

AMERICAN NATIONAL STANDARD

ANSI/ASSE Z359.11-2014 Safety Requirements for Full Body Harnesses

Part of the Fall Protection Code



AMERICAN SOCIETY OF
SAFETY ENGINEERS



The information and materials contained in this publication have been developed from sources believed to be reliable. However, the American Society of Safety Engineers (ASSE) 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, ASSE or the Z359 Committee does not ensure that adherence to these recommendations will protect the safety or health of any persons, or preserve property.

American National Standard

Safety Requirements for Full Body Harnesses

Secretariat

American Society of Safety Engineers

1800 East Oakton Street
Des Plaines, Illinois 60018-2187

Approved August 25, 2014

Effective September 1, 2015

American National Standards Institute, Inc.

American National Standard

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Caution Notice: This American National Standard may be revised or withdrawn at any time.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.

Published February 2015 by:

American Society of Safety Engineers
1800 East Oakton Street
Des Plaines, Illinois 60018-2187
(847) 699-2929 • www.asse.org

Copyright ©2015 by American Society of Safety Engineers
All Rights Reserved.

No part of this publication may be reproduced in any form, in an electronic retrieval system or otherwise, without the prior written permission of the publisher.

Printed in the United States of America

Foreword (This Foreword is not a part of American National Standard Z359.11-2014.)

This standard, national in scope, was developed by an Accredited Standards Committee functioning under the procedures of the American National Standards Institute, with the American Society of Safety Engineers (ASSE) 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.

The Z359 Committee solicits public input that may suggest the need for revisions to this standard. Such input should be sent to the Secretariat, ASC Z359, American Society of Safety Engineers, 1800 E. Oakton Street, Des Plaines, IL 60018-2187.

This standard was developed and approved for submittal to ANSI by the American National Standards Committee on Standards for Fall Protection, Z359. Committee approval of the standard does not necessarily imply that all committee members voted for its approval. At the time it approved this standard, the Z359 Committee had the following members:

Randall Wingfield, Chair
Basil Tominna, P.E., Vice Chair
Timothy R. Fisher, CSP, CHMM, ARM, CPEA, Secretary
Jennie Dalesandro, Administrative Technical Support

Organization Represented

Name of Representative

3M	Raymond Mann Michael Cameron
American Airlines	Len Bradley
American Society of Safety Engineers	Jubal D. Hamernik, Ph.D., P.E. John Stephen Frost, CSP
Bashlin Industries, Inc.	Preston Anderson Bradley S. McGill
Boeing Company	Chuck Orebaugh Joey R. Junio, P.E.
Buckingham Mfg. Co., Inc.	James Rullo DeForest Canfield
Capital Safety Group	J. Thomas Wolner, P.E. Judd Perner
Chevron	Craig Berkenmeier Joshua Ockmond, CSP
Clear Channel Outdoor	Jim Poage Dan Rossi
ClimbTech LLC	Karl Guthrie Eric Patrick
Elk River, Inc.	Delisa Calhoun Erik Arendall
Ellis Fall Safety Solutions, LLC	J. Nigel Ellis, Ph.D., P.E., CSP, CPE John T. Whitty, P.E.
FallTech	Dustin Hawkins Paul Breves
Flexible Lifeline Systems	Hugh Armstrong Amber Svoboda
General Motors	Ken Mahnick Kyle Sullivan
Gravitec Systems, Inc.	Randall Wingfield Dave Lough
Hartford Steam Boiler Inspection & Insurance Co.	Timothy Healey Jerry Kucharski, CFPS
High Engineering Corp.	Greg Small, P.Eng., M.Eng. Doug Myette
Honeywell Safety Products	Bradley Rohlf Chris Huber
ISEA – International Safety Equipment Association	Dan Shipp
Indianapolis Power and Light	David H. Pate, CUSA David Baldwin
Ingersoll Rand	Mark Winchester

INSPEC International Ltd.	Paul Clarke, CEng, MIMechE
LJB Inc.	Andrew Diamond, MInstP, BSc (Hons)
Latchways PLC	Thomas Kramer, P.E., CSP
Lawrence Livermore National Security	Rupert Noton, CEng, MStructE
Liberty Mutual Group	Tim Bissett, BEng (Hons), CEng, MIMechE
Lighthouse Safety LLC	Tim Fletcher
MSA	Kevin Goodwin
Monsanto	Steve McConnell
Murdock Webbing Co. Inc.	John Rabovsky, MS, CSP, ARM
National Association of Tower Erectors	Cal Sparks
Pamela R. Huck, Inc.	John Corriveau
Parsons Engineering Group	Marc Harkins
Peakworks	John Giovengo
PenSafe	Robert Kling, P.E., CSP
Pigeon Mountain Industries, Inc.	Adam Chapin
Reliance Industries, LLC	Bob Golz
SPRAT – Society of Professional Rope Access Technicians	Greg Pilgrim
Safety Connection, Inc.	Gordon Lyman
Safety Equipment Institute	Don Doty
Safety Through Engineering, Inc. (dba STE, Inc.)	Pamela Huck, CSP
Sellstrom Manufacturing Co./RTC Division	William R. Parsons, P.Eng.
Shell Exploration & Production Co.	Ryan Newbury, P.Eng.
Skylotec North America, LP	Tim Accursi
SPANCO, Inc. / Rigid Lifelines	Gabe Fusco
Sparkling Clean Window Company & Surface Solutions	Keith Smith
Sturges Manufacturing Co., Inc.	Jeff Bowles
Superior Energy Services, Inc.	Kim Hunter
	Dan Henn
	W. Joe Shaw
	Loui McCurley
	Jim Frank
	Clint Honeycutt, Sr.
	Janice Honeycutt
	Steve Sanders
	Michael C. Wright, P.E., CPE, CSP
	Mark Williams
	Kenneth Lemke
	Steve Batke
	Steven Kim Biggs
	Joe B. George
	Mark Conover
	Kurani Seyhan
	Arnie Galpin, P.E.
	Tim Bambrick
	Sam Terry
	Art Schneider
	Richard Griffith
	Tyler Griffith
	Spencer Colbert
	Noel J. Spicuza, III

Tractel Inc.	Doug Knapp
Transport Workers Union	Catalin Anesia
Travelers	James Mark
Tritech Fall Protection Systems, Inc.	Scott H. Richert, CSP, ARM, ALCM
UL LLC	John Seto, P.E
United Auto Workers	Craig Siciliani
U.S. Air Force Safety Center	Steven D. Corrado
U.S. Bureau of Reclamation	G.W. Barrett
U.S. Department of Interior – BSEE	Tom Kinman
U.S. Department of the Navy	Matthew S. Uptmor
Vertical Access LLC	Mark S. Kantorowicz
WJE	Robert Baker
Walt Disney Company	Shawn Smith
Western Area Power Administration	Shaun Reed
	John M. Cushing, Jr.
	Wilbon Rhome
	Basil Tominna, P.E.
	Shawn Smith
	Kelly Streeter, P.E.
	Keith Luscinski
	Daniel Gach, AIA, NCARB
	Jason Kamman, CSP
	Ken Young, P.E.
	Ian Bevan
	Patrick T. Nies
	Will Schnyer

Subgroup Z359.11 had the following members:

Preston Anderson, Chair
Mark Conover, Vice Chair
Tim Accursi
Andrew Broadway
Paul Clarke, CEng, MIMechE
Jeremy Deason
Jim Frank
Arnie Galpin, P.E.
Bob Golz
Tom Kinman
Doug Knapp
Bradley S. McGill
James Rullo
Keith Smith
Rick Vance
Randall Wingfield
J. Thomas Wolner, P.E.

Contents

SECTION	PAGE
1. Scope, Purpose, Application, Exceptions and Interpretations	8
1.1 Scope	8
1.2 Purpose and Application	8
1.3 Exceptions	9
1.4 Interpretations	9
2. Definitions	10
3. Requirements	10
3.1 Design Requirements	10
3.2 Attachment Element Requirements	12
3.3 Component Requirements	17
4. Qualification Testing	19
4.2 Test Equipment	19
4.3 Test Procedures	20
5. Markings and Instructions	23
5.1 Marking Requirements	23
5.2 Instruction Requirements	24
6. User Inspection, Maintenance and Storage of Equipment	26
7. References	26
Figures	27
Annex A: Proper Use and Maintenance of Full Body Harnesses	42

STANDARD REQUIREMENTS

1. SCOPE, PURPOSE, APPLICATION, EXCEPTIONS AND INTERPRETATIONS

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 140 kg).

1.2 Purpose and Application.

1.2.1 This standard applies to FBHs used in occupations requiring personal protection against falls from heights and if required, shall allow for the specialized functions of travel restraint, positioning, suspension and/or rescue.

1.2.2 This standard applies only to FBHs and auxiliary equipment designed specifically for use as part of the FBH.

1.2.3 This standard is intended to be used by the manufacturers, distributors, purchasers and users of FBHs, as well as testing, certifying and regulating bodies.

1.2.4 Before any FBH shall bear the marking ANSI Z359.11, or be represented in any way as being in compliance with this standard, all applicable requirements of this standard shall be met.

1.2.5 FBHs which meet this standard are intended to be used with other components of a system that limits maximum arrest force to 1,800 pounds (8 kN) or less.

EXPLANATORY INFORMATION

(Not part of American National Standard Z359.11)

E1 *It is expected that products be compliant to the requirements of this standard within 6 months after the publication of this standard.*

E1.1 *See Figures 1a through 1e for five basic examples of full body harnesses covered under this standard. Figures 1f through 1h show example harnesses and belts that are not acceptable for use under the requirements of this standard.*

At the time of this standard's development, insufficient scientific data existed regarding the use of FBHs outside of the weight capacity defined.

E1.2.2 *Integrated and non-integrated equipment such as a vest, suspension seat and extended dorsal or specialized attachment elements are included within this standard. FBH including energy absorbing lanyards that cannot be tested separately are outside of the scope of this standard.*

E1.2.5 *It is essential that the users of this type of equipment receive proper training and instruction, including detailed procedures for the safe use of such equipment in their work application. Refer to ANSI/ASSE Z359.2, Minimum Requirements for a Comprehensive Managed Fall Protection Program, for guidance on training requirements. Proper fit of*