

NFPA® 1987

Standard on Combination Unit Respirator Systems for Tactical and Technical Operations

2023 Edition



NFPA, 1 Batterymarch Park, Quincy, MA 02169-7471
An International Codes and Standards Organization

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

ADDITIONAL IMPORTANT NOTICES AND DISCLAIMERS CONCERNING NFPA® STANDARDS

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NFPA codes, standards, recommended practices, and guides (“NFPA Standards”) should be aware that these documents may be superseded at any time by the issuance of a new edition, may be amended with the issuance of Tentative Interim Amendments (TIAs), or be corrected by Errata. It is intended that through regular revisions and amendments, participants in the NFPA standards development process consider the then-current and available information on incidents, materials, technologies, innovations, and methods as these develop over time and that NFPA Standards reflect this consideration. Therefore, any previous edition of this document no longer represents the current NFPA Standard on the subject matter addressed. NFPA encourages the use of the most current edition of any NFPA Standard [as it may be amended by TIA(s) or Errata] to take advantage of current experience and understanding. An official NFPA Standard at any point in time consists of the current edition of the document, including any issued TIAs and Errata then in effect.

To determine whether an NFPA Standard has been amended through the issuance of TIAs or corrected by Errata, visit the “Codes & Standards” section at www.nfpa.org.

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.

IMPORTANT NOTICES AND DISCLAIMERS CONCERNING 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.

REMINDER: 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 a new edition, may be amended with the issuance of Tentative Interim Amendments (TIAs), or be corrected by Errata. It is intended that through regular revisions and amendments, participants in the NFPA standards development process consider the then-current and available information on incidents, materials, technologies, innovations, and methods as these develop over time and that NFPA Standards reflect this consideration. Therefore, any previous edition of this document no longer represents the current NFPA Standard on the subject matter addressed. NFPA encourages the use of the most current edition of any NFPA Standard [as it may be amended by TIA(s) or Errata] to take advantage of current experience and understanding. An official NFPA Standard at any point in time consists of the current edition of the document, including any issued TIAs and Errata then in effect.

To determine whether an NFPA Standard has been amended through the issuance of TIAs or corrected by Errata, visit the “Codes & Standards” section at www.nfpa.org.

Copyright © 2022 National Fire Protection Association®. All Rights Reserved.

NFPA® 1987

Standard on

Combination Unit Respirator Systems for Tactical and Technical Operations

2023 Edition

This edition of NFPA 1987, *Standard on Combination Unit Respirator Systems for Tactical and Technical Operations*, was prepared by the Technical Committee on Tactical and Technical Operations Respiratory Protection Equipment and released by the Correlating Committee on Fire and Emergency Services Protective Clothing and Equipment. It was issued by the Standards Council on April 4, 2022, with an effective date of April 24, 2022.

This edition of NFPA 1987 was approved as an American National Standard on April 24, 2022.

Origin and Development of NFPA 1987

In August 2015, the Standards Council responded to a new project request submitted by Brian Clifford of the Federal Bureau of Investigation. The request related to the use of respiratory protection equipment for emergency operations that incorporated a combination of respiratory protective methods in one system. This system, at a minimum, would contain the capabilities of a self-contained breathing apparatus (SCBA) and at least one other respiratory protective method [air-purifying respirator (APR) or powered air-purifying respirator (PAPR)]. After review, the Standards Council determined there was a well-established technical need and a demonstrated demand for a standard addressing design, use, testing, and certification of combined unit respirators (CUR) not covered by any existing standards.

The Standards Council assigned this new project to the Technical Committee on Tactical and Technical Operations Respiratory Protection Equipment, because it already had the expertise and diversity to fulfill the request. The technical committee met for the first time to discuss this new standard in July 2016, at NFPA headquarters in Quincy, MA. The Standards Council approved the draft of NFPA 1987 to enter revision cycle in August 2019, as a Fall 2021 document.

This edition of the standard specifies the minimum requirements for the certification (Chapter 4), design (Chapter 6), performance (Chapter 7), and testing (Chapter 8) of new combination unit respirators (CUR) and for replacement parts, components, and accessories for such respirators.

Correlating Committee on Fire and Emergency Services Protective Clothing and Equipment

Rick L. Swan, Chair

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

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]
Cristine Z. Fargo, International Safety Equipment Association, VA [M]
Edmund Farley, Pittsburgh Bureau Of Fire, PA [E]
Diane B. Hess, PBI Performance Products, Inc., NC [M]
Thomas M. Hosea, US Department of the Navy, FL [RT]
Ronald Johnston, Superior Products, OH [M]
Rep. Compressed Gas Association
Beth C. Lancaster, US Department of Defense, VA [E]
Jeff Legendre, Northborough Fire Department, MA [U]
Karen E. Lehtonen, LION Group, Inc., OH [M]
David G. Matthews, Fire & Industrial (PPE) Ltd., United Kingdom [SE]
Rep. International Standards Organization
Benjamin Mauti, Globe Manufacturing/Mine Safety Appliances Company, PA [M]

Michael F. McKenna, Michael McKenna & Associates, LLC, CA [SE]
Douglas Menard, Boston Fire Department, MA [U]
John H. Morris, 3M Company, GA [M]
Amanda H. Newsom, UL LLC, NC [RT]
Stephen R. Sanders, ASTM/Safety Equipment Institute (SEI), VA [RT]
Jeffrey O. Stull, International Personnel Protection, Inc., TX [M]
Jonathan V. Szalajda, National Institute for Occupational Safety & Health, PA [E]
Robert D. Tutterow, Jr., Fire Industry Education Resource 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
Dick Weise, Los Angeles County Fire Department/Safer, CA [U]
Harry P. Winer, HIP Consulting LLC, MA [SE]

Alternates

David T. Bernzweig, Columbus (OH) Division of Fire, OH [L]
(Alt. to Rick L. Swan)
Louis Carpentier, Innotex Inc., Canada [M]
(Alt. to William A. Van Lent)
Robin B. Childs, US Department of Defense, VA [E]
(Alt. to Beth C. Lancaster)
Daniel Glucksman, International Safety Equipment, VA [M]
(Alt. to Cristine Z. Fargo)
Kenneth Hayes, Boston Fire Department, MA [U]
(Alt. to Douglas Menard)
Judge W. Morgan, 3M Scott Safety, NC [M]
(Alt. to John H. Morris)
Gary L. Neilson, Sparks, NV [U]
(Alt. to Robert D. Tutterow, Jr.)

Jeffrey Peterson, National Institute for Occupational Safety & Health (NIOSH), PA [E]
(Alt. to Jonathan V. Szalajda)
Kevin M. Roche, Facets Consulting, AZ [M]
(Alt. to Bruce H. Varner)
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)
Jian Xiang, The DuPont Company, Inc., VA [M]
(Alt. to Diane B. Hess)

Nonvoting

Robert J. Athanas, SAFE-IR, Incorporated, NY [SE]
Rep. TC on Electronic Safety Equipment
Christina M. Baxter, Emergency Response Tips, LLC, FL [U]
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
Jeremy Metz, West Metro Fire Rescue, CO [U]
Rep. TC on Special Operations PC&E
Stephen T. Miles, National Institute for Occupational Safety & Health, WV [E]
Rep. TC on Respiratory Protection Equipment
Chris Farrell, NFPA Staff Liaison

Brian Montgomery, US Department of Justice, DC [E]
Rep. Tactical and Technical Operations Respiratory Protection Equipment
Jay L. Tarley, National Institute for Occupational Safety & Health, WV [E]
Rep. TC on Wildland Fire Fighting PC&E
Tim W. Tomlinson, Addison Fire Department, TX [C]
Rep. TC on Structural and Proximity Fire Fighting PC&E

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 Tactical and Technical Operations Respiratory Protection Equipment

Brian Montgomery, Chair
US Department of Justice, DC [E]

Craig Adams, Los Angeles Police Department, CA [U]
Rep. The InterAgency Board
Edward Anderson, Boston Fire Department, MA [U]
Daniel J. Barker, US Department of Defense, MD [RT]
Christina M. Baxter, Emergency Response Tips, LLC, FL [SE]
Gary Beals, US Marine Corps, VA [U]
Brian J. Clifford, US Federal Bureau of Investigation, VA [U]
Caoimhin P. Connell, Park County Sheriff’s Office, CO [SE]
Rep. The InterAgency Board
Robin R. Gainey, Jacksonville Fire Rescue Department, FL [L]
Rep. International Association of Fire Fighters
Beth C. Lancaster, US Department of Defense, VA [E]
Ken Lawson, SPO Inc., VA [M]
Clint Mayhue, Avon Protection Systems, GA [M]

Judge W. Morgan, 3M Scott Safety, NC [M]
Amanda H. Newsom, UL LLC, NC [RT]
Ed Roncone, Libertyville Police Department, IL [C]
Rep. Illinois Law Enforcement Alarm System
Stephen R. Sanders, ASTM/Safety Equipment Institute (SEI), VA [RT]
Robert Sell, Draeger, Inc., PA [M]
Randy Sterett, Orange County Sheriff’s Department, CA [U]
Rep. National Bomb Squad Commanders Advisory Board
Jonathan V. Szalajda, National Institute for Occupational Safety & Health, PA [E]
Rep. National Institute for Occupational Safety & Health
Marco Tekelenburg, Mine Safety Appliance Company, PA [M]
Tim West, Wilcox Industries, MT [M]

Alternates

Jason L. Allen, Intertek Testing Services, NY [RT]
(Voting Alt.)
Adam Bilger, Mine Safety Appliance Company (MSA), PA [M]
(Alt. to Marco Tekelenburg)
D. Mark Bledsoe, US Federal Bureau of Investigation, VA [U]
(Alt. to Brian J. Clifford)
Robin B. Childs, US Department of Defense, VA [E]
(Alt. to Beth C. Lancaster)
Mark Ciampaglio, US Army- Edgewood Chemical Biological Center (ECBC), MD [RT]
(Alt. to Daniel J. Barker)
Denice Young Durrant, UL LLC, NC [RT]
(Alt. to Amanda H. Newsom)
David Hodson, DAH Consultant, United Kingdom [M]
(Alt. to Robert Sell)

John H. Morris, 3M Company, GA [M]
(Alt. to Judge W. Morgan)
Gregory W. Sackman, Seattle Police Department, WA [U]
(Alt. to Craig Adams)
Jarrett Seal, National Bomb Squad Commanders Advisory Board (NBSCAB), FL [U]
(Alt. to Randy Sterett)
Robert R. Stein, National Institute for Occupational Safety & Health, (NIOSH), PA [E]
(Alt. to Jonathan V. Szalajda)
Erin W. Valliere, Marine Corps Systems Command, VA [U]
(Alt. to Gary Beals)
Stephanie Marie Wilson, Naval Surface Warfare Center, FL [SE]
(Voting Alt.)

Nonvoting

Lana A. Nieves, US Department of Labor, DC [E]
Rep. Occupational Safety & Health Administration
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 respiratory protection equipment and selection, care, and maintenance of respiratory protection equipment for non-firefighting emergency services operations including, but not limited to, tactical law enforcement, confined space, and hazardous materials operations, during incidents involving hazardous or oxygen-deficient atmospheres. This Committee does not cover respiratory protection equipment for firefighting operations addressed by the Technical Committee on Respiratory Protection Equipment.

Contents

Chapter 1 Administration	1987– 6	6.2 CUR/Open-Circuit SCBA Mode Design Requirements.	1987– 22
1.1 Scope.	1987– 6	6.3 CUR/PAPR Mode.	1987– 28
1.2 Purpose.	1987– 6	6.4 CUR/Air-Purifying Respirator Mode Design Requirements.	1987– 28
1.3 Application.	1987– 6		
1.4 Units.	1987– 7		
Chapter 2 Referenced Publications	1987– 7	Chapter 7 Performance Requirements	1987– 29
2.1 General.	1987– 7	7.1 CUR System Tests.	1987– 29
2.2 NFPA Publications.	1987– 7	7.2 CUR/Open-Circuit SCBA Mode Tests.	1987– 31
2.3 Other Publications.	1987– 7	7.3 CUR/PAPR Mode.	1987– 34
2.4 References for Extracts in Mandatory Sections. (Reserved)	1987– 9	7.4 CUR/APR Mode.	1987– 34
		7.5 Optional CUR Toxic Industrial Chemical Permeation Resistance Performance.	1987– 35
Chapter 3 Definitions	1987– 9	Chapter 8 Test Methods	1987– 36
3.1 General.	1987– 9	8.1 CUR System Requirements.	1987– 36
3.2 NFPA Official Definitions.	1987– 9	8.2 CUR/Open-Circuit SCBA Mode.	1987– 50
3.3 General Definitions.	1987– 10	8.3 PAPR Airflow Performance Tests.	1987– 68
Chapter 4 Certification	1987– 12	8.4 CUR/APR Mode Performance Tests.	1987– 69
4.1 General.	1987– 12	8.5 Optional Toxic Industrial Chemical Permeation Resistance Test.	1987– 72
4.2 Certification Program.	1987– 12		
4.3 Inspections and Testing.	1987– 13	Annex A Explanatory Material	1987– 75
4.4 Recertification.	1987– 16	Annex B Surrogate Pressure Vessel Preparation Procedure	1987– 79
4.5 Manufacturers' Quality Assurance Programs.	1987– 16	Annex C Requalification of SCBA Breathing Air Cylinders	1987– 81
4.6 Hazards Involving Compliant Product.	1987– 17	Annex D Informational References	1987– 82
4.7 Manufacturers' Investigations of Complaints and Returns.	1987– 17	Index	1987– 83
4.8 Manufacturers' Safety Alert and Product Recall Systems.	1987– 17		
Chapter 5 Labeling and Information	1987– 18		
5.1 Product Label Requirements.	1987– 18		
5.2 User Information.	1987– 18		
Chapter 6 Design Requirements	1987– 22		
6.1 CUR System Requirements.	1987– 22		

NFPA 1987**Standard on****Combination Unit Respirator Systems for
Tactical and Technical Operations****2023 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. Extracted text may be edited for consistency and style and may include the revision of internal paragraph references and other references as appropriate. Requests for interpretations or revisions of extracted text shall be sent to the technical committee responsible for the source document.

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

Chapter 1 Administration**1.1 Scope.**

1.1.1* This standard shall specify the minimum requirements for the design, performance, testing, and certification of new combination unit respirator (CUR) systems and for the replacement parts, components, and accessories for such respirators.

1.1.2 Reserved.

1.1.3 This standard shall not specify requirements for respiratory protection equipment that is used for firefighting operations.

1.1.4* This standard shall not specify requirements for any accessories not certified by the National Institute for Occupational Safety and Health (NIOSH) that could be attached to a CUR.

1.1.5 This standard shall not establish criteria for CURs for water or underwater operations.

1.1.6 This standard shall not establish criteria for protection from ionizing radiation.

1.1.7 Safety.

1.1.7.1 This standard shall not be construed as addressing all of the safety concerns associated with the use of CURs.

1.1.7.2 It shall be the responsibility of the persons and organizations that use CURs to establish safety and health practices and to determine the applicability of regulatory limitations prior to use.

1.1.7.3 This standard shall not be construed as addressing all of the safety concerns, if any, associated with the use of this standard by testing facilities.

1.1.7.4 It shall be the responsibility of the persons and organizations that use this standard to conduct testing of CURs to establish safety and health practices and to determine the applicability of regulatory limitations prior to using this standard for any designing, manufacturing, or testing.

1.1.8 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 minimum levels of CUR performance for respiratory protection for emergency services personnel in non-firefighting operations and in atmospheres that are categorized as follows:

- (1) Entry into and escape from immediately dangerous to life or health (IDLH) atmospheres when in open-circuit SCBA mode
- (2) Entry into non-IDLH and escape from IDLH and non-IDLH atmospheres when in APR mode or PAPR mode

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 respiratory protective situations and IDLH atmospheres to which personnel can be exposed.

1.2.3 Use.

1.2.3.1 This standard shall not be interpreted or used as a detailed manufacturing or purchase specification.

1.2.3.2 This standard shall be permitted to be referenced in purchase specifications as minimum requirements.

1.2.3.3* This standard shall not address all performance or functional properties of CUR that can be of importance when references as part of purchase specifications.

1.3 Application.**1.3.1 Emergency Services Organizations.**

1.3.1.1 This standard shall apply to all CURs used by emergency services organizations for respiratory protection of its personnel during rescue, hazardous materials, and terrorist incident responses, and similar operations where products of combustion, oxygen deficiency, particulates, toxic products, or other IDLH atmospheres exist or could exist at the incident scene.

1.3.1.2* If the CUR is equipped with a universal emergency breathing safety system (UEBSS), the UEBSS performance requirements set forth in this standard shall apply only to CURs

used by emergency services organizations for respiratory protection of its personnel during the applications listed in 1.3.1.1.

1.3.2 This standard shall apply to the design, manufacturing, and certification of new CURs.

1.3.3 This standard shall apply to accessories attached to a CUR that are certified by NIOSH for use with that specific CUR.

1.3.4 Reserved.

1.3.5 This standard shall not apply to closed-circuit self-contained breathing apparatus (SCBA).

1.3.6 This standard shall not apply to accessories that can be attached to CURs but which are not certified by NIOSH for use with that specific CUR.

1.3.7* Except for the cautions and limitations specified in Chapter 5, this standard shall not apply to the use of CURs.

1.4 Units.

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

1.4.2 Equivalent values in parentheses shall not be considered as the requirement because those values might be 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 1971, *Standard on Protective Ensembles for Structural Fire Fighting and Proximity Fire Fighting*, 2018 edition.

NFPA 1989, *Standard on Breathing Air Quality for Emergency Services Respiratory Protection*, 2019 edition.

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

2.3 Other Publications.

2.3.1 ANSI Publications. American National Standards Institute, Inc. (operations) 25 West 43rd Street, 4th Floor, New York, NY 10036; (headquarters) 1899 L Street, NW, 11th Floor, Washington, DC 20036.

ANSI/ASA S3.2, *Method for Measuring the Intelligibility of Speech over Communication Systems*, 2009, reaffirmed 2014.

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

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

ASTM B117, *Standard Practice for Operating Salt Spray (Fog) Apparatus*, 2018.

ASTM D395, *Standard Test Method for Rubber Property—Compression Set*, 2018.

ASTM D412, *Standard Test Methods for Vulcanized Rubber and Thermoplastic Elastomers—Tension*, 2016.

ASTM D572, *Standard Test Method for Rubber—Deterioration by Heat and Oxygen*, 2004, reapproved 2015.

ASTM D573, *Standard Test Method for Rubber—Deterioration in Air Oven*, 2004, reapproved 2015.

ASTM D624, *Standard Test Method for Tear Strength of Conventional Vulcanized Rubber and Thermoplastic Elastomers*, 2000, reapproved 2012.

ASTM D746, *Standard Test Method for Brittleness Temperature of Plastics and Elastomers by Impact*, 2014.

ASTM D1003, *Standard Test Method for Haze and Luminous Transmittance of Transparent Plastics*, 2013.

ASTM D2240, *Standard Test Method for Rubber Property—Durometer Hardness*, 2015e1.

ASTM D2632, *Standard Test Method for Rubber Property—Resilience by Vertical Rebound*, 2015.

ASTM D3182, *Standard Practice for Rubber—Materials, Equipment, and Procedures for Mixing Standard Compounds and Preparing Standard Vulcanized Sheets*, 2016.

2.3.3 CGA Publications. Compressed Gas Association, 8484 Westpark Drive, Suite 220, McLean, VA 22102.

CGA G-7.1, *Commodity Specification for Air*, 2018.

CGA V-1, *Standard for Compressed Gas Cylinder Valve Outlet and Inlet Connections*, 2019.

2.3.4 DoD Publications. Department of Defense, Naval Publications and Forms Center (NPFC), 5801 Tabor Avenue, Philadelphia, PA 19120.

MIL-STD-282, *Test Method Standard—Filter Units, Protective Clothing, Gas-Mask Components and Related Products: Performance Test Methods*, 2015.

2.3.5 EBU Publications. European Broadcasting Union, L'Ancienne-Route 17A, Postal Box 45 Grand-Saconnex, Geneva, Switzerland.

EBU Technical Recommendation R68, *Alignment level in digital audio production equipment and in digital audio recorders*, 2000.

2.3.6 EN Publications (CEN). European Committee for Standardization Central Secretariat, Rue de la Science 23, B-1040 Brussels, Belgium.

EN 136, *Respiratory protective devices. Full face masks. Requirements, testing, marking*, 1998.

EN 137, *Respiratory protective devices. Self-contained open-circuit compressed air breathing apparatus with full face mask. Requirements, testing, marking*, 2006.

2.3.7 IEC Publications. International Electrotechnical Commission, 3, rue de Varembe, P.O. Box 131, CH-1211 Geneva 20, Switzerland.

IEC 60268, *Sound System Equipment — Part 16: Objective Rating of Speech Intelligibility by Speech Transmission Index*, 2011.