

NFPA®

1977

**Standard on Protective
Clothing and Equipment for
Wildland Fire Fighting**

2016



IMPORTANT NOTICES AND DISCLAIMERS CONCERNING NFPA® STANDARDS

NOTICE AND DISCLAIMER OF LIABILITY CONCERNING THE USE OF NFPA STANDARDS

NFPA® codes, standards, recommended practices, and guides (“NFPA Standards”), of which the document contained herein is one, are developed through a consensus standards development process approved by the American National Standards Institute. This process brings together volunteers representing varied viewpoints and interests to achieve consensus on fire and other safety issues. While the NFPA administers the process and establishes rules to promote fairness in the development of consensus, it does not independently test, evaluate, or verify the accuracy of any information or the soundness of any judgments contained in NFPA Standards.

The NFPA disclaims liability for any personal injury, property or other damages of any nature whatsoever, whether special, indirect, consequential or compensatory, directly or indirectly resulting from the publication, use of, or reliance on NFPA Standards. The NFPA also makes no guaranty or warranty as to the accuracy or completeness of any information published herein.

In issuing and making NFPA Standards available, the NFPA is not undertaking to render professional or other services for or on behalf of any person or entity. Nor is the NFPA undertaking to perform any duty owed by any person or entity to someone else. Anyone using this document should rely on his or her own independent judgment or, as appropriate, seek the advice of a competent professional in determining the exercise of reasonable care in any given circumstances.

The NFPA has no power, nor does it undertake, to police or enforce compliance with the contents of NFPA Standards. Nor does the NFPA list, certify, test, or inspect products, designs, or installations for compliance with this document. Any certification or other statement of compliance with the requirements of this document shall not be attributable to the NFPA and is solely the responsibility of the certifier or maker of the statement.



ALERT: THIS STANDARD HAS BEEN MODIFIED BY A TIA OR ERRATA

Users of NFPA codes, standards, recommended practices, and guides (“NFPA Standards”) should be aware that NFPA Standards may be amended from time to time through the issuance of Tentative Interim Amendments or corrected by Errata. An official NFPA Standard at any point in time consists of the current edition of the document together with any Tentative Interim Amendment and any Errata then in effect.

In order to determine whether an NFPA Standard has been amended through the issuance of Tentative Interim Amendments or corrected by Errata, visit the “Codes & Standards” section on NFPA’s website. There, the document information pages located at the “List of NFPA Codes & Standards” provide up-to-date, document-specific information including any issued Tentative Interim Amendments and Errata.

To view the document information page for a specific NFPA Standard, go to <http://www.nfpa.org/docinfo> to choose from the list of NFPA Standards or use the search feature to select the NFPA Standard number (e.g., NFPA 101). The document information page includes postings of all existing Tentative Interim Amendments and Errata. It also includes the option to register for an “Alert” feature to receive an automatic email notification when new updates and other information are posted regarding the document.

IMPORTANT NOTICES AND DISCLAIMERS CONCERNING NFPA® STANDARDS

ADDITIONAL NOTICES AND DISCLAIMERS

Updating of NFPA Standards

Users of NFPA codes, standards, recommended practices, and guides (“NFPA Standards”) should be aware that these documents may be superseded at any time by the issuance of new editions or may be amended from time to time through the issuance of Tentative Interim Amendments or corrected by Errata. An official NFPA Standard at any point in time consists of the current edition of the document together with any Tentative Interim Amendments and any Errata then in effect. In order to determine whether a given document is the current edition and whether it has been amended through the issuance of Tentative Interim Amendments or corrected through the issuance of Errata, consult appropriate NFPA publications such as the National Fire Codes® Subscription Service, visit the NFPA website at www.nfpa.org, or contact the NFPA at the address listed below.

Interpretations of NFPA Standards

A statement, written or oral, that is not processed in accordance with Section 6 of the Regulations Governing the Development of NFPA Standards shall not be considered the official position of NFPA or any of its Committees and shall not be considered to be, nor be relied upon as, a Formal Interpretation.

Patents

The NFPA does not take any position with respect to the validity of any patent rights referenced in, related to, or asserted in connection with an NFPA Standard. The users of NFPA Standards bear the sole responsibility for determining the validity of any such patent rights, as well as the risk of infringement of such rights, and the NFPA disclaims liability for the infringement of any patent resulting from the use of or reliance on NFPA Standards.

NFPA adheres to the policy of the American National Standards Institute (ANSI) regarding the inclusion of patents in American National Standards (“the ANSI Patent Policy”), and hereby gives the following notice pursuant to that policy:

NOTICE: The user’s attention is called to the possibility that compliance with an NFPA Standard may require use of an invention covered by patent rights. NFPA takes no position as to the validity of any such patent rights or as to whether such patent rights constitute or include essential patent claims under the ANSI Patent Policy. If, in connection with the ANSI Patent Policy, a patent holder has filed a statement of willingness to grant licenses under these rights on reasonable and nondiscriminatory terms and conditions to applicants desiring to obtain such a license, copies of such filed statements can be obtained, on request, from NFPA. For further information, contact the NFPA at the address listed below.

Law and Regulations

Users of NFPA Standards should consult applicable federal, state, and local laws and regulations. NFPA does not, by the publication of its codes, standards, recommended practices, and guides, intend to urge action that is not in compliance with applicable laws, and these documents may not be construed as doing so.

Copyrights

NFPA Standards are copyrighted. They are made available for a wide variety of both public and private uses. These include both use, by reference, in laws and regulations, and use in private self-regulation, standardization, and the promotion of safe practices and methods. By making these documents available for use and adoption by public authorities and private users, the NFPA does not waive any rights in copyright to these documents.

Use of NFPA Standards for regulatory purposes should be accomplished through adoption by reference. The term “adoption by reference” means the citing of title, edition, and publishing information only. Any deletions, additions, and changes desired by the adopting authority should be noted separately in the adopting instrument. In order to assist NFPA in following the uses made of its documents, adopting authorities are requested to notify the NFPA (Attention: Secretary, Standards Council) in writing of such use. For technical assistance and questions concerning adoption of NFPA Standards, contact NFPA at the address below.

For Further Information

All questions or other communications relating to NFPA Standards and all requests for information on NFPA procedures governing its codes and standards development process, including information on the procedures for requesting Formal Interpretations, for proposing Tentative Interim Amendments, and for proposing revisions to NFPA standards during regular revision cycles, should be sent to NFPA headquarters, addressed to the attention of the Secretary, Standards Council, NFPA, 1 Batterymarch Park, P.O. Box 9101, Quincy, MA 02269-9101; email: stds_admin@nfpa.org

For more information about NFPA, visit the NFPA website at www.nfpa.org. All NFPA codes and standards can be viewed at no cost at www.nfpa.org/docinfo.

Copyright © 2015 National Fire Protection Association®. All Rights Reserved.

NFPA® 1977

Standard on

Protective Clothing and Equipment for Wildland Fire Fighting

2016 Edition

This edition of NFPA 1977, *Standard on Protective Clothing and Equipment for Wildland Fire Fighting*, was prepared by the Technical Committee on Wildland Fire Fighting Protective Clothing and Equipment and released by the Correlating Committee on Fire and Emergency Services Protective Clothing and Equipment. It was issued by the Standards Council on November 14, 2015, with an effective date of December 4, 2015, and supersedes all previous editions.

This document has been amended by one or more Tentative Interim Amendments (TIAs) and/or Errata. See “Codes & Standards” at www.nfpa.org for more information.

This edition of NFPA 1977 was approved as an American National Standard on December 4, 2015.

Origin and Development of NFPA 1977

The Technical Committee on Fire Service Protective Clothing and Equipment began work on this standard in April 1989 in answer to requests from the wildland fire service to establish a standard covering the protective clothing and equipment used by fire fighters during wildland fire-fighting operations. The Subcommittee on Wildland Fire Fighting Protective Clothing and Equipment was formed to develop the document. Based on information studied by this subcommittee, the majority of documented injuries to wildland fire fighters are related to heat stress. The goal of this standard was to provide thermal protection for the wildland fire fighter against external heat sources with flame-resistant clothing and equipment while not inducing an extraordinary internal heat stress load.

The protection package encompassed by this standard consists of protective clothing and equipment for normal exposure limits and an emergency fire shelter for severe exposure situations in which serious injury or death can result.

The developmental work for the first edition was completed by the subcommittee in the spring of 1992 and presented to the Technical Committee for its action. The first edition of NFPA 1977, *Standard on Protective Clothing and Equipment for Wildland Fire Fighting*, was presented at the Annual Meeting in Orlando, FL, and issued with an effective date of August 20, 1993.

The entire project for fire service protective clothing and equipment was reorganized by the Standards Council in January 1995. The new project had a Technical Correlating Committee on Fire and Emergency Services Protective Clothing and Equipment and seven technical committees operating within the project. The former standing Subcommittee on Wildland Fire Fighting Protective Clothing and Equipment was changed into the new Technical Committee on Wildland Fire Fighting Protective Clothing and Equipment and had the responsibility for the 1998 edition of NFPA 1977.

The second edition of NFPA 1977 was presented to the NFPA membership at the 1998 Annual Meeting in Cincinnati, OH, on May 20, 1998, and was issued by the Standards Council with an effective date of August 5, 1998.

The 2005 edition (third edition) was a complete revision of NFPA 1977 and was reformatted according to the new style for all NFPA codes and standards. Because of the new style, most of the chapter numbering and paragraph numbering changed; therefore, the chapter titles and numbering, as well as paragraph numbering, changed. While the 2005 edition's content was in a different order than in previous editions, all the material was there. The Committee included in Chapter 4 new requirements for manufacturers' quality assurance programs and for situations in which hazards involving compliant products are believed to exist, including the appropriate actions in addressing such situations if there is a previously unknown threat to the users. These requirements

apply to all fire and emergency services product standards that are the responsibility of this project. The 2005 edition included additional items of wildland fire fighting protective clothing and equipment that were not addressed in previous editions, including cold weather outerwear, chain saw protectors, load carrying equipment, and goggles. Visibility enhancement for items of wildland fire fighting protective clothing and equipment was added as a nonmandatory option should purchasers choose to specify such enhancements in the purchase specifications. The requirements for face protection accessories, for all other accessories, and for fire shelters were deleted. All labeling, design, performance, and testing requirements were reviewed and refined as necessary.

The 2011 edition featured the addition of new tables on total surface area of all reinforcements. The tables on minimum sizing requirements for protective upper and lower torso garments and one-piece garments were revised. Also, new annex sections explaining heat and thermal shrinkage tests using temperatures less than 260°C were added.

The 2016 edition features editorial changes throughout the document, including updates and title changes to the referenced documents in Chapter 2. Technical changes related to the hand measurement procedure are provided to be consistent with the requirements of NFPA 1951, *Standard on Protective Ensembles for Technical Rescue Incidents*, and NFPA 1971, *Standard on Protective Ensembles for Structural Fire Fighting and Proximity Fire Fighting*. The technical committee has clarified what is meant by stitching failure and has revised performance requirements for sewing thread. The committee also has revised the requirements for testing and wash cycles and has corrected cross-references for sample conditioning.

Correlating Committee on Fire and Emergency Services Protective Clothing and Equipment

William E. Haskell, III, *Chair*

National Institute for Occupational Safety & Health, MA [E]

Eric J. Beck, *Secretary*

Mine Safety Appliances Company, PA [M]

Rep. Compressed Gas Association

Jason L. Allen, Intertek Testing Services, NY [RT]

Joseph Arrington, San Antonio Fire Department, TX [U]

Roger L. Barker, North Carolina State University, NC [SE]

James E. Brinkley, International Association of Fire Fighters, DC [L]

Rep. International Association of Fire Fighters

Steven D. Corrado, UL LLC, NC [RT]

Cristine Z. Fargo, International Safety Equipment Association, VA [M]

Robert A. Freese, Globe Manufacturing Company, NH [M]

Patricia A. Gleason, Safety Equipment Institute (SEI), VA [RT]

Beverly F. Gulledge, Tyco/Scott Safety, NC [M]

David V. Haston, U.S. Department of Agriculture, ID [E]

Diane B. Hess, PBI Performance Products, Inc., NC [M]

Thomas M. Hosea, U.S. Department of the Navy, FL [RT]

James S. Johnson, Lawrence Livermore National Laboratory, CA [RT]

Jeff Legendre, Northborough Fire Department, MA [U]

Karen E. Lehtonen, Lion Group, Inc., OH [M]

David G. Matthews, Fire & Industrial (P.P.E) Ltd., United Kingdom [SE]

Rep. International Standards Organization

Michael F. McKenna, Michael McKenna & Associates, LLC, CA [SE]

Anthony D. Putorti, Jr., National Institute of Standards & Technology, MD [RT]

Jack E. Reall, Columbus (OH) Division of Fire, OH [L]

Rep. Columbus Firefighters Union

Jeffrey O. Stull, International Personnel Protection, Inc., TX [M]

Tim W. Tomlinson, Addison Fire Department, TX [C]

Robert D. Tutterow, Jr., Fire Industry Equipment Research Organization (FIERO), NC [U]

Rep. NFPA Fire Service Section

William A. Van Lent, Veridian Ltd., Inc., IA [M]

Rep. Fire & Emergency Manufacturers & Services Association

Bruce H. Varner, BHVarner & Associates, AZ [M]

Rep. International Fire Service Training Association

Harry P. Winer, HIP Consulting LLC, MA [SE]

Alternates

Louis Carpentier, Innotech Inc., Canada [M]

(Alt. to William A. Van Lent)

Brandi L. Chestang, U.S. Department of the Navy, FL [RT]

(Alt. to Thomas M. Hosea)

Patricia A. Freeman, Globe Manufacturing Company, LLC, NH [M]

(Alt. to Robert A. Freese)

Tim J. Gardner, 3M Company, MN [M]

(Alt. to Cristine Z. Fargo)

Pamela A. Kavalesky, Intertek Testing Services, NY [RT]

(Alt. to Jason L. Allen)

Judge W. Morgan, Tyco/Scott Safety, CA [M]

(Alt. to Beverly F. Gulledge)

Gary L. Neilson, Sparks, NV [U]

(Alt. to Robert D. Tutterow, Jr.)

Amanda H. Newsom, UL LLC, NC [RT]

(Alt. to Steven D. Corrado)

Anthony Petrilli, U.S. Department of Agriculture, MT [E]

(Alt. to David V. Haston)

Stephen R. Sanders, Safety Equipment Institute (SEI), VA [RT]

(Alt. to Patricia A. Gleason)

Russell Shephard, Australasian Fire & Emergency Service Authorities Council, Australia [SE]

(Alt. to David G. Matthews)

David P. Stoddard, Michael McKenna & Associates, LLC, CA [SE]

(Alt. to Michael F. McKenna)

Grace G. Stull, International Personnel Protection, Inc., TX [M]

(Alt. to Jeffrey O. Stull)

Jonathan V. Szalajda, National Institute for Occupational Safety & Health, PA [E]

(Alt. to William E. Haskell, III)

Donald B. Thompson, North Carolina State University, NC [SE]

(Alt. to Roger L. Barker)

Jian Xiang, The DuPont Company, Inc., VA [M]

(Alt. to Diane B. Hess)

Nonvoting

Robert J. Athanas, FDNY/SAFE-IR, Incorporated, NY [U]

Rep. TC on Electronic Safety Equipment

Christina M. Baxter, U.S. Department of Defense, VA [E]

Rep. TC on Hazardous Materials PC&E

Tricia L. Hock, Safety Equipment Institute (SEI), VA [RT]

Rep. TC on Emergency Medical Services PC&E

Stephen J. King, Babylon, NY [SE]

Rep. TC on Structural and Proximity Fire Fighting PC&E

Jeremy Metz, West Metro Fire Rescue, CO [U]

Rep. TC on Special Operations PC&E

Brian Montgomery, U.S. Department of Justice, DC [E]

Rep.

Daniel N. Rossos, Oregon Department of Public Safety Standards & Training, OR [E]

Rep. TC on Respiratory Protection Equipment

Rick L. Swan, IAFF Local 2881/CDF Fire Fighters, CA [L]

Rep. TC on Wildland Fire Fighting PC&E

Chris Farrell, NFPA Staff Liaison

This list represents the membership at the time the Committee was balloted on the final text of this edition. Since that time, changes in the membership may have occurred. A key to classifications is found at the back of the document.

NOTE: Membership on a committee shall not in and of itself constitute an endorsement of the Association or any document developed by the committee on which the member serves.

Committee Scope: This Committee shall have primary responsibility for documents on the design, performance, testing, and certification of protective clothing and protective equipment manufactured for fire and emergency services organizations and personnel, to protect against exposures encountered during emergency incident operations. This Committee shall also have the primary responsibility for documents on the selection, care, and maintenance of such protective clothing and protective equipment by fire and emergency services organizations and personnel.

Technical Committee on Wildland Fire Fighting Protective Clothing and Equipment

Rick L. Swan, Chair

IAFF Local 2881/CDF Fire Fighters, CA [L]
Rep. International Association of Fire Fighters

Marc Mousseau, Secretary

Canadian Interagency Forest Fire Centre, Canada [U]

Mark Y. Ackerman, University of Alberta, Canada [SE]

Jason L. Allen, Intertek Testing Services, NY [RT]

Richard Brown, Calaveras Consolidated Fire Protection District, CA [C]

Rep. National Volunteer Fire Council

Steven D. Corrado, UL LLC, NC [RT]

Vincent Diaz, Atlantic Thread & Supply Company Inc., MD [M]

Andrew D. Ellison, Exponent, Inc., MA [SE]

David P. Fanning, E. D. Bullard Company, KY [M]

Tricia L. Hock, Safety Equipment Institute (SEI), VA [RT]

Grant Hunter, Lacrosse Footwear Inc, OR [M]

R. J. Johnson, U.S. Department of the Interior, ID [E]

Kirk S. Kushen, Kern County Fire Department, CA [E]

Michael A. Laton, Honeywell First Responder Products, OH [M]

Benjamin Mauti, Mine Safety Appliances Company, PA [M]

David A. Moore, Jr., Glendale Fire Department, OH [E]

Anthony Petrilli, U.S. Department of Agriculture, MT [RT]
Rep. USDA Forest Service

Brian P. Shiels, PBI Performance Products, Inc., NC [M]

David L. Teter, CAL FIRE, CA [E]

Richard Weise, Los Angeles County Fire Department, CA [U]
Rep. Southern Area Fire Equipment Research

Gary C. Wood, North Carolina Division of Forest Resources, NC [C]

Alternates

Dennis K. Davis, USDA Forest Service, MT [RT]
(Alt. to Anthony Petrilli)

Derrick Davis, Kern County Fire Department, CA [E]
(Alt. to Kirk S. Kushen)

Matthew D. Elmore, E. D. Bullard Company, KY [M]
(Alt. to David P. Fanning)

Joel Fassbinder, Montana State Council of Professional Fire Fighters/IAFF, MT [L]
(Alt. to Rick L. Swan)

William E. Haskell, III, National Institute for Occupational Safety & Health, MA [E]
(Voting Alt. to NIOSH Rep.)

Andrew Kaiser, UL LLC, NC [RT]
(Alt. to Steven D. Corrado)

Pamela A. Kavalesky, Intertek Testing Services, NY [RT]
(Alt. to Jason L. Allen)

Steve W. McClintock, U.S. Department of the Interior, NV [C]
(Alt. to Richard Brown)

Dean D. Moran, Safety Equipment Institute (SEI), VA [RT]
(Alt. to Tricia L. Hock)

John F. Rihn, Mine Safety Appliances Company, PA [M]
(Alt. to Benjamin Mauti)

Debra G. Robinson, PBI Performance Products, Inc., NC [M]
(Alt. to Brian P. Shiels)

David G. Trebisacci, NFPA Staff Liaison

This list represents the membership at the time the Committee was balloted on the final text of this edition. Since that time, changes in the membership may have occurred. A key to classifications is found at the back of the document.

NOTE: Membership on a committee shall not in and of itself constitute an endorsement of the Association or any document developed by the committee on which the member serves.

Committee Scope: This Committee shall have primary responsibility for documents on protective clothing and protective equipment, except respiratory protective equipment, that provides hand, foot, torso, limb and head protection, as well as interface protection for fire fighters or other emergency services responders during incidents involving wildland fire fighting operations. These operations include the activities of fire suppression and property conservation in forest, brush, grass, ground cover, and other such vegetation that is not within structures but that is involved in fire. Additionally, this Committee shall have primary responsibility for documents on the selection, care, and maintenance of wildland fire fighting protective clothing and protective equipment by fire and emergency services organizations and personnel.

Contents

Chapter 1 Administration	1977– 7	7.3 Protective Work Glove Item Performance Requirements.	1977– 35
1.1 Scope.	1977– 7	7.4 Protective Footwear Item Performance Requirements.	1977– 36
1.2 Purpose.	1977– 7	7.5 Protective Face/Neck Shroud Item Performance Requirements.	1977– 36
1.3 Application.	1977– 8	7.6 Protective Goggle Item Performance Requirements.	1977– 37
1.4 Units.	1977– 8	7.7 Chain Saw Protector Item Performance Requirements.	1977– 37
Chapter 2 Referenced Publications	1977– 8	7.8 Protective Driving Gloves Item Performance Requirements.	1977– 37
2.1 General.	1977– 8	7.9 Load-Carrying Equipment Item Performance Requirements.	1977– 38
2.2 NFPA Publications.	1977– 8	Chapter 8 Test Methods	1977– 38
2.3 Other Publications.	1977– 8	8.1 Preconditioning.	1977– 38
2.4 References for Extracts in Mandatory Sections.	1977– 9	8.2 Radiant Protective Performance (RPP) Test. .	1977– 40
Chapter 3 Definitions	1977– 9	8.3 Flame Resistance Test.	1977– 41
3.1 General.	1977– 9	8.4 Heat and Thermal Shrinkage Resistance Test.	1977– 43
3.2 NFPA Official Definitions.	1977– 9	8.5 Total Heat Loss Test.	1977– 46
3.3 General Definitions.	1977– 10	8.6 Tear Resistance Test.	1977– 46
Chapter 4 Certification	1977– 12	8.7 Cleaning Shrinkage Resistance Test.	1977– 47
4.1 General.	1977– 12	8.8 Seam Breaking Strength Test.	1977– 48
4.2 Certification Program.	1977– 12	8.9 Thread Melting Test.	1977– 48
4.3 Inspection and Testing.	1977– 13	8.10 Burst Strength Test.	1977– 48
4.4 Annual Verification of Product Compliance. .	1977– 14	8.11 Top Impact Resistance Test (Force) After Radiant Conditioning.	1977– 49
4.5 Manufacturer's Quality Assurance Program. ..	1977– 15	8.12 Helmet Physical Penetration Resistance Test After Radiant Conditioning.	1977– 49
4.6 Hazards Involving Compliant Product.	1977– 15	8.13 Helmet Antiglare Flammability Test.	1977– 49
4.7 Manufacturer's Investigation of Complaints and Returns.	1977– 16	8.14 Flame Resistance Test for Protective Footwear.	1977– 50
4.8 Manufacturer's Safety Alert and Product Recall Systems.	1977– 16	8.15 Suspension System Retention Test.	1977– 50
Chapter 5 Labeling and Information	1977– 16	8.16 Retroreflectivity Test.	1977– 51
5.1 Protective Garments.	1977– 16	8.17 Retention System Test.	1977– 52
5.2 Protective Helmet.	1977– 17	8.18 Protective Footwear Abrasion Test.	1977– 53
5.3 Protective Work Gloves.	1977– 18	8.19 Goggle and Headlamp Clip Attachment Test.	1977– 53
5.4 Protective Footwear.	1977– 19	8.20 Protective Glove Flame Resistance Test.	1977– 54
5.5 Protective Face/Neck Shroud.	1977– 19	8.21 Conductive Heat Resistance Test.	1977– 55
5.6 Protective Goggles.	1977– 20	8.22 Thermal Protective Performance (TPP) Test.	1977– 56
5.7 Chain Saw Protectors.	1977– 21	8.23 Cut Resistance Test.	1977– 57
5.8 Protective Driving Gloves.	1977– 22	8.24 Puncture Resistance Test.	1977– 57
5.9 Load-Carrying Equipment.	1977– 23	8.25 Dexterity Test.	1977– 58
Chapter 6 Design Requirements	1977– 24	8.26 Grip Test.	1977– 58
6.1 Protective Garment Item Design Requirements.	1977– 24	8.27 Corrosion Resistance Test.	1977– 59
6.2 Protective Helmet Item Design Requirements.	1977– 25	8.28 Footwear Conductive Heat Resistance Test. ...	1977– 60
6.3 Protective Work Glove Item Design Requirements.	1977– 27	8.29 Eyelet and Stud Post Attachment Test.	1977– 60
6.4 Protective Footwear Item Design Requirements.	1977– 29	8.30 Chain Saw Protector Cut Resistance Test.	1977– 61
6.5 Protective Face/Neck Shroud Item Design Requirements.	1977– 32	8.31 Label Durability and Legibility Test 1.	1977– 61
6.6 Protective Goggle Item Design Requirements.	1977– 32	8.32 Label Durability and Legibility Test 2.	1977– 62
6.7 Chain Saw Protector Item Design Requirements.	1977– 32	8.33 Slip Resistance Test.	1977– 63
6.8 Protective Driving Glove Item Design Requirements.	1977– 33	8.34 Torque Test.	1977– 63
6.9 Load-Carrying Equipment Item Design Requirements.	1977– 33	8.35 Thread-Breaking Strength Test.	1977– 64
Chapter 7 Performance Requirements	1977– 33	Annex A Explanatory Material	1977– 64
7.1 Protective Garment Item Performance Requirements.	1977– 33	Annex B Informational References	1977– 69
7.2 Protective Helmet Item Performance Requirements.	1977– 34	Index	1977– 70

NFPA 1977

Standard on

Protective Clothing and Equipment for Wildland Fire Fighting

2016 Edition

IMPORTANT NOTE: This NFPA document is made available for use subject to important notices and legal disclaimers. These notices and disclaimers appear in all publications containing this document and may be found under the heading “Important Notices and Disclaimers Concerning NFPA Standards.” They can also be viewed at www.nfpa.org/disclaimers or obtained on request from NFPA.

UPDATES, ALERTS, AND FUTURE EDITIONS: New editions of NFPA codes, standards, recommended practices, and guides (i.e., NFPA Standards) are released on scheduled revision cycles. This edition may be superseded by a later one, or it may be amended outside of its scheduled revision cycle through the issuance of Tentative Interim Amendments (TIAs). An official NFPA Standard at any point in time consists of the current edition of the document, together with all TIAs and Errata in effect. To verify that this document is the current edition or to determine if it has been amended by TIAs or Errata, please consult the National Fire Codes® Subscription Service or the “List of NFPA Codes & Standards” at www.nfpa.org/docinfo. In addition to TIAs and Errata, the document information pages also include the option to sign up for alerts for individual documents and to be involved in the development of the next edition.

NOTICE: An asterisk (*) following the number or letter designating a paragraph indicates that explanatory material on the paragraph can be found in Annex A.

A reference in brackets [] following a section or paragraph indicates material that has been extracted from another NFPA document. As an aid to the user, the complete title and edition of the source documents for extracts in mandatory sections of the document are given in Chapter 2 and those for extracts in informational sections are given in Annex B. Extracted text may be edited for consistency and style and may include the revision of internal paragraph references and other references as appropriate. Requests for interpretations or revisions of extracted text shall be sent to the technical committee responsible for the source document.

Information on referenced publications can be found in Chapter 2 and Annex B.

Chapter 1 Administration

1.1 Scope.

1.1.1 This standard shall specify the minimum design, performance, testing, and certification requirements for items of wildland fire fighting protective clothing and equipment, including protective garments, protective helmets, protective gloves, protective footwear, protective goggles, and protective chain saw protectors; and for load-carrying equipment.

1.1.2 This standard shall specify requirements for any accessories or enhancements built into, attached to, or sold with the certified wildland fire fighting protective clothing and equipment and for load-carrying equipment by the product manufacturer for later attachment and shall be tested with the wildland fire fighting protective clothing and equipment and

for load-carrying equipment with those accessories and enhancements installed or attached, as specified in 4.3.13.

1.1.3* This standard shall not be interpreted as providing criteria for respiratory protection for wildland fire fighting operations as wildland fire fighting respiratory protection equipment is specified in NFPA 1984.

1.1.4 This standard alone shall not be interpreted as providing criteria for protective clothing or equipment for structural fire fighting operations.

1.1.5 This standard shall not be interpreted as providing criteria for fire shelters for wildland fire entrapment situations.

1.1.6 This standard shall not be construed as addressing all safety concerns, if any, associated with its use. It shall be the responsibility of the persons and organizations that use this standard to establish safety and health practices and to determine the applicability of regulatory limitations prior to use of this standard.

1.1.7 Certification of wildland fire fighting protective clothing and equipment to the requirements of this standard shall not preclude certification to additional appropriate standards where the protective clothing or equipment meet all applicable requirements of each standard.

1.1.8 This standard shall not be construed as addressing all of the safety concerns associated with the use of compliant respirators. It shall be the responsibility of the persons and organizations that use compliant respirators to establish safety and health practices and to determine the applicability of regulatory limitations prior to use.

1.1.9 This standard shall not be construed as addressing all of the safety concerns, if any, associated with the use of this standard by testing facilities. It shall be the responsibility of the persons and organizations that use this standard to conduct testing of respirators to establish safety and health practices and to determine the applicability of regulatory limitations prior to using this standard for any designing, manufacturing, and testing.

1.1.10 Nothing herein shall be construed to restrict any jurisdiction or manufacturer from exceeding these minimum requirements.

1.2 Purpose.

1.2.1* The purpose of this standard shall be to establish a minimum level of protection against the adverse environmental effects encountered by personnel performing wildland fire fighting operations.

1.2.2 To achieve this purpose, this standard shall establish minimum requirements for wildland fire fighting protective garments, helmets, gloves, footwear, goggles, chain saw protectors, and load-carrying equipment used by fire fighters during wildland fire fighting operations.

1.2.3* Controlled laboratory tests used to determine compliance with the performance requirements of this standard shall not be deemed as establishing performance levels for all situations to which wildland fire fighting personnel can be exposed.

1.2.4 This standard shall not be interpreted or used as a detailed manufacturing or purchase specification but shall be permitted to be referenced in purchase specifications as minimum requirements.

1.3 Application.

1.3.1 This standard shall apply to the design, manufacturing, and certification of new wildland fire fighting protective clothing and equipment and new wildland fire fighting load-carrying equipment.

1.3.2 This standard shall apply to any accessories or enhancements built into, attached to, or sold with the certified new wildland fire fighting protective clothing and equipment and for new wildland fire fighting load-carrying equipment by the product manufacturer for later attachment and shall be tested with the wildland fire fighting respirator with those accessories and enhancements installed or attached, as specified in 4.3.13.

1.3.3 This edition of NFPA 1977 shall not apply to wildland fire fighting protective clothing and equipment and wildland fire fighting load-carrying equipment manufactured to previous editions of this standard.

1.3.4 This standard shall not apply to any wildland protective clothing and equipment or wildland fire fighting load-carrying equipment manufactured to the requirements of any other organization's standards.

1.3.5* This standard shall not apply to respiratory protection for personnel during wildland fire fighting operations.

1.3.6 This standard shall not apply to fire shelters for use by fire fighters during wildland fire entrapment situations.

1.3.7 This standard alone shall not apply to protection for structural fire fighting operations performed during wildland fire incidents.

1.3.8 This standard alone shall not apply to protection from hazards and adverse environmental effects of emergency medical services (EMS), hazardous materials, and technical rescue operations.

1.3.9 This standard alone shall not apply to protection for terrorism incidents from chemical, biological, radiological, and nuclear (CBRN) agents.

1.3.10 This standard shall not apply to the use of wildland fire fighting protective clothing and equipment and wildland fire fighting load-carrying equipment as such use requirements are specified in NFPA 1500.

1.4 Units.

1.4.1 In this standard, values for measurement are followed by an equivalent in parentheses, but only the first stated value shall be regarded as the requirement.

1.4.2 Equivalent values in parentheses shall not be considered as the requirement, because these values are approximate.

Chapter 2 Referenced Publications

2.1 General. The documents or portions thereof listed in this chapter are referenced within this standard and shall be considered part of the requirements of this document.

2.2 NFPA Publications. National Fire Protection Association, 1 Batterymarch Park, Quincy, MA 02169-7471, www.nfpa.org.

NFPA 1500, *Standard on Fire Department Occupational Safety and Health Program*, 2013 edition.

NFPA 1984, *Standard on Respirators for Wildland Fire-Fighting Operations*, 2016 edition.

2.3 Other Publications.

2.3.1 AATCC Publications. American Association of Textile Chemists and Colorists, P.O. Box 12215, Research Triangle Park, NC 27709, www.aatcc.org.

AATCC 135, *Dimensional Changes of Fabrics After Home Laundering*, 2004.

2.3.2 Aerospace Industries Association Publications. Aerospace Industries Association, 100 Wilson Blvd., Suite 1700, Arlington, VA 22209-3928, www.aia-aerospace.org.

NASM 27980, *Fastener, Snap, Style 2* (Regular Wire Spring Clamp Type), 1998.

2.3.3 ANSI/ISEA Publications. American National Standards Institute, 25 West 43rd Street, 4th Floor, New York, NY 10036, www.ansi.org.

ANSI/ISEA Z87.1, *Occupational and Educational Personal Eye and Face Protection Devices*, 2010.

ANSI/ISEA Z89.1, *Industrial Head Protection*, 2014.

2.3.4 ASTM Publications. ASTM International, 100 Barr Harbor Drive, P.O. Box C700, West Conshohocken, PA 19428-2959, www.astm.org.

ASTM B117, *Standard Practice for Operating Salt Spray (Fog) Apparatus*, 2011.

ASTM B152/B152M, *Standard Specification for Copper Sheet, Strip, Plate, and Rolled Bar*, 2013.

ASTM D1424, *Standard Test Method for the Tear Resistance of Woven Fabrics by Falling Pendulum (Elmendorf-Type) Apparatus*, 2013.

ASTM D1683/D1683M, *Standard Test Method for Failure in Sewn Seams of Woven Fabrics*, 2011a.

ASTM D1776, *Standard Practice for Conditioning Textiles for Testing*, 2008e1.

ASTM D2256/D2256M, *Tensile Properties of Yarns by the Single-Strand Method*, 2015.

ASTM D3787, *Standard Test Method for Bursting Strength of Textiles — Constant-Rate-of-Traverse (CRT) Ball Burst Test*, 2011.

ASTM D4966, *Standard Test Method for Abrasion Resistance of Textile Fabrics (Martindale Abrasion Tester Method)*, 2012e1.

ASTM D6413/D6413M, *Standard Test Method for Flame Resistance of Textiles (Vertical Test)*, 2013b.

ASTM D7138, *Standard Test Method to Determine Melting Temperature of Synthetic Fibers*, 2008.

ASTM E809, *Standard Test Method for Measuring Photometric Characteristics of Retroreflectors*, 2013.

ASTM E810, *Standard Test Method for Coefficient of Retroreflection of Retroreflective Sheeting Utilizing the Coplanar Geometry*, 2013.

ASTM F1060, *Standard Test Method for Thermal Protective Performance of Materials for Protective Clothing for Hot Surface Contact*, 2008.

ASTM F1342/F1342M, *Standard Test Method for Protective Clothing Material Resistance to Puncture*, 2013e1.

ASTM F1414, *Standard Test Method for Measurement of Cut Resistance to Chain Saw in Lower Body (Legs) Protective Clothing*, 2013.

ASTM F1790, *Test Methods for Measuring Cut Resistance of Materials Used in Protective Clothing*, 2005.

ASTM F1868, *Standard Test Method for Thermal and Evaporative Resistance of Clothing Materials Using a Sweating Hot Plate*, 2014.

ASTM F1897, *Standard Specification for Leg Protection for Chain Saw Users*, 2014.

ASTM F1939, *Standard Test Method for Radiant Heat Resistance of Flame Resistant Clothing Materials with Continuous Heating*, 2008.

ASTM F2010/F2010M, *Standard Test Method for Evaluation of Glove Effects on Wearer Hand Dexterity Using Modified Pegboard Test*, 2010.

ASTM F2894, *Standard Test Method for Evaluation of Materials, Protective Clothing and Equipment for Heat Resistance Using a Hot Air Circulating Oven*, 2014.

ASTM F2913, *Standard Test Method for Measuring the Coefficient of Friction for Evaluation of Slip Performance of Footwear and Test Surfaces/Flooring Using a Whole Shoe Tester*, 2011.

2.3.5 EN Publications. European Standard, BSI, Customer Service, 389 Chiswick High Road, London, W4 4AL, U.K., www.bsigroup.com/en/.

EN 471, *High Visibility Warning Clothing for Professional Use. Test Methods and Requirements*, 2004, A1:2008.

2.3.6 ISO Publications. International Organization for Standardization, 1, ch. de la Voie-Creuse, CP 56, CH 1211 Geneva 20, Switzerland.

ISO 27, *Guidelines for corrective action to be taken by a certification body in the event of misuse of its mark of conformity*, 1983.

ISO 62, *General requirements for bodies operating assessment and certification/registration of quality systems*, 2008.

ISO 65, *General requirements for bodies operating product certification systems*, 1996.

ISO 4649, *Rubber vulcanized or thermoplastic — Determination of abrasion resistance using a rotating cylindrical drum device*, 2010.

ISO 9001, *Quality management systems — requirements*, 2008.

ISO 17011, *General requirements for accreditation bodies accrediting conformity assessment bodies*, 2004.

ISO 17025, *General requirements for the competence of testing and calibration laboratories*, 2005.

ISO 17492, *Clothing for protection against heat and flame — determination of heat transmission on exposure to both flame and radiant heat*, 2004.

2.3.7 U.S. Government Publications – Code of Federal Regulations. U.S. Government Publishing Office, Washington, DC 20402, www.access.gpo.gov/nara/cfr/cfr-table-search.html

Title 29, Code of Federal Regulations, Part 1910.132, “Personal Protective Equipment,” 2009.

2.3.8 U.S. Government Publications – Military Specifications and Commercial Item Descriptions. DLA Document Production Service Building 4/D, 700 Robbins Avenue, Philadelphia, PA 19111-5094, <http://quicksearch.dla.mil>.

Commercial Item Description A-A-55126B, *Fastener Tapes, Hook and Loop, Synthetic*, 7 September 2006.

Commercial Item Description A-A-55634A, *Zipper (Fasteners, Slide Interlocking)*, 23 March 2004.

Military Specification MIL-DTL-10884H, *Fastener, Snap*, 20 July 2005.

2.3.9 Other Publications.

Merriam-Webster's Collegiate Dictionary, 11th edition, Merriam-Webster, Inc., Springfield, MA, 2003.

2.4 References for Extracts in Mandatory Sections. (Reserved)

Chapter 3 Definitions

3.1 General. The definitions contained in this chapter shall apply to the terms used in this standard. Where terms are not defined in this chapter or within another chapter, they shall be defined using their ordinarily accepted meanings within the context in which they are used. *Merriam-Webster's Collegiate Dictionary*, 11th edition, shall be the source for the ordinarily accepted meaning.

3.2 NFPA Official Definitions.

3.2.1* Approved. Acceptable to the authority having jurisdiction.

3.2.2* Authority Having Jurisdiction (AHJ). An organization, office, or individual responsible for enforcing the requirements of a code or standard, or for approving equipment, materials, an installation, or a procedure.

3.2.3 Labeled. Equipment or materials to which has been attached a label, symbol, or other identifying mark of an organization that is acceptable to the authority having jurisdiction and concerned with product evaluation, that maintains periodic inspection of production of labeled equipment or materials, and by whose labeling the manufacturer indicates compliance with appropriate standards or performance in a specified manner.

3.2.4* Listed. Equipment, materials, or services included in a list published by an organization that is acceptable to the authority having jurisdiction and concerned with evaluation of products or services, that maintains periodic inspection of production of listed equipment or materials or periodic evaluation of services, and whose listing states that either the equipment, material, or service meets appropriate designated standards or has been tested and found suitable for a specified purpose.

3.2.5 Shall. Indicates a mandatory requirement.

3.2.6 Should. Indicates a recommendation or that which is advised but not required.

3.2.7 Standard. An NFPA Standard, the main text of which contains only mandatory provisions using the word “shall” to indicate requirements and that is in a form generally suitable for mandatory reference by another standard or code or for

adoption into law. Nonmandatory provisions are not to be considered a part of the requirements of a standard and shall be located in an appendix, annex, footnote, informational note, or other means as permitted in the NFPA Manuals of Style. When used in a generic sense, such as in the phrase “standards development process” or “standards development activities,” the term “standards” includes all NFPA Standards, including Codes, Standards, Recommended Practices, and Guides.

3.3* General Definitions.

3.3.1 Brim. A part of the shell of the helmet extending around the entire circumference of the helmet.

3.3.2 Certification/Certified. A system whereby a certification organization determines that a manufacturer has demonstrated the ability to produce a product that complies with the requirements of this standard, authorizes the manufacturer to use a label on listed products that comply with the requirements of this standard, and establishes a follow-up program conducted by the certification organization as a check on the methods the manufacturer uses to determine continued compliance of labeled and listed products with the requirements of this standard.

3.3.3 Certification Organization. An independent, third-party organization that determines product compliance with the requirements of this standard using product testing and evaluation, and administers a labeling/ listing/ follow-up program.

3.3.4 Chain Saw Protectors. See 3.3.77.

3.3.5 Char. The formation of a brittle residue where the material is exposed to thermal energy.

3.3.6 Chin Strap. An adjustable strap for the helmet that fits under or around the chin to secure the helmet to the head.

3.3.7 Cold Weather Outerwear. See 3.3.80.

3.3.8 Compliance/Compliant. Meeting or exceeding all applicable requirements of this standard.

3.3.9 Component. Any material, part, or subassembly used in the construction of the compliant product.

3.3.10 Composite. The layer or layers of materials or components.

3.3.11 Drip. To run or fall in drops or blobs.

3.3.12 Ease. The size requirements and tolerance of garments that allows good fit and do not inhibit the natural body movements or the performance of job-related tasks.

3.3.13 Face/Neck Shroud. See 3.3.82.

3.3.14 Flame Resistance (protective apparel). The property of a material whereby combustion is prevented, terminated, or inhibited following application of a flaming or non-flaming source of ignition, with or without subsequent removal of the ignition source. Flame resistance can be an inherent property of a material, or it can be imparted by specific treatment. (See also 3.3.29.)

3.3.15 Fluorescence. A process by which radiant flux of certain wavelengths is absorbed and reradiated non-thermally in other, usually longer, wavelengths.

3.3.16 Follow-Up Program. The sampling, inspections, tests, or other measures conducted by the certification organization on a periodic basis to determine the continued compliance of labeled and listed products that are being produced by the manufacturer to the requirements of this standard.

3.3.17 Footwear. See 3.3.83.

3.3.18 Footwear Upper. That portion of the footwear element above the sole, heel, and insole.

3.3.19 Garment. See 3.3.84, Wildland Fire Fighting Protective Garments.

3.3.20 Glove Body. The part of the glove that extends from the tip of the fingers to the wrist crease, or a specified distance beyond the wrist crease.

3.3.21 Gloves. See 3.3.81.

3.3.22 Goggle Clip. The component of the helmet that retains the strap of the goggle or headlamp.

3.3.23* Goggles. See 3.3.85.

3.3.24* Gusset. The relatively flexible material in protective footwear that joins the upper quarter and the tongue to provide expansion when donned.

3.3.25 Hardware. Nonfabric components of the protective clothing and equipment including, but not limited to, those made of metal or plastic.

3.3.26 Headform. A device that simulates the configuration of the human head.

3.3.27 Heel Breast. The forward face of the footwear heel.

3.3.28 Helmet. See 3.3.86.

3.3.29 Inherent Flame Resistance. Flame resistance that is derived from the essential characteristics of the fiber or polymer.

3.3.30 Insole. The inner component of the footwear upon which the foot rests.

3.3.31 Interlining. Any textile that is incorporated into any garment as a layer between the outer and inner layers.

3.3.32 Jacket. See 3.3.87.

3.3.33 Lining. Any material that is used to cover or partially cover the inside surface area of a protective garment.

3.3.34 Load-Carrying Equipment. See 3.3.78.

3.3.35 Lower Torso. The area of the body trunk below the waist, excluding the legs, ankles, and feet.

3.3.36 Manufacturer. The entity that directs and controls compliant product design, compliant product manufacturing, or compliant product quality assurance; or the entity that assumes the liability for the compliant product or provides the warranty for the compliant product.

3.3.37 Melt. A response to heat by a material resulting in evidence of flowing or dripping.

3.3.38 Nape Device. A component used to aid in helmet retention.

3.3.39 Neck Shroud. See 3.3.82.

3.3.40 One-Piece Garment. See 3.3.88.

3.3.41 Peak. The part of the helmet extending forward over the wearer's forehead.

3.3.42* Product Label. A marking provided by the manufacturer for each compliant product containing compliance statements, certification statements, manufacturer and model information, or similar data.

3.3.43 Protective Clothing and Equipment. See 3.3.79.

3.3.44 Protective Cold Weather Outerwear. See 3.3.80.

3.3.45 Protective Driving Gloves. See 3.3.81.

3.3.46 Protective Face/Neck Shroud. See 3.3.82.

3.3.47 Protective Footwear. See 3.3.83.

3.3.48 Protective Garments. See 3.3.84.

3.3.49 Protective Goggles. See 3.3.85.

3.3.50 Protective Helmet. See 3.3.86.

3.3.51 Protective Jacket. See 3.3.87.

3.3.52 Protective One-Piece Garment. See 3.3.88.

3.3.53 Protective Shirt. See 3.3.89.

3.3.54 Protective Trousers. See 3.3.90.

3.3.55 Protective Work Gloves. See 3.3.91.

3.3.56 Proximity Fire Fighting. Specialized fire-fighting operations that can include the activities of rescue, fire suppression, and property conservation at incidents involving fires producing very high levels of radiant heat as well as conductive and convective heat.

3.3.57 Radiant Protective Performance (RPP). A numerical value indicating the resistance of materials to a radiant heat exposure.

3.3.58 Retroreflection/Retroreflective. The reflection of light in which the reflected rays are preferentially returned in the direction close to the opposite of the direction of the incident rays, with this property being maintained over wide variations of the direction of the incident rays.

3.3.59 Sample. (1) The ensemble, element, item, component, or composite that is conditioned for testing. (See also 3.3.65, Specimen.) (2) Ensembles, elements, items, or components that are randomly selected from the manufacturer's production line, from the manufacturer's inventory, or from the open market.

3.3.60 Seams.

3.3.60.1* Major Seam. Seam assemblies where rupture exposes the wearer to immediate danger.

3.3.60.2* Minor Seam. Remaining seam assemblies that are not classified as major seams.

3.3.60.3 Seam Assembly. The structure obtained when materials are joined by means of a seam.

3.3.61 Separate/Separation. A material response evidenced by splitting or delaminating.

3.3.62 Shank. The component of footwear that provides additional support to the instep.

3.3.63 Shirt. See 3.3.89.

3.3.64 Shroud. See 3.3.82.

3.3.65 Specimen. The conditioned ensemble, element, item, or component that is tested. Specimens are taken from samples. (See also 3.3.59.)

3.3.66 Structural Fire Fighting. The activities of rescue, fire suppression, and property conservation in buildings, enclosed structures, vehicles, marine vessels, or like properties that are involved in a fire or emergency situation.

3.3.67* Tex. A direct yarn size system that identifies the weight in grams for 1000 meters of yarn.

3.3.68 Textile Fabric. A planar structure consisting of yarns or fibers.

3.3.69 Thermal Protective Performance (TPP). A numerical value indicating the resistance of materials to a convective and radiant heat exposure.

3.3.70* Tongue. The part of the protective footwear that is provided for lace up protective footwear with a closure that extends from the vamp to the top line of the footwear between sides of the footwear upper and is exposed to the exterior environment when the footwear is correctly donned.

3.3.71 Top Line. The top edge of protective footwear that includes the tongue, gusset, quarter, collar, and shaft.

3.3.72 Trim. See 3.3.75.

3.3.73 Trousers. See 3.3.90.

3.3.74 Upper Torso. The area of the body trunk above the waist and extending to the shoulder, excluding the arms, wrists, and hands.

3.3.75 Visibility Markings. Retroreflective and fluorescent conspicuity enhancements. Retroreflective enhancements improve night time conspicuity, and fluorescent enhancements improve day time conspicuity.

3.3.76 Wildland Fire Fighting. The activities of fire suppression and property conservation in woodlands, forests, grasslands, brush, prairies, and other such vegetation, or any combination of vegetation, that is involved in a fire situation but is not within buildings or structures.

3.3.77 Wildland Fire Fighting Chain Saw Protectors. The items of protective equipment that provide protection to the legs, or to the lower torso and legs, excluding the ankles and feet.

3.3.78 Wildland Fire Fighting Load-Carrying Equipment. The item of equipment worn by the wildland fire fighter to facilitate the carrying of gear.

3.3.79* Wildland Fire Fighting Protective Clothing and Equipment. Items of compliant protective clothing and equipment products that provide protection from some risks, but not all risks, of emergency incident operations.

3.3.80 Wildland Fire Fighting Protective Cold Weather Outerwear. Items of protective clothing that provide protection to the upper or lower torso, arms, and legs to provide insulation for warmth of the wearer during cold weather.

3.3.81 Wildland Fire Fighting Protective Driving Gloves. The items of protective clothing that provide protection to the

hands and wrists, and dexterity and grip to the hands that is critical to operating fire fighting vehicles and special equipment during wildland fire fighting operations.

3.3.82 Wildland Fire Fighting Protective Face/Neck Shroud. Items of protective clothing that provide protection to the face and neck area.

3.3.83 Wildland Fire Fighting Protective Footwear. Items of protective clothing that provide protection to the foot, ankle, and lower leg.

3.3.84* Wildland Fire Fighting Protective Garments. Items of protective clothing that provide protection to the wearer's upper or lower torso, excluding the hands, face, and feet.

3.3.85* Wildland Fire Fighting Protective Goggle. The items of protective equipment that provide protection to the eyes and a portion of the face.

3.3.86 Wildland Fire Fighting Protective Helmet. Items of protective equipment that provide protection to the head.

3.3.87 Wildland Fire Fighting Protective Jacket. The protective outer garment item that provides protection to the upper torso and arms, excluding the hands and head.

3.3.88 Wildland Fire Fighting Protective One-Piece Garment. The single-piece protective garment item that provides protection to the upper and lower torso, arms, and legs, excluding the head, hands, and feet.

3.3.89 Wildland Fire Fighting Protective Shirt. A protective garment item that provides protection to the upper torso and arms, excluding the head and hands.

3.3.90 Wildland Fire Fighting Protective Trousers. The protective garment items that provide protection to the lower torso and legs, excluding the feet.

3.3.91 Wildland Fire Fighting Protective Work Gloves. The items of protective clothing that provide protection to the hands and wrists while directly engaged in wildland fire fighting operations.

3.3.92 Winter Liner. An optional component layer that provides added insulation against cold.

Chapter 4 Certification

4.1 General.

4.1.1 The process of certification for protective clothing and equipment as being compliant with NFPA 1977 shall meet the requirements of Section 4.1 through Section 4.8.

4.1.2 All compliant protective clothing and equipment that are labeled as being compliant with this standard shall meet or exceed all applicable requirements specified in this standard and shall be certified.

4.1.2.1 The wildland fire fighting protective face/neck shroud shall be certified to the requirements specified in Sections 6.5 and 7.5 with a specific compliant wildland fire fighting protective helmet or helmets.

4.1.3 All certification shall be performed by a certification organization that meets at least the requirements specified in Section 4.2 and that is accredited for personal protective equipment in accordance with ISO 65, *General requirements for bodies*

operating product certification systems. The accreditation shall be issued by an accreditation body operating in accordance with ISO 17011, *General requirements for accreditation bodies accrediting conformity assessment bodies*.

4.1.4 Manufacturers shall not claim compliance with portions or segments of the requirements of this standard and shall not use the NFPA 1977, in any statements about their respective product(s) unless the product(s) is certified as compliant to this standard.

4.1.5 All compliant protective clothing and equipment shall be labeled and listed.

4.1.6 All compliant protective clothing and equipment shall also have a product label that meets the requirements specified in 5.1.1, 5.2.1, 5.3.1, 5.4.1, 5.5.1, 5.6.1, 5.7.1, 5.8.1, and 5.9.1.

4.1.7* The certification organization's label, symbol, or identifying mark shall be attached to the product label, or shall be part of the product label, or shall be immediately adjacent to the product label.

4.1.8 The certification organization shall not issue any new certifications to the 2011 edition of this standard on or after the NFPA effective date for the 2016 edition, which is December 4, 2015.

4.1.9 The certification organization shall not permit any manufacturer to continue to label any protective clothing and equipment certified as compliant with the 2011 edition of this standard on or after November 14, 2016.

4.1.10 The certification organization shall require manufacturers to remove all certification labels and product labels indicating compliance with the 2011 edition of this standard from all protective clothing and equipment that are under the control of the manufacturer on November 14, 2016 and the certification organization shall verify that this action is taken.

4.2 Certification Program.

4.2.1* The certification organization shall not be owned or controlled by manufacturers or vendors of the product being certified.

4.2.2 The certification organization shall be primarily engaged in certification work and shall not have a monetary interest in the product's ultimate profitability.

4.2.3 The certification organization shall be accredited for personal protective equipment in accordance with ISO 65, *General requirements for bodies operating product certification systems*. The accreditation shall be issued by an accreditation body operating in accordance with ISO 17011, *General requirements for accreditation bodies accrediting conformity assessment bodies*.

4.2.4 The certification organization shall refuse to certify products to this standard that do not comply with all applicable requirements of this standard.

4.2.5* The contractual provisions between the certification organization and the manufacturer shall specify that certification is contingent on compliance with all applicable requirements of this standard.

4.2.5.1 The certification organization shall not offer or confer any conditional, temporary, or partial certifications.

4.2.5.2 Manufacturers shall not be authorized to use any label or reference to the certification organization on products that are not compliant with all applicable requirements of this standard.

4.2.6* The certification organization shall have laboratory facilities and equipment available for conducting proper tests to determine product compliance.

4.2.6.1 The certification organization laboratory facilities shall have a program in place and functioning for calibration of all instruments, and procedures shall be in use to ensure proper control of all testing.

4.2.6.2 The certification organization laboratory facilities shall follow good practice regarding the use of laboratory manuals, form data sheets, documented calibration and calibration routines, performance verification, proficiency testing, and staff qualification and training programs.

4.2.7 The certification organization shall require the manufacturer to establish and maintain a quality assurance program that meets the requirements of Section 4.5.

4.2.7.1* The certification organization shall require the manufacturer to have a product recall system specified in Section 4.8, as part of the manufacturer's quality assurance program.

4.2.7.2 The certification organization shall audit the manufacturer's quality assurance program to ensure that the quality assurance program provides continued product compliance with this standard.

4.2.8 The certification organization and the manufacturer shall evaluate any changes affecting the form, fit, or function of the compliant product to determine its continued certification to this standard.

4.2.9* The certification organization shall have a follow-up inspection program of the manufacturer's facilities of the compliant product with at least two random and unannounced visits per 12-month period to verify the product's continued compliance.

4.2.9.1 As part of the follow-up inspection program, the certification organization shall select sample compliant product at random from the manufacturer's production line, from the manufacturer's in-house stock, or from the open market.

4.2.9.2 Sample product shall be evaluated by the certification organization to verify the product's continued compliance in order to ensure that the materials, components, and manufacturing quality assurance systems are consistent with the materials, components, and manufacturing quality assurance that were inspected and tested by the certification organization during initial certification and recertification.

4.2.9.3 The certification organization shall be permitted to conduct specific testing to verify the product's continued compliance.

4.2.9.4 For products, components, and materials where prior testing, judgment, and experience of the certification organization have shown results to be in jeopardy of not complying with this standard, the certification organization shall conduct more frequent testing of sample product, components, and materials acquired in accordance with 4.2.9.1 against the applicable requirements of this standard.

4.2.10 The certification organization shall have in place a series of procedures, as specified in Section 4.6, that address report(s) of situation(s) in which a compliant product is subsequently found to be hazardous.

4.2.11 The certification organization's operating procedures shall provide a mechanism for the manufacturer to appeal decisions. The procedures shall include the presentation of information from both sides of a controversy to a designated appeals panel.

4.2.12 The certification organization shall be in a position to use legal means to protect the integrity of its name and label. The name and label shall be registered and legally defended.

4.3 Inspection and Testing.

4.3.1 For both initial certification and recertification of protective clothing and equipment, the certification organization shall conduct both inspection and testing as specified in this section.

4.3.2 All inspections, evaluations, conditioning, and testing for certification or for recertification shall be conducted by a certification organization's testing laboratory that is accredited in accordance with the requirements of ISO 17025, *General requirements for the competence of testing and calibration laboratories*.

4.3.2.1 The certification organization's testing laboratory's scope of accreditation to ISO 17025, *General requirements for the competence of testing and calibration laboratories*, shall encompass testing of personal protective equipment.

4.3.2.2 The accreditation of a certification organization's testing laboratory shall be issued by an accreditation body operating in accordance with ISO 17011, *General requirements for accreditation bodies accrediting conformity assessment bodies*.

4.3.3 A certification organization shall be permitted to utilize conditioning and testing results conducted by a product or component manufacturer for certification or recertification provided the manufacturer's testing laboratory meets the requirements specified in 4.3.3.1 through 4.3.3.5.

4.3.3.1 The manufacturer's testing laboratory shall be accredited in accordance with the requirements of ISO 17025, *General requirements for the competence of testing and calibration laboratories*.

4.3.3.2 The manufacturer's testing laboratory's scope of accreditation to ISO 17025, *General requirements for the competence of testing and calibration laboratories*, shall encompass testing of personal protective equipment.

4.3.3.3 The accreditation of a manufacturer's testing laboratory shall be issued by an accreditation body operating in accordance with ISO 17011, *General requirements for accreditation bodies accrediting conformity assessment bodies*.

4.3.3.4 The certification organization shall approve the manufacturer's testing laboratory.

4.3.3.5 The certification organization shall determine the level of supervision and witnessing of the conditioning and testing for certification or recertification conducted at the manufacturer's testing laboratory.

4.3.4 Sampling levels for testing and inspection shall be established by the certification organization and the manufacturer to ensure a reasonable and acceptable reliability at a reasonable and acceptable confidence level that products certified to this standard are compliant, unless such sampling levels are specified herein.

4.3.5 Inspection by the certification organization shall include a review of all product labels to ensure that all required label attachments, compliance statements, certification statements, and other product information are at least as specified for the protective clothing and equipment in 5.1.1, 5.2.1, 5.3.1, 5.4.1, 5.5.1, 5.6.1, 5.7.1, 5.8.1, and 5.9.1.

4.3.6 Inspection by the certification organization shall include an evaluation of any symbols and pictorial graphic representations used on product labels or in user information, as permitted in 5.1.1.6, 5.2.1.6, 5.3.1.6, 5.4.1.6, 5.5.1.6, 5.6.1.6, 5.7.1.6, 5.8.1.6, and 5.9.1.6, to ensure that the symbols are clearly explained in the product's user information package.

4.3.7 Inspection by the certification organization shall include a review of the user information required by 5.1.2, 5.2.2, 5.3.2, 5.4.2, 5.5.2, 5.6.2, 5.7.2, 5.8.2, and 5.9.2 to ensure that the information has been developed and is available.

4.3.8 Inspection and evaluation by the certification organization for determining compliance with the design requirements specified in Chapter 6 shall be performed on whole or complete products.

4.3.9 Testing to determine product compliance with the performance requirements specified in Chapter 7 shall be conducted by the certification organization in accordance with the specified testing requirements of Chapter 8.

4.3.9.1 Testing shall be performed on specimens representative of materials and components used in the actual construction of the protective clothing and equipment.

4.3.9.2 The certification organization also shall be permitted to use sample materials cut from a representative product.

4.3.10 The certification organization shall accept from the manufacturer, for evaluation and testing for certification, only product or product components that are the same in every respect to the actual final product or product component.

4.3.11 The certification organization shall not allow any modifications, pretreatment, conditioning, or other such special processes of the product or any product component prior to the product's submission for evaluation and testing by the certification organization.

4.3.12 The certification organization shall not allow the substitution, repair, or modification, other than as specifically permitted herein, of any product or any product component during testing.

4.3.13 Where there are any accessories, enhancements, or both that are built into, or attachable to, or detachable from wildland fire fighting protective clothing and equipment and wildland fire fighting load-carrying equipment by the product manufacturer, the certification organization shall evaluate and inspect the product as specified in Chapter 6 and shall test the product as specified in Chapter 8, and the product shall meet the performance requirements specified in Chapter 7 with those accessories and enhancements installed or attached to

ensure the performance and functions of the protective clothing and equipment or the load-carrying equipment.

4.3.14 The certification organization shall not allow test specimens that have been conditioned and tested for one method to be reconditioned and tested for another test method unless specifically permitted in the test method.

4.3.15 Any change in the design, construction, or material of a compliant product shall necessitate new inspection and testing to verify compliance to all applicable requirements of this standard that the certification organization determines can be affected by such change. This recertification shall be conducted before labeling the modified product, accessories, or enhancements certified as being compliant with this standard.

4.3.16 The manufacturer shall maintain all design and performance inspection and test data from the certification organization used in the certification of the manufacturer's compliant product. The manufacturer shall provide such data, upon request, to the purchaser or authority having jurisdiction.

4.4 Annual Verification of Product Compliance.

4.4.1 All protective clothing and equipment labeled as being compliant with this standard shall undergo recertification on an annual basis. This recertification shall include the following:

- (1) Inspection and evaluation to all design requirements as required by this standard on all manufacturer models and components
- (2) Testing to all performance requirements as required by this standard on all manufacturer models and components with the following protocol:
 - (a) Where a test method incorporates testing both before and after the laundering preconditioning specified in 8.1.2 and the test generates quantitative results, recertification testing shall be limited to the conditioning that yielded the worst-case test result during the initial certification for the model or component.
 - (b) Where a test method incorporates testing both before and after laundering preconditioning specified in 8.1.2 and the test generates nonquantitative results (e.g., pass/fail for melt/drip), recertification shall be limited to a single conditioning procedure in any given year. Subsequent annual recertifications shall cycle through the remaining conditioning procedures to ensure that all required conditionings are included over time.
 - (c) Where a test method requires the testing of three specimens, a minimum of one specimen shall be tested for annual recertification. For conductive heat resistance testing of gloves, three specimens shall be tested.
 - (d) Where a test method requires the testing of five or more specimens, a minimum of two specimens shall be tested for annual recertification.

4.4.2 Samples of manufacturer models and components for recertification acquired from the manufacturer or component supplier during random and unannounced visits as part of the follow-up inspection program in accordance with 4.2.9 shall be permitted to be used toward annual recertification.

4.4.2.1 For recertification, the certification organization shall acquire at least one complete item of protective clothing or equipment.

4.4.2.2 The certification organization shall also acquire a sufficient quantity of components to be tested for recertification as required by 4.4.3.

4.4.3 Protective clothing, equipment, and components shall be inspected, evaluated, and tested as specified in 4.4.3.1 and 4.4.3.2.

4.4.3.1 One sample of each protective clothing or equipment item shall be inspected and evaluated to each of the design requirements specified in Chapter 6.

4.4.3.2 One sample of each protective clothing or equipment item or components shall be tested for overall performance as specified in Chapter 7.

4.4.4 The manufacturer shall maintain all design, inspection, performance, and test data from the certification organization produced during the recertification of manufacturer's models and components. The manufacturer shall provide such data, upon request, to the purchaser or to the authority having jurisdiction.

4.5 Manufacturer's Quality Assurance Program.

4.5.1 The manufacturer shall provide and operate a quality assurance program that meets the requirements of this section and that includes a product recall system as specified in 4.2.7.1 and Section 4.8.

4.5.2 The operation of the quality assurance program shall evaluate and test compliant product production against this standard to ensure that production remains in compliance.

4.5.3 The manufacturer shall be registered to ISO 9001, *Quality management systems — requirements*.

4.5.3.1 Registration to the requirements of ISO 9001, *Quality management systems—requirements*, shall be conducted by a registrar that is accredited for personal protective equipment in accordance with ISO 62, *General requirements for bodies operating assessment and certification/registration of quality systems*. The registrar shall affix the accreditation mark on the ISO registration certificate.

4.5.3.2 The scope of the ISO registration shall include at least the design and manufacturing systems management for the type of personal protective equipment being certified.

4.5.4* Any entity that meets the definition of manufacturer as specified in Section 3.3, and therefore is considered to be the "manufacturer," but does not manufacture or assemble the compliant product, shall meet the requirements specified in Section 4.5.

4.5.5* Where the manufacturer uses subcontractors in the construction or assembly of the compliant product, the locations and names of all subcontractor facilities shall be documented and the documentation shall be provided to the manufacturer's ISO registrar and the certification organization.

4.5.6 Where manufacturers make custom-sized or specially fitted gloves for accommodating the special needs of individual firefighters, the manufacturer shall employ the same manufacturing methods as used for making required glove sizes.

4.5.6.1 The manufacturer shall notify the certification organization as required in 4.2.8 and shall obtain written approval from the certification organization prior to proceeding with any modifications to an existing certified glove design.

4.5.6.2 Where gloves are provided with a moisture barrier, custom-fitting gloves shall be individually evaluated to verify the integrity of the glove moisture barrier using air or other similar method to ensure that the glove is constructed in a leak-free manner.

4.6 Hazards Involving Compliant Product.

4.6.1* The certification organization shall establish procedures to be followed where situation(s) are reported in which a compliant product is subsequently found to be hazardous. These procedures shall comply with the provisions of ISO 27, *Guidelines for corrective action to be taken by a certification body in the event of misuse of its mark of conformity*, and as modified herein.

4.6.2* Where a report of a hazard involved with a compliant product is received by the certification organization, the validity of the report shall be investigated.

4.6.3 With respect to a compliant product, a hazard shall be a condition, or create a situation, that results in exposing life, limb, or property to an imminently dangerous or dangerous condition.

4.6.4 Where a specific hazard is identified, the determination of the appropriate action for the certification organization and the manufacturer to undertake shall take into consideration the severity of the hazard and its consequences to the safety and health of users.

4.6.5 Where it is established that a hazard is involved with a compliant product, the certification organization shall determine the scope of the hazard including products, model numbers, serial numbers, factory production facilities, production runs, and quantities involved.

4.6.6 The certification organization's investigation shall include, but not be limited to, the extent and scope of the problem as it might apply to other compliant product or compliant product components manufactured by other manufacturers or certified by other certification organizations.

4.6.7 The certification organization shall also investigate reports of a hazard where compliant product is gaining widespread use in applications not foreseen when the standard was written, such applications in turn being ones for which the product was not certified, and no specific scope of application has been provided in the standard, and no limiting scope of application was provided by the manufacturer in written material accompanying the compliant product at the point of sale.

4.6.8 The certification organization shall require the manufacturer of the compliant product or of the compliant product component, if applicable, to assist the certification organization in the investigation and to conduct its own investigation as specified in Section 4.7.

4.6.9 Where the facts indicating a need for corrective action are conclusive and the certification organization's appeal procedures referenced in 4.2.11 have been followed, the certification organization shall initiate corrective action immediately, provided there is a manufacturer to be held responsible for such action.

4.6.10 Where the facts are conclusive and corrective action is indicated, but there is no manufacturer to be held responsible, such as when the manufacturer is out of business or the manufacturer is bankrupt, the certification organization shall imme-

diately notify relevant governmental and regulatory agencies and issue a notice to the user community about the hazard.

4.6.11* Where the facts are conclusive and corrective action is indicated, the certification organization shall take one or more of the following corrective actions:

- (1) Notification of parties authorized and responsible for issuing a safety alert when, in the opinion of the certification organization, such a notification is necessary to inform the users.
- (2) Notification of parties authorized and responsible for issuing a product recall when, in the opinion of the certification organization, such a recall is necessary to protect the users.
- (3) Removing the mark of certification from the product.
- (4) Where a hazardous condition exists and it is not practical to implement 4.6.11(1), 4.6.11(2), or 4.6.11(3), or the responsible parties refuse to take corrective action, the certification organization shall notify relevant governmental and regulatory agencies and issue a notice to the user community about the hazard.

4.6.12 The certification organization shall provide a report to the organization or responsible individual identifying the reported hazardous condition and notify them of the corrective action indicated, or that no corrective action is indicated.

4.6.13* Where a change to an NFPA standard(s) is felt to be necessary, the certification organization shall also provide a copy of the report and corrective actions indicated to NFPA, and shall also submit either a Public Proposal for a proposed change to the next revision of the applicable standard, or a proposed Temporary Interim Amendment (TIA) to the current edition of the applicable standard.

4.7 Manufacturer's Investigation of Complaints and Returns.

4.7.1 Manufacturers shall provide corrective action in accordance with ISO 9001, *Quality management systems — requirements*, for investigating written complaints and returned products.

4.7.2 Manufacturers' records of returns and complaints related to safety issues shall be retained for at least 5 years.

4.7.3 Where the manufacturer discovers, during the review of specific returns or complaints, that a compliant product or compliant product component can constitute a potential safety risk to end users and is possibly subject to a safety alert or product recall, the manufacturer shall immediately contact the certification organization and provide all information about its review to assist the certification organization with its investigation.

4.8 Manufacturer's Safety Alert and Product Recall Systems.

4.8.1 A manufacturer shall establish a written safety alert system and a written product recall system that describes the procedures to be used in the event that it decides, or is directed by the certification organization, to either issue a safety alert or to conduct a product recall.

4.8.2 The manufacturer's safety alert and product recall system shall provide the following:

- (1) The establishment of a coordinator and responsibilities by the manufacturer for the handling of safety alerts and product recalls
- (2) A method of notifying all dealers, distributors, purchasers, users, and NFPA about the safety alert or product

recall that can be initiated within a 1-week period following the manufacturer's decision to issue a safety alert or to conduct a product recall, or after the manufacturer has been directed by the certification organization to issue a safety alert or conduct a product recall

- (3) Techniques for communicating accurately and understandably the nature of the safety alert or product recall and in particular the specific hazard or safety issue found to exist
- (4) Procedures for removing product from the market that is recalled and for documenting the effectiveness of the product recall
- (5) A plan for repairing, replacing, or compensating purchasers for returned product

Chapter 5 Labeling and Information

5.1 Protective Garments.

5.1.1 Product Label Requirements.

5.1.1.1 Each garment shall have a product label or labels permanently and conspicuously attached. At least one product label shall be conspicuously located inside each garment when the garment is properly assembled with all layers and components in place.

5.1.1.2 Configuration of the product label and attachment of the product label shall not interfere with the legibility of any printed portion of the product label.

5.1.1.3 Multiple label pieces shall be permitted in order to carry all statements and information required to be on the product label.

5.1.1.4* The certification organization's label, symbol, or identifying mark shall be permanently attached to the product label or shall be part of the product label.

5.1.1.5 All worded portions of the required product label shall be printed at least in English.

5.1.1.6 Symbols and other pictorial graphic representations shall be permitted to be used to supplement or in place of worded statements on the product label(s) where explanations for symbols and pictorial graphic representations are provided in the user information.

5.1.1.7 The following statement shall be printed legibly on the product label, and all letters shall be at least 2.5 mm ($\frac{3}{32}$ in.) high:

**“THIS WILDLAND FIRE FIGHTING PROTECTIVE
GARMENT MEETS THE REQUIREMENTS OF NFPA 1977,
STANDARD ON PROTECTIVE CLOTHING AND EQUIP-
MENT FOR WILDLAND FIRE FIGHTING, 2016 EDITION.**

DO NOT REMOVE THIS LABEL!”

5.1.1.8 At least the following information shall also be printed legibly on the product label, with all letters at least 1.6 mm ($\frac{1}{16}$ in.) high:

- (1) Manufacturer's name, identification, or designation
- (2) Manufacturer's address
- (3) Country of manufacture
- (4) Manufacturer's garment identification number, lot number, or serial number
- (5) Month and year of manufacture (not coded)

- (6) Model or style name, number, or design
- (7) Size, using the garment sizes specified in 6.1.14
- (8) Garment materials and percent content
- (9) Cleaning precautions

5.1.2 User Information.

5.1.2.1 The garment manufacturer shall provide at least the user information that is specified in 5.1.2.5 with each garment.

5.1.2.2 The garment manufacturer shall attach the required user information or packaging containing the user information to the garment in such a manner that it is not possible to use the garment without being aware of the availability of the information.

5.1.2.3 The required user information or packaging containing the user information shall be attached to the garment so that a deliberate action is necessary to remove it. The garment manufacturer shall provide notice that the user information is to be removed ONLY by the end user.

5.1.2.4 Symbols and other pictorial graphic representations shall be permitted to be used to supplement or in place of worded statements where explanations for symbols and pictorial graphic representations are provided in the user information.

5.1.2.5 The garment manufacturer shall provide at least the following instructions and information with each garment:

- (1) Pre-use information
 - (a) Safety considerations
 - (b) Limitations of use
 - (c) Garment marking recommendations and restrictions
 - (d) A statement that most performance properties of the garment cannot be tested by the user in the field
 - (e) Warranty information
- (2) Preparation for use
 - (a) Sizing/adjustment
 - (b) Recommended storage practices
- (3) Inspection frequency and details
- (4) Donning/doffing
 - (a) Donning and doffing procedures
 - (b) Sizing and adjustment procedures
 - (c) Interface issues
- (5) Proper use consistent with NFPA 1500 and 29 CFR 1910.132, "Personal Protective Equipment"
- (6) Maintenance and cleaning
 - (a) Cleaning instructions and precautions with a statement advising users not to use garments that are not thoroughly cleaned and dried
 - (b) Maintenance criteria and methods of repair where applicable
 - (c) Decontamination procedures
- (7) Retirement and disposal criteria and considerations

5.2 Protective Helmet.

5.2.1 Product Label Requirements.

5.2.1.1 Each helmet shall have a product label or labels permanently and conspicuously attached. At least one product label shall be conspicuously located on or inside each helmet

when the helmet is properly assembled with all components in place.

5.2.1.2 Configuration of the product label and attachment of the product label shall not interfere with the legibility of any printed portion of the product label.

5.2.1.3 Multiple label pieces shall be permitted in order to carry all the statements and information required to be on the product label.

5.2.1.4* The certification organization's label, symbol, or identifying mark shall be permanently attached to the product label or shall be part of the product label.

5.2.1.5 All worded portions of the required product label shall be printed at least in English.

5.2.1.6 Symbols and other pictorial graphic representations shall be permitted to be used to supplement or in place of worded statements on the product label(s) where explanations for symbols and pictorial graphic representations are provided in the user information.

5.2.1.7 The following statement shall be printed legibly on the product label, and all letters shall be at least 2.5 mm ($\frac{3}{32}$ in.) high:

**"THIS WILDLAND FIRE FIGHTING PROTECTIVE
HELMET MEETS THE REQUIREMENTS OF NFPA 1977,
STANDARD ON PROTECTIVE CLOTHING AND EQUIP-
MENT FOR WILDLAND FIRE FIGHTING, 2016 EDITION.**

DO NOT REMOVE THIS LABEL!"

5.2.1.8 At least the following information shall also be printed legibly on the product label, with all letters at least 1.6 mm ($\frac{1}{16}$ in.) high:

- (1) Manufacturer's name, identification, or designation
- (2) Manufacturer's address
- (3) Country of manufacture
- (4) Manufacturer's helmet identification number, lot number, or serial number
- (5) Month and year of manufacture (not coded)
- (6) Model or style name, number, or design
- (7) Helmet size or size range
- (8) Nominal weight of helmet
- (9) Cleaning precautions

5.2.2 User Information.

5.2.2.1 The helmet manufacturer shall provide at least the user information that is specified in 5.2.2.5 with each helmet.

5.2.2.2 The helmet manufacturer shall attach the required user information or packaging containing the user information to the helmet in such a manner that it is not possible to use the helmet without being aware of the availability of the information.

5.2.2.3 The required user information or packaging containing the user information shall be attached to the helmet so that a deliberate action is necessary to remove it. The helmet manufacturer shall provide notice that the user information is to be removed ONLY by the end user.

5.2.2.4 Symbols and other pictorial graphic representations shall be permitted to be used to supplement or in place of worded statements where explanations for symbols and pictorial graphic representations are provided in the user information.

5.2.2.5 The helmet manufacturer shall provide at least the following instructions and information with each helmet:

- (1) Pre-use information
 - (a) Safety considerations
 - (b) Limitations of use
 - (c) Helmet marking recommendations and restrictions
 - (d) A statement that most performance properties of the helmet cannot be tested by the user in the field
 - (e) Warranty information
- (2) Preparation for use
 - (a) Sizing/adjustment
 - (b) Recommended storage practices
- (3) Inspection frequency and details
- (4) Donning/doffing
 - (a) Donning and doffing procedures
 - (b) Sizing and adjustment procedures
 - (c) Interface issues
- (5) Proper use consistent with NFPA 1500 and 29 CFR 1910.132, "Personal Protective Equipment"
- (6) Maintenance and cleaning
 - (a) Cleaning instructions and precautions with a statement advising users not to use helmets that are not thoroughly cleaned and dried
 - (b) Maintenance criteria and methods of repair where applicable
 - (c) Decontamination procedures
- (7) Retirement and disposal criteria and considerations

5.3 Protective Work Gloves.

5.3.1 Product Label Requirements.

5.3.1.1 Each protective work glove shall have a product label or labels permanently and conspicuously attached. At least one product label shall be conspicuously located on or inside each work glove when the glove is properly assembled with all components in place.

5.3.1.2 Configuration of the product label and attachment of the product label shall not interfere with the legibility of any printed portion of the product label.

5.3.1.3 Multiple label pieces shall be permitted in order to carry all the statements, symbols, and information required to be on the product label.

5.3.1.4* The certification organization's label, symbol, or identifying mark shall be permanently attached to the product label or shall be part of the product label.

5.3.1.5 All worded portions of the required product label shall be printed at least in English.

5.3.1.6 Symbols and other pictorial graphic representations shall be permitted to be used to supplement or in place of worded statements on the product label(s) where explanations for symbols and pictorial graphic representations are provided in the user information.

5.3.1.7 The following statement shall be printed legibly on the work glove product label, and all letters shall be at least 2.5 mm ($\frac{3}{32}$ in.) high:

"THIS WILDLAND FIRE FIGHTING PROTECTIVE WORK GLOVE MEETS THE WORK GLOVE REQUIREMENTS OF NFPA 1977, STANDARD ON PROTECTIVE CLOTHING AND EQUIPMENT FOR WILDLAND FIRE FIGHTING, 2016 EDITION.

DO NOT REMOVE THIS LABEL!"

5.3.1.8 At least the following information shall also be printed legibly on the work glove product label, with all letters at least 1.6 mm ($\frac{1}{16}$ in.) high:

- (1) Manufacturer's name, identification, or designation
- (2) Manufacturer's address
- (3) Country of manufacture
- (4) Manufacturer's glove identification number, lot number, or serial number
- (5) Month and year of manufacture (not coded)
- (6) Model or style name, number, or design
- (7) Glove size or size range
- (8) Cleaning precautions

5.3.2 User Information.

5.3.2.1 The protective work glove manufacturer shall provide at least the user information that is specified in 5.3.2.5 with each work glove pair.

5.3.2.2 The protective work glove manufacturer shall attach the required user information or packaging containing the user information to the work glove pair in such a manner that it is not possible to use the work gloves without being aware of the availability of the information.

5.3.2.3 The required user information or packaging containing the user information shall be attached to the work glove pair so that a deliberate action is necessary to remove it. The protective work glove manufacturer shall provide notice that the user information is to be removed ONLY by the end user.

5.3.2.4 Symbols and other pictorial graphic representations shall be permitted to be used to supplement or in place of worded statements where explanations for symbols and pictorial graphic representations are provided in the user information.

5.3.2.5 The protective work glove manufacturer shall provide at least the following instructions and information with each work glove pair:

- (1) Pre-use information
 - (a) Safety considerations
 - (b) Limitations of use
 - (c) Glove marking recommendations and restrictions
 - (d) A statement that most performance properties of the gloves cannot be tested by the user in the field
 - (e) Warranty information
- (2) Preparation for use
 - (a) Sizing/adjustment
 - (b) Recommended storage practices
- (3) Inspection frequency and details
- (4) Donning/doffing
 - (a) Donning and doffing procedures
 - (b) Sizing and adjustment procedures

- (c) Interface issues
- (5) Proper use consistent with NFPA 1500
- (6) Maintenance and cleaning
 - (a) Cleaning instructions and precautions with a statement advising users not to use gloves that are not thoroughly cleaned and dried
 - (b) Maintenance criteria and methods of repair where applicable
- (7) Retirement and disposal criteria and considerations

5.3.2.6 The protective work glove manufacturer shall make available to prospective purchasers and the purchaser a chart illustrating the hand dimension ranges specified in 6.3.5.

5.4 Protective Footwear.

5.4.1 Product Label Requirements.

5.4.1.1 Each footwear pair shall have a product label or labels permanently and conspicuously attached to each boot half pair. At least one product label shall be conspicuously located on or inside each boot when the boot is properly assembled with all components in place.

5.4.1.2 Configuration of the product label and attachment of the product label shall not interfere with the legibility of any printed portion of the product label.

5.4.1.3 Multiple label pieces shall be permitted in order to carry all the statements and information required to be on the product label.

5.4.1.4* The certification organization's label, symbol, or identifying mark shall be permanently attached to the product label or shall be part of the product label.

5.4.1.5 All worded portions of the required product label shall be printed at least in English.

5.4.1.6 Symbols and other pictorial graphic representations shall be permitted to be used to supplement or in place of worded statements on the product label(s) where explanations for symbols and pictorial graphic representations are provided in the user information.

5.4.1.7 The following statement shall be printed legibly on the product label, and all letters shall be at least 2.5 mm ($\frac{3}{32}$ in.) high:

“THIS WILDLAND FIRE FIGHTING PROTECTIVE FOOTWEAR MEETS THE REQUIREMENTS OF NFPA 1977, STANDARD ON PROTECTIVE CLOTHING AND EQUIPMENT FOR WILDLAND FIRE FIGHTING, 2016 EDITION.

DO NOT REMOVE THIS LABEL!”

5.4.1.8 At least the following information shall also be printed legibly on the product label, with all letters at least 1.6 mm ($\frac{1}{16}$ in.) high:

- (1) Manufacturer's name, identification, or designation
- (2) Manufacturer's address
- (3) Country of manufacture
- (4) Manufacturer's footwear identification number, lot number, or serial number
- (5) Month and year of manufacture (not coded)
- (6) Model or style name, number, or design
- (7) Footwear size and width
- (8) Cleaning precautions

5.4.2 User Information.

5.4.2.1 The footwear manufacturer shall provide at least the user information that is specified in 5.4.2.5 with each footwear pair.

5.4.2.2 The footwear manufacturer shall attach the required user information or packaging containing the user information to the boot pair in such a manner that it is not possible to use the boots without being aware of the availability of the information.

5.4.2.3 The required user information or packaging containing the user information shall be attached to the boot pair so that a deliberate action is necessary to remove it. The footwear manufacturer shall provide notice that the user information is to be removed ONLY by the end user.

5.4.2.4 Symbols and other pictorial graphic representations shall be permitted to be used to supplement or in place of worded statements where explanations for symbols and pictorial graphic representations are provided in the user information.

5.4.2.5 The footwear manufacturer shall provide at least the following instructions and information with each footwear pair:

- (1) Pre-use information
 - (a) Safety considerations
 - (b) Limitations of use
 - (c) Boot marking recommendations and restrictions
 - (d) A statement that most performance properties of the boots cannot be tested by the user in the field
 - (e) Warranty information
- (2) Preparation for use
 - (a) Sizing/adjustment
 - (b) Recommended storage practices
- (3) Inspection frequency and details
- (4) Donning/doffing
 - (a) Donning and doffing procedures
 - (b) Sizing and adjustment procedures
 - (c) Interface issues
- (5) Proper use consistent with NFPA 1500 and 29 CFR 1910.132, “Personal Protective Equipment”
- (6) Maintenance and cleaning
 - (a) Cleaning instructions and precautions with a statement advising users not to use boots that are not thoroughly cleaned and dried
 - (b) Maintenance criteria and methods of repair where applicable
 - (c) Decontamination procedures
- (7) Retirement and disposal criteria and considerations

5.4.2.6 Manufacturers shall be required to establish and provide, upon request, a size conversion chart for each model or style of protective footwear based on toe length, arch length, and foot width as measured on the Brannock Scientific Foot Measuring Device.

5.5 Protective Face/Neck Shroud.

5.5.1 Product Label Requirements.

5.5.1.1 Each face/neck shroud shall have a product label or labels permanently and conspicuously attached.

5.5.1.2 Configuration of the product label and attachment of the product label shall not interfere with the legibility of any printed portion of the product label.

5.5.1.3 Multiple label pieces shall be permitted in order to carry all statements and information required to be on the product label.

5.5.1.4* The certification organization's label, symbol, or identifying mark shall be permanently attached to the product label or shall be part of the product label.

5.5.1.5 All worded portions of the required product label shall be printed at least in English.

5.5.1.6 Symbols and other pictorial graphic representations shall be permitted to be used to supplement or in place of worded statements on the product label(s) where explanations for symbols and pictorial graphic representations are provided in the user information.

5.5.1.7 The following statement shall be printed legibly on the product label, and all letters shall be at least 2.5 mm ($\frac{3}{32}$ in.) high:

**“THIS WILDLAND FIRE FIGHTING PROTECTIVE FACE/
NECK SHROUD MEETS THE REQUIREMENTS OF
NFPA 1977, STANDARD ON PROTECTIVE CLOTHING
AND EQUIPMENT FOR WILDLAND FIRE FIGHTING,
2016 EDITION.**

DO NOT REMOVE THIS LABEL!”

5.5.1.8 At least the following information shall also be printed legibly on the product label, with all letters at least 1.6 mm ($\frac{1}{16}$ in.) high:

- (1) Manufacturer's name
- (2) Manufacturer's address
- (3) Country of manufacture
- (4) Manufacturer's number, lot, or serial number
- (5) Month and year of manufacture (not coded)
- (6) Model or style name, number, or design
- (7) Identification of the compliant helmet(s) with which the face/neck shroud was certified

5.5.2 User Information.

5.5.2.1 The face/neck shroud manufacturer shall provide at least the user information that is specified in 5.5.2.5 with each shroud.

5.5.2.2 The shroud manufacturer shall attach the required user information or packaging containing the user information to the shroud in such a manner that it is not possible to use the shroud without being aware of the availability of the information.

5.5.2.3 The required user information or packaging containing the user information shall be attached to the shroud so that a deliberate action is necessary to remove it. The garment manufacturer shall provide notice that the user information is to be removed ONLY by the end user.

5.5.2.4 Symbols and other pictorial graphic representations shall be permitted to be used to supplement or replace worded statements or user information where explanations for symbols and pictorial graphic representations are provided.

5.5.2.5 The face/neck shroud manufacturer shall provide at least the following instructions and information with each face/neck shroud.

- (1) Pre-use information
 - (a) Safety considerations
 - (b) Limitations of use
 - (c) Shroud marking recommendations and restrictions
 - (d) A statement that most performance properties of the shroud cannot be tested by the user in the field
 - (e) Warranty information
- (2) Preparation for use
 - (a) Sizing/adjustment
 - (b) Recommended storage practices
- (3) Inspection frequency and details
- (4) Donning/doffing
 - (a) Donning and doffing procedures
 - (b) Sizing and adjustment procedures
 - (c) Interface issues
- (5) Proper use consistent with NFPA 1500 and 29 CFR 1910.132, “Personal Protective Equipment”
- (6) Maintenance and cleaning
 - (a) Cleaning instructions and precautions with a statement advising users not to use shrouds that are not thoroughly cleaned and dried
 - (b) Maintenance criteria and methods of repair where applicable
 - (c) Decontamination procedures
- (7) Retirement and disposal criteria and considerations

5.5.2.6 The manufacturer shall identify by manufacturer name and model number the helmet(s) with which the face/neck shroud has been certified and include instructions in the user information for how the face/neck shroud is worn with each helmet with which the face/neck shroud is certified.

5.6 Protective Goggles.

5.6.1 Product Label Requirements.

5.6.1.1 Each pair of goggles shall have a product label configured and attached to the goggles so that the product label shall not interfere with the legibility of any printed portion of the label.

5.6.1.2 Product labels shall be permitted to be configured as labels attached to the goggles, tags attached to the goggles, or package labels printed on or attached to the package containing the smallest number of goggles from which the user withdraws a pair of goggles for use.

5.6.1.3 Multiple label pieces shall be permitted in order to carry all statements and information required to be on the product label.

5.6.1.4* The certification organization's label, symbol, or identifying mark shall be permanently attached to the product label or shall be part of the product label.

5.6.1.5 All worded portions of the required product labels shall be printed at least in English.

5.6.1.6 Symbols and other pictorial graphic representations shall be permitted to be used to supplement or in place of worded statements on the product label(s) where explanations for symbols and pictorial graphic representations are provided in the user information.

5.6.1.7 The following statement shall be printed legibly on the product label, and all letters shall be at least 2.5 mm ($\frac{3}{32}$ in.) high:

“THIS WILDLAND FIRE FIGHTING PROTECTIVE GOGGLE MEETS THE REQUIREMENTS OF NFPA 1977, STANDARD ON PROTECTIVE CLOTHING AND EQUIPMENT FOR WILDLAND FIRE FIGHTING, 2016 EDITION.

DO NOT REMOVE THIS LABEL!”

5.6.1.8 At least the following information shall also be printed legibly on the product label, with all letters at least 1.6 mm ($\frac{1}{16}$ in.) high:

- (1) Manufacturer's name
- (2) Manufacturer's address
- (3) Country of manufacture
- (4) Manufacturer's number, lot, or serial number
- (5) Month and year of manufacture
- (6) Model or style name, number, or design

5.6.1.9 In addition to the goggles product label, each goggles lens shall bear the following:

- (1) The manufacturer's identifying mark or symbol
- (2) The certification organization's label, symbol, or identifying mark
- (3) The statement “NFPA 1977, 2016 Ed.” in letters at least 2 mm ($\frac{1}{16}$ in.) high

5.6.1.10 All markings on the goggles lens shall be permanent, legible, and placed so that they do not interfere with the vision of the wearer.

5.6.2 User Information.

5.6.2.1 The goggles manufacturer shall provide at least the user information that is specified in 5.6.2.5 with each pair of goggles.

5.6.2.2 The goggles manufacturer shall attach the required user information or packaging containing the user information to the goggles in such a manner that it is not possible to use the goggles without being aware of the availability of the information.

5.6.2.3 The required user information or packaging containing the user information shall be attached to the goggles so that a deliberate action is necessary to remove it. The goggles manufacturer shall provide notice that the user information is to be removed ONLY by the end user.

5.6.2.4 Symbols and other pictorial graphic representations shall be permitted to be used to supplement or replace worded statements or user information where explanations for symbols and pictorial graphic representations are provided.

5.6.2.5 The goggle manufacturer shall provide at least the following instructions and information with each pair of goggles:

- (1) Pre-use information
 - (a) Safety considerations
 - (b) Limitations of use
 - (c) Recommendations and restrictions
 - (d) Warranty information
 - (e) A statement that most performance properties of the goggles cannot be tested by the user in the field

- (2) Preparation for use
 - (a) Sizing/adjustment
 - (b) Recommended storage practices
- (3) Inspection frequency and details
- (4) Donning/doffing
 - (a) Donning and doffing procedures
 - (b) Sizing and adjustment procedures
 - (c) Helmet/goggles interface issues
- (5) Proper use consistent with NFPA 1500 and 29 CFR 1910.132, “Personal Protective Equipment”
- (6) Maintenance and cleaning
 - (a) Cleaning instructions and precautions
 - (b) Maintenance criteria and methods of repair where applicable
 - (c) Decontamination procedures
- (7) Retirement and disposal criteria and considerations

5.7 Chain Saw Protectors.

5.7.1 Product Label Requirements.

5.7.1.1 Each chain saw protector shall have a product label or labels permanently and conspicuously attached.

5.7.1.2 Configuration of the product label and attachment of the product label shall not interfere with the legibility of any printed portion of the product label.

5.7.1.3 Multiple label pieces shall be permitted in order to carry all statements and information required.

5.7.1.4* The certification organization's label, symbol, or identifying mark shall be permanently attached to the product label or shall be part of the product label.

5.7.1.5 All worded portions of the required product label shall be printed at least in English.

5.7.1.6 Symbols and other pictorial graphic representations shall be permitted to be used to supplement or in place of worded statements on the product label(s) where explanations for symbols and pictorial graphic representations are provided in the user information.

5.7.1.7 The following statement shall be printed legibly on the product label, and all letters shall be at least 2.5 mm ($\frac{3}{32}$ in.) high:

“THIS WILDLAND FIRE FIGHTING CHAIN SAW PROTECTOR MEETS THE REQUIREMENTS OF NFPA 1977, STANDARD ON PROTECTIVE CLOTHING AND EQUIPMENT FOR WILDLAND FIRE FIGHTING, 2016 EDITION.

DO NOT REMOVE THIS LABEL!”

5.7.1.8 At least the following information shall also be printed legibly on the product label, with all letters at least 1.6 mm ($\frac{1}{16}$ in.) high:

- (1) Manufacturer's name, identification, or designation
- (2) Manufacturer's address
- (3) Country of manufacture
- (4) Manufacturer's lot number, or serial number
- (5) Month and year of manufacture (not coded)
- (6) Model or style name, number, or design
- (7) Size
- (8) Cleaning precautions

5.7.2 User Information.

5.7.2.1 The chain saw protector manufacturer shall provide at least the user information that is specified in 5.7.2.5 with each chain saw protector.

5.7.2.2 The chain saw protector manufacturer shall attach the required user information or packaging containing the user information to the chain saw protector in such a manner that it is not possible to use it without being aware of the availability of the information.

5.7.2.3 The required user information or packaging containing the user information shall be attached to the chain saw protector so that a deliberate action is necessary to remove it. The chain saw protector manufacturer shall provide notice that the user information is to be removed **ONLY** by the end user.

5.7.2.4 Symbols and other pictorial graphic representations shall be permitted to be used to supplement or in place of worded statements where explanations for symbols and pictorial graphic representations are provided in the user information.

5.7.2.5 The chain saw protector manufacturer shall provide at least the following instructions and information with each pair of chain saw protectors:

- (1) Pre-use information
 - (a) Safety considerations
 - (b) Limitations of use
 - (c) A statement that most performance properties of the chain saw protective device cannot be tested by the user in the field
 - (d) Warranty information
- (2) Preparation for use
 - (a) Sizing/adjustment
 - (b) Recommended storage practices
- (3) Inspection frequency and details
- (4) Donning/doffing
 - (a) Donning and doffing procedures
 - (b) Sizing and adjustment procedures
 - (c) Interface issues
 - (d) Maintenance and cleaning
 - (e) Cleaning instructions and precautions
- (5) Proper use consistent with 29 CFR 1910.132, "Personal Protective Equipment"
- (6) Maintenance and cleaning
 - (a) Cleaning instructions and precautions
 - (b) Maintenance criteria and methods of repair where applicable
 - (c) Decontamination procedures
- (7) Retirement and disposal criteria and considerations

5.8 Protective Driving Gloves.

5.8.1 Product Label Requirements.

5.8.1.1 Each protective driving glove shall have a product label or labels permanently and conspicuously attached. At least one product label shall be conspicuously located on or inside each driving glove when the glove is properly assembled with all components in place.

5.8.1.2 Configuration of the product label and attachment of the product label shall not interfere with the legibility of any printed portion of the product label.

5.8.1.3 Multiple label pieces shall be permitted in order to carry all the statements, symbols, and information required to be on the product label.

5.8.1.4* The certification organization's label, symbol, or identifying mark shall be permanently attached to the product label or shall be part of the product label.

5.8.1.5 All worded portions of the required product label shall be printed at least in English.

5.8.1.6 Symbols and other pictorial graphic representations shall be permitted to be used to supplement or in place of worded statements on the product label(s) where explanations for symbols and pictorial graphic representations are provided in the user information.

5.8.1.7 The following statement shall be printed legibly on the driving glove product label, and all letters shall be at least 2.5 mm ($\frac{3}{32}$ in.) high:

"THIS PROTECTIVE DRIVING GLOVE MEETS THE DRIVING GLOVE REQUIREMENTS OF NFPA 1977, STANDARD ON PROTECTIVE CLOTHING AND EQUIPMENT FOR WILDLAND FIRE FIGHTING, 2016 EDITION.

DO NOT REMOVE THIS LABEL!"

5.8.1.8 At least the following information shall also be printed legibly on the driving glove product label, with all letters at least 1.6 mm ($\frac{1}{16}$ in.) high:

- (1) Manufacturer's name, identification, or designation
- (2) Manufacturer's address
- (3) Country of manufacture
- (4) Manufacturer's glove identification number, lot number, or serial number
- (5) Month and year of manufacture (not coded)
- (6) Model or style name, number, or design
- (7) Glove size or size range
- (8) Cleaning precautions

5.8.2 User Information.

5.8.2.1 The protective driving glove manufacturer shall provide at least the user information that is specified in 5.8.2.5 with each driving glove pair.

5.8.2.2 The protective driving glove manufacturer shall attach the required user information or packaging containing the user information to the driving glove pair in such a manner that it is not possible to use the driving gloves without being aware of the availability of the information.

5.8.2.3 The required user information or packaging containing the user information shall be attached to the driving glove pair so that a deliberate action is necessary to remove it. The protective driving glove manufacturer shall provide notice that the user information is to be removed **ONLY** by the end user.

5.8.2.4 Symbols and other pictorial graphic representations shall be permitted to be used to supplement or in place of worded statements where explanations for symbols and pictorial graphic representations are provided in the user information.

5.8.2.5 The protective driving glove manufacturer shall provide at least the following instructions and information with each driving glove pair:

- (1) Pre-use information