

NFPA®

1992

**Standard on
Liquid Splash–Protective
Ensembles and Clothing for
Hazardous Materials
Emergencies**

2018



Documents
Document Sharing Hub

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.

REVISION SYMBOLS IDENTIFYING CHANGES FROM THE PREVIOUS EDITION

Text revisions are shaded. A  before a section number indicates that words within that section were deleted and a  to the left of a table or figure number indicates a revision to an existing table or figure. When a chapter was heavily revised, the entire chapter is marked throughout with the  symbol. Where one or more sections were deleted, a • is placed between the remaining sections. Chapters, annexes, sections, figures, and tables that are new are indicated with an .

Note that these indicators are a guide. Rearrangement of sections may not be captured in the markup, but users can view complete revision details in the First and Second Draft Reports located in the archived revision information section of each code at www.nfpa.org/docinfo. Any subsequent changes from the NFPA Technical Meeting, Tentative Interim Amendments, and Errata are also located there.



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 a Tentative Interim Amendment (TIA) or corrected by Errata. An official NFPA Standard at any point in time consists of the current edition of the document together with any TIAs and Errata then in effect.

To determine whether an NFPA Standard has been amended through the issuance of TIAs or corrected by Errata, go to 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 13). The document information page provides up-to-date document-specific information as well as postings of all existing TIAs 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.

ISBN: 978-145591729-7 (Print)
ISBN: 978-145591730-3 (PDF)
ISBN: 978-145591773-0 (eBook)

 **Documents**
Document Sharing Hub

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 © 2017 National Fire Protection Association®. All Rights Reserved.

NFPA® 1992

Standard on

Liquid Splash–Protective Ensembles and Clothing for Hazardous Materials Emergencies

2018 Edition

This edition of NFPA 1992, *Standard on Liquid Splash–Protective Ensembles and Clothing for Hazardous Materials Emergencies*, was prepared by the Technical Committee on Hazardous Materials 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 August 1, 2017, with an effective date of August 21, 2017, 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 1992 was approved as an American National Standard on August 21, 2017.

Origin and Development of NFPA 1992

In 1985, the National Transportation Safety Board (NTSB) issued report I-004-5 on a hazardous material incident that occurred in Benicia, California. In that report, the NTSB recommended that standards be developed for protective clothing for protection from hazardous chemicals. The United States Department of Transportation (DOT) issued a position that requested private sector standards development to undertake the project of writing the standards on hazardous chemical protective clothing and asked other governmental agencies to assist and participate in the private sector standards development system. The DOT at that time also directly requested that NFPA develop documents on hazardous chemical protective clothing. The Environmental Protection Agency (EPA), the United States Coast Guard (USCG), the Federal Emergency Management Agency (FEMA), and the Occupational Safety and Health Administration (OSHA) either endorsed the DOT position or adopted position statements modeled after it.

During 1985, the NFPA Standards Council approved a project for development of these standards and assigned the project to the Technical Committee on Fire Service Protective Clothing and Equipment. The technical committee established a standing Subcommittee on Hazardous Chemicals Protective Clothing, which began its work in Phoenix, Arizona, in March 1986. Representatives from USCG, FEMA, and OSHA participated on the subcommittee.

At the same time, the American Society for Testing and Materials (ASTM) was developing a document on a selection of chemicals for evaluating protective clothing materials that would serve as one of several ASTM testing criteria that would be referenced in the NFPA standards.

The subcommittee met several times over a 2 ½-year period at different locations across the country and developed two standards, one for vapor-protective ensembles and one for liquid splash-protective ensembles and clothing. These standards are today known as NFPA 1991, *Standard on Vapor-Protective Ensembles for Hazardous Materials Emergencies and CBRN Terrorism Incidents*, and NFPA 1992, *Standard on Liquid Splash–Protective Ensembles and Clothing for Hazardous Materials Emergencies*.

NFPA 1992 addresses liquid splash–protective ensembles and clothing designed to protect emergency response personnel against exposure to specified chemicals in liquid splash environments during hazardous materials emergencies. Documentation is required for chemical penetration resistance of garment material against an NFPA battery of test chemicals and any additional chemicals or specific chemical mixtures for which the manufacturer is certifying the suit. The NFPA battery of chemicals was selected from ASTM F1001, *Standard Guide for Chemicals to Evaluate Protective Clothing Materials*. These chemicals do not include liquid chemicals with known or suspected carcinogenicity or skin toxicity because these garments deal with skin exposure and not inhalation. This criterion produces a different subset of ASTM F1001 chemicals to be certified.

This standard includes performance requirements that were established to reflect simulated-use conditions. An overall suit water penetration test is included to ensure that the suit provides full-body splash protection. Materials testing includes burst strength, tear resistance, flammability resistance testing, abrasion resistance, cold temperature performance, and flexural fatigue testing. These tests are required so that garment materials will provide adequate protection in the environment in which they will be used.

The first edition of NFPA 1992 was voted on by the Association at the 1989 Fall Meeting in Seattle, Washington, on November 15, 1989, and had an effective date of February 5, 1990.

The Subcommittee on Hazardous Chemicals Protective Clothing began an early revision (4-year cycle) of the 1990 edition of NFPA 1992 in December 1991. During 1993, the NFPA restructured the manner in which committees were organized, and all standing subcommittees were eliminated. Within the Technical Committee on Fire Service Protective Clothing and Equipment, the former standing subcommittees were reorganized as task groups to address specific technical issues, and the technical committee assumed the entire responsibility for NFPA 1992.

The 1994 edition of NFPA 1992 encompassed revised scope and purpose sections to include optional components for enhanced protection and replacement items. Test methods were updated and refined to better ensure repeatability of testing results. Extensive changes were made to the product labels to better accommodate the optional and replacement items.

The 1994 edition was acted on by the membership of the Association at the NFPA Annual Meeting in San Francisco, California, on May 18, 1994, and was issued with an effective date of August 5, 1994.

In January 1995, the entire project for fire service protective clothing and equipment was reorganized by the Standards Council. 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 Hazardous Chemicals Protective Clothing was established as the new Technical Committee on Hazardous Materials Protective Clothing and Equipment and given the responsibility for NFPA 1992.

The 2000 edition changed the title to *Standard on Liquid Splash-Protective Ensembles and Clothing for Hazardous Materials Emergencies* and was a complete revision. It addressed the protection as encapsulating and non-encapsulating ensembles in addition to individual items of protective clothing. It also combined certain requirements for liquid splash protection for support function activities from the former NFPA 1993, *Standard on Support Function Protective Clothing for Hazardous Chemical Operations*, the 1994 edition, which was withdrawn on January 14, 2000. Protective clothing certified as compliant with NFPA 1993 was seldom used by hazardous materials incident responders. More practical requirements for liquid splash-protective ensembles and clothing used for response and support activities were included in that edition of NFPA 1992.

The 2000 edition was presented to the Association membership at the 1999 November Meeting in New Orleans, Louisiana, on November 17, 1999, and issued by the Standards Council with an effective date of February 11, 2000.

The 2005 edition (fourth edition) of NFPA 1992 was again a complete revision and was reformatted according to the new style for all NFPA codes and standards. Because of the new style, most of the chapter numbering, as well as paragraph numbering, was changed. While the 2005 edition's content was in a different order than in previous editions, all the material was there, and the table of contents directed users of the document to the appropriate chapters and sections. The committee included in Chapter 4 new requirements for manufacturers' quality assurance programs and for situations where hazards involving compliant products are believed to exist, including the appropriate actions in addressing these situations if there is a previously unknown threat to the users. Those requirements were applied to all fire and emergency services product standards that are the responsibility of this project. All design, performance, and testing requirements were reviewed and refined as necessary.

The 2005 edition was presented to the Association membership at the 2004 November meeting in Miami Beach, Florida on November 17, 2004, and issued by the Standards Council with an effective date of February 7, 2005.

The 2012 edition of NFPA 1992 (fifth edition) was extensively revised and included a new optional requirement on material total heat loss in Chapter 8, several new definitions, and updates to several ANSI, ISO, and ASTM standards. This edition deleted the footwear sole puncture resistance test and revised both the slip resistance test method and the flexural fatigue procedure for footwear. The 2012 edition featured changes to requirements of the manufacturers' quality assurance program in Chapter 4.

The 2012 edition was issued by the Standards Council with an effective date of January 2, 2012.

The 2018 edition of NFPA 1992 (sixth edition) has a significant change in its scope whereby it no longer states that NFPA 1992 protective clothing and ensembles are not designed for use with known or suspected carcinogens and instead establishes the standard as applying to any chemicals that are not gas or vapor-producing liquids at concentrations known to be toxic to the skin. The chemical challenges within NFPA 1992 have been changed to represent more operationally relevant chemicals, such as sodium hydroxide and sodium hypochlorite, as well as chemicals known to degrade materials, such as dimethylformamide and tetrachloroethylene. In addition, several test methods have been updated to more closely match operational parameters, and other tests have been added for assessing hand-glove insertion/reinsertion and defining a minimum field of vision. Footwear sole puncture resistance and toe impact/compression resistance requirements have been replaced by compliance with the ASTM F2413 specification for protective footwear. Footwear requirements have been broadened to offer more footwear choices for end users. Specific criteria have been added to address separate hoods and elastomeric interface materials. Evaporative resistance has been added as an optional test for reporting the breathability of ensemble garment materials. Finally, the technical data package organization and content has been standardized across the chemical protective clothing standards to provide enhanced clarity for the operator in order to make educated decisions.

Correlating Committee on Fire and Emergency Services Protective Clothing and Equipment

William E. Haskell, III, *Chair*

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

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

James B. Area, Chimera Enterprises International, MD [SE]

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]

Edmund Farley, Pittsburgh Bureau Of Fire, PA [E]

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

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

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]

Gregory J. Mackin, Boston Fire Department, MA [E]

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

Rep. International Standards Organization

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

Rep. Compressed Gas Association

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

John H. Morris, TYCO/Scott Safety, GA [M]

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

Steven H. Weinstein, Honeywell Safety Products, CA [M]

Richard Weise, Los Angeles County Fire Department, CA [U]

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

Alternates

Louis Carpentier, Innotex Inc., Canada [M]

(Alt. to William A. Van Lent)

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, NC [M]

(Alt. to John H. Morris)

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, ASTM/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)

W. Jason Traynor, MSA Safety, PA [M]

(Alt. to Benjamin Mauti)

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, ASTM/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]

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, VA [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 Hazardous Materials Protective Clothing and Equipment

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

Patricia A. Gleason, *Secretary*
ASTM/Safety Equipment Institute (SEI), VA [RT]

Jason L. Allen, Intertek Testing Services, NY [RT]
Ted S. Buck, Orr Safety Corporation, KY [M]
Brian J. Clifford, U.S. Federal Bureau of Investigation, VA [U]
Steven D. Corrado, UL LLC, NC [RT]
Richard P. Daly, Jr., St. Charles Fire Department, MO [U]
Nicholas Del Re, Fire Department City of New York, NY [L]
Rep. International Association of Fire Fighters
Dustin Green, Citrus County Sheriffs Office, FL [C]
Russell R. Greene, Battelle Memorial Institute, OH [RT]
Todd W. Haines, Dallas/Fort Worth International Airport, TX [U]
A. Ira Harkness, U.S. Department of the Navy, FL [RT]
William E. Haskell, III, National Institute for Occupational Safety & Health, MA [E]
Ryan C. Hirschey, Saint-Gobain Performance Plastics, NH [M]
Kyle Kerbow, Lakeland Industries, TX [M]
Rep. International Safety Equipment Association
Michael P. Kienzle, W. L. Gore & Associates, Inc., MD [M]

Andra Kirsteins, U.S. Department of the Army, MA [RT]
Karen E. Lehtonen, Lion Group, Inc., OH [M]
Susan L. Lovasic, The DuPont Company, Inc., VA [M]
Philip C. Mann, Kappler, Inc., AL [M]
John W. North, Alexandria Fire Department, VA [U]
Ulf Nystrom, Ansell Protective Solutions, Sweden [M]
Paul G. Rogers, Fire Department City of New York, NY [U]
Rep. Fire Department City of New York
Robert E. Shelton, City of Cincinnati Fire Department, OH [C]
Jeffrey O. Stull, International Personnel Protection, Inc., TX [M]
Donald B. Thompson, North Carolina State University, NC [SE]
Robert West, Texas Instruments, Inc., TX [U]
John E. Wisner, Jr., United Steam Fire Engine Company No. 3, AZ [U]
James P. Zeigler, J. P. Zeigler, LLC, VA [SE]
Michael Ziskin, Field Safety Corporation, CT [RT]

Alternates

Dale Gregory Beggs, Texas Instruments, Inc., TX [U]
(Alt. to Robert West)
D. Mark Bledsoe, U.S. Federal Bureau of Investigations, VA [U]
(Alt. to Brian J. Clifford)
Ronald L. Bove, W. L. Gore & Associates, Inc., MD [M]
(Alt. to Michael P. Kienzle)
Ted J. Cooper, U.S. Department of the Navy, FL [RT]
(Alt. to A. Ira Harkness)
Paul Vincent Dulisse, New York City Fire Department, NY [U]
(Alt. to Paul G. Rogers)
William A. Fithian, ASTM/Safety Equipment Institute (SEI), VA [RT]
(Alt. to Patricia A. Gleason)
Pamela A. Kavalesky, Intertek Testing Services, NY [RT]
(Alt. to Jason L. Allen)
Jeffrey Kennedy, Austin Fire Department, TX [U]
(Alt. to Todd W. Haines)
Devang Khariwala, Saint-Gobain Performance Plastics, NH [M]
(Alt. to Ryan C. Hirschey)
Paul S. Lakomiak, Ansell/Onguard Industries/Dunlop, MD [M]
(Alt. to Ulf Nystrom)

Thomas McGowan, NFPA Staff Liaison

Beth C. Lancaster, U.S. Department of Defense, VA [E]
(Alt. to Christina M. Baxter)
Amanda H. Newsom, UL LLC, NC [RT]
(Alt. to Steven D. Corrado)
R. Bryan Ormond, North Carolina State University, NC [SE]
(Alt. to Donald B. Thompson)
Louis V. Ott, Gentex Corporation, PA [M]
(Alt. to Kyle Kerbow)
Enrique Eduardo Perea, Miami Dade Fire Rescue, FL [L]
(Alt. to Nicholas Del Re)
Diane Redden, Lion Group, Inc., OH [M]
(Alt. to Karen E. Lehtonen)
Richard C. Shoaf, St. Charles Fire Department, MO [U]
(Alt. to Richard P. Daly, Jr.)
Grace G. Stull, International Personnel Protection, Inc., TX [M]
(Alt. to Jeffrey O. Stull)
Quoc T. Truong, U.S. Department of the Army, MA [RT]
(Alt. to Andra Kirsteins)
Kristin Williamson, The DuPont Company, Inc., VA [M]
(Alt. to Susan L. Lovasic)

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 for fire fighters and other emergency services responders during incidents that involve hazardous materials operations. These operations involve the activities of rescue; hazardous material confinement, containment, and mitigation; and property conservation where exposure to substances that present an unusual danger to responders are present or could occur due to toxicity, chemical reactivity, decomposition, corrosiveness, or similar reactions. Additionally, this Committee shall have primary responsibility for documents on the selection, care, and maintenance of hazardous materials protective clothing and protective equipment by fire and emergency services organizations and personnel.

Contents

Chapter 1 Administration	1992- 9	Chapter 7 Performance Requirements	1992- 28
1.1 Scope.	1992- 9	7.1 Protective Garment Elements and Items Performance Requirements.	1992- 28
1.2 Purpose.	1992- 9	7.2 Protective Glove Elements and Items Performance Requirements.	1992- 29
1.3 Application.	1992- 10	7.3 Protective Footwear Elements and Items Performance Requirements.	1992- 29
1.4 Units.	1992- 10	7.4 Nonencapsulating Protective Ensemble Performance Requirements.	1992- 29
Chapter 2 Referenced Publications	1992- 10	7.5 Encapsulating Protective Ensemble Performance Requirements.	1992- 30
2.1 General.	1992- 10	7.6 Optional Chemical Flash Fire Escape Protection Performance Requirements.	1992- 30
2.2 NFPA Publications.	1992- 10	7.7 Protective Hood Elements and Item Performance Requirements.	1992- 30
2.3 Other Publications.	1992- 10		
2.4 References for Extracts in Mandatory Sections.	1992- 11	Chapter 8 Test Methods	1992- 30
Chapter 3 Definitions	1992- 11	8.1 Sample Preparation Procedures.	1992- 30
3.1 General.	1992- 11	8.2 Liquidtight Integrity Test 1.	1992- 31
3.2 NFPA Official Definitions.	1992- 11	8.3 Overall Garment Function and Integrity Test.	1992- 32
3.3 General Definitions.	1992- 12	8.4 Chemical Penetration Resistance Test.	1992- 34
Chapter 4 Certification	1992- 14	8.5 Burst Strength Test.	1992- 36
4.1 General.	1992- 14	8.6 Puncture Propagation Tear Resistance Test. ..	1992- 36
4.2 Certification Program.	1992- 14	8.7 Cold Temperature Performance Test 1.	1992- 36
4.3 Inspection and Testing.	1992- 15	8.8 Seam/Closure Breaking Strength Test.	1992- 37
4.4 Annual Verification of Product Compliance. .	1992- 16	8.9 Visor High-Mass Impact Resistance Test.	1992- 37
4.5 Manufacturers' Quality Assurance Program. .	1992- 17	8.10 Liquidtight Integrity Test 2.	1992- 37
4.6 Hazards Involving Compliant Product.	1992- 17	8.11 Cut Resistance Test.	1992- 38
4.7 Manufacturers' Investigation of Complaints and Returns.	1992- 18	8.12 Puncture Resistance Test 1.	1992- 39
4.8 Manufacturers' Safety Alert and Product Recall Systems.	1992- 18	8.13 Gloved Hand Dexterity Test.	1992- 39
Chapter 5 Labeling and Information	1992- 18	8.14 Abrasion Resistance Test.	1992- 39
5.1 Product Label Requirements.	1992- 18	8.15 Ladder Shank Bend Resistance Test.	1992- 40
5.2 User Information.	1992- 21	8.16 Slip Resistance Test.	1992- 40
5.3 Technical Data Package.	1992- 22	8.17 Overall Ensemble Flash Test.	1992- 40
Chapter 6 Design Requirements	1992- 26	8.18 Heat Transfer Performance Test.	1992- 43
6.1 Protective Garment Elements and Items Design Requirements.	1992- 26	8.19 Flammability Resistance Test.	1992- 43
6.2 Protective Glove Elements and Items Design Requirements.	1992- 26	8.20 Total Heat Loss Test.	1992- 43
6.3 Protective Footwear Elements and Items Design Requirements.	1992- 26	8.21 Ultimate Tensile Strength Test.	1992- 44
6.4 Nonencapsulating Ensemble Design Requirements.	1992- 26	8.22 Puncture Resistance Test Two.	1992- 44
6.5 Encapsulating Ensemble Design Requirements.	1992- 27	8.23 Evaporative Resistance Test.	1992- 44
6.6 Optional Chemical Flash Fire Protection Design Requirements.	1992- 27	8.24 Fitting Pull-Out Strength Test.	1992- 45
6.7 Protective Hood Elements and Item Design Requirements.	1992- 27	8.25 Exhaust Valve Mounting Strength Test.	1992- 46
		Annex A Explanatory Material	1992- 46
		Annex B Informational References	1992- 53
		Index	1992- 54

NFPA 1992

Standard on

Liquid Splash–Protective Ensembles and Clothing for Hazardous Materials Emergencies

2018 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 the recommendations sections of this document are given in Chapter 2 and those for extracts in the 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 should 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 minimum requirements for the design, performance, testing, documentation, and certification for liquid splash–protective ensembles, ensemble elements, and protective clothing used by emergency response personnel during hazardous materials incidents.

Δ 1.1.2* This standard shall also specify additional *optional* criteria for liquid splash–protective ensembles *only* for *escape protection* from chemical flash fires encountered during hazardous materials incidents.

1.1.3 This standard shall specify requirements for new liquid splash–protective ensembles, new ensemble elements, and new protective clothing.

N 1.1.3.1 Ensemble elements shall include garments, gloves, footwear, and hoods.

1.1.4* This standard alone shall not specify requirements for protective ensembles or clothing for hazardous materials emergencies where the hazardous material is present as a gas or a vapor-producing liquid at vapor concentrations known to be toxic to the skin.

Δ 1.1.5* This standard alone shall not specify requirements for protection from chemical or biological terrorism agents or from chemical or biological terrorism incidents. Requirements for such protection shall be provided by protective ensembles that are certified as compliant with NFPA 1994 or ensembles that are certified as compliant with NFPA 1991.

1.1.6* This standard alone shall not specify requirements for protective clothing for any fire-fighting applications.

1.1.7* This standard alone shall not specify requirements for protection from ionizing radiation; biological, liquefied gas, or cryogenic liquid hazards; or *explosive atmospheres caused by vapors, dust, or particulates*.

1.1.8* This standard shall not specify requirements for the respiratory protection that is necessary for proper protection with the protective ensemble.

1.1.9 This standard shall not specify requirements for any accessories that could be attached to the product but are not necessary for the product to meet the requirements of this standard.

1.1.10 Certification of compliant liquid splash–protective ensembles, ensemble elements, and protective clothing to the requirements of this standard shall not preclude certification to additional appropriate standards where the ensemble, ensemble elements, or protective clothing meet all the applicable requirements of each standard.

1.1.11 This standard shall not be construed as addressing all of the safety concerns, if any, associated with its use for the designing, manufacturing, testing, or certifying of product to meet the requirements of this standard. It shall be the responsibility of the persons and organizations that use this standard to establish safety and health practices and determine the applicability of regulatory limitations prior to use of this standard.

1.1.12 Nothing herein shall 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 for emergency response personnel against adverse liquid-splash environments during hazardous materials emergency incidents.

1.2.1.1 The purpose of this standard shall also be to establish a minimum level of *limited* chemical flash fire protection, *for escape only* in the event of a chemical flash fire, as an option for compliant liquid splash–protective ensembles, ensemble elements, and protective clothing.

1.2.1.2 The purpose of this standard shall be to provide emergency response organizations the flexibility to specify the option in 1.2.1.1 in their purchase specifications according to the anticipated exposure and expected needs of the emergency response organization.

1.2.2* 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 personnel can be exposed.

1.2.3 This standard is not intended to be utilized 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, testing, and certification of new liquid splash-protective ensembles, new ensemble elements, and new protective clothing.

1.3.2 This standard alone shall not specify requirements for protective ensembles or clothing for hazardous materials emergencies where the hazardous material is present as a gas or a vapor-producing liquid at vapor concentrations known to be toxic to the skin.

1.3.3 This edition of NFPA 1992 shall not apply to liquid splash-protective ensembles, ensemble elements, and protective clothing manufactured to previous editions of this standard.

1.3.4 This standard alone shall not apply to protective clothing for any fire-fighting applications.

1.3.5 This standard alone shall not apply to protective clothing for protection from ionizing radiation, cryogenic liquid hazards, or explosive atmospheres caused by vapor, dust, or particulates.

1.3.6* This standard shall not apply to the respiratory protection that is necessary for proper protection with the liquid splash-protective ensemble or protective clothing.

Δ 1.3.7 This standard shall not apply to use requirements for liquid splash-protective ensembles or protective clothing; such requirements are specified in NFPA 1500.

1.3.8* The requirements of this standard shall not apply to any accessories that could be attached to the product but are not necessary for the product to meet the requirements of this standard.

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, as 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.

NFPA 704, *Standard System for the Identification of the Hazards of Materials for Emergency Response*, 2017 edition.

NFPA 1500, *Standard on Fire Department Occupational Safety, Health, and Wellness Program*, 2018 edition.

NFPA 1951, *Standard on Protective Ensembles for Technical Rescue Incidents*, 2018 edition.

NFPA 1971, *Standard on Protective Ensembles for Structural Fire Fighting and Proximity Fire Fighting*, 2018 edition.

NFPA 1981, *Standard on Open-Circuit Self-Contained Breathing Apparatus (SCBA) for Emergency Services*, 2013 edition.

NFPA 1986, *Standard on Respiratory Protection Equipment for Tactical and Technical Operations*, 2017 edition.

NFPA 1991, *Standard on Vapor-Protective Ensembles for Hazardous Materials Emergencies and CBRN Terrorism Incidents*, 2016 edition.

NFPA 1994, *Standard on Protective Ensembles for First Responders to Hazardous Materials and CBRN Terrorism Incidents*, 2018 edition.

2.3 Other Publications.

Δ 2.3.1 AAFA Publications. American Apparel and Footwear Association, 1601 North Kent Street, Suite 1200, Arlington, VA 22209.

FIA Standard 1209, *Whole Shoe Flex*, 1984.

2.3.2 ANSI Publications. American National Standards Institute, Inc., 25 West 43rd Street, 4th Floor, New York, NY 10036.

ANSI/ISEA Z87.1, *American National Standard for Occupational and Educational Personal Eye and Face Protection Devices*, 2015.

ANSI/ISEA Z89.1, *American National Standard for Industrial Head Protection*, 2014.

Δ 2.3.3 ASTM Publications. ASTM International, 100 Barr Harbor Drive, P.O. Box C700, West Conshohocken, PA 19428-2959.

ASTM D412, *Standard Test Methods for Vulcanized Rubber and Thermoplastic Elastomers—Tension*, 2015a.

ASTM D471, *Standard Test Method for Rubber Property—Effect of Liquids*, 2016.

ASTM D747, *Standard Test Method for Apparent Bending Modulus of Plastics by Means of a Cantilever Beam*, 2010.

ASTM D751, *Standard Test Methods for Coated Fabrics*, 2011.

ASTM D2582, *Standard Test Method for Puncture Propagation Tear Resistance of Plastic Film and Thin Sheetings*, 2009.

ASTM D4157, *Standard Test Method for Abrasion Resistance of Textile Fabrics (Oscillatory Cylinder Method)*, 2013.

ASTM D5151, *Standard Test Method for Detection of Holes in Medical Gloves*, 2015.

ASTM F392/F392M, *Standard Practice for Conditioning of Flexible Barrier Materials for Flex Durability*, 2015.

ASTM F903, *Standard Test Method for Resistance of Protective Clothing Materials to Penetration by Liquids*, 2010.

ASTM F1154, *Standard Practices for Qualitatively Evaluating the Comfort, Fit, Function, and Durability of Protective Ensembles and Ensemble Components*, 2011.

ASTM F1301, *Standard Practice for Labeling Chemical Protective Clothing*, 2011, e1.

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

ASTM F1358, *Standard Test Method for Effects of Flame Impingement on Materials Used in Protective Clothing Not Designated Primarily for Flame Resistance*, 2016.

ASTM F1359/F1359M, *Standard Test Method for Liquid Penetration Resistance of Protective Clothing or Protective Ensembles Under a Shower Spray While on a Manikin*, 2016.

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

ASTM F2412, *Standard Test Methods for Foot Protection*, 2011.

ASTM F2413, *Standard Specification for Performance Requirements for Protective (Safety) Toe Cap Footwear*, 2011.

ASTM F2700, *Standard Test Method for Unsteady-State Heat Transfer Evaluation of Flame Resistant Materials for Clothing with Continuous Heating*, 2013.

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.

• **N 2.3.4 CDC Publications.** Centers for Disease Control and Prevention, 1600 Clifton Road, Atlanta, GA 30329.

Statement of Standard for NIOSH CBRN APR Testing, 2004.

Statement of Standard for NIOSH CBRN PAPR Testing, 2004.

Statement of Standard for NIOSH CBRN SCBA Testing, 2004.

• **Δ 2.3.5 ISO Publications.** International Organization for Standardization, ISO Central Secretariat, BIBC II, Chemin de Blandonnet 8, CP 401, 1214 Vernier, Geneva, Switzerland.

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

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 9001, *Quality Management Systems — Requirements*, 2015.

ISO 11092, *Textiles — Physiological effects — Measurement of thermal and water-vapour resistance under steady-state conditions (sweating guarded-hotplate test)*, 2014.

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

ISO 17021, *Conformity assessment — Requirements for bodies providing audit and certification of management systems*, 2011.

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

ISO/IEC 17065, *Conformity assessment — Requirements for bodies certifying products, processes, and services*, 2012.

2.3.6 U.S. Government Publications. U.S. Government Publishing Office, 732 North Capitol Street, NW, Washington, DC 20401-0001.

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

Δ 2.3.7 Other Publications.

American Conference of Governmental Industrial Hygienists (ACGIH), *Threshold Limit Values for Chemical Substances and Physical Agents and Biological Exposure Indices*, 2014.

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 Afterflame Time. The length of time for which a material, component, or chemical protective suit continues to burn after the simulated chemical flash fire has ended.

3.3.2 Biological Agents. Biological materials that are capable of causing disease or long-term damage to the human body.

3.3.3 Boot. See 3.3.42, Liquid Splash-Protective Footwear.

3.3.4 Care. Procedures for cleaning, decontamination, and storage of protective clothing and equipment.

3.3.5 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.

3.3.6 Certification Organization. An independent, third party organization that determines product compliance with the requirements of this standard with a labeling/listing/follow-up program.

3.3.7 Chemical and Biological Terrorism Incidents. Situations involving the release of chemical or biological warfare agents in civilian areas by terrorists.

3.3.8* Chemical Flash Fire. The ignition of a flammable and ignitable vapor or gas that produces an outward expanding flame front as those vapors or gases burn. This burning and expanding flame front, a fireball, will release both thermal and kinetic energy to the environment.

3.3.9* Chemical-Protection Layer. The material or composite used in an ensemble or clothing for the purpose of providing protection from chemical hazards.

3.3.10 Chemical-Protective Material. Any material or composite used in liquid splash-protective ensemble or clothing for the purpose of providing protection from chemical hazards; can be a part of the “primary suit material.”

3.3.11 Clothing Items. See 3.3.40, Liquid Splash-Protective Clothing.

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

3.3.13* Component(s). Any material, part, or subassembly used in the construction of the compliant product.

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

3.3.15* Cryogenic Liquid. A refrigerated liquefied gas having a boiling point below -130°F (-90°C) at atmospheric pressure.

N 3.3.16 Elastomer. A polymeric material that returns to its original length and shape after stretching.

N 3.3.17* Elastomeric Interface Material. An exposed elastomeric material that is not otherwise used as a garment material, which provides an interface between components of the ensemble or ensemble elements, other than seams, and if applicable, the interface between the respirator facepiece and the ensemble or ensemble elements.

3.3.18 Element(s). See 3.3.22, Ensemble Elements.

3.3.19 Emergency Response Personnel. Personnel assigned to organizations that have the responsibility for responding to hazardous materials emergencies.

Δ 3.3.20 Encapsulating. A type of ensemble that covers the wearer and the wearer's respirator.

3.3.21 Ensemble. See 3.3.41, Liquid Splash-Protective Ensemble.

3.3.22 Ensemble Elements. Ensemble elements including garments, gloves, footwear, and hoods.

N 3.3.22.1 Hazardous Materials and Emergencies Protective Footwear. The element of the protective ensemble that provides protection to the foot, ankle, and lower leg.

N 3.3.22.2 Hazardous Materials and Emergencies Protective Footwear Cover. The item of the protective ensemble to be worn over standard footwear that provides a barrier and physical protection to the wearer's feet.

N 3.3.22.3 Hazardous Materials and Emergencies Protective Garment(s). The element of the protective ensemble that provides protection to the upper and lower torso, head, arms, and legs; excluding the hands and feet.

N 3.3.22.4 Hazardous Materials and Emergencies Protective Glove(s). The element of the protective ensemble that provides protection to the wearer's hands and wrists.

N 3.3.22.5 Hazardous Materials and Emergencies Protective Hood. The element of the protective ensemble that provides protection to the wearer's head and neck.

3.3.23 Exhaust Valve. One-way vent that releases exhaust to the outside environment and prevents entry of outside environment.

3.3.24* External Fittings. Any component that allows the passage of gases, liquids, or electrical current from the outside to the inside of the element or item as well as any fitting externally located on, and part of, the ensemble that is not part of the garment material, visor material, gloves, footwear, seams, or closure assembly.

3.3.25 Flammable or Explosive Atmospheres. Atmospheres containing solids, liquids, vapors, or gases at concentrations that will burn or explode if ignited.

3.3.26 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 or listed products that are being produced by the manufacturer to the requirements of this standard.

3.3.27 Footwear. See 3.3.42, Liquid Splash-Protective Footwear.

3.3.28 Footwear Upper. That portion of the footwear above the sole, heel, or insole.

3.3.29 Garment. See 3.3.43, Liquid Splash-Protective Garment.

3.3.30 Garment Closure. The garment component designed and configured to allow the wearer to don (put-on) and doff (take-off) the garment.

3.3.31 Garment Closure Assembly. The combination of the garment closure and the seam attaching the garment closure to the garment, including any protective flap or cover.

3.3.32 Garment Material. The principal chemical-protective material used in the construction of the liquid splash-protective suit.

3.3.33 Glove. See 3.3.44, Liquid Splash-Protective Glove.

3.3.34* Hazardous Materials. A substance (solid, liquid, or gas) that when released is capable of creating harm to people, the environment, and property.

3.3.35 Hazardous Materials Emergencies. Incidents involving the release or potential release of hazardous materials.

N 3.3.36 Hood. See 3.3.45, Liquid-Splash Protective Hood.

3.3.37* Ionizing Radiation. Extremely short-wavelength, high energy penetrating rays of alpha, beta, gamma and x-rays emitted from radioactive elements and isotopes (radionuclides).

3.3.38 Ladder Shank. Reinforcement to the shank area of protective footwear designed to provide additional support to the instep when standing on a ladder rung.

3.3.39* Liquefied Gas. A gas that, under its charged pressure, is partially liquid at 21°C (70°F).

3.3.40* Liquid Splash-Protective Clothing. Multiple items of compliant protective clothing and equipment products that provide protection from some risks, but not all risks, of hazardous materials emergency incident operations involving liquids.

3.3.41* Liquid Splash-Protective Ensemble. Multiple elements of compliant protective clothing and equipment products that when worn together provide protection from some risks, but not all risks, of hazardous materials emergency incident operations involving liquids to the torso, legs, arms, head, hands, and feet.

3.3.42* Liquid Splash-Protective Footwear. The element of the protective ensemble, or the item of protective clothing that provides liquid chemical protection and physical protection to the feet, ankles, and lower legs.

Δ 3.3.43* Liquid Splash-Protective Garment. The element of the protective ensemble or the item of protective clothing that provides liquid chemical protection to the upper and lower torso, arms and legs, excluding the head, hands, and feet.

3.3.44 Liquid Splash-Protective Glove. The element of the protective ensemble, or the item of protective clothing that provides liquid chemical protection to the hands and wrists.

N 3.3.45* Liquid-Splash Protective Hood. The element of the protective ensemble or an item of protective clothing that provides liquid chemical protection and physical protection to the head and neck.

3.3.46 Maintenance. Procedures for inspection, repair, and removal from service of liquid splash-protective ensembles or clothing.

3.3.47 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 or provides the warranty for the compliant product.

N 3.3.48 Melt. A response to heat by a material resulting in evidence of flowing and dripping.

3.3.49 Model. The collective term used to identify a group of individual liquid splash-protective ensembles or protective clothing of the same basic design and components from a single manufacturer produced by the same manufacturing and quality assurance procedures that are covered by the same certification.

3.3.50* Nonencapsulating Ensemble. A type of ensemble that does not fully cover the wearer's respirator and relies on the facepiece of the respirator to have an interface with the garment to complete the enclosure of the wearer.

Δ 3.3.51 Outer Boot. A secondary boot worn over another footwear item that provides physical protection for the chemical-protective material in order for liquid splash-protective footwear to meet certain requirements of this standard.

3.3.52 Outer Garment. A secondary garment worn over another garment that provides physical protection for the chemical-protective material in order for liquid splash-protective garment to meet certain requirements of this standard.

3.3.53 Outer Glove. A secondary glove worn over another glove that provides physical protection for the chemical-protective material in order for the liquid splash-protective glove to meet certain requirements of this standard.

3.3.54* Particulates. Finely divided solid matter that is dispersed in air.

3.3.55 Primary Suit Materials. Liquid splash-protective ensemble and clothing materials limited to the garment material, hood material, visor material, glove material, and footwear material that provide protection from chemical and physical hazards.

3.3.56* Product Label. A label or marking affixed by the manufacturer to each compliant product, or product package. Such labels contain compliance statements, certification statements, general information, care, maintenance, or similar data.

3.3.57 Protective Clothing. See 3.3.40, Liquid Splash-Protective Clothing.

3.3.58 Protective Ensemble. See 3.3.41, Liquid Splash-Protective Ensemble.

3.3.59 Protective Footwear. See 3.3.42, Liquid Splash-Protective Footwear.

3.3.60 Protective Garment. See 3.3.43, Liquid Splash-Protective Garment.

3.3.61 Protective Gloves. See 3.3.44, Liquid Splash-Protective Glove.

3.3.62 Puncture-Resistant Device. A reinforcement to the bottom of protective footwear that is designed to provide puncture resistance.

3.3.63 Radionuclide. An isotope form of an element or radioactive element that emits radiation in excess of normal background radiation levels.

3.3.64 Recall System. The action by which a manufacturer identifies an element, provides notice to the users, withdraws an element from the marketplace and distribution sites, and returns the element to the manufacturer or other acceptable location for corrective action.

3.3.65 Respirator. A certified device that provides respiratory protection for the wearer within the limits of the certification.

3.3.66 Seam. Any permanent attachment of two or more chemical-protective clothing materials, excluding external fittings, gaskets, and suit closure assemblies, in a line formed by joining the separate material pieces.

3.3.67* Self-Contained Breathing Apparatus (SCBA). An atmosphere-supplying respirator that supplies a respirable air atmosphere to the user from a breathing air source that is independent of the ambient environment and designed to be carried by the user.

N 3.3.68* Sock. An extension of the garment or suit leg or a separate item that covers the entire foot and is intended to be worn inside a protective outer boot.

3.3.69 Storage Life. The date to remove from service a liquid splash-protective ensemble, element, or clothing item that has undergone proper care and maintenance in accordance with the manufacturer's instructions but has not been used either in training or at actual incidents.

3.3.70 Suit Closure. The component that allows the wearer to enter (don) and exit (doff) the liquid splash-protective ensemble.

3.3.71* Vapor-Protective Ensemble. Multiple elements of compliant protective clothing and equipment products that when worn together provide protection from some risks, but not all risks, of hazardous materials emergency incident operations involving vapors.

3.3.72 Visor Material. The transparent chemical-protective material that allows the wearer to see outside the protective ensemble hood.

Chapter 4 Certification

4.1 General.

4.1.1 The process of certification for protective ensembles and ensemble elements as being compliant with NFPA 1992 shall meet the requirements of Section 4.1, General; Section 4.2, Certification Program; Section 4.3, Inspection and Testing; Section 4.4, Annual Verification of Product Compliance; Section 4.5, Manufacturers' Quality Assurance Program; Section 4.6, Hazards Involving Compliant Product; Section 4.7, Manufacturers' Investigation of Complaints and Returns; and Section 4.8, Manufacturers' Safety Alert and Product Recall Systems.

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

Δ 4.1.3 All certification shall be performed by a certification organization that meets at least the requirements specified in Section 4.2, Certification Program, and that is accredited for personal protective equipment in accordance with ISO/IEC 17065, *Conformity assessment — Requirements for bodies certifying products, processes, and services*. The accreditation shall be issued by an accreditation body operating in accordance with ISO 17011, *Conformity assessment — 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 name or the name or identification of this standard, NFPA 1992, 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 ensembles and ensemble elements shall be labeled and listed.

4.1.6 All compliant ensembles and ensemble elements shall also have a product label that meets the requirements specified in Section 5.1, Product Label Requirements.

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 2012 edition of this standard on or after the NFPA effective date for the 2018 edition, which is August 21, 2017.

4.1.9 The certification organization shall not permit any manufacturer to continue to label any ensembles or ensemble elements that are certified as compliant with the 2012 edition of this standard on or after August 21, 2018.

4.1.10 The certification organization shall require manufacturers to remove all certification labels and product labels indicating compliance with the 2012 edition of this standard from all ensembles and ensemble elements that are under the control of the manufacturer on August 21, 2018, and the certification organization shall verify this action is taken.

• 4.1.11 Liquid splash-protective ensembles or liquid splash-protective clothing items shall not be certified for chemical or specific chemical mixtures with skin notations as indicated by American Conference of Governmental Industrial Hygienists (ACGIH), *Threshold Limit Values for Chemical Substances and Physical Agents and Biological Exposure Indices*, and that have a vapor pressure greater than 5 mm Hg at 25°C (77°F).

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.

Δ 4.2.3 The certification organization shall be accredited for personal protective equipment in accordance with ISO/IEC 17065, *Conformity assessment — Requirements for bodies certifying products, processes, and services*. The accreditation shall be issued by an accreditation body operating in accordance with

ISO 17011, *Conformity assessment — 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 in place 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, *Manufacturers' Quality Assurance Program*.

4.2.7.1* The certification organization shall require the manufacturer to have a product recall system specified in Section 4.8, *Manufacturers' Safety Alert and Product Recall Systems*, 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 assure that the materials, components, and manufac-

turing 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 products, 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, *Hazards Involving Compliant Product*, 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 ensembles and ensemble elements, 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, *Conformity assessment — 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, *Conformity assessment — 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. This information shall be included in the manufacturer's technical data package.

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 ensemble and ensemble elements in Section 5.1, Product Label Requirements.

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 by in 5.1.1.7, 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 Section 5.2, User Information, to ensure that the information has been developed and is available.

4.3.8 Inspection by the certification organization shall include a review of the technical data package to determine compliance with the requirements of Section 5.3, Technical Data Package.

4.3.9 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.

4.3.10 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.

4.3.10.1 Testing shall be performed on specimens representative of materials and components used in the actual construction of the protective ensemble and ensemble element.

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

4.3.11 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.

4.3.12 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.

4.3.13 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.

4.3.14 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 The certification organization shall test ensemble elements with the specific ensemble(s) with which they are to be certified.

4.3.16* 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 as being compliant with this standard.

4.3.17 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 (AHJ).

4.4 Annual Verification of Product Compliance.

4.4.1 All ensembles and ensemble elements that are labeled as being compliant with this standard shall undergo recertification on an annual basis. This recertification shall include inspection and evaluation to all design requirements and testing to all performance requirements as required by this standard on all manufacturer models and components as specified in 4.4.3.

4.4.1.1 Any change that affects the element's performance under design or performance requirements of this standard shall constitute a different model.

4.4.1.2 For the purpose of this standard, models shall include each unique pattern, style, or design of the element.

4.4.2 Samples of manufacturer's models and components for recertification shall be acquired from the manufacturer or component supplier during random and unannounced visits as part of the follow-up inspection program. For recertification, the certification organization shall acquire at least one liquid splash-protective garment, one pair of liquid splash-protective gloves, one pair of liquid splash-protective footwear, and one complete liquid splash-protective nonencapsulating or encapsulating ensemble outfitted with all manufacturer-provided external fittings. The certification organization shall also acquire a sufficient quantity of component samples to be tested for recertification as required by 4.4.3.

4.4.3 Liquid splash-protective ensembles, ensemble elements, and ensemble components shall be inspected, evaluated, and tested for annual recertification.

4.4.3.1 Each liquid splash-protective ensemble and ensemble element shall be inspected and evaluated to each of the design requirements specified in Chapter 6.

4.4.3.2 Each liquid splash-protective ensemble specimen shall be tested for overall performance as specified in Section 7.1 using the following sequence of tests:

- (1) The liquid splash-protective ensemble specimen shall then be tested for liquidtight integrity as specified in Section 8.2, Liquidtight Integrity Test 1.
- (2) The liquid splash-protective ensemble specimen shall then be tested for overall function and integrity as specified in Section 8.3, Overall Garment Function and Integrity Test.
- (3) If certified for optional chemical flash fire protection, the liquid splash-protective ensemble shall then be tested for overall ensemble flash protection as specified in Section 8.17, Overall Ensemble Flash Test.

4.4.3.3* All garment material, visor, glove, footwear, hoods, and optional chemical flash fire protection performance requirements shall be evaluated as specified in Chapter 7, with the following modifications:

- (1) Chemical penetration resistance testing shall be limited to the testing specified in 7.1.2, 7.1.6.1, 7.1.7.1, 7.1.8.1, 7.1.9.2, 7.2.2, 7.2.7, 7.3.2, and 7.3.8, and shall be performed against the following chemicals:
 - (a) Fuel H — surrogate gasoline [42.5 percent toluene, 42.5 percent isooctane, and 15 percent denatured ethanol, volume/volume (v/v)] as defined in ASTM D471, *Standard Test Method for Rubber Property-Effect of Liquids*.
 - (b) Methyl isobutyl ketone, CAS No. 108-10-1, >95 percent, weight/weight (w/w)
 - (c) Sulfuric acid, CAS No. 7664-93-9, 93.1 percent, w/w
- (2) A total of two specimens shall be permitted for testing requirements. If the testing is specified for both directions of a material, a total of two specimens per material direction shall be permitted for testing requirements.

4.4.4 The manufacturer shall maintain all design and performance inspection and test data from the certification organization used in the recertification of manufacturer's models and components. The manufacturer shall provide such data, upon request, to the purchaser or the AHJ.

4.5 Manufacturers' 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, Manufacturers' Safety Alert and Product Recall Systems.

4.5.2 The operation of the quality assurance program shall evaluate and test compliant product production to the requirements of 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 17021, *Conformity assessment — Requirements for bodies providing audit and certification of management systems*.

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

4.5.3.3 The registrar shall affix the accreditation mark on the ISO registration certificate.

4.5.4* Any entity that meets the definition of *manufacturer* as specified in 3.3.47 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.

4.6 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 Guide 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 products 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 the manufacturer 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, *Manufacturers' Investigation of Complaints and Returns*.

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 immediately 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 (1), (2), or (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 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 the 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 Manufacturers' 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 that is possibly subject to a safety alert or product recall, the manufacturer shall immediately contact the certification organization and provide all information about their review to assist the certification organization with their investigation.

4.8 Manufacturers' Safety Alert and Product Recall Systems.

4.8.1 Manufacturers 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 manufacturers' 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 the 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 that is recalled and for documenting the effectiveness of the product recall
- (5) A plan for either repairing or replacing the product or compensating purchasers for a returned product

Chapter 5 Labeling and Information

5.1 Product Label Requirements.

5.1.1 General.

5.1.1.1* Each liquid splash-protective garment element and item shall have a product label permanently and conspicuously attached to or printed on each garment when the garment is properly assembled with all layers, components, and component parts in place.

5.1.1.2 Each liquid splash-protective glove element and item shall have a product label permanently and conspicuously attached to or printed on the top outside of the gauntlet of each glove piece when the glove is properly assembled with all layers, components, and component parts in place. In addition, each package containing one or more pairs of liquid splash-protective gloves shall have a product label attached to, printed on, or inserted in the glove package.

5.1.1.3 All liquid splash-protective footwear elements and items shall have a product label permanently and conspicuously attached to or printed on the inside of each footwear piece when the footwear is properly assembled with all layers, components, and component parts in place. In addition, each package containing one or more pairs of liquid splash-protective footwear shall have a product label attached to, printed on, or inserted in the footwear package.

5.1.1.4 Each liquid splash-protective ensemble shall have a product label permanently and conspicuously attached to or