

NFPA 1976

Standard on Protective Ensemble for Proximity Fire Fighting

2000 Edition



National Fire Protection Association, 1 Batterymarch Park, PO Box 9101, Quincy, MA 02269-9101
An International Codes and Standards Organization

This is a preview. [Click here to purchase the full publication.](#)

NFPA 1976

Standard on Protective Ensemble for Proximity Fire Fighting

2000 Edition



National Fire Protection Association, 1 Batterymarch Park, PO Box 9101, Quincy, MA 02269-9101
An International Codes and Standards Organization

[This is a preview. Click here to purchase the full publication.](#)

Copyright ©
National Fire Protection Association, Inc.
One Batterymarch Park
Quincy, Massachusetts 02269

IMPORTANT NOTICE ABOUT THIS DOCUMENT

NFPA codes, standards, recommended practices, and guides, 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 its codes and 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 this document. The NFPA also makes no guaranty or warranty as to the accuracy or completeness of any information published herein.

In issuing and making this document 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 this document. 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.

NOTICES

All questions or other communications relating to this document 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 documents during regular revision cycles, should be sent to NFPA headquarters, addressed to the attention of the Secretary, Standards Council, National Fire Protection Association, 1 Batterymarch Park, P.O. Box 9101, Quincy, MA 02269-9101.

Users of this document should be aware that this document may be amended from time to time through the issuance of Tentative Interim Amendments, and that an official NFPA document at any point in time consists of the current edition of the document together with any Tentative Interim Amendments then in effect. In order to determine whether this document is the current edition and whether it has been amended through the issuance of Tentative Interim Amendments, 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 above.

A statement, written or oral, that is not processed in accordance with Section 5 of the Regulations Governing Committee Projects 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.

The NFPA does not take any position with respect to the validity of any patent rights asserted in connection with any items which are mentioned in or are the subject of this document, and the NFPA disclaims liability for the infringement of any patent resulting from the use of or reliance on this document. Users of this document are expressly advised that determination of the validity of any such patent rights, and the risk of infringement of such rights, is entirely their own responsibility.

Users of this document should consult applicable federal, state, and local laws and regulations. NFPA does not, by the publication of this document, intend to urge action that is not in compliance with applicable laws, and this document may not be construed as doing so.

Licensing Policy

This document is copyrighted by the National Fire Protection Association (NFPA). By making this document available for use and adoption by public authorities and others, the NFPA does not waive any rights in copyright to this document.

1. Adoption by Reference—Public authorities and others are urged to reference this document in laws, ordinances, regulations, administrative orders, or similar instruments. Any deletions, additions, and changes desired by the adopting authority must be noted separately. Those using this method are requested to notify the NFPA (Attention: Secretary, Standards Council) in writing of such use. The term "adoption by reference" means the citing of title and publishing information only.

2. Adoption by Transcription—**A.** Public authorities with lawmaking or rule-making powers only, upon written notice to the NFPA (Attention: Secretary, Standards Council), will be granted a royalty-free license to print and republish this document in whole or in part, with changes and additions, if any, noted separately, in laws, ordinances, regulations, administrative orders, or similar instruments having the force of law, provided that: (1) due notice of NFPA's copyright is contained in each law and in each copy thereof; and (2) that such printing and republication is limited to numbers sufficient to satisfy the jurisdiction's lawmaking or rule-making process. **B.** Once this NFPA Code or Standard has been adopted into law, all printings of this document by public authorities with lawmaking or rule-making powers or any other persons desiring to reproduce this document or its contents as adopted by the jurisdiction in whole or in part, in any form, upon written request to NFPA (Attention: Secretary, Standards Council), will be granted a nonexclusive license to print, republish, and vend this document in whole or in part, with changes and additions, if any, noted separately, provided that due notice of NFPA's copyright is contained in each copy. Such license shall be granted only upon agreement to pay NFPA a royalty. This royalty is required to provide funds for the research and development necessary to continue the work of NFPA and its volunteers in continually updating and revising NFPA standards. Under certain circumstances, public authorities with lawmaking or rule-making powers may apply for and may receive a special royalty where the public interest will be served thereby.

3. Scope of License Grant—The terms and conditions set forth above do not extend to the index of this document.

(For further explanation, see the Policy Concerning the Adoption, Printing, and Publication of NFPA Documents, which is available upon request from the NFPA.)

Copyright © 2000 NFPA, All Rights Reserved

NFPA 1976

Standard on

Protective Ensemble for Proximity Fire Fighting

2000 Edition

This edition of NFPA 1976, *Standard on Protective Ensemble for Proximity Fire Fighting*, was prepared by the Technical Committee on Specialized Fire-Fighting Applications Protective Clothing and Equipment, released by the Technical Correlating Committee on Fire and Emergency Services Protective Clothing and Equipment, and acted on by the National Fire Protection Association, Inc., at its November Meeting held November 14–17, 1999, in New Orleans, LA. It was issued by the Standards Council on January 14, 2000, with an effective date of February 11, 2000, and supersedes all previous editions.

This edition of NFPA 1976 was approved as an American National Standard on February 11, 2000.

Origin and Development of NFPA 1976

This document was the first from the Technical Committee on Fire Service Protective Clothing and Equipment to address speciality protective clothing for fire-fighting operations other than structural fire fighting.

It is intended to provide thermal protection from high levels of radiant heat as well as thermal protection from conductive and convective heat present during proximity fire-fighting operations such as those involving bulk flammable liquids, bulk flammable gases, bulk flammable material, and during aircraft rescue and fire fighting.

The Subcommittee on Proximity Protective Clothing began their work in 1987 and passed their work on to the Technical Committee in January 1991. The first edition was presented to the Association at the 1992 Annual Meeting in New Orleans, LA and became effective on August 14, 1992.

Since the first edition, the entire project for fire service protective clothing and equipment was recognized in January 1995 by the Standards Council. The new project has 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 Proximity Protective Clothing was established as the new Technical Committee on Specialized Fire-Fighting Applications Protective Clothing and Equipment and has responsibility for NFPA 1976.

This second edition, with the new title of *Standard on Protective Ensemble for Proximity Fire Fighting*, represents a complete revision to the first edition and addresses the protection as an ensemble rather than separate items. This edition establishes requirements for all ensemble elements, including helmets, garments, shrouds, gloves, and footwear. This second edition was presented to the Association membership at the 1999 Fall Meeting in New Orleans, LA on November 17, 1999, and was issued by the Standards Council with an effective date of February 11, 2000.

Technical Correlating Committee on Fire and Emergency Services Protective Clothing and Equipment (FAE-AAC)

Richard M. Duffy, Chair
Int'l Assn. of Fire Fighters, DC [L]
Rep. Int'l Assn. of Fire Fighters

William M. Lambert, Secretary
Mine Safety Appliances Co., PA [M]
(Alt. to W.B. Miller)

Leslie Anderson, U.S. Forest Service Technology & Development Center, MT [E]

Thomas G. Augherton, Safety Equipment Inst., VA [RT]

Dennis W. Browner, Scott Aviation, NC [M]

Rep. Industrial Safety Equipment Assn.

Robert H. Chiostergi, Southern Mills Inc., GA [M]

Robert A. Freese, Globe Mfg. Co., NH [M]

William L. Grilliot, Morning Pride Mfg. Co., OH [M]

Rep. Fire and Emergency Mfrs. and Services Assn. Inc.

Cheryl L. Harris, DuPont, VA [M]

Virgil Hathaway, San Diego Fire Dept., CA [U]

Rep. Southern Area Fire Equipment Research

James S. Johnson, Lawrence Livermore Nat'l Labs, CA [RT]

Cy Long, Texas Commission on Fire Protection, TX [E]

David G. Matthews, United Kingdom Fire Brigades Assn., England [SE]

Rep. Int'l Standards Organization

Wayde B. Miller, Jacksonville Beach, FL [M]

Rep. Compressed Gas Assn./Mine Safety Appliances Co.

Jim Minx, Oklahoma State Firefighters Assn., OK [C]

Jeffrey O. Stull, Int'l Personnel Protection, Inc., TX [SE]

Frank P. Taylor, Lion Apparel, Inc., OH [M]

Robert D. Tutterow, Jr., Charlotte Fire Dept., NC [U]

Rep. Fire Industry Equipment Research Organization

Bruce H. Varner, City of Carrollton Fire Dept., TX [U]

Rep. Int'l Fire Service Training Assn.

Harry Winer, U.S. Navy, MA [RT]

Thomas L. Wollan, Underwriters Laboratories Inc., NC [RT]

Alternates

Janice C. Bradley, Industrial Safety Equipment Assn., VA [M]

(Alt. to D. W. Browner)

Nicholas J. Curtis, Lion Apparel, Inc., OH [M]

(Alt. to F. P. Taylor)

Patricia A. Freeman, Globe Mfg. Co., NH [M]

(Alt. to R. A. Freese)

Patricia A. Gleason, Safety Equipment Inst., VA [RT]

(Alt. to T. G. Augherton)

Bob Montgomery, Celanese Corp., NC [M]

(Alt. to C. L. Harris)

Daniel P. Ryan, Underwriters Laboratories Inc., NC [RT]

(Alt. to T. L. Wollan)

Tricia Vogelpohl, Springfield, LLC, SC [M]

(Alt. to R. H. Chiostergi)

Nonvoting

Don R. Forrest, United Firefighters of LA City, CA [L]

Bryan C. Heirston, Oklahoma City Fire Dept., OK [L]

Rep. Int'l Assn. of Fire Fighters

Richard Mangan, USDA Forest Service, MT [RT]

James S. Nee, ARFF Working Group, PA [U]

Rep. Aircraft Rescue & Fire Fighting Working Group

Kirk H. Owen, Plano Fire Dept., TX [U]

Rep. NFPA Fire Service Section

Ray F. Reed, Dallas Fire Dept., TX [U]

Bruce W. Teele, 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
Specialized Fire-Fighting Applications Protective Clothing and Equipment (FAE-SFA)**

James S. Nee, Chair
PA [U]

Rep. Aircraft Rescue & Fire Fighting Working Group

Harry Winer, Secretary
U.S. Navy, MA [RT]

Charles L. Barber, DuPont, VA [M]
Karl J. Beeman, Globe Firefighters Suits, NM [M]
Catherine R. Dodgen, Intertek Testing Services, NY [RT]
George Freeman, Dallas Fire Dept., TX [U]
William R. Hutfilz, Clark County Fire Dept., NV [U]
David V. Jackson, U.S. Navy/NAVAIR, MD [E]
James Jones, Mason & Hanger Corp., TX [E]
George (Clif) McDaniel, U.S. Marine Corps, MD [E]
Kenneth Ray Mobley, City of El Paso Fire Dept., TX [U]

Bob Montgomery, Celanese Corp., NC [M]
Louis V. Ott, Gentex Corp., PA [M]
Daniel P. Ryan, Underwriters Laboratories Inc., NC [RT]
Mel Seng, Norcross Safety Products, IL [M]
Scott E. Snyder, The Boeing Fire Dept., WA [U]
Florencio D. Soliz, III, City of Austin Fire Dept., TX [U]
Frank P. Taylor, Lion Apparel Inc., OH [M]
William J. Tibbett, Texas Commission on Fire Protection, TX [E]

Alternates

Prakash G. Devasthali, Norcross Safety Products, IL [M]
(Alt. to M. Seng)
Patricia A. Freeman, Globe Mfg. Co., NH [M]
(Alt. to K. J. Beeman)

Andrew G. Schwartz, Lion Apparel Inc., OH [M]
(Alt. to F. P. Taylor)
Karen E. Strumlock, Intertek Testing Services, NY [RT]
(Alt. to C. R. Dodgen)

Bruce W. Teele, NFPA Staff Liaison

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

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

Committee Scope: This Committee shall have primary responsibility for documents on protective clothing and protective equipment, except respiratory protective equipment, that provides hand, foot, torso, limb, head, and interface protection for fire fighters or other emergency services responders during incidents that include, but are not limited to, bulk flammable gas fires, bulk flammable liquid fires, flammable metal fires, nuclear fuel fires, exotic fuel fires, that present an unusual or extraordinary danger to personnel and involve highly specialized fire-fighting operations. These operations include the activities of rescue, fire suppression, and property conservation during fires producing very high levels of conductive, convective, or radiant heat or any combination thereof.

Additionally, this committee shall have primary responsibility for documents on the selection, care, and maintenance of specialized fire-fighting applications, protective clothing and protective equipment by fire and emergency services organizations and personnel.

Contents

Chapter 1 Administration	1976- 5	6-12 Conductive and Compressive Heat Resistance Test (CCHR)	1976-38
1-1 Scope	1976- 5	6-13 Thermal Protective Performance (TPP) Test	1976-39
1-2 Purpose	1976- 5	6-14 Thread Melting Test	1976-43
1-3 Definitions	1976- 5	6-15 Tear Resistance Test	1976-43
1-4 Units	1976- 8	6-16 Burst Strength Test	1976-43
Chapter 2 Certification	1976- 9	6-17 Seam Breaking Strength Test	1976-44
2-1 General	1976- 9	6-18 Top Impact Resistance Test (Force)	1976-44
2-2 Certification Organization	1976- 9	6-19 Impact Resistance Test (Acceleration)	1976-46
2-3 Inspection and Testing	1976- 9	6-20 Faceshield Component Resistance Test	1976-48
2-4 Recertification	1976-11	6-21 Impact and Compression Tests	1976-49
2-5 Manufacturer's Quality Assurance Program	1976-12	6-22 Physical Penetration Resistance Test	1976-49
2-6 ISO Registration for Manufacturers	1976-12	6-23 Puncture Resistance, Test One	1976-49
Chapter 3 Labeling and Information	1976-12	6-24 Puncture Resistance, Test Two	1976-50
3-1 Product Label Requirements	1976-12	6-25 Cut Resistance Test	1976-50
3-2 User Information	1976-13	6-26 Abrasion Resistance Test	1976-50
Chapter 4 Design Requirements	1976-13	6-27 Cleaning Shrinkage Resistance Test	1976-50
4-1 Proximity Protective Garment Design Requirements	1976-13	6-28 Water Penetration Test	1976-51
4-2 Protective Helmet Design Requirements ..	1976-14	6-29 Liquid Penetration Resistance Test	1976-52
4-3 Protective Glove Design Requirements ...	1976-15	6-30 Viral Penetration Resistance Test	1976-52
4-4 Proximity Protective Footwear Design Requirements	1976-17	6-31 Wet Flex	1976-53
4-5 Protective Wristlet Interface Component Design Requirements	1976-18	6-32 Adhesion After Wet Flex-Tape Method ...	1976-54
4-6 Accessory Design Requirements	1976-18	6-33 Flex at Low Temperature	1976-54
Chapter 5 Performance Requirements	1976-18	6-34 Resistance to High-Temperature Blocking	1976-55
5-1 Proximity Protective Garment Performance Requirements	1976-18	6-35 Corrosion Resistance Test	1976-55
5-2 Proximity Protective Helmet Performance Requirements	1976-19	6-36 Electrical Insulation Test One	1976-55
5-3 Proximity Protective Glove Performance Requirements	1976-20	6-37 Electrical Insulation Test Two	1976-56
5-4 Protective Footwear Performance Requirements	1976-21	6-38 Overall Liquid Integrity Test One	1976-56
5-5 Protective Wristlet Interface Component Performance Requirements	1976-22	6-39 Overall Liquid Integrity Test Two	1976-57
Chapter 6 Test Methods	1976-23	6-40 Retention System Test	1976-57
6-1 Sample Preparation Procedures	1976-23	6-41 Suspension System Retention Test	1976-58
6-2 Flame Resistance, Test One	1976-24	6-42 Liner Retention Test	1976-58
6-3 Flame Resistance, Test Two	1976-25	6-43 Glove Hand Function Tests	1976-59
6-4 Flame Resistance, Test Three	1976-26	6-44 Grip Test	1976-60
6-5 Flame Resistance, Test Four	1976-27	6-45 Ladder Shank Bend Resistance Test	1976-60
6-6 Heat and Thermal Shrinkage Resistance Test	1976-28	6-46 Slip Resistance Test	1976-61
6-7 Conductive Heat Resistance, Test One ...	1976-31	6-47 Label Durability and Legibility Test One ..	1976-61
6-8 Conductive Heat Resistance, Test Two ...	1976-32	6-48 Label Durability and Legibility Test Two ..	1976-62
6-9 Radiant Heat Resistance, Test One	1976-32	6-49 Shell Retention Test	1976-62
6-10 Radiant Reflective, Test Two	1976-32	6-50 Luminous (Visible) Transmittance Test ...	1976-62
6-11 Radiant Heat Transmittance, Test Three ..	1976-37	6-51 Helmet Shroud Opening Size Retention Test	1976-63
		6-52 Whole Garment Liquid Penetration Test ..	1976-63
		6-53 Eyelet and Stud Post Attachment Test ...	1976-65
		Chapter 7 Referenced Publications	1976-65
		Appendix A Explanatory Material	1976-66
		Appendix B Referenced Publications	1976-71
		Index	1976-72

NFPA 1976**Standard on****Protective Ensemble for Proximity
Fire Fighting****2000 Edition**

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

Information on referenced publications can be found in Chapter 7 and Appendix B.

Chapter 1 Administration**1-1* Scope.**

1-1.1 This standard shall specify the minimum design, performance, and certification requirements and the test methods for proximity protective ensembles, including protective coats, protective trousers, protective coveralls, helmets, gloves, footwear, and interface components.

1-1.2 This standard shall apply to the design, manufacturing, and certification of new proximity protective ensembles or new individual elements of the proximity protective ensemble. This standard shall not apply to proximity fire-fighting protective clothing and equipment manufactured to comply with previous editions of NFPA 1976, *Standard on Protective Clothing for Proximity Fire Fighting*.

1-1.3 This standard shall not apply to protective clothing or ensembles for structural or wildland fire-fighting operations, for entry specialized fire-fighting operations, or for hazardous materials emergency operations. This standard shall not apply to protection from radiological agents, protection from all biological agents, or protection from all hazardous chemicals.

1-1.4 This standard shall not apply to the use of proximity fire-fighting protective clothing and equipment, since these requirements are specified in NFPA 1500, *Standard on Fire Department Occupational Safety and Health Program*.

1-1.5 Certification of the proximity fire-fighting protective ensemble, or individual elements of the protective ensemble, to the requirements of this standard shall not preclude certification to additional appropriate standards where the protective ensemble or elements of the protective ensemble meet all applicable requirements of each standard.

1-1.6 The requirements of this standard shall not apply to accessories that might be attached to any element of the proximity fire-fighting protective ensemble unless specifically addressed herein.

1-1.7 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 against adverse environmental conditions during proximity fire-fighting incidents that release high levels of radiant heat as well as convective and conductive heat.

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 proximity fire-fighting personnel can be exposed.

1-2.3 This standard is not intended to be used as a detailed manufacturing or purchase specification but shall be permitted to be referenced in purchase specifications as minimum requirements.

1-3 Definitions.

1-3.1* Accessories. Those items that are attached to a proximity protective ensemble element but designed in such a manner to be removable from the proximity protective ensemble element and that are not necessary to meet the requirements of this standard.

1-3.2 Aircraft Rescue and Fire Fighting. The fire-fighting actions, performed both inside and outside of aircraft, that are taken to rescue persons and to control or extinguish fire involving or adjacent to aircraft on the ground.

1-3.3* Approved. Acceptable to the authority having jurisdiction.

1-3.4 Arch. A footwear term; the bottom curve of the foot, from the heel to the ball.

1-3.5* Authority Having Jurisdiction. The organization, office, or individual responsible for approving equipment, materials, an installation, or a procedure.

1-3.6 Barrier Material. A single-layer fabric or a laminated or coated, multilayer material considered as a single-layer fabric that limits transfer from the face of the layer to the other side.

1-3.7 Basic Plane. The anatomical plane that includes the superior rim of the external auditory meatus, the upper edge of the external openings of the ear, and the inferior margin of the orbit, which is the lowest point of the floor of the eye socket.

1-3.8 Basic Weight. The weight of the helmet, including all components specified in 4-2.2.

1-3.9 Biological Agents. Biological materials that could be capable of causing a disease or long-term damage to the human body.

1-3.10* Bitragion Coronal Arc. The arc between the right and left trignon as measured over the top of the head in a plane perpendicular to the midsagittal plane.

1-3.11* Bitragion Inion Arc. The arc between trignon as measured over the inion; for test purposes, the bitragion inion arc is identified as Datum plane 10 in Figures 6-18.4.1(a) through (c).

1-3.12 Body Fluids. Fluids produced by the body including, but not limited to, blood, semen, mucus, feces, urine, vaginal secretions, breast milk, amniotic fluid, cerebrospinal fluid, synovial fluid, and pericardial fluid.

1-3.13 Brim. That part of the helmet shell extending around the entire circumference of the helmet.

1-3.14 Brim Line. The horizontal plane intersecting the point of the front opening of the helmet at the midsagittal plane.

1-3.15 Cargo Pockets. Pockets located on the proximity protective garment exterior.

1-3.16 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 require-