

NFPA®

1953

Standard on
Protective Ensembles for
Contaminated Water Diving

2021



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NFPA® 1953

Standard on

Protective Ensembles for Contaminated Water Diving

2021 Edition

This edition of NFPA 1953, *Standard on Protective Ensembles for Contaminated Water Diving*, was prepared by the Technical Committee on Special Operations 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 March 15, 2020, with an effective date of April 4, 2020, and supersedes all previous editions.

This edition of NFPA 1953 was approved as an American National Standard on April 4, 2020.

Origin and Development of NFPA 1953

The Technical Committee on Special Operations Protective Clothing and Equipment began the process of creating the first edition of NFPA 1953 in 2008 with a request to the Standards Council. After some clarification, the committee received permission to begin work on a draft, which was completed and approved by the Standards Council in August 2012.

The technical committee developed NFPA 1953 with the goal of establishing protection requirements for protective clothing and equipment to reduce the safety risks and health risks associated with exposure of personnel to the hazards of contaminated water diving.

It is left to emergency services organizations to select the appropriate items for the protection of their emergency responders based on the expected and anticipated contaminated water incidents to which the organizations will or could be expected to respond.

The 2021 edition of NFPA 1953 added a definition for *facility* to match other documents in the standard and language in Chapter 4 to cover manufacturing in multiple facilities. There is also an updated Table 4.4.1 to make the recertification schedule easier to understand and apply. The committee also removed the abrasion resistance test and chemical permeation resistance test for dry suits (but not closure assemblies) and corresponding performance requirements. A corresponding resistance test was added to replace the removed one.

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Committee Scope: This Committee shall have primary responsibility for documents on special operations protective clothing and protective equipment, except respiratory equipment, that provides hand, foot, torso, limb, head, and interface protection for fire fighters and other emergency services responders during incidents involving special operations functions including, but not limited to, structural collapse, trench rescue, confined space entry, urban search and rescue, high angle/mountain rescue, vehicular extraction, swift water or flooding rescue, contaminated water diving, and air operations.

This Committee shall also have primary responsibility for documents on station/work uniform garments that are not of themselves primary protective garments but can be combined with a primary protective garment to serve dual or multiple functions.

Additionally, this Committee shall have primary responsibility for documents on the selection, care, and maintenance of special operations protective clothing and equipment by fire and emergency services organizations and personnel.

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Standard on

Protective Ensembles for Contaminated Water Diving

2021 Edition

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

Chapter 1 Administration

1.1* Scope.

1.1.1* This standard shall specify the minimum design, performance, testing, and certification requirements for protective clothing and equipment items, including dry suit, dry suit gloves and dry suit footwear designed to provide limited protection from physical, environmental and certain chemical and biological hazards that are listed herein for emergency services personnel during contaminated water dive operations.

1.1.2* This standard shall specify requirements for protective clothing and protective equipment used during operations in contaminated water dive operations.

1.1.3 This standard shall not specify requirements for protective clothing and protective equipment used during operations in surface water, swift water, tidal water, surf, and ice.

1.1.4* This standard shall not specify requirements for protective clothing and protective equipment for any other technical

rescue operation, any fire-fighting operations, or any hazardous materials emergencies.

1.1.5* This standard shall specify requirements for any accessories or enhancements built into, attached to, or sold with contaminated water dive operations protective clothing and equipment by the protective clothing and equipment manufacturer for later attachment, and shall be tested with the protective clothing and equipment with the accessories and enhancements installed or attached, to assure the performance and functions of the contaminated water dive operations protective clothing and equipment.

1.1.6 This standard shall not be construed as addressing all of the safety concerns associated with the use of compliant contaminated water dive operations protective clothing and equipment. It shall be the responsibility of the persons and organizations that use compliant contaminated water dive operations protective clothing and equipment to establish safety and health practices and to determine the applicability of regulatory limitations prior to use.

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

1.1.8 Certification of contaminated water dive operations protective clothing and equipment to the requirements of this standard shall not preclude certification to additional appropriate standards where the protective clothing or equipment meets all the applicable requirements of each standard.

1.1.9 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 protection for emergency services personnel assigned to or involved in performing search and rescue activities in and below the surface of contaminated water.

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 emergency services personnel might be exposed.

1.2.3* This standard is not intended 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, manufacture, and certification of new contaminated water dive operations protective clothing and equipment.

1.3.2 This standard shall not apply to any contaminated water dive operations protective clothing and equipment manufactured to the requirements of any other organization's standards.

1.3.3 This standard shall not apply to the use of any contaminated water dive operations protective clothing and equipment, as such use requirements for fire departments are specified in NFPA 1500 and the use requirements specified by other emergency services organizations.

1.3.4 This standard shall apply to protective clothing and protective equipment used during contaminated water dive operations.

1.3.5 This standard shall not apply to protective clothing and protective equipment for operations in surface water, swift water, tidal water, surf, and ice.

1.3.6 This standard shall not apply to protective clothing and protective equipment for any other technical rescue operation, any fire-fighting operations, or any hazardous materials emergencies.

1.3.7 This standard shall not apply to protection from all biological agents or to protection from all hazardous chemicals.

1.3.8* This standard shall apply to any accessories or enhancements built into, attached to, or sold with the contaminated water dive operations protective clothing and equipment by the protective clothing and equipment manufacturer for later attachment, and shall be tested with the protective clothing and equipment with the accessories and enhancements installed or attached, to assure the performance and functions of the contaminated water dive operations protective clothing and equipment.

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 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 1500™, *Standard on Fire Department Occupational Safety, Health, and Wellness Program*, 2020 edition.

NFPA 1670, *Standard on Operations and Training for Technical Search and Rescue Incidents*, 2017 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 AATCC Publications. American Association of Textile Chemists and Colorists, P.O. Box 12215, Research Triangle Park, NC 27709.

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

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

ASTM B117, *Standard Practice of Using Salt Spray (Fog) Apparatus*, 2018.

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

ASTM D751, *Standard Test Methods for Coated Fabrics*, 2019.

ASTM D2061, *Standard Test Methods for Strength Tests for Zippers*, 2013.

ASTM D2062, *Standard Test Methods for Operability of Zippers*, 2014.

ASTM D2582, *Standard Test Method for Puncture-Propagation Tear Resistance of Plastic Film and Thin Sheeting*, 2016.

ASTM D3884, *Standard Guide for Abrasion Resistance of Textile Fabrics (Rotary Platform, Double-Head Method)*, 2017.

ASTM D3885, *Standard Test Method for Abrasion Resistance of Textile Fabrics (Flexing and Abrasion Method)*, 2015.

ASTM D4157, *Standard Test Method for Abrasion Resistance of Textile Fabrics (Oscillatory Cylinder Method)*, 2017.

ASTM D4966, *Standard Test Method for Abrasion Resistance of Textile Fabrics (Martindale Abrasion Tester Method)*, 2016.

ASTM D5035, *Standard Test Method for Breaking Force and Elongation of Textile Fabrics (Strip Method)*, 2015.

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

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

ASTM F739, *Standard Test Method for Permeation of Liquids and Gases Through Protective Clothing Materials Under Conditions of Continuous Contact*, 2012e1.

ASTM F903, *Standard Test Method for Resistance of Materials Used in Protective Clothing to Penetration by Liquids*, 2018.

ASTM F1101, *Standard Guide for Selection of Chemicals to Evaluate Protective Clothing Materials*, 2017.

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

ASTM F1671/F1671M, *Standard Test Method for Resistance of Materials Used in Protective Clothing to Penetration by Blood-Borne Pathogens Using Phi-X174 Bacteriophage Penetration as a Test System*, 2013.

ASTM F1790/F1790M, *Standard Test Method for Measuring Cut Resistance of Materials Used in Protective Clothing with CPP Test Equipment*, 2015.

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*, 2019.

2.3.3 CAN/CGSB Publications. Canadian General Standards Board, Public Works and Government Services Canada, 11 Laurier Street, Phase III, Place du Portage, Gatineau, QC K1A 0S5, Canada.

CAN/CGSB-65.16, *Immersion Suit Systems*, 2005.

▲ **2.3.4 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 1817, *Rubber, vulcanized or thermoplastic — Determination of the effect of liquids*, 2015.

ISO 9001, *Quality management systems — Requirements*, 2015.

ISO 17011, *Conformity assessment — Requirements for accreditation bodies accrediting conformity assessment bodies*, 2017.

ISO/IEC 17021, *Conformity assessment — Requirements for bodies providing audit and certification of management systems — Part 1: Requirements*, 2015.

ISO/IEC 17025, *General requirements for the competence of testing and calibration laboratories*, 2017.

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

▲ **2.3.5 UL Publications.** Underwriters Laboratories Inc., 333 Pfingsten Road, Northbrook, IL 60062-2096.

ANSI/UL 1197, *Standard for Immersion Suits*, 2013.

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

Title 46, Code of Federal Regulations, Part 164.018, “Retro-reflective Material for Lifesaving Equipment.”

2.3.7 Other Publications.

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

▲ **2.4 References for Extracts in Mandatory Sections. (Reserved)**

Chapter 3 Definitions

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

3.2 NFPA Official Definitions.

3.2.1* Approved. Acceptable to the authority having jurisdiction.

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

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

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

3.2.5 Shall. Indicates a mandatory requirement.

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

3.2.7 Standard. An NFPA Standard, the main text of which contains only mandatory provisions using the word “shall” to indicate requirements and that is in a form generally suitable for mandatory reference by another standard or code or for adoption into law. Nonmandatory provisions are not to be considered a part of the requirements of a standard and shall be located in an appendix, annex, footnote, informational note, or other means as permitted in the NFPA Manuals of Style. When used in a generic sense, such as in the phrase “standards development process” or “standards development activities,” the term “standards” includes all NFPA Standards, including Codes, Standards, Recommended Practices, and Guides.

3.3 General Definitions.

3.3.1 Bootie. A sock-like extension of the dry suit leg that covers the entire foot.

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

3.3.3 Closure. The component that allows the wearer to enter (don) and exit (doff) the dry diving suit.

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

3.3.5 Compliant Product. Product that is covered by this standard and has been certified as meeting all applicable requirements of this standard that pertain to the product.

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

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

3.3.8 Contaminated Water. A body of water that potentially contains a chemical or biological substance that poses a chronic or acute health risk to exposed personnel.

3.3.9 Diving Helmet. Headgear that provides protection from contaminated water by sealing the diver's entire head from the water while incorporating the breathing system.

3.3.10 Dry Suit. A suit that provides exposure protection for contaminated water operations.

3.3.10.1 Dry Suit Closure Assembly. The combination of the dry suit closure and the seam attaching the dry suit closure to the dry suit, excluding any protective flap or cover.

3.3.10.2* Dry Suit Footwear. The portion of the dry suit ensemble for contaminated water diving that is designed to provide protection to the foot, ankle, and lower leg.

3.3.10.3 Dry Suit Overboot. A secondary boot worn over an integrated attached bootie.

3.3.11 Exhaust Valve. Device used to allow for removal air from the dry suit.

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

3.3.13 Full-Face Diving Mask. A type of diving mask that seals the whole of the diver's face from the water and contains a mouthpiece or diving valve that provides the diver with breathing gas allowing the diver see clearly underwater, providing the diver's face with some protection from cold and polluted water, increasing breathing security and providing a space for equipment that lets the diver communicate with the surface support team.

3.3.14 Glove. An item of protective clothing used with contaminated water dry suits that are designed to provide minimum protection to fingers, thumb, hand, and wrist.

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

3.3.16 Inlet Valve. Device used to allow for addition of air into the dry suit.

3.3.17 Manufacturer. The entity that directs or controls any of the following: compliant product design, compliant product manufacturing, or compliant product quality assurance; or the entity that assumes the liability for the compliant product or provides the warranty for the compliant product.

3.3.18 Manufacturing Facility. A facility that is involved in the production, assembly, final inspection, or labeling of the compliant end product.

3.3.19 Model. The collective term used to identify a group of individual items, elements, or items 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.

3.3.20* Moderate Contamination. Contaminated water where increased levels of chemical and/or biological contamination are anticipated to be found; poses a moderate health risk to the rescuer if not properly protected.

3.3.21 Neck Seal. A device used for preventing water from entering the dry suit at the neck.

3.3.22 Penetration. For a protective clothing material or item the process by which a substance moves through closures, seams, interstices, and pinholes or other imperfections on a non-molecular level.

3.3.23* Permeation. The process by which a chemical moves through a protective clothing material on a molecular level.

3.3.24 Product. See 3.3.5, Compliant Product.

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

3.3.26 Reinforcement. An area of added mechanical protection.

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

3.3.28 Sample. The equipment, equipment component, ensemble, element, item, component, or composite that is conditioned for testing. (See also 3.3.31, Specimen.)

3.3.29 Seam. Any permanent attachment of two or more materials, in a line formed by joining the separate material pieces.

3.3.30* Severe Contamination. Grossly contaminated water with highly concentrated chemical and/or biological contamination; poses an immediate and/or severe health risk to rescuers if not fully encapsulated.

3.3.31 Specimen. The conditioned equipment, equipment component, ensemble, element, product, item, composite, component, or opposite that is tested. Specimens are taken from samples. (See also 3.3.28, Sample.)

3.3.32 Suit. See 3.3.10, Dry Suit.

3.3.33 Suit Material. The primary protective principal material(s) used in the construction of contaminated water dry suits.

3.3.34 Trim. See 3.3.35, Visibility Markings.

3.3.35 Visibility Markings. Retroreflective enhancements that improve nighttime conspicuity and fluorescent enhancements that improve daytime conspicuity.

3.3.36 Wrist Seal. A device used for preventing water from entering the dry suit at the wrist.

Chapter 4 Certification

4.1 General.

Δ 4.1.1 The process of certifying contaminated water dive operations protective clothing and equipment as compliant with NFPA 1953 shall meet the requirements of Section 4.1, General, through Section 4.8, Manufacturers' Safety Alert and Product Recall Systems.

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

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 (PPE) 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 — 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 1953, in any statements about their respective item(s) unless the item(s) is certified as compliant to this standard.

4.1.5 All compliant protective clothing and equipment shall be labeled.

4.1.6 All compliant contaminated water dive protective clothing and equipment items shall be listed by the certification organization. This listing shall uniquely identify the certified product, for example, by style, model number, or part number.

4.1.7 All compliant contaminated water dive protective clothing and equipment items shall also have a product label that meets the requirements specified in Section 5.1, Product Label Requirements.

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

N 4.1.9 The certification organization shall not issue any new certifications to the 2015 edition of NFPA 1953 on or after the NFPA effective date for the 2021 edition.

N 4.1.10 The certification organization shall not permit any manufacturer to continue to label any protective ensembles or ensemble elements that are certified as compliant with the 2015 edition of NFPA 1953 plus 12 months.

N 4.1.11 The certification organization shall require manufacturers to remove all certification labels and product labels indicating compliance with the 2015 edition of NFPA 1953 from all protective ensembles and ensemble elements that are under the control of the manufacturer on the effective date of this standard plus 12 months.

4.2 Certification Program.

4.2.1* The certification organization shall not be owned or controlled by manufacturers or vendors of the items 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 PPE 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 — Requirements for accreditation bodies accrediting conformity assessment bodies*.

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

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

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

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

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

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

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

4.2.7 The certification organization shall require the manufacturer to establish and maintain a quality assurance program that meets the requirements of Section 4.5, Manufacturer's Quality Assurance Program.

4.2.7.1* The certification organization shall require the manufacturer to have a product recall system as 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 manufacturing facilities of the compliant product with at least two random, unannounced visits per 12-month period to verify the product's continued compliance. Where portions of the production processes are carried out by multiple facilities, the certification organization shall determine the appropriate follow-up program according to the facility or facilities that most closely meet the definition of *manufacturing facility* (see 3.3.18).

4.2.9.1 As part of the follow-up inspection program, the certification organization shall select sample compliant product at random from the manufacturing facility's production line, from the manufacturer's or manufacturing facility'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 manufacturing quality assurance systems are consistent with the materials, components, and manufacturing quality assurance systems that were inspected and tested by the certification organization during initial certification and recertification.

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

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

4.2.10 The certification organization shall have in place a series of procedures, as specified in Section 4.6, 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 items, 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/IEC 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/IEC 17025, *General requirements for the competence of testing and calibration laboratories*, shall encompass testing of PPE.

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 — 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 PPE.

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 — Requirements for accreditation bodies accrediting conformity assessment bodies*.

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

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

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

4.3.5 Inspection and evaluation 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 product in Section 5.1, Product Label Requirements.

4.3.6 Inspection and evaluation 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 5.1.5, to ensure that the symbols are clearly explained in the product's user information package.

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

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

4.3.9.1 Testing shall be performed on specimens representative of materials and components used in the actual construction of the compliant product.

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

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

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

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

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

4.3.14 The certification organization shall test an ensemble element with the specific ensemble(s) with which it is to be certified.

4.3.15 Any change in the design, construction, or materials 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.

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

4.4 Annual Verification of Product Compliance.

4.4.1 All products that are labeled as being compliant with this standard shall undergo recertification on an annual basis. This recertification shall include the following:

- (1) Inspection and evaluation to all design requirements as required by the standard on all manufacturer models and components
- (2) Testing to all performance requirements as specified in Table 4.4.1 on all manufacturers' models and components within the following protocol:
 - (a) Where a test method incorporates testing both before and after the laundering preconditioning specified in 8.1.3 and the test generates quantitative results, recertification testing shall be limited to the conditioning that yielded the worst-case test result during the initial certification for the model or component.
 - (b) Where a test method incorporates testing both before and after the laundering preconditioning specified in 8.1.3 and the test generates nonquantitative results, recertifications shall be limited to a

single conditioning procedure in any given year. Subsequent annual recertification shall cycle through the remaining conditioning procedure to ensure that all required conditionings are included over time.

- (c) Where a test method requires the testing of three specimens, a minimum of one specimen shall be tested for annual certification.
- (d) Where a test method requires the testing of five or more specimens, a minimum of two specimens shall be tested for annual certification.

4.4.1.1 This recertification shall include inspection and evaluation to all design requirements and testing to all performance requirements as required by this standard on all manufacturers' models and components as required by 4.4.3.

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

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

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

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

4.4.4 Samples of manufacturer models and components for recertification shall be acquired as part of the follow-up program in accordance with 4.2.9 and shall be permitted to be used toward annual recertification.

4.4.5 The manufacturer shall maintain all design, inspection, performance, and test data from the certification organization used in the recertification of manufacturer models and components. The manufacturer shall provide such data, upon request, to the purchaser or authority having jurisdiction.

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 assure 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 PPE in accordance with ISO/IEC 17021, *Conformity assessment — Requirements for bodies providing audit and certification of management systems — Part 1: Requirements*.

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

Table 4.4.1 Recertification Schedule

Product/Test	Initial Certification	Year 2	Year 3	Year 4	Year 5
Wet suit					
7.1.1 Overall Donning Efficiency Test	X				
7.1.2 Breaking Strength Test	X		X		
7.1.3 Puncture Propagation Tear Resistance Test	X				
7.1.4 Seam/Closure Breaking Strength Test	X	X	X	X	X
7.1.5 Liquid Absorption Resistance Test	X				
7.1.6 Retroreflectivity Test	X				
7.1.7 Zipper Strength Test	X				
7.1.8 Resistance to Twist of Pull and Slider Test	X				
7.1.9 Opening and Closing of Zippers Test	X				
7.1.10 Corrosion Resistance Test	X				
7.1.11 Label Durability and Legibility Test	X				
Ice suit					
7.3.1 Overall Liquid Integrity One	X				
7.3.2 Air Retention Test	X	X	X	X	X
7.3.3 Viral Penetration Resistance Test	X				
7.3.4 Overall Donning Efficiency Test	X				
7.3.5 Thermal Insulation Test	X		X		
7.3.6 Breaking Strength Test	X		X		
7.3.7 Puncture Propagation Tear Resistance Test	X		X		
7.3.8 Seam/Closure Breaking Strength Test	X	X	X	X	X
7.3.9 Liquid Absorption Resistance Test	X		X		
7.3.10 Liquid Penetration Resistance Test	X				
7.3.11 Retroreflectivity Test	X				
7.3.12 Water Penetration and Air Evacuation Test	X				
7.3.13 Buoyancy Test	X				
7.3.14 Corrosion Resistance Test	X				
7.3.15 Label Durability and Legibility Test	X				
7.3.16 Zipper Point Breaking Strength Test	X				
7.3.17 Zipper Leak Resistance Test	X	X	X	X	X
7.3.18 Opening and Closing of Zippers Test	X				
7.3.19 Zipper Opening and Closing Force Test	X				
Wet suit gloves					
7.5.1 Cut Resistance Test	X			X	
7.5.2 Puncture Resistance Test	X		X		

(continues)

Table 4.4.1 *Continued*

Product/Test	Initial Certification	Year 2	Year 3	Year 4	Year 5
7.5.3 Abrasion Resistance Test Two	X			X	
7.5.4 Glove Hand Function Test	X				
7.5.5 Grip Test	X				
7.5.6 Glove Donning Test	X				
7.5.7 Corrosion Resistance Test	X				
7.5.8 Label Durability and Legibility Test	X				
Dry suit gloves					
7.6.1 Cut Resistance Test	X			X	
7.6.2 Puncture Resistance Test	X		X		
7.6.3 Abrasion Resistance Test Two	X			X	
7.6.4 Glove Hand Function Test	X				
7.6.5 Grip Test	X				
7.6.6 Glove Donning Test	X				
7.6.7 Corrosion Resistance Test	X				
7.6.8 Liquid Penetration Resistance Test	X				
7.6.9 Viral Penetration Resistance Test	X				
7.6.10 Overall Liquid Integrity Test Two	X		X		
7.6.11 Label Durability and Legibility Test	X				
PFD					
7.10.1 Buoyancy Test – SG3, SG20 of UL 1123	X				
7.10.2 Label Durability and Legibility Test	X				
7.10.3 Corrosion Resistance Test	X				
6.11.1 Water Entry Test – SG3, SG16 of UL 1123	X				
6.11.1 Flotation Stability Test – SG3, SG16 of UL 1123	X				
6.11.1 Buoyancy Distribution Test – SG3, SG19 of UL 1123	X				
6.11.1 Tensile Strength – SG3, SG24 of UL 1123	X				
6.11.1 750 Pound Shoulder Tensile Test – SG3, SG10, SG24 of UL 1123	X				
6.11.1 750 Pound Harness Strength Test (without accelerated weathering) – SG9 of UL 1123	X				
6.11.1 Pamphlet Strength of Attachment Test – SG3, SG35 of UL 1123	X				
6.11.1 Pull Toggle Security of Attachment – SG7A of UL 1123	X				
Helmet					
7.4.1 Helmet Bucketing Test	X				

(continues)

Shaded text = Revisions.  = Text deletions and figure/table revisions. • = Section deletions.  = New material