D., P.E., CSP, CPE</td>
</tr>
<tr>
<td></td>
<td>John Whitty, P.E.</td>
</tr>
<tr>
<td>ExxonMobil</td>
<td>Freddie Johnson</td>
</tr>
<tr>
<td></td>
<td>Zachary Shanklin</td>
</tr>
<tr>
<td>FallTech</td>
<td>Zack Winters</td>
</tr>
<tr>
<td></td>
<td>Mike Tavis</td>
</tr>
<tr>
<td>Flexible Lifeline Systems</td>
<td>Michael Bailey, P.E.</td>
</tr>
<tr>
<td>General Motors Company</td>
<td>Graham Parr</td>
</tr>
<tr>
<td></td>
<td>Ken Mahnick</td>
</tr>
<tr>
<td>GME Supply Company</td>
<td>Daniel Pobst</td>
</tr>
<tr>
<td></td>
<td>Caleb Messer</td>
</tr>
<tr>
<td>Gorbel Inc.</td>
<td>Allen Baughman</td>
</tr>
<tr>
<td></td>
<td>Kevin Duhamel</td>
</tr>
<tr>
<td>Gravitec Systems, Inc.</td>
<td>Kevin Denis</td>
</tr>
<tr>
<td></td>
<td>David Lough</td>
</tr>
<tr>
<td>High Engineering Corporation</td>
<td>William Parsons, P.Eng.</td>
</tr>
<tr>
<td>Honeywell</td>
<td>Bradley Rohlf</td>
</tr>
<tr>
<td></td>
<td>Steven McPherson</td>
</tr>
<tr>
<td>Indianapolis Power and Light Company</td>
<td>Nick Hutchinson</td>
</tr>
<tr>
<td>INSPEC International Ltd.</td>
<td>Paul Clarke, CEng, MIMechE</td>
</tr>
<tr>
<td></td>
<td>Andrew Diamond, MInstP, BSc (Hons)</td>
</tr>
<tr>
<td>International Safety Equipment Association</td>
<td>Cristine Fargo</td>
</tr>
<tr>
<td></td>
<td>Justin Patton</td>
</tr>
<tr>
<td>Jelco</td>
<td>Philip Clemmons</td>
</tr>
<tr>
<td>Kee Safety, Inc.</td>
<td>Graham Willmott</td>
</tr>
<tr>
<td>KMI Construction</td>
<td>John Ingram</td>
</tr>
<tr>
<td>Lawrence Livermore National Security, LLC</td>
<td>Louis Renner, CSP</td>
</tr>
<tr>
<td>Liberty Mutual</td>
<td>Glenn Sparks</td>
</tr>
<tr>
<td></td>
<td>Matthew Zaffini</td>
</tr>
</tbody>
</table>
Lighthouse Safety, LLC
John Corriveau
Mark Benes

LJB Inc.
Thomas Kramer, P.E., CSP
Rupert Noton, CEng, MiStructE

Malta Dynamics, LLC
David Ivey
Chris Holland

Martin/Martin Consulting Engineers
Andrew Emmons, P.E.
Al Jording, P.E.

MSA
Rob Willis
Tim Bissett

Murdock Webbing Company, Inc.
Rick Toll
Stephan Gelinas

National Association of Tower Erectors
John Jones
Justin Miller

Pensafe Inc.
Keith Smith

Petzl
Jeremiah Wangsgard
Keith Luscinski

Pigeon Mountain Industries
Jeff Bowles
Lou McCurley

Pure Safety Group
Warren Faber
Andre Pelland

Reliance Industries
Dan Henn
W. Joe Shaw

Rigid Lifelines
Arnie Galpin, P.E.
Kynan Wynne

Rooftop Anchor, Inc.
Tyson Munford, P.E.

Safety Equipment Institute, Inc.
Stephen Sanders
Mark Winchester

Schreiber Foods
George Jerome

Shell Oil Company
Edward Grosse
Gregory Byers

SKYLOTEC North America LP
Douglas Mercier
Michael Masterson, Jr.

Southern Weaving Company
Andrew Broadway
Curtiss Burdette

Sparkling Clean Window Company
Samuel Terry
Art Schneider

SPRAT
Charley Rankin, M.S.
Cedric Smith

STE
Michael Wright, P.E., CPE, CSP
Mark Williams

Sturges Manufacturing, Inc.
Tyler Griffith

SureWerx/PeakWorks
Tim Accursi
Juan Rangel

Travelers
Scott Richert, CSP, ARM, ALCM

Trinity Industries, Inc.
Robin Wagstaff

Tritech Fall Protection Systems, Inc.
Craig Siciliani
Chris Moemke, EIT

U.S. Air Force
Robert Baker

U.S. Bureau of Reclamation
Shawn Smith, CSP

U.S. Department of Interior - BSEE
Corey Dickson
John Cushing, Jr.

U.S. Navy
Basil Tominna, P.E.
Ronald Silva, P.E.

UAW
Matthew Uptmor, OHST
Subgroup Z359.12 had the following members:

Tim Accursi, Chair
Keith Smith, Vice Chair
Lynn Camp
Paul Clarke, CEng, MIMechE
John Corriveau
Jeremy Deason, P.E.
J. Nigel Ellis, Ph.D., P.E., CSP, CPE
Nick Hutchinson
Loui McCurley
David Pate, CUSA
Jeffrey Reep
James Rullo
W. Joe Shaw
Contents
1. Scope, Purpose, Applications, Exceptions and Interpretations .................................................. 10
   1.1 Scope ................................................................................................................................. 10
   1.2 Purpose and Applications ................................................................................................. 10
   1.3 Exceptions ......................................................................................................................... 10
   1.4 Interpretations ................................................................................................................... 11
2. Definitions .................................................................................................................................. 11
3. Requirements ............................................................................................................................. 12
   3.1 Component and Element Requirements ............................................................................. 12
4. Qualification Testing ................................................................................................................... 13
   4.1 Test Equipment and Test Specimens .................................................................................. 13
   4.2 Component, Constituent and Element Testing .................................................................... 15
5. Marking and Instructions ............................................................................................................ 17
   5.1 General Marking Requirements ......................................................................................... 17
   5.2 Specific Marking Requirements ......................................................................................... 18
   5.3 Specific Instruction Requirements ..................................................................................... 18
6. User Inspection, Maintenance and Storage ............................................................................. 19
   6.1 Inspection ........................................................................................................................... 19
   6.2 Maintenance and Storage .................................................................................................... 19
7. Equipment Selection .................................................................................................................. 19
8. References .................................................................................................................................. 19
1. Scope, Purpose, Applications, Exceptions and Interpretations

1.1 Scope
This standard establishes requirements for the performance, design, marking, qualification, test methods and removal from service of connectors.

NOTE: See Figures 1 and 2 for illustrations of the equipment covered by this standard. Connectors are commonly referred to as fall protection hardware. Equipment used in personal fall protection systems is commonly referred to as personal protective equipment (PPE) in the literature of the safety field.

1.2 Purpose and Applications

1.2.1 This standard addresses only components that are used in the interconnection of a complete unit, intended to be used as a primary single link to a permanent anchorage connector and/or intended to be used as a primary attachment point.

NOTE: Examples of common connectors are snap hooks, carabiners, D-rings, O-rings, buckles and adjusters.

1.2.2 This standard addresses fall protection hardware used in occupations requiring personal protection against falls from heights and applies to the manufacturers, distributors, purchasers, test labs and users of such equipment.

NOTE: This is a voluntary consensus standard. The legal requirements for protection against falls from heights are established by applicable regulatory bodies governing occupational safety.

1.2.3 Before any equipment shall bear the marking Z359.12 or be represented in any way as being in compliance with this standard, all applicable requirements of this standard shall be met. Such compliance shall be established in accordance with the requirements specified in ANSI/ASSP Z359.7.

1.3 Exceptions

1.3.1 The requirements of this standard do not address material handling or sports-related activities.

1.3.2 Although personal fall protection systems (as well as personal protective systems for climbing, man riding, travel restriction, rescue and evacuation) incorporating horizontal lifelines may suitably incorporate components or subsystems specified herein, those systems and components and subsystems which are unique to them are outside the scope of this standard for personal fall arrest systems.

NOTE: Hardware incorporated into work positioning systems outlined by ANSI/ASSP Z359.3 are covered by this standard.

1.3.3 Body belts, window cleaner belts, chest-waist harnesses and chest harnesses, even when referred to as body supports, are not addressed by the provisions of this fall protection standard.