NFPA 1975
Standard on Station/Work Uniforms for Fire and Emergency Services

1999 Edition

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

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NFPA 1975

Standard on

Station/Work Uniforms for Fire and Emergency Services

1999 Edition

This edition of NFPA 1975, *Standard on Station/Work Uniforms for Fire and Emergency Services,* was prepared by the Technical Committee on Special Operations 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 Fall Meeting held November 16–18, 1998, in Atlanta, GA. It was issued by the Standards Council on January 15, 1999, with an effective date of February 4, 1999, and supersedes all previous editions.

This edition of NFPA 1975 was approved as an American National Standard on February 4, 1999.

Origin and Development of NFPA 1975

The Technical Committee on Protective Equipment for Fire Fighters began work on NFPA 1975 in 1982 in response to requests from the fire service to establish requirements for flame-resistant station uniform clothing. The first edition was acted on by the membership of the Association at the 1985 Annual Meeting in Chicago, Illinois, and was issued with an effective date of June 26, 1985.

Following the 1985 edition, the name of the technical committee was changed to the Technical Committee on Fire Service Protective Clothing and Equipment. Under the direction of that technical committee, a subcommittee was formed to address station work uniform concerns. The Subcommittee on Station/Work Uniforms began revision of the 1985 edition on NFPA 1975 in 1988, and the second edition was acted on by the membership of the Association at the 1990 Annual Meeting in San Antonio, Texas, and was issued with an effective date of August 17, 1990.

The subcommittee on Station/Work Uniforms began an early revision (4-year cycle) of the 1990 edition of NFPA 1975 in December 1991. During 1993, the NFPA restructured the manner in which committees were organized, and all standing subcommittees were eliminated. Within the Technical Committee on Fire Service Protective Clothing and Equipment, the former standing subcommittees were reorganized as task groups to address specific technical issues, and the technical committee assumed the entire responsibility for NFPA 1975.

The third edition of 1975 encompassed revised scope and purpose sections to more clearly identify what a station/work uniform is intended to be and that, because of the limited degree of protection it affords, it is not, of itself, a primary protective garment. However, a station/work uniform garment should not cause or contribute to injury from an unexpected thermal exposure. The concept of "dual-purpose" station/work uniform garments that also are designed and certified as a primary protective garment was introduced for situations including, but not limited to, wildland fire fighting or emergency medical services. Revisions to certain definitions also strengthen these areas. A new thermal shrinkage test for fabrics was added to the requirements. An increase of the pre-test conditioning by either washing or drycleaning was added to assure that treated flame-resistant fabrics will retain their flame-resistant characteristics over the expected life of the garment. The fourth edition was acted on by the membership of the Association at the Annual Meeting in San Francisco, California, on May 18, 1994, and was issued with an effective date of August 5, 1994.

This fourth edition includes a major change whereby flame-resistant garments are no longer required exclusively, but garments are now allowed to be made either from flame-resistant fabrics or from cotton or wool fabrics. Flame resistance performance and testing can be specified by the purchaser where desired and would be above the minimum requirements. The heat resistance and thermal shrinkage resistance requirements were retained. The heat resistance and thermal shrinkage resistance performance requirements were combined into a single requirement, since they use the same test method and test exposure. The chapter on certification was reformatted by moving product labels and user information into a new Chapter 3. A new Chapter 4 on design requirements was also added.

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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.

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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 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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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 performance and certification requirements and the test methods for textiles and other materials used in the construction of station/work uniforms for fire and emergency services personnel.

1-1.2 This standard shall apply to the manufacture and certification of new station/work uniforms and to the individual garments comprising station/work uniforms. This standard shall not apply to station/work uniforms and garments manufactured to previous editions of this standard.

1-1.3* This standard alone shall not apply to uniforms and garments that are intended to provide primary protection from a given hazard exposure.

1-1.4 Certification of station/work uniforms to the requirements of this standard shall not preclude certification to additional appropriate primary protective garment standards where the garments meet all requirements of each standard.

1-1.5 Nothing herein shall be construed to restrict any jurisdiction or manufacturer from exceeding these minimum requirements.

1-2 Purpose.

1-2.1 The purpose of this standard shall be to establish minimum criteria for station/work uniforms.

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 fire and emergency services personnel might be exposed.

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

1-3 Definitions.

Approved.* Acceptable to the authority having jurisdiction.

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

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 compliance with the requirements of this standard.

Certification Mark or Label. The authorized identification symbol or logo of the certification organization.

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

Compliant. Meeting or exceeding all applicable requirements of this standard.

Components.* All materials and hardware — such as emblems, thread, trim, bindings, zippers, snaps, buttons, and labels, but excluding interlinings — used in the construction of station/work uniforms.

Drip. To run or fall in drops or blobs.

Flame Resistance. The property of a material whereby combustion is prevented, terminated, or inhibited following application of a flaming or nonflaming source of ignition, with or without subsequent removal of the ignition source. Flame resistance can be an inherent property of the textile material, or it can be imparted by specific treatment.

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.

Garment. A unit of textile apparel that covers the torso and limbs or parts of limbs.

Inherent Flame Resistance. As applied to textiles, flame resistance that is derived from an essential characteristic of the fiber or polymer from which the textile is made.

Interlining. Any textile that is intended for incorporation into any article of clothing as a layer between outer and inner layers.

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.

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 identified standards or has been tested and found suitable for a specified purpose.

Major Stress Seams. Classes of seams that designate minimum sewn seam requirements.

Class I. The seat seams, side seams, and inseams of pants; the seat seams, side seams, inseams, and waist seams in the bottom

portion of coveralls; and the yoke(s) seams, side seams, sleeve set and close seams, and shoulder seams for the upper portion of coveralls.

Class II. The yoke(s) seams, side seams, sleeve set and close seams, and shoulder seams for knit fabrics and woven shirting fabrics.

Manufacturer. The entity that assumes the liability and provides the warranty for the compliant product.

Melt. A material's response to heat, evidenced by softening of the fiber polymer that results in flowing or dripping.

Primary Protective Garment. A garment that is designed, certified, and intended to be the barrier of protection from a specific hostile environment.

Product Label. A label or marking affixed by the manufacturer to each compliant station/work uniform garment. Such labels contain compliance statements, general information, care, maintenance, or similar data. The product label is not the certification organization's label, symbol, or identifying mark; however, the certification organization's label, symbol, or identifying mark is attached to or a part of the product label.

Separate. A material's response, evidenced by splitting or delaminating.

Sewn Seam. A series of stitches joining two or more separate plies of material(s) of planar structure, such as textiles.

Shall. Indicates a mandatory requirement.

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

Standard. A document, the main text of which contains only mandatory provisions using the word "shall" to indicate requirements and which is in a form generally suitable for mandatory reference by another standard or code or for adoption into law. Nonmandatory provisions are located in an appendix, and are not to be considered a part of the requirements of a standard.

Station/Work Uniforms. Garments that are certified as compliant with this standard and are intended to be worn by members of the fire and emergency services while on duty. Not protective garments or primary protective garments. Station/work uniform garments exclude clothing items that are intended for use as underwear, socks, dress uniforms, and outerwear jackets.

Textiles. A planar structure material consisting of yarns or fibers.

1-4 Units.

1-4.1 In this standard, values for measurement are followed by an equivalent value in parentheses, but only the first stated value shall be regarded as the requirement. Equivalent values in parentheses shall not be considered as the requirement, as these values could be approximate.

Chapter 2 Certification

2-1 General.

2-1.1 All station/work uniforms that are labeled as being compliant with this standard shall meet or exceed all applicable requirements specified in this standard and shall be certified. Manufacturers shall not claim compliance with a portion(s) or segment(s) of the requirements of this standard and shall not use the name or identification of this standard, NFPA 1975, in any statements about their respective products unless the product is certified to this standard.

2-1.2 All certification shall be performed by a certification organization that meets at least the requirements specified in Section 2-2 and that is accredited for personal protective equipment in accordance with ANSI Z34.1, *Standard for Third-Party Certification Program for Products, Processes, and Services.*

2-1.3* Station/work uniforms that are intended to provide primary protection from a specific hazard(s) shall not be certified *only* to this standard. Station/work uniforms that are intended to provide primary protection from a specific hazard(s) shall be certified to the appropriate NFPA standard(s) that applies to protection from the intended hazard(s) and shall also be certified to this standard.

2-1.4 All individual garments of compliant station/work uniforms shall be labeled and listed. The product label(s) shall meet the requirements specified in 3-1.1.

2-1.5* The certification organization's label, symbol, or identifying mark shall be attached to the product label or shall be part of the product label.

2-1.6 The certification organization shall not certify any station/work uniform garments to the 1994 edition of this standard on or after 1 August 1999.

2-1.7 The certification organization shall not permit any manufacturer to label any station/work uniform garments as compliant with the 1994 edition of this standard on or after 1 August 1999.

2-1.8 The certification organization shall require manufacturers to remove all certification labels and product labels indicating compliance with the 1994 edition of this standard from all station/work uniform garments that are under the control of the manufacturer on 1 August 1999. The certification organization shall verify that this action is taken.

2-2 Certification Program.

2-2.1* The certification organization shall not be owned or controlled by manufacturers or vendors of the product being certified. The certification organization shall be primarily engaged in certification work and shall not have a monetary interest in the product's ultimate profitability.

2-2.2 The certification organization shall refuse to certify products to this standard that do not comply with all applicable requirements of this standard.

2-2.3* 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. There shall be no conditional, temporary, or partial certifications. Manufacturers shall not be authorized to use any label or reference to the certification organization on products that are not manufactured in compliance with all applicable requirements of this standard.

2-2.4* The certification laboratory shall have laboratory facilities and equipment available for conducting proper tests, shall have a program for calibration of all instruments in place and operating, and shall have procedures in use to ensure proper control of all testing. Good practice shall be followed

regarding the use of laboratory manuals, form data sheets, documented calibration and calibration routines, performance verification, proficiency testing, and staff qualification and training programs.

2-2.5 The certification organization shall require the manufacturer to establish and maintain a program of production inspection and testing that at least meets the requirements of Section 2-4. The certification organization shall ensure that the audit assurance program provides continued product compliance with this standard.

2-2.6 The certification organization and the manufacturer shall evaluate any changes affecting the form, fit, or function of the certified product to determine its continued certification to this standard.

2-2.7* The certification organization shall have a follow-up inspection program of the manufacturing facilities of the certified product, with at least two random and unannounced visits per 12-month period. As part of the follow-up inspection program, the certification organization shall select sample product at random from the manufacturer's production line, from the manufacturer's in-house stock, or from the open market. Sample product shall be inspected and tested by the certification organization to verify the product's continued compliance.

2-2.8 The certification organization shall have a program for investigating field reports alleging malperformance or failure of listed products.

2-2.9* The certification organization shall require the manufacturer to have a product recall system as part of the manufacturer's quality assurance program.

2-2.10 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.

2-2.11 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.

2-3 Inspection and Testing.

2-3.1 Sampling levels for testing and inspection shall be established by the certification organization and the manufacturer to assure a reasonable and acceptable reliability at a reasonable and acceptable confidence level that products certified to this standard are compliant unless such sampling levels are specified herein. This information shall be provided to the purchaser upon request.

2-3.2 All inspections, evaluations, conditioning, and testing for certification or for recertification shall be conducted by the certification organization.

2-3.3 Any inspection, evaluation, conditioning, or testing conducted by a product manufacturer shall not be used in the certification or recertification process.

2-3.4 Inspection by the certification organization shall include a review of all product labels to ensure that all required label attachments, compliance statements, certification statements, and other product information are at least as specified in Section 3-1 for the specific item.

2-3.5 Inspection by the certification organization shall include a review of the user information required by Section 3-2 to ensure that the information has been developed and is available.

2-3.6 Testing conducted by the certification organization in accordance with the testing requirements of Chapter 6, for determining product compliance with the applicable requirements specified in Chapter 5 of this standard, shall be performed on samples representative of materials and components used in the actual construction of emergency medical garments, gloves, or face protection devices. The certification organization shall also be permitted to use sample materials cut from a representative product.

2-3.7 Any change in the design, construction, or material of a compliant product shall necessitate new inspection and testing to verify compliance to all applicable requirements of this standard that the certification organization determines can be affected by such change. This recertification shall be conducted before labeling the modified products as being compliant with this standard.

2-3.8 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. 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. 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.

2-4 Manufacturer's Quality Assurance Program.

2-4.1 The manufacturer shall provide and maintain a quality assurance program that includes a documented inspection and product recall system. The manufacturer shall have an inspection system to substantiate conformance to this standard.

2-4.2 The manufacturer shall maintain written inspection and testing instructions. The instructions shall prescribe inspection and testing of materials, work in process, and completed articles. Criteria for acceptance and rejection of materials, processes, and final product shall be part of the instructions.

2-4.3 The manufacturer shall maintain records of all pass/fail tests. Pass/fail records shall indicate the disposition of the failed material or product.

2-4.4 The manufacturer's inspection system shall provide for procedures that assure the latest applicable drawings, specifications, and instructions are used for fabrication, inspection, and testing.

2-4.5 The manufacturer shall, as part of the quality assurance program, maintain a calibration program of all instruments used to ensure proper control of testing. The calibration program shall be documented as to the date of calibration and performance verification.

2-4.6 The manufacturer shall maintain a system for identifying the appropriate inspection status of component materials, work in process, and finished goods.

2-4.7 The manufacturer shall establish and maintain a system for controlling nonconforming material, including proce-

dures for the identification, segregation, and disposition of rejected material. All nonconforming materials or products shall be identified to prevent use, shipment, and intermingling with conforming materials or products.

2-4.8 The manufacturer's quality assurance program shall be audited by the third-party certification organization to determine that the program is sufficient to ensure continued product compliance with this standard.

2-5* ISO Registration for Manufacturers.

2-5.1 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 2-2.9.

2-5.2 The manufacturer shall be registered to ISO 9001, *Quality Systems —- Model for Quality Assurance in Design, Development, Production, Installation, and Servicing.*

2-5.3 All elements of the protective ensemble shall be required to be assembled in a facility that is registered at least to ISO 9002, *Quality Systems — Model for Quality Assurance in Production, Installation, and Servicing.*

2-5.4 The ISO registration requirements shall have an effective date of 1 March 2001.

2-5.5 Until 1 March 2001, or until the date the manufacturer becomes ISO registered, whichever date occurs first, the manufacturer shall comply with Section 2-4.

Chapter 3 Labeling and Information

3-1 Product Label Requirements.

3-1.1 Each station/work uniform garment shall have a product label(s) permanently and conspicuously attached. At least one product label shall be conspicuously located inside each garment. The product label shall be attached to the garment along the entire perimeter of the label.

3-1.2 Multiple label pieces shall be permitted in order to carry all required statements and information on the product label.

3-1.3* The certification organization's label, symbol, or identifying mark shall be permanently attached to the product label or shall be part of the product label.

3-1.4 All worded portions of the required product label shall be printed at least in English.

3-1.5 Symbols and other pictorial graphic representations shall be permitted to be used to supplement worded statements on the product label(s).

3-1.6 The following statement shall be printed legibly on the product label. All letters shall be at least 3 mm ($^1/_8$ in.) high.

"THIS STATION/WORK UNIFORM GARMENT MEETS THE REQUIREMENTS OF NFPA 1975, STANDARD ON STATION/WORK UNIFORMS FOR FIRE AND EMERGENCY SERVICES, 1999 EDITION.
DO NOT REMOVE THIS LABEL."

3-1.7 The following information shall also be printed legibly on the product label. All letters shall be at least 2 mm ($^1/_{16}$ in.) high.

(a) Manufacturer's name
(b) Manufacturer's address
(c) Manufacturer's number or cut/lot number or serial number
(d) Country of manufacture
(e) Country of origin of textile fabric
(f) Style name or design
(g) Date of manufacture
(h) Size
(i) Cleaning and drying instructions, including applicable warnings regarding detergents, soaps, cleaning additives, and bleaches
(j) Fiber content and composition

3-2 User Information.

3-2.1 The garment manufacturer shall provide user information including, but not limited to, warnings, general information, and instructions with each garment.

3-2.2 The garment manufacturer shall attach the required user information, or packaging containing the user information, to the garment in such a manner that it is not possible to use the garment without being aware of the availability of the information.

3-2.3 The required user information, or packaging containing the user information, shall be attached to the garment so that a deliberate action is necessary to remove it. The garment manufacturer shall provide notice that the user information is to be removed only by the end user.

3-2.4 The garment manufacturer shall provide at least the following instructions and information with each garment:

(a) Pre-use information
    1. Safety considerations
    2. Garment marking recommendations and restrictions
    3. A statement that most performance properties of the garment cannot be tested by the user in the field
    4. Warranty information
(b) Inspection frequency and details
(c)* Maintenance
    1. Cleaning instructions
    2. Methods of repair where applicable
    3. Decontamination procedures for both chemical and biological contamination
(d) Retirement and disposal criteria and consideration

Chapter 4 Design Requirements

4-1 General.

4-1.1 Station/work uniforms shall be constructed either from flame-resistant fabrics or from nominally 100 percent cotton or wool fabrics.

4-1.2 Where station/work uniforms are constructed from flame-resistant fabrics, the garments shall be stitched with thread of an inherently flame-resistant fiber.

Chapter 5 Performance Requirements

5-1 Heat and Thermal Shrinkage Resistance.

5-1.1 Specimens of textiles and components — excluding interlinings, collar stays, elastic, and hook and pile fasteners

when placed where they will not come into direct contact with the body — shall be tested individually for heat resistance as specified in Section 6-2, Heat and Thermal Shrinkage Resistance Test, and shall not melt, drip, separate, or ignite; and shall not shrink more than 15 percent in any direction.

5-2 Seam Strength.

5-2.1 Specimens of all major stress seams shall be tested for seam strength as specified in Section 6-3, Seam Breaking Strength Test, and shall demonstrate a sewn seam strength equal to or greater than that stipulated for each class of seam specified.

5-2.1.1 Class I major stress seams of woven fabrics shall have a minimum of 245 N (55 lbf) of breaking strength for either thread or fabric.

5-2.1.2 Class II major stress seams of woven fabrics shall have a minimum of 180 N (40 lbf) of breaking strength for either thread or fabric.

5-2.1.3 Class I and II major stress seams of knit fabrics shall have a minimum of 180 N (40 lbf) of burst strength for either thread or fabric.

5-3 Thread Heat Resistance.

5-3.1 For station/work uniforms constructed with flame-resistant fabrics, specimens of all thread utilized in garment construction shall be tested for heat resistance as specified in Section 6-4, Thread Heat Resistance Test, and shall not melt.

5-4 Product Label Printing Durability.

5-4.1 Specimens of product labels shall be tested for printing durability as specified in Section 6-5, Label Print Durability Test, and shall be legible.

Chapter 6 Test Methods

6-1 Sample Preparation Procedures.

6-1.1 Application.

6-1.1.1 The sample preparation procedures contained in this section shall apply to each test method in this chapter as specified.

6-1.1.2 Only the specific sample preparation procedure or procedures referenced in the sample preparation section of each test method shall be applied to that test method.

6-1.2 Room Temperature Conditioning Procedure.

6-1.2.1 Samples shall be conditioned at a temperature of 21°C, ±3°C (70°F, ±5°F) and a relative humidity of 65 percent ±5 percent until equilibrium is reached, as determined in accordance with Section 4 of Federal Test Method 191A, *Textile Testing Methods*, or for at least 24 hours, whichever is shortest. Specimens shall be tested within 5 minutes after removal from conditioning.

6-1.3 Industrial Washing and Drying Procedure.

6-1.3.1 Samples shall be subjected to 100 cycles of washing and drying. Each washing cycle shall be as specified in Table 6-1.3.1.

6-1.3.2 No bleach or softener shall be used during any portion of the laundry cycle.

6-1.3.3 The machine shall be filled with water to the specified level prior to adding chemicals. The water level shall be determined by measuring inside the washing machine from the bottommost portion of the basket to the water surface. This water

Table 6-1.3.1* Washing Cycle Procedure

Operations	Time (min)	Temp °C	Temp °F	Water Level	Quantity per Wash Load g	Quantity per Wash Load oz
Break	101	66	150	Low		
Sodium meta silicate					17	0.6
Sodium tripoly phosphate					11	0.4
Tergitol 15-S-9 or equivalent					22	0.8
Drain	1					
Carry-over	5	66	150	Low		
Drain	1					
Rinse	2	57	135	High		
Drain	1					
Rinse	2	48	118	High		
Drain	1					
Rinse	2	38	100	High		
Drain	1					
Sour	5	38	100	Low		
Sodium silicofluoride					6	0.2
Drain	1					
Extract	5					

level measurement shall be 125 mm (5 in.) for the low setting and 250 mm (10 in.) for the high setting. Water hardness shall not exceed 25 ppm.

6-1.3.4 The extraction cycle shall continue as specified in Table 6-1.3.1 or until water is no longer flowing to drain. The load shall be removed immediately after the extraction cycle concludes.

6-1.3.5 A full load of 9 kg (20 lb) shall be laundered. A dummy load, if needed to make a full load, shall be as specified in Section 12.4 of AATCC 135, *Dimensional Changes in Automatic Home Laundering of Woven and Knit Fabrics*.

6-1.3.6 The machine type shall be a front-loading, 15-kg (35-lb) capacity, industrial washer capable of performing the operations specified in Table 6-1.3.1.

6-1.3.7 Samples shall be tumbled dry. The dryer temperature shall be preset to provide a maximum dryer exhaust exit temperature not greater than 82°C, ±3°C (180°F, ±5°F) with a 9-kg (20-lb) load.

6-1.3.8 Samples shall be removed from the dryer immediately after drying is complete. Additional drying time shall be avoided.

6-1.4 Commercial Dry-Cleaning Procedure.

6-1.4.1 Specimens shall be subjected to 100 cycles of dry cleaning as specified in the procedures of Sections 9.2 and 9.3 of AATCC 158, *Dimensional Changes in Dry-Cleaning in Perchloroethylene: Machine Method*.

6-2* Heat and Thermal Shrinkage Resistance Test.

6-2.1 Application.

6-2.1.1 This test method shall apply to garment textiles, other garment, components, and hardware.

6-2.1.2 Modifications to this test method for testing only garment textiles shall be as specified in 6-2.8.

6-2.1.3 Modifications to this test method for other garment components shall be as specified in 6-2.9.

6-2.1.4 Modifications to this test method for testing hardware shall be as specified in 6-2.10.

6-2.2 Specimens.

6-2.2.1 Heat resistance testing only shall be conducted on a minimum of three specimens for each hardware item, label material, and other protective garment materials specified in 6-2.1.3.

6-2.2.2 Both heat and thermal shrinkage resistance testing shall be conducted on a minimum of three specimens for each garment textile. Each separable layer of multilayer material systems or composites shall be tested as an individual layer.

6-2.3 Sample Preparation.

6-2.3.1 All samples to be tested shall be preconditioned as specified in 6-1.2.

6-2.3.2 All samples that are designated by the manufacturer on the product label to be washed shall be tested both before and after conditioning by 100 cycles of washing and drying according to the method specified in 6-1.3.

6-2.3.3 Samples that are designated by the manufacturer on the product label to be dry-cleaned shall be tested both before and after conditioning by 100 cycles of dry cleaning according to the method specified in 6-1.4.

6-2.4 Apparatus.

6-2.4.1 The test oven shall be a horizontal flow circulating oven with minimum interior dimensions such that the specimens can be suspended and be at least 50 mm (2 in.) from any interior oven surface or other test specimens.

6-2.4.2 The test oven shall have an airflow rate of 38 m/min to 76 m/min (125 ft/min to 250 ft/min) at the standard temperature and pressure of 21°C (70°F) at 1 atmosphere, measured at the center point of the oven.

6-2.4.3 A test thermocouple shall be positioned so that it is level with the horizontal centerline of a mounted sample specimen. The thermocouple shall be equidistant between the vertical centerline of a mounted specimen placed in the middle of the oven and the oven wall where the airflow enters the test chamber. The thermocouple shall be an exposed bead, Type J or K, No. 30 AWG thermocouple. The test oven shall be heated and the test thermocouple stabilized at 260°C, +6/−0°C (500°F, +10/−0°F) for a period of not less than 30 minutes.

6-2.5 Procedure.

6-2.5.1 Specimen marking and measurements shall be conducted in accordance with the procedure specified in AATCC 135, *Dimensional Changes in Automatic Home Laundering of Woven and Knit Fabrics*.

6-2.5.2 The specimen shall be suspended by metal hooks at the top and centered in the oven so that the entire specimen is not less than 50 mm (2 in.) from any oven surface or other specimen and so that airflow is parallel to the plane of the material.

6-2.5.3 The oven door shall not remain open more than 15 seconds. The airflow shall be shut off while the door is open and turned on when the door is closed. The total oven recovery time after the door is closed shall not exceed 30 seconds.

6-2.5.4 The specimen, mounted as specified, shall be exposed in the test oven for 5 minutes, +10/−0 seconds. The test exposure time shall begin when test thermocouple recovers to a temperature of 260°C, +6/−0°C (500°F, +10/−0°F).

6-2.5.5 Immediately after the specified exposure, the specimen shall be removed and examined for evidence of ignition, melting, dripping, or separation.

6-2.5.6 After the specified exposure, the specimen shall also be measured to determine pass/fail. Knit fabric shall be pulled to original dimensions and shall be allowed to relax for 1 minute prior to measurement to determine pass/fail.

6-2.6 Report.

6-2.6.1 Observations of ignition, melting, dripping, or separation shall be reported for each specimen.

6-2.6.2 The percent change in the width and length dimensions of each specimen shall be calculated. Results shall be reported as the average of all three specimens in each dimension.

6-2.7 Interpretation.

6-2.7.1 Any evidence of ignition, melting, dripping, or separation on any specimen shall constitute failing performance.

6-2.7.2 The average percent change in both dimensions shall be used to determine pass/fail performance. Failure in any one dimension shall constitute failure for the entire sample. *(See Section 5-1.)*

6-2.8 Specific Requirements for Testing Garment Textile Materials.

6-2.8.1 Each specimen shall be 380 mm × 380 mm, ±13 mm (15 in. × 15 in., $\pm^1/_2$ in.) and shall be cut from the fabric to be utilized in the construction of the clothing item.

6-2.8.2 Samples for conditioning shall be at least 1 m (39 in.) square of each material.

6-2.8.3 Testing shall be performed as described in 6-2.2 through 6-2.7.

6-2.9 Specific Requirements for Testing Other Garment Components.

6-2.9.1 Specimen length shall be 150 mm (6 in.), other than for textiles utilized in the clothing item in lengths less than 150 mm (6 in.), where length shall be the same as in the clothing item. Specimen width shall be 150 mm (6 in.), other than for textiles utilized in the clothing item in widths less than 150 mm (6 in.), where widths shall be the same as in the clothing item.

6-2.9.2 Samples for conditioning shall include material sewn onto a 1 m (39 in.) square of ballast material no closer than 50 mm (2 in.) apart in parallel strips. The ballast material shall be as specified in AATCC 135, *Dimensional Changes in Automatic Home Laundering of Woven and Knit Fabrics*. Specimens shall be removed from the ballast material prior to testing.

6-2.9.3 Testing shall be performed as described in 6-2.2 through 6-2.7. Thermal shrinkage shall not be measured.

6-2.10 Specific Requirements for Testing Hardware Components.

6-2.10.1 A minimum of three complete hardware items shall be tested.

6-2.10.2 Hardware shall not be conditioned.

6-2.10.3 Testing shall be performed as described in 6-2.2 through 6-2.7. Thermal shrinkage shall not be measured.

6-3* Seam Breaking Strength Test.

6-3.1 Application.

6-3.1.1 This test method shall apply to seam assemblies for garments.

6-3.2 Specimens.

6-3.2.1 A minimum of five seam specimens representative of the garment shall be tested for each seam type.

6-3.2.2 A straight seam shall be permitted to be cut from the finished garment or shall be permitted to be prepared by joining two pieces of the garment fabric in the same manner as the actual seam construction in the garment using the same thread, seam type, and stitch type as used in the finished garment.

6-3.3 Sample Preparation.

6-3.3.1 Samples shall be conditioned as specified in 6-1.2.

6-3.3.2 Samples for conditioning shall be full clothing items or shall be 305 mm (12 in.) or greater lengths of seam with at least 150 mm (6 in.) of material on either side of the seam centerline.

6-3.4 Procedure.

6-3.4.1 All woven seam assemblies shall be tested in accordance with ASTM D 1683a, *Standard Test Method for Failure in Sewn Seams of Woven Fabric*. The test machine shall be operated at a rate of 305 mm/min (12 in./min).

6-3.4.2 All knit seam assemblies shall be tested in accordance with ASTM D 3940, *Standard Test Method for Failure in Sewn Seams of Knit Fabric*.

6-3.5 Report.

6-3.5.1 The seam breaking strength for each seam specimen shall be reported. The average seam breaking strength for each seam type shall also be reported.

6-3.5.2 The type of seams tested shall be reported as to whether the specimens were cut from the finished garment or prepared from fabric samples.

6-3.6 Interpretation.

6-3.6.1 The average seam breaking strength for each seam type shall be used to determine pass/fail performance.

6-4* Thread Heat Resistance Test.

6-4.1 Application.

6-4.1.1 This test method applies to each type of thread used in garments constructed with flame-resistant fabrics.

6-4.2 Specimens.

6-4.2.1 A total of three different specimens of each thread type shall be evaluated.

6-4.3 Sample Preparation.

6-4.3.1 Samples shall be conditioned as specified in 6-1.2.

6-4.3.2 Samples for conditioning shall be 150 mm (6 in.) or greater lengths of thread.

6-4.4 Procedure.

6-4.4.1 Specimens shall be tested to a temperature of 260°C (500°F) in accordance with Method 1534, Melting Point of Synthetic Fibers, of Federal Test Method Standard 191A, *Textile Test Methods*.

6-4.5 Report.

6-4.5.1 The condition of specimens shall be observed at 260°C (500°F).

6-4.5.2 The pass/fail results for each specimen tested shall be reported.

6-4.6 Interpretation.

6-4.6.1 Any specimen exhibiting melting at 260°C (500°F) shall constitute failing performance for the thread type.

6-5* Label Print Durability Testing.

6-5.1 Application.

6-5.1.1 This test method shall apply to garment labels.

6-5.2 Specimens.

6-5.2.1 A total of three different specimens shall be tested. Sample specimens of product labels shall be attached to a compliant support fabric measuring 380 mm × 380 mm, ±13 mm (15 in. × 15 in., $\pm^1/_2$ in.) in the same manner as they are to be attached on the compliant garment.

6-5.3 Sample Preparation.

6-5.3.1 Samples of product labels to be tested shall be preconditioned as specified in 6-1.2.

6-5.3.2 Samples of product labels for station/work uniforms that are designated by the manufacturer on the product label to be washed shall be preconditioned as specified in 6-1.3.

6-5.3.3 Samples of product labels for station/work uniforms that are designated by the manufacturer on the product label to be dry-cleaned shall be preconditioned as specified in 6-1.4.

6-5.4 Procedure.

6-5.4.1 Specimens shall be examined at a distance of 305 mm (12 in.) by the unaided eye with 20/20 vision or vision corrected to 20/20.

6-5.5 Report.

6-5.5.1 The legibility of each specimen shall be reported as pass or fail.

6-5.6 Interpretation.

6-5.6.1 Any one specimen failing the test shall constitute failing performance for the test.

Chapter 7 Referenced Publications

7-1 The following documents or portions thereof are referenced within this standard as mandatory requirements and shall be considered part of the requirements of this standard. The edition indicated for each referenced mandatory document is the current edition as of the date of the NFPA issuance of this standard. Some of these mandatory documents might also be referenced in this standard for specific informational purposes and, therefore, are also listed in Appendix B.

7-1.1 AATCC Publications. American Association of Textile Chemists and Colorists, P.O. Box 12215, Research Triangle Park, NC 27709.

AATCC 135, *Dimensional Changes in Automatic Home Laundering of Woven and Knit Fabrics*, 1995.

AATCC 158, *Dimensional Changes in Dry-Cleaning in Perchloroethylene: Machine Method*, 1995.

7-1.2 ANSI Publication. American National Standards Institute, Inc., 11 W. 42nd Street, 13th floor, New York, NY 10036.

ANSI Z34.1, *Standard for Third-Party Certification Program for Products, Processes, and Services*, 1993.

7-1.3 ASTM Publications. American Society for Testing and Materials, 100 Barr Harbor Drive, West Conshohocken, PA 19428-2959.

ASTM D 1683a, *Standard Test Method for Failure in Sewn Seams of Woven Fabric*, 1995.

ASTM D 3940, *Standard Test Method for Failure in Sewn Seams of Knit Fabric*, 1983.

7-1.4 GSA Publication. General Services Administration, Specifications Activity, Printed Materials Supply Division, Building 197, Naval Weapons Plant, Washington, DC 20407.

Federal Test Method Standard 191A, *Textile Test Methods*, 1978.

7-1.5 ISO Publications. International Standards Organization, 1 rue de Varembé, Cafe Postale 56, CH-1211 GENEVE 20, Switzerland.

ISO 9001, *Quality Systems — Model for Quality Assurance in Design, Development, Production, Installation, and Servicing*, 1994.

ISO 9002, *Quality Systems — Model for Quality Assurance in Production, Installation, and Servicing*, 1994.

Appendix A Explanatory Material

Appendix A is not a part of the requirements of this NFPA document but is included for informational purposes only. This appendix contains explanatory material, numbered to correspond with the applicable text paragraphs.

A-1-1.3 Station/work uniforms that are compliant only with NFPA 1975 are not protective garments or primary protective garments and cannot be relied on to provide protection from specific hazards, such as those encountered during structural or wildland fire fighting. Other standards are available for garments that will provide primary protection for specific hazards to which fire fighters can be exposed while participating in emergency operations or training. However, compliant station/work uniforms also could be certified to another standard for primary protective garments and thereby could be both a primary protective garment for the specific hazard that the other standard addresses and a station/work uniform that is compliant with NFPA 1975. Examples of primary protective garment standards include, but are not limited to, NFPA 1977, *Standard on Protective Clothing and Equipment for Wildland Fire Fighting*, and NFPA 1999, *Standard on Protective Clothing for Emergency Medical Operations*.

A-1-2.3 The purchaser should provide the vendor with a detailed specification for performance and design criteria. A number of recommendations for the development of purchasing agreements follow.

To facilitate effective and consistent communications between the purchaser and the vendor, specific contact persons should be designated to address such issues as contract requirements, order status, delivery schedules, and problem resolution.

In addition to the performance requirements specified by Chapter 5 and to ensure that station/work uniforms are ordered and manufactured in a consistent manner, purchasers should consider the development of a detailed purchase specification that includes the following:

(a) Compliance of the garments with NFPA 1975, 1999 edition
(b) Reference item numbers for each item required by the purchase specification
(c) Additional material/component requirements
(d) Individual sizing: A station/work uniform that restricts movement or conflicts with the function of primary protective garments increases the risk of injury. ASTM F 1731, *Practice for Body Measurement and Sizing of Fire and Rescue Services Uniforms and Other Thermal Hazard Protective Uniforms*, could be useful for sizing station/work uniforms.
(e) Color

(f) Number of units
(g) Special service requirements
(h) Pockets or emblems (number, type, and detailed description of placement)
(i) Special wrapping and packaging requirements
(j) Shipment terms and conditions
(k) Manufacturer's warranty

Where additional requirements are specified by the purchaser and these requirements exceed those of this standard, the purchaser should consider requiring the vendor to provide test data that demonstrate garment compliance with the additional requirements of the purchasing agreement. Test methods and test procedures should be discussed and mutually agreed on between the purchaser and vendor as part of the specifications acceptance process.

The purchaser should develop a coordinated system to maintain records on purchase order details and specifications, testing results for any requested performance criteria that exceed the requirements of this standard, vendor performance, delivery schedules, and invoice inventory. The purchase specifications and the system should provide the procedures needed to address compliance or noncompliance with the purchasing contract.

A-1-3 Approved. The National Fire Protection Association does not approve, inspect, or certify any installations, procedures, equipment, or materials; nor does it approve or evaluate testing laboratories. In determining the acceptability of installations, procedures, equipment, or materials, the authority having jurisdiction may base acceptance on compliance with NFPA or other appropriate standards. In the absence of such standards, said authority may require evidence of proper installation, procedure, or use. The authority having jurisdiction may also refer to the listings or labeling practices of an organization that is concerned with product evaluations and is thus in a position to determine compliance with appropriate standards for the current production of listed items.

A-1-3 Authority Having Jurisdiction. The phrase "authority having jurisdiction" is used in NFPA documents in a broad manner, since jurisdictions and approval agencies vary, as do their responsibilities. Where public safety is primary, the authority having jurisdiction may be a federal, state, local, or other regional department or individual such as a fire chief; fire marshal; chief of a fire prevention bureau, labor department, or health department; building official; electrical inspector; or others having statutory authority. For insurance purposes, an insurance inspection department, rating bureau, or other insurance company representative may be the authority having jurisdiction. In many circumstances, the property owner or his or her designated agent assumes the role of the authority having jurisdiction; at government installations, the commanding officer or departmental official may be the authority having jurisdiction.

A-1-3 Components. Any sewn, post-manufacturing modification to a compliant station/work uniform should utilize thread as specified in Section 5-3. Emblems, heraldry, and other garment lettering/identification are not covered by this standard. Direct garment lettering with paints, inks or dyes, or individually attached letters can pose a risk to the wearer if exposed to heat or fire. Unless any fabric used as a carrier for the garment lettering meets the fabric requirements of this standard, it can also pose a risk to the wearer.

A-1-3 Listed. The means for identifying listed equipment may vary for each organization concerned with product evaluation; some organizations do not recognize equipment as listed unless it is also labeled. The authority having jurisdiction should utilize the system employed by the listing organization to identify a listed product.

A-2-1.3 See A-1-1.3.

A-2-1.5 The National Fire Protection Association (NFPA), from time to time, has received complaints that certain items of fire and emergency services protective clothing or protective equipment might be carrying labels falsely identifying them as compliant with an NFPA standard. The requirement for placing the certification organization's mark on or attached to the product label is to help ensure that the purchaser can readily determine compliance of the respective product through independent third-party certification.

NFPA advises those purchasing station/work uniforms or garments to be aware that in order to meet the requirements of NFPA 1975, *Standard on Station/Work Uniforms for Fire and Emergency Services,* station/work uniforms and garments must meet the following conditions:

(a) They must be certified by an independent third-party certification organization.
(b) They must carry the label, symbol, or other identifying mark of that certification organization.

NOTE: Any station/work uniform garment that does not bear the mark of an independent third-party certification organization is *not compliant* with NFPA 1975, even if the product label states that the garment is compliant.

For further information about certification and product labeling, Chapters 2 and 3 of NFPA 1975 should be referenced. Also, the definitions for "certification/certified," "labeled," and "listed" in Section 1-3 should be reviewed.

Third-party certification is an important means of ensuring the quality of station/work clothing. To be certain that an item is properly certified, labeled, and listed, the NFPA strongly recommends that prospective purchasers require appropriate evidence of certification for the specific product and model from the manufacturer before purchasing. Prospective purchasers should also contact the certification organizations and request copies of the certification organization's "list" of certified products to the appropriate NFPA standard. This "listing" is a requirement of third-party certification by this standard and is a service performed by the certification organization.

All NFPA 1975 station/work uniform garments must carry the label, symbol, or other identifying mark of that certification organization.

NOTE: Any station/work garment that does not bear the mark of an independent third-party certification organization is *not compliant* with the appropriate NFPA standard, even if the product label states that the item is compliant.

A-2-2.1 The certification organization should have sufficient breadth of interest and activity so that the loss or award of a specific business contract would not be a determining factor in the financial well-being of the agency.

A-2-2.3 The contractual provisions covering certification programs should contain clauses advising the manufacturer that, if requirements change, the product should be brought into compliance with the new requirements by a stated effective date through a compliance review program involving all currently listed products.