

NFPA®

1992

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

2018



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NFPA® 1992

Standard on

Liquid Splash–Protective Ensembles and Clothing for Hazardous Materials Emergencies

2018 Edition

This edition of NFPA 1992, *Standard on Liquid Splash–Protective Ensembles and Clothing for Hazardous Materials Emergencies*, was prepared by the Technical Committee on Hazardous Materials Protective Clothing and Equipment and released by the Correlating Committee on Fire and Emergency Services Protective Clothing and Equipment. It was issued by the Standards Council on August 1, 2017, with an effective date of August 21, 2017, and supersedes all previous editions.

This document has been amended by one or more Tentative Interim Amendments (TIAs) and/or Errata. See “Codes & Standards” at www.nfpa.org for more information.

This edition of NFPA 1992 was approved as an American National Standard on August 21, 2017.

Origin and Development of NFPA 1992

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

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

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

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

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

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

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

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

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

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

In January 1995, the entire project for fire service protective clothing and equipment was reorganized by the Standards Council. The new project had a Technical Correlating Committee on Fire and Emergency Services Protective Clothing and Equipment and seven technical committees operating within the project. The former standing Subcommittee on Hazardous Chemicals Protective Clothing was established as the new Technical Committee on Hazardous Materials Protective Clothing and Equipment and given the responsibility for NFPA 1992.

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

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

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

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

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

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

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

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