PROTECTIVE GLOVES

FOR STRUCTURAL FIREFIGHTING AND PROXIMITY FIREFIGHTING

Official User Information Guide

DANGER

- ***Do not use your Protective Garments until you have read and understood all labels on your Protective Garments and this Official User Information Guide.***
- ***If attached, only end user shall separate this guide from the garment. Remove guide from the garment (if attached) prior to using the garment for emergency operations.***

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Official User Information Guide

Protective Gloves for Structural and Proximity Firefighting

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2025 Revision

Contents

Chapter 1

Introduction

DANGER

Structural and proximity firefighting and emergency operations are ultra-hazardous and unavoidably dangerous activities. Lack of proper training may lead to death, burns, injuries, diseases, and illnesses. To reduce your risk, do not use your gloves as part of your protective ensemble until you have read this guide, all manufacturer's instructions, and have been thoroughly trained by your fire department or employer in firefighting tactics, safety procedures and the proper use of your protective ensemble.

This FEMSA Official User Information Guide provides warnings, information and instructions related to the selection, care and maintenance of your protective gloves designed for structural firefighting or proximity firefighting.

Where a part of this guide specifically provides information on proximity gloves, the narrative text is background highlighted in gray.

While this guide addresses some aspects of use, it does not in any way cover tactics for firefighting or emergency operations. To use this guide effectively, you must thoroughly understand its contents and the information provided on the glove's product label. Proper training and supervision for use of personal protective equipment (PPE) in firefighting and emergency operations is critical to your safety. Contact your supervisor immediately if you are unsure about any aspect related to the selection, use, care, and maintenance of your protective.

Organization of Guide

This guide includes warnings and information related to selection, limitations of use, care and maintenance of your protective gloves. It is divided into several chapters addressing specific areas of information and instructions for improving your understanding for the proper selection, use, care, and maintenance of your protective gloves. These sections include:

- Selection Considerations
- Use and Limitations of Protective Clothing
- Inspection
- Cleaning and Decontamination
- Repair
- Storage
- Retirement and Disposal
- Special Incident Procedures

The information in this guide is consistent with both:

- The NFPA 1851 portion of the NFPA 1850, Standard on Selection, Care, and Maintenance of Protective Ensembles for Structural and Proximity Firefighting and Open-Circuit Self-Contained Breathing Apparatus (SCBA), 2026 Edition.
- The NFPA 1971 portion of NFPA 1970, Standard on Protective Ensembles for Structural and Proximity Firefighting, Work Apparel, Open-Circuit Self-Contained Breathing Apparatus (SCBA) for Emergency Services, and Personal Alert Safety Systems (PASS), 2025 Edition.

A short list of key changes for these standards compared to the prior editions is provided below.

It is important for you to refer to NFPA 1850, 2026 edition and to other standards that may apply to your fire department or organization. A list of references and how to obtain copies of these references appears later in this guide.

The glossary contains specific terms important in using and understanding this guide.

Key Changes in NFPA 1970 and NFPA 1850

Significant changes have been made in both the product standard defining minimum requirements for firefighting protective gloves (NFPA 1970) and the end user standard (NFPA 1850) that specifies the minimum requirements for selection, care, and maintenance of these products by fire departments and other organizations.

New or Modified Requirements within NFPA 1970 (for protective gloves)

Minimal changes were made to the glove requirements compared with the prior 2018 Edition of NFPA 1971; these changes include:

- The NFPA 1971 requirements have been combined with requirements for work apparel (NFPA 1975), SCBA (NFPA 1981), and PASS (NFPA 1982) into a consolidated standard – NFPA 1970. Structural and proximity gloves within the 1971 portion of NFPA 1970.
- The principal textile and barrier film-based materials (most commonly the liner, moisture barrier, and wristlet) used in the construction of gloves must be tested for over 300 restricted substances and show levels below established maximum thresholds.
- Additional optional requirements are specified for labeling that indicates that the same materials identified above do not contain intentionally added per- or polyfluorinated alkyl substances (PFAS).

- Manufacturers are permitted to use an alternative sizing scheme if they can demonstrate fitting the 5th to the 95th percentile of the firefighter population based on independent firefighter hand dimensions. When this scheme is used, it must be supported by a range of hand dimensions that relate to the manufacturer-specified sizes. A minimum of 7 sizes must be provided in each glove style.
- A few minor changes were made in different test methods including those for better measuring the liquid penetration resistance of glove moistures and the way that glove heat/thermal shrinkage is measured. End users will likely not observe any differences in gloves because of these changes.
- Several optional tests have been included in a new Annex G that involve separate glove evaluation or gloves as part of a full ensemble. These include testing for flash fire protection (ensemble), physiological impact (ensemble), total heat loss (ensemble), evaporative resistance (ensemble or gloves separately), and functionality (ensemble). These tests are not required and do not have any associated minimum criteria.

New or Modified Requirements for within NFPA 1850 (for protective gloves)

The primary revisions affecting selection, care, and maintenance of protective gloves from the prior 2020 Edition of NFPA 1851 include:

- NFPA 1851 related to structural and proximity firefighting protective ensembles was combined with NFPA 1852 on SCBA as a new consolidated NFPA 1850 standard.
- Fire departments and organizations are required to appoint individuals as Personal Protective Clothing Manager and Technician with specific roles and responsibilities for managing the care and maintenance of protective ensemble items.
- Fire departments and organizations are required to provide training on the new edition of the NFPA 1850 standard within one year following the date it is issued.
- Detergents used in the cleaning of protective gloves cannot have a pH lower than 6 (slightly acetic) or higher than 9.5 (moderately alkaline). The older maximum pH was 10.5
- Wash and drying temperatures are now permitted to be up to 120oF (15oF higher than before).
- Machine-based processes for cleaning gloves are now permitted.
- A new “glove water infiltration” test is included as part of advanced inspection procedures to determine if liquid can leak into the glove after repeated use and is required annually.

Types of Warnings

Each section of this guide is important; however, within each section of this guide, different types of warnings are given to attract your attention to specific limitations or potential hazards. Specific "signal words" indicate the level of the severity (consequences) of the particular warnings as shown at right.

Be sure to read the other text in this Guide accompanying any warning as it provides additional important information to assist you in understanding the warning.

DANGER

This indicates a hazardous situation which, if not avoided, will result in death or serious injury.

This red and red border represent Safety Red

WARNING

This indicates a hazardous situation which, if not avoided, could result in death or serious injury.

This grey and grey border represent Safety Orange

CAUTION

This indicates a hazardous situation which, if not avoided, could result in minor or moderate injury.

This white and black border represent Safety Yellow

General Precautions

Firefighting and emergency operations are ultra-hazardous, unavoidably dangerous activities. To reduce your risk of death, burns, injuries, diseases, and illnesses, you must carefully read and strictly follow this entire FEMSA Official User Information Guide and all labels on your protective gloves and other parts of your protective ensemble.

When you fight fires or engage in emergency operations, you are constantly at risk of death, burns, injuries, diseases, and illnesses. There is no such thing as a "routine" or "ordinary" fire or emergency operation. While use of safety equipment such as a protective ensemble, including your protective gloves, can reduce your risk of death, burns, injuries, diseases, or illnesses, it does not make firefighting and emergency operations are completely safe. Even with the use of your protective ensemble, firefighting is unavoidably dangerous.

This entire guide deals with issues that directly affect your life and safety. Even such matters as how you clean, store and maintain your protective gloves and how well the gloves fit, directly impact your life, safety and well-being. It is important to read and heed this entire guide to reduce your risk of death, burns, injuries, diseases, and illnesses.

- As described in this guide, before and after every use, carefully inspect your protective gloves for cleanliness (soiling and contamination), physical damage, thermal or physical damage, excessive wear particularly the outer sole tread), non-functioning hardware (if present), loss of liquid integrity, and poor fit. You may need to further inspect and evaluate certain elements for specific conditions as described in the Inspection Chapter below. Do not use your protective gloves if you detect any condition indicating damage, degradation or weakening of the gloves' protective capabilities.
- Keep your protective gloves clean and properly maintained as described in this Guide. Soiled, contaminated or damaged gloves present several different hazards that increase your risk for death, burns, injury, diseases, and illnesses.
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- It is impossible for you to test most performance properties of your protective gloves in the field. Knowledgeable, experienced and qualified people within your organization or by qualified facilities should periodically inspect and service all elements of your protective ensemble, including your protective gloves.
- Your protective gloves will age. NFPA 1850, dictates a mandatory retirement for structural gear of ten years from the date of manufacture. However, this should not be construed as meaning that all protective clothing will last for ten years. The usable service life of your gloves depends on the number, type and degree of exposures, the work environment, frequency of use, and the quality of care and maintenance for the gloves. It is the responsibility of both you and your fire department or employer to determine when to take your gloves out of service and how to do so. Do not use any gloves showing signs of damage, weakening or degradation of any protective quality. Most gloves will generally wear out well before their NFPA 1850 (1851) established maximum service life.
- Do not wear examination gloves or liners under your protective gloves that may melt or transfer heat onto your skin.
- Never use your protective gloves in firefighting or emergency operations unless you are at the peak of mental alertness and physical fitness. Do not engage in firefighting or emergency operations while under the influence of drugs, alcohol or other conditions or factors that would impair your physical and mental abilities.
- You must use extreme caution at all times for all emergency operations. You must be constantly and fully aware of your surroundings, stay alert, react to changing conditions, know (through training) your limitations and the limitations of your equipment (through training and applying NFPA and OSHA standards). You must avoid exceeding these limitations at all times.

The discussion on hazards in this guide are simply examples of the many circumstances and variable factors that can combine in countless different ways to harm you. It is impossible to list all of the ways in which you may be killed, burned, injured, or suffer disease and illness. No protective ensemble can provide complete protection from all conditions. As a firefighter or emergency responder you work in an ultra-hazardous environment. Even using your protective ensemble, exercising extreme caution, and with the best training and supervision, your firefighting and emergency activities remain ultra-hazardous and unavoidably dangerous.

How to Reduce Your Risk

You can reduce, but not eliminate, your risk of death, burns, injuries, diseases, and illnesses through the following:

- Receiving proper training and continual practice in firefighting and emergency tactics and safety.
- Selecting, maintaining and using your safety equipment properly.
- Exercising extreme caution at all times. Your protective ensemble does not make you completely safe from death, burns, injuries, diseases, or illnesses.
- Understanding the design, performance, and use limitations of applicable versions of NFPA 1970 (1971), NFPA 1550, NFPA 1581, NFPA 1850 (1851), NFPA 1950 (1951, 1977, and 1999), NFPA 1990, and other NFPA standards, as well as applicable Federal, state and local regulations specific to the selection, use, care, and maintenance of firefighting personal protective equipment (e.g., regulations of the Occupational Safety and Health Administration (OSHA) of the U.S. Department of Labor contained in 29 CFR 1910.132-140, "Personal Protective Equipment," and 29 CFR.1910.156, "Fire Brigades"). You must understand the content of these publications.

Training by Your Fire Department or Employer

This guide does not discuss firefighting tactics and safety procedures. Your fire department or employer must provide proper training and constant practice in firefighting tactics and safety procedures consistent with its knowledge and basic approach to firefighting and emergency operations.

Your fire department or employer is in the best position to know and respond to the dangers present in any fire or emergency operation. Accordingly, your fire department or employer must select the appropriate type of safety gear (including structural or proximity firefighting protective ensembles) for use at every fire scene or emergency operation.

This guide instructs you on how to maintain your protective gloves. It also tells you about the limitations of your protective gloves and your overall protective ensemble. No protective gloves or protective ensemble or any other safety equipment protects you from all burns, injuries, diseases, illnesses, conditions, hazards, or death.

To reduce—but not eliminate—your risk of death, burns, injuries, diseases, or illnesses, you must carefully read, fully understand, and strictly follow this entire guide and all labels on your protective gloves, the applicable NFPA standards, and OSHA and other applicable regulations. The information contained in this guide and on the labels in your protective ensemble are for your safety and can save your life.

Remember, however, that even with the best protective ensemble, safety procedures and training, you are constantly at risk of death, burns, injuries, diseases, and illnesses during firefighting and emergency operations.

HAVE YOU READ AND UNDERSTOOD THIS FEMSA OFFICIAL USER INFORMATION GUIDE?

The FEMSA Official User Information Guide contains vital safety warnings and important user instructions. Do not use your protective gloves until you have read and understand all information contained in it. Below is a simple worksheet that you should complete before using your protective gloves.

1.	Have you completed all required training to properly and safely perform your duties as a firefighter and emergency worker?	☐ Yes ☐ No
2.	Have you read and do you understand all warnings, precautions, directions, and instructions contained in this FEMSA Official User Information Guide?	☐ Yes ☐ No
3.	Have you read and do you understand the intended use and limitations of your protective gloves contained in the FEMSA Official User Information Guide?	☐ Yes ☐ No
4.	Have you read and do you understand the inspection, cleaning, repair, and maintenance warnings and instructions contained in the FEMSA Official User Information Guide?	☐ Yes ☐ No
5.	Have you read and do you understand the requirements for storage, retirement and disposal of protective clothing contained in the FEMSA Official User Information Guide?	☐ Yes ☐ No
6.	Before using your new protective gloves, have you inspected it and established that it fits you properly as outlined in the FEMSA Official User Information Guide?	☐ Yes ☐ No
7.	Are you familiar with how to obtain replacement guides and how to contact your manufacturer for any additional information you may require as outlined in the FEMSA Official User Information Guide?	☐ Yes ☐ No
8.	Do you understand that the human skin will burn at temperatures much, much lower than the fabrics used in your protective gloves and that you may sustain a burn or other injury with little or no warning?	☐ Yes ☐ No
9.	Do you understand that no protective gloves can protect you from all hazards and/or conditions that you might encounter while performing your job?	☐ Yes ☐ No
10.	Have you read, do you understand, and do you agree to accept the risks and responsibilities outlined in the personal responsibility code located on the back cover of the FEMSA Official User Information Guide?	☐ Yes ☐ No

DO NOT WEAR YOUR PROTECTIVE GLOVES UNTIL YOU HAVE ANSWERED **YES** TO EACH OF THESE QUESTIONS.

Chapter 2

Selection Considerations

Selecting your firefighting protective ensembles entails three parts:

1. Your fire department or employer selects the appropriate protective ensemble including protective gloves to purchase.
2. You, your fire department, or your employer, decide which ensemble to wear for a specific firefighting or other emergency operation.
3. You ensure that your protective ensemble elements, including your protective gloves, are correctly fitted for you and that they work together properly.

While your fire department or employer controls some parts of the selection process, you must be aware of the specific hazards that you face during firefighting and other emergency operations and ensure that the ensemble and ensemble elements that you are wearing fit correctly and work together to provide the intended protection.

Selection for Purchase

Prior to starting the selection process for structural firefighting ensembles and ensemble elements and proximity firefighting ensembles and ensemble elements, your fire department or employer must perform a risk assessment. The risk assessment must include, but not be limited to, the hazards that firefighters can encounter, based on the following:

- Type of duties performed
- Distinguishing response activities for different potential incidents
- Organization's experience
- Incident operations
- Geographic location and climate
- Specific physical area of operations
- Likelihood of CBRN terrorism incident
- Need for two sets of ensemble elements or spare ensemble elements

OSHA regulations (Title 29, Code of Federal Regulations Part 1910.132, "General Requirements" of Subpart I, Personal Protective Equipment) require that fire departments and organizations conduct a hazard assessment in their selection of firefighting protective ensembles and ensemble elements. This hazard assessment identifies the specific hazards that firefighters may encounter and involves a determination of the appropriate personal protective equipment to protect individuals against those hazards.

Each fire department or organization uses a different process for the selection of PPE for structural and proximity firefighting. As a minimum, this process must ensure that the protective ensemble and ensemble elements comply with the applicable version of NFPA 1971, Standard on Protective Ensembles for Structural and Proximity Fire Fighting or the new consolidated standard, NFPA 1970.

A fire department or organization may consider a number of other factors in their selection of PPE that include the level of insulation, the stress impact of the clothing on individual firefighters, and the compliance of the products with federal, state, and local regulations related to certain restricted substances (chemicals that are limited in their use as ingredients in different product materials due to human health, toxicity, or environment concerns).

General requirements are provided in NFPA 1850 (1851) for fire departments or organizations to take into account when they choose specified protective gloves and other protective clothing.

Additional Protective Gloves Selection Factors Suggested by NFPA 1970 (1971)

PFAS Content in Protective Gloves

The new NFPA 1970 standard permits manufacturers for protective ensemble elements, including protective gloves, to be labeled as not having intentionally added per- and polyfluorinated alkyl substances (PFAS). If this claim is made for the specific glove model, it will appear as follows:

THESE PROTECTIVE GLOVES UPON CERTIFICATION HAS A PFAS (TOTAL FLUORINE) CONCENTRATION OF NO MORE THAN 100 PPM.

This is an optional claim for the manufacturer to provide as part of the product certification label. There are several important aspects of this label to understand:

- The ability for the manufacturer to make this claim is based on independent testing of the principal textile or barrier materials that may include the shell (textile), moisture barrier, innermost lining, and wristlet have been tested for total fluorine that measures 100 ppm or less.
- Leather shells are specifically excluded. Other materials that are used in the gloves such as reinforcement layers or other portions of the glove that do not cover the majority of the hand, thread, elastic, and labels are NOT required to be tested.
- Total fluorine is a proxy for total amount of PFAS in the materials and will tend to overreport the level of PFAS because fluorine may be found in other chemicals present in the material that are not considered PFAS, but the testing does not distinguish between PFAS and non-PFAS chemicals that contain fluorine.
- The level of 100 parts per million (‘ppm”) is an arbitrary level that is agreed to distinguish whether PFAS has been intentionally added. This level may or may not coincide with state or local restrictions.
- If it is important to have a further understanding of this label claim, contact the manufacturer for more information.

Types of Gloves

A variety of different types of gloves may be certified to NFPA 1970 (1971), 2025 Edition. All gloves are required to:

- Use a composite, which may be a single layer or as continuous or joined multiple layers.
- Have each individual layer "graded" to ensure correct sizing on the wearer's hands.
- Consist of a glove "body" that covers the hand from the tips of the fingers to at least 2 inches past the wrist crease and includes either an attached wristlet or gauntlet end.
- Be available in at least seven sizes. The mandatory sizing system uses a number representing index finger length from the base of the finger in millimeters covering four lengths (64, 70, 76, and 82) with a letter-based width (N = normal; W = wide, and XW = extra wide). Minimum sizes include 64N, 70N, 70W, 76N, 76W, 82N, and 82W. Extra wide gloves are not required but may be optionally provided.
- Some manufacturers may provide "cadet" sized gloves, which generally are gloves with shorter fingers. Manufacturers may also offer several other sizes.
- Per the new 2025 edition of NFPA 1970, glove manufactures can use an entirely different glove system with different size designations if they offer at least 7 sizes and fit the 5th to 95th percentile of the fire service population as found in the NIOSH Firefighter Hand Anthropometry and Structural Glove Sizing report. Key dimensions in this database include hand length, hand breadth (width), palm length, and palm breadth. Other dimensions include thumb and finger lengths and widths.
- Proximity firefighting protective gloves are separately specified to have the aluminized outer layer extend to certain parts of the hand and wrist including the back of the fingers and thumb, back of the hand and lower arm away from the palm.

Other characteristics of gloves include:

- All firefighting gloves are five-fingered and may either have a gauntlet end, area of composite that extends past the wearer's wrist cuff and generally is hemmed or a knit wristlet or cuff.
- Shorter gloves with gauntlets or wristlets are intended to be worn underneath the ends of the coat sleeves to provide an effective interface with the protective coat. Coats that have a thumb hole in the coat wristlet or tab tend to allow maintaining the interface between the glove and coat sleeve.
- Some gloves may have an extended gauntlet (a "glove extension") that can incorporate different materials including garment outer shells, moisture barriers, and thermal barriers. These gloves usually have straps with hardware near the end of the extension to allow the extension to be tightened against the sleeve, if needed.
- Most gloves use various types of thermally stable, flame-resistant leather shells. In some cases, different types of fabrics may be used in parts of the gloves in place of leather.
- Underlying glove layers include a moisture barrier, most often a film, that is created in the form of a hand silhouette that is inserted into the glove shell. Lining materials are also included next to the wearer's hand.
- Gloves composites can also include additional layers for either durability or additional insulation. Many gloves incorporate an extra insulating layer on the back of the hand or fingers since these parts of the gloves typically have the greatest heat exposure.
- Several gloves also have thermally resistant exterior reinforcements that may be leather, fabric, or molded rubber components for protecting knuckles or the back of the wearer's hands.

- Various designs and patterns are used in creating gloves. Many gloves are two-dimensional where the seams attach the palm to the back. Other gloves have a more three-dimensional design where side panels are provided on the sides of the finger and the inner thumb and are known as fourchettes. These designs are intended to provide better fit and improved hand function.
- Glove labels include one or more fabric labels that are sewn into the interior of the gloves. These labels should not be removed.

Structural Firefighting Gloves Performance

Structural firefighting protective gloves must:

- Meet a thermal protective performance test that sets minimum insulation requirements of the glove composite for fireground conditions representative of a flashover, or emergency condition firefighting. A lesser value is established for the wristlet or glove interface area where the end of the glove is expected to be overlapped by the end of the coat sleeve.
- Not show degradation from extended high heat exposure (5 minutes at 500oF) in the form of melting, separating, or igniting. Gloves cannot also shrink more than 8 percent in either their length or width under these conditions. Glove linings are further separately tested as separate samples.
- Limit the amount of heat transfer through the composite when placed on a hot surface for an extended time for preventing the onset of pain and burn injury.
- Reduce the likelihood of a second-degree burn injury when exposed to moderate levels of radiant heat under wet conditions.
- Resist ignition, not be extensively charred, not melt or drip, and not lose 5% of its mass when directly exposed to flame.
- Be constructed of thread that does not melt below 500oF.
- Not leak when partially submerged and flexed in surfactant-treated water.
- Have composite materials and seams that resist the penetration of both liquid chemicals representative of fireground exposures, and blood borne pathogens simulating Hepatitis and HIV.
- Hold up to physical hazards that include puncture and cut through of glove composite materials.
- Use wristlet materials with adequate burst strength.
- Have seams attaching the wristlet to the glove body with sufficient breaking strength.
- Be easily donned/doffed and not allow the liner to detach or invert when hands are repeatedly put into and taken out of the gloves.
- Provide appropriate levels of hand function for gross dexterity, use of tools, grip, and applying torque.
- Use hardware that resists corrosion.

Proximity Firefighting Glove Performance

Proximity firefighting gloves must meet the same requirements as structural gloves except for hardware corrosion resistance, plus additional tests that evaluate the effectiveness of the outer aluminized layer that is required on different parts of the gloves. The aluminized fabric layers must:

- Provide a minimum level of radiant heat protective performance.
- Not crack or results in surface delamination when repeatedly flexed under wet conditions or subjected to lower temperature conditions.
- Not stick together when subjected to extended high heat.

Selection for Use

Prior to using structural and proximity firefighting protective ensembles and ensemble elements, it is essential to understand the differences in types of firefighting and the protective ensembles available for use.

Types of Firefighting and Emergency Operations

Structural firefighting is the physical activities of rescue, fire suppression and property conservation in buildings, enclosed structures, vehicles, marine vessels, or like properties that are involved in a fire or an emergency. Structural firefighting involves a large range of different fire ground hazards and constantly changing conditions.

Proximity firefighting involves specialized firefighting operations that can include the rescue activities, fire suppression and property conservation at incidents involving fires producing high levels of radiant heat as well as conductive and convective heat.

Examples of fires that commonly produce high levels of radiant heat, as well as convective and conductive heat, and could result in incidents incorporating proximity firefighting operations include, but are not limited to, bulk flammable liquid fires, bulk flammable gas fires, bulk flammable metal fires, and aircraft fires. These operations usually are exterior operations but might be combined with interior operations.

Proximity firefighting is not structural firefighting but may be combined with structural firefighting operations. Proximity firefighting also is not entry firefighting. Unlike entry firefighting, proximity firefighting does not involve direct entry of firefighters into flames. Proximity operations are performed close to the actual fire, where the high levels of radiant heat as well as the convective and conductive heat would overcome the thermal protection provided by structural firefighting protective ensembles. The proximity firefighting protective ensembles provide enhanced protection from these thermal and radiant exposures.

DANGER

Your protective gloves are part of a protective ensemble, which is not suitable for all types of firefighting and all types of emergency operations. Use of an unsuitable protective ensemble may lead to death, burns, injuries, diseases, and illnesses. In order to reduce your risk, your fire department or employer must make a determination as to whether your protective ensemble is suitable for each specific application.

DANGER

This guide does not address the protection provided by structural or proximity firefighting protective ensembles that are certified for protection from CBRN Terrorism Agents. This guide does not address and there are no recognized consensus standards for entry firefighting protective ensembles. Use of structural or proximity ensembles in these situations may lead to death, burns, injuries, diseases, and illnesses.

Entry firefighting involves extraordinarily specialized firefighting operations that can include rescue activities, fire suppression and property conservation at incidents involving fires producing extreme levels of radiant, conductive and convective heat. Examples of fires that commonly produce extreme levels of convective, conductive and radiant heat and could result in incidents incorporating entry firefighting operations include, but are not limited to, bulk flammable liquid fires, bulk flammable gas fires, bulk flammable metals, and aircraft fires. Highly specialized thermal protection is necessary for people involved in such extraordinarily specialized operations due to the scope of these operations and because direct entry into flames is made. Usually these operations are exterior operations, outside of structures. Entry firefighting is not structural firefighting or proximity firefighting. **Therefore, your protective gloves are not suitable for this type of firefighting.**

Other types of specialized emergency operations include, but are not limited to, hazardous materials emergencies, emergency medical operations, urban search and rescue operations, wildland firefighting and water rescue operations. Each of these types of operations involves unique hazards and require specialized types of protective ensembles that are generally not met or optimal for the use of structural firefighting protective clothing. Regardless, it is up to your department, organization, or employer to make the decision for what operations and emergencies your protective ensemble, including your protective gloves, can be used for.

Firefighting Protective Ensembles

An ensemble includes all of your protective clothing and equipment intended to provide protection against different hazards. This ensemble consists of different ensemble elements that must work together to provide protection from some risks, but not all risks, of emergency incident operations.

Structural firefighting protective ensembles include, at a minimum, protective garments (coat and pants or coveralls), a protective helmet, protective gloves, protective footwear, and a protective hood. Each of these elements must be certified to the respective structural firefighting protective element requirements of NFPA 1970(1971), 2025 Edition.

Proximity firefighting protective ensembles include protective garments (coat and pants or coveralls), a protective helmet with shroud, protective gloves, and protective footwear. Most organizations also use protective gloves. Each of these elements must be certified to the respective proximity firefighting protective element requirements of NFPA 1970 (1971), 2025 Edition.

Each ensemble also includes other equipment such as respiratory protection (i.e., SCBA), communications equipment, and other devices to provide protection from some risks, but not all risks, associated with emergency incident operations.

NFPA standards exist for different types of ensembles used at other emergency incident operations, including but not limited to technical rescue incidents, (NFPA 1950 [1951]), hazardous materials and CBRN operations (NFPA 1990), wildland firefighting (NFPA 1950 [1977]) and emergency medical operations (NFPA 1950 [1999]). The new NFPA 1950, 2025 Edition standard provides requirements for protective clothing and ensembles for technical rescue incidents (NFPA 1951), emergency medical operations (NFPA 1999), and wildland firefighting (NFPA 1977).

Firefighting and Other Emergency Hazards

It is essential that you understand the different types of ensembles and the limitations of protective ensembles to protect against potential hazards. The list of potential hazards that you may encounter during firefighting and other emergency operations include, but are not limited to:

- Thermal hazards
- Chemical, biological and radiological hazards
- Physical hazards
- Electrical hazards
- Hazards caused by the wearing or use of the equipment itself
- Hazards based on your position and operating area

The frequency and severity of exposure to these hazards vary with the specific locations, operations, conditions, and time. Consequences of exposure to different hazards may range from no effect to death. The risk associated with a hazard is dependent on the likelihood of exposure in combination with the consequences of the exposure. In the sections below, hazards are generalized to the entire ensemble since many exposures can affect multiple areas of the firefighter.

Many of the specific hazards covered in this part of the guide are explained in terms of the overall ensemble that also includes the protective garments, protective helmet, protective footwear, and protective hoods, in addition to protective gloves.

Where pertinent, specific limitations or unique information relative to gloves is also provided and is highlighted in pink.

DANGER

Protective ensembles addressed in this guide do not protect against all hazards and under all circumstances of use. Use of a protective ensemble unsuitable for a specific use may lead to death, burns, injuries, diseases, and illnesses. It is the responsibility of the end user to assess potential hazards and the risk for exposure to determine the suitability of the protection ensemble for a specific use.

Thermal Hazards

DANGER

If your protective ensemble is exposed to any type of heat, including but not limited to radiant, convective or conductive heat, you may be burned underneath the protective ensemble with no warning and no sign of damage to the protective ensemble. Be constantly alert to the possibility of a type of thermal exposure and other hazards.

Thermal hazards represent extremes of temperatures and heat energy. In the case of firefighting, the principal hazard is exposure to high temperatures and heat energy that can cause burn injury. In firefighting, burns are a constant threat regardless of conditions.

Your protective ensemble does not protect you from all burns and injuries. There are limits to the protection your protective ensemble can provide.

Though your protective ensemble reduces your risk of burns or injuries, you can still be seriously burned or injured underneath your protective ensemble with no sign of damage to your protective ensemble elements.

Burns are a function of time and amount of heat transferred to the body. You can be burned in relatively low temperature environments if your protective ensemble is exposed to heat or flames for long periods of time. Similarly, you can be burned over a very short time if your protective ensemble is exposed to relatively high temperatures. Scientists have plotted the times at which different amounts of heat cause human skin to burn on what is called the “burn curve.” Whether or not your skin ever reaches the “burn curve” is a function of many variables, some of which are listed below.

Your protective ensemble is made of heat-resistant materials. Even though you may not notice any burn damage to your protective ensemble element, you can still be burned suddenly and without warning. Heat can build up and be stored in your protective ensemble element to the point where your skin burns. Your skin burns at temperatures far below the burning point of your protective ensemble. Do not be misled by the absence of thermal damage to your protective ensemble. Even without such damage, you may still be burned suddenly and without warning.

Conductive Heat Burns

Conductive heat is transferred by direct contact with the heat source. Examples of conductive heat transfer would be standing or kneeling on a hot floor, leaning against a hot wall or coming into contact with flames or hot debris. Depending on conditions, this sort of contact can burn you underneath your protective ensemble element with no advance warning and no sign of damage to your protective ensemble.

Both the palm and back sides of your protective gloves constantly encounter hot surfaces, particularly if you hand hot items for cleaning a path, attempt to open a door that may have a heated doorknob, or crawl where your hands come touch the floor.

Suppose, for example, you lean your shoulder against a hot wall at a fire scene. The heat passes from the wall to the shoulder of your protective ensemble by direct contact (conduction). The layers of materials in your protective ensemble are compressed by the weight of your body against the hot surface. If you remain leaning long enough, or if the heat is severe enough, the heat may build up in your protective ensemble and eventually pass through the compressed layers of your protective ensemble and burn your shoulder. The greater the temperature or rate of heat transfer at the surface, the less time it will take for the heat to build up in your protective ensemble and eventually pass through the protective ensemble to burn you. Similarly, a lesser heat source can burn you depending upon the length of time that you are exposed to it. How quickly this may happen depends on the length of exposure, amount of heat transferred, the specific materials used in the protective ensemble elements, the cleanliness and condition of the protective ensemble element, and other factors. Depending on conditions, you may not feel the heat buildup in your protective ensemble element before you are burned.

DANGER

If your protective ensemble comes in contact with flames, a hot environment or hot object, you may be burned beneath your protective ensemble with no warning and no sign of damage to the protective ensemble. Be constantly alert to the possibility of exposure to flames, a hot environment, hot objects and other hazards.

Radiant Heat Burns

Your protective ensemble does not have to be in direct contact with a hot surface or hot object in order for you to be burned. Heat can build up in your protective ensemble and pass through your protective ensemble as the result of exposure to radiant heat. For example, while fighting a fire you may be exposed to radiant heat for a period of time during which your protective ensemble absorbs the heat. Even if you did not compress the clothing system, or if you were to kneel or lean against a non-heated surface, the heat absorbed by the protective ensemble may still be great enough so that you are burned. Merely positioning your body so that the protective ensemble pulls tight against your body (as in squatting so that the knee area is pulled tight across the knees, raising your arm so that the shoulder is tight across your upper body, bending your elbow, etc.) can result in a burn because of compression.

This type of occurrence is also possible for your protective gloves, mainly on the back side, when you are grasping a hose or a tool and the glove materials pull across the back of your hands. Many manufacturers reinforce this area of the gloves because radiant heat can penetrate the gloves when exposed to radiant heat for an extended period in this fashion.

You do not have to kneel or lean against a surface to be burned. You do not have to compress the layers of your protective ensemble to be burned. You may be exposed to a high enough level of radiant heat for a short enough time or a low level of radiant heat for a longer time that causes you to be burned with no compression of the protective ensemble. Depending on conditions, you may not feel the heat build-up in and/or pass through, your protective ensemble materials, before you are burned.

Convective Heat Burns

Convective heat is transferred by hot gases. Although you may be burned by direct contact with flames, you do not have to contact flames to be burned. If your protective ensemble is exposed to heated air or gases at a fire scene, you can be burned. You may not be able to see these heated gases. The likelihood of being burned by convective heat transfer increases as the air temperatures increase and with increased times of exposure.

The information above concerning conductive and radiant heat burns applies to convective burns as well. You should consider all of the information pertaining to conductive and radiant heat burns when considering the possible effects of convective heat.

No Such Thing as a “Routine” or “Ordinary” Fire

You can be seriously burned underneath your protective ensemble even though fire scene conditions may not appear to be extreme. You do not have to be near or in contact with flame, hot debris or hot surfaces to be burned. You can be burned underneath your protective ensemble in many ways. There are many variable factors at every fire scene that may interact to cause such burns. Some of these variables are the type of heat (radiant, convective and conductive) to which you are exposed, the amount of heat, your distance from the heat source, the length of time you are exposed to the heat, and the cleanliness and condition of your protective ensemble element. These and many other variables are constantly changing at a fire scene and can combine to burn you at any given moment.

Because there are so many variables that are constantly changing, it is impractical to calculate when or if your skin will reach the temperature on the “burn curve” underneath your protective ensemble sufficient to burn you at any particular time or location at any particular fire scene. Because conditions at a fire are constantly changing, there is no such thing as a “routine” or “ordinary” fire. Every fire scene is unique and the threat that it presents is constantly changing around you. Do not assume that because you have not been burned before at similar fire scenes that you cannot be burned under what appears to be similar circumstances. Any of the variables can combine with other variables in completely unexpected ways to seriously burn you.

Wetness

Getting your protective ensemble wet can, under certain circumstances, create a thermal hazard and increase your risk of burns. Under other circumstances, getting your protective ensemble elements wet can decrease your risk of burns. For example, suppose your protective ensemble gets wet from hose water or your own sweat. Up to a point, the water in the protective ensemble will absorb heat and increase your level of protection from bums. If the water absorbs enough heat, however, it may—as hot water—transmit heat through your protective ensemble by conduction to burn you. How quickly this may happen is a function of the length of exposure, amount of heat transferred, amount of water in the protective ensemble, which layers of the protective ensemble are wet, which layers are dry, the materials used in the protective ensemble, the cleanliness and condition of the protective ensemble, and other factors. Depending on the exposure conditions, you may not feel the heat buildup in and pass through your protective ensemble before you are burned.

Make sure your protective ensemble is thoroughly dry before use.

Do not use protective gloves if they are still wet from cleaning, from prior use in a different response, or from some other source.

Feeling Heat under Protective Elements

Your protective ensemble lowers your ability to feel heat. You may not feel heat underneath your protective ensemble before suffering a burn. Do not assume that because you are not feeling heat or discomfort through your protective ensemble that you cannot be burned. You must remain constantly alert to the fact that you are operating in an ultra-hazardous, heated environment. While wearing SCBA, ear covers, a protective hood or other gear, you will be even less able to feel heat. Be constantly alert to the possibility of exposure to heat. You must use extreme caution at all times to limit your exposure to heat.

Different areas of your protective gloves may react to heat, flame, and other hazards in different ways. Your protective gloves meet all the applicable NFPA standards; however, not all components are equally flame and heat resistant. Depending on the different types of materials (e.g., exterior or interior reinforcements, wristlets or gauntlets, and other features as well as different layering of materials on the overall construction of the gloves) in addition to various construction methods, some parts of your hands and lower arms may be more protected than others. For example, gloves with knuckle protectors as an outer reinforcement material provides a larger number of layers on this part of your gloves compared to other parts. Yet, depending on how that layer absorbs and retains heat, it may or may not provide improved flame and heat protection.

Before the use of protective ensemble elements, SCBA and other modern safety equipment, firefighters were unable to stay too long or go too deep into a fire scene without great discomfort caused by heat and smoke. Protective ensembles, SCBA, and other modern equipment have increased firefighters' level of protection. At the same time, these products have reduced firefighters' ability to feel heat and to be aware of their surroundings. Just because your comfort level has increased, do not assume that you are not at risk. Pay close attention to your surroundings and fire scene conditions. Unless you remain constantly alert, you may get too close to the heat or stay exposed to it for too long. You must use extreme caution at all times and limit your exposure to heat.

If you do feel heat under any part of your protective ensemble, you may still have time to escape injury. The amount of time between feeling pain and suffering a burn is called "alarm time." If at any time you feel heat or even minor discomfort or unusual sensation (especially underneath your protective ensemble or other equipment)—sometimes referred to as "bee sting"-like pain—burn injury may be imminent. You should remove yourself as soon as safely possible from the heated environment. If you cannot safely leave, change your body position (e.g., get off a hot surface, back up or turn away from the heat source, etc.) or cool your environment.

DANGER

Your protective ensemble and other equipment will lower your ability to feel heat. Do not be misled by the absence of heat or discomfort underneath your protective ensemble or other equipment. Even though you do not feel heat or discomfort, you can be severely burned or injured suddenly and without warning. Be constantly alert to the possibility of exposure to heat and other hazards.

DANGER

If you feel heat or some slight discomfort or unusual sensation under your protective ensemble, you may have already been burned or are about to be burned. Immediately remove yourself from the hazardous situation and check for injury. Be constantly alert to the possibility of exposure to heat and other hazards.

No Such Person as an "Ordinary" Firefighter

Just as there is no such thing as a "routine" or "ordinary" fire, there is also no such thing as an "ordinary" firefighter. Each person reacts differently to pain, excitement, adrenaline rush, and danger. Because of this, some firefighters have less "alarm time" than others when facing a potential burn situation. These firefighters may have a very high tolerance for pain or may be less aware of their pain so that they are burned before feeling any pain. You may be burned underneath your protective ensemble with no advance warning. Also, you may encounter such a tremendous temperature that you may be burned before feeling any pain and with no advance warning. You must remain constantly alert to your changing environment and not exceed the limitations of yourself or your equipment.

Molten Substances and Hot Liquids

You may encounter molten metals and other substances as well as hot liquids at the emergency scene. Your protective ensemble may not prevent the effects of or penetration of these hazardous substances under all circumstances. Molten substances may adhere to portions of your protective ensemble and while staying in place transfer high levels of heat energy through your protective ensemble causing an increased risk for burn injury. Similarly, you may come into contact with hot liquids, such as heated water from accumulated hose spray at a firefighting operation.

Your gloves are particularly likely to contact hot water in low-lying layers of the structure where you may be crawling while in the fire structure. While your protective gloves are designed to be essentially waterproof, this does not mean that certain circumstances can cause leakage of hot water into your gloves, or that hot water can enter through the top of your gloves when you are operating in different positions where your coat sleeve to glove interface becomes compromised.

These liquids may be at temperatures that can burn on contact with little or no warning. You must avoid contact with molten substances and hot liquids during firefighting and emergency operations to reduce your risk of death, injuries and burns.

Extreme Cold Temperatures

Even though your protective ensemble is designed to limit your risk from high-temperature, thermal exposures, it does not protect you from all exposures to cold temperatures in the environment or from cryogenic or liquefied chemicals. The ability of your protective ensemble to insulate you in cold environments depends on many factors, including but not limited to the ambient temperature, wind speed, levels of moisture, your physical activity, and the length of time you spend in the environment in which you are wearing your ensemble. As with heat exposures, longer exposures at cold temperatures increase the risk of health effects, such as hypothermia and frostbite.

Your hands are particularly susceptible to cold temperatures, especially if your gloves become wet. This is because your hands have a large surface area with low hand volume (which makes it more difficult to prevent loss of heat).

Chemical, Biological and Radiological Hazards

DANGER

Your protective ensemble may not protect you from chemical, biological or radiological hazards that can cause death, burns, injuries, diseases, and illnesses. To reduce your risk, obtain proper training in recognizing and handling these hazards and choose a suitable protective ensemble.

Chemical, radiological and biological hazards (poisons, toxins, carcinogens, radioactivity, germs, infectious body fluids, airborne or bloodborne pathogens, etc.) that firefighters and emergency personnel encounter are a matter of life and death. You are at risk of death, injuries, diseases, and illnesses as a result of exposure to these hazards. As a firefighter, you must learn about these hazards and how to protect yourself from them.

There are numerous Federal, state and local environmental regulations and health codes on how to deal with chemical, radiological and biological hazards. For example, OSHA regulations in 29 CFR 1910.120 cover hazardous waste operations and emergency response while 29 CFR 1910.1030 cover employer requirements for reducing employee exposure to bloodborne pathogens. These regulations apply to firefighters and other emergency responders.

This guide does not address all the hazards associated with chemical, biological or radiological exposures or how to protect you from them. This guide provides limited information on these hazards and tells only how you should go about cleaning, donning and doffing your protective elements to minimize—but not eliminate—your exposure to these hazards. (See later chapters.)

Chemical Hazards

Chemicals present health, flammability, reactivity, or other hazards. The health hazards associated with different chemicals include, but are not limited to, carcinogenicity, toxicity, sensitization, irritation, and corrosiveness (burns). The specific types of hazards and their severity associated with chemicals vary with the specific chemical and the form in which exposure occurs. The effects of some hazardous exposures may be immediate and show up during or shortly after the exposure occurs. Effects from other hazards may not appear until much later following the exposure or following repeated exposure to chemicals.

Chemicals create health hazards by contacting or entering the body through inhalation, skin absorption, ingestion, or injection. While respirators, such as SCBA, are designed to protect firefighters and emergency responders from inhalation or ingestion of chemicals, protective clothing is designed to limit or prevent contact of chemicals with the skin. The state of the chemicals and their physical properties (density, ease of evaporation, whether present as gas or vapor, liquid or solid) affect how you are potentially exposed to chemicals.

Your protective gloves are not vapor-proof. Certain chemical gases and vapors will either penetrate or permeate through different portions of your gloves, either through the materials, or more likely, simply come in from the top opening at the gloves and coat sleeve interface area of your protective ensemble. Depending on the nature of the chemicals, the skin on your lower arm and hands may be exposed to some vapors or gases while wearing your protective ensemble.

Your protective gloves are not liquid proof. Even by having moisture barrier as part of your gloves, liquids may still penetrate your gloves or contact areas near the opening where wicking of liquids into the interior of the gloves can occur. The ability of liquids to penetrate and contact you depend on the type of chemical, its physical properties, the volume of chemical to which you are exposed, and the conditions at the emergency scene.

Your protective gloves do not stop exposure to all solid chemicals. Solid chemicals, particularly soot particles, and other contaminants can still enter through the top of the gloves and reach the skin on your lower arms and hands.

Chemicals may also be flammable. The relative flammability of chemicals depends on many factors, including, but not limited to, the state of the chemical, its ease of evaporation and flammable limits. Chemical gases and vapors may accumulate in areas of the emergency scene and present a flash fire hazard. You must avoid flammable vapor exposures.

The exterior of your protective gloves may also absorb hazardous and/or flammable vapors and/or liquids that may later ignite.

Certain chemicals may also present cryogenic and liquefied gas hazards. In this form, chemicals present extreme hazards from cold temperatures and upon release into the environment may create relatively highly concentrated areas of the chemical which present further health and flammability hazards. You must avoid contact with cryogenic and liquefied gas hazards.

Chemicals may also be reactive. Some chemicals react violently, explode or create other hazards when put into contact with incompatible substances. For example, sodium metal reacts explosively upon contact with water. Other chemicals may exhibit severe reactions when exposed to air, heat and other substances. You must avoid contact with known reactive chemicals.

Biological Hazards

Bloodborne pathogens are bacteria, viruses, germs, and similar harmful microorganisms and substances carried in blood and body fluids, which can cause death, diseases and illnesses. While some of your ensemble elements have been tested for liquid penetration resistance and material penetration resistance to viruses, this does not mean that it will protect you under all circumstances from bloodborne pathogens.

While protective glove composite materials are evaluated for penetration against bloodborne pathogens, this does not mean that you will not contact bloodborne pathogens. As with liquid chemicals, liquids containing pathogens can still enter at the top of the gloves in the interface area. This is particularly possible when operating around flood water. Therefore, you are still at risk of death, diseases and illnesses due to contact with such pathogens.

Biological hazards also include, but are not limited to, airborne pathogens, biogenic toxins, biogenic allergens, and bites from insects and animals.

The range of effects from exposure to these hazards vary with the type of biological agent. Your protective ensemble elements may limit some exposure to some biological hazards, but do not protect against all biological hazards under all conditions.

Radiological Hazards

There are two types of radiation: ionizing and non-ionizing. Ionizing radiation includes alpha particles, beta particles, gamma rays, X-rays, and other forms of highly energetic radiation emitted from radioactive materials. Exposure to ionizing radiation causes changes in the body that can result in serious or fatal health effects. Non-ionizing radiation includes ultraviolet (UV) light, infrared light, microwaves, and radio frequencies. Different health

effects exist with exposure to the different types of non-ionizing radiation. The exposure intensity and duration affect how radiological hazards cause effects on the human body. Your protective ensemble does not provide protection from radiological hazards. Therefore, you must avoid contact will all radiological hazards to reduce your risk of death, injuries, diseases, and illnesses associated with radiological exposure.

Even the best protective ensemble cannot protect you completely from chemical, radiological and biological hazards. Protective ensemble elements can reduce—but not eliminate—your risk of death, diseases and illnesses due to these hazards.

Traffic and Vehicle Hazards

Activities that distract your full and undivided attention to approaching traffic are a common physical hazard encountered by firefighters and other emergency personnel. Your protective ensemble is not designed to protect you if you are struck by a vehicle or involved in a vehicle accident. You should always be seated and wear a seat belt when riding in a moving vehicle. You should not operate on or near a roadway without receiving training in the proper way of doing so and without appropriate protective equipment. Exercise extreme caution when operating on or near a roadway or around vehicular traffic. The high visibility materials that are part of your protective ensemble are not always adequate for you to be seen by approaching traffic or equipment. You may be required to wear supplemental high visibility safety apparel that is appropriate for your operations.

Your operating conditions may further prevent adequate visibility to drivers or equipment operators from seeing you.

DANGER

Your protective ensemble does not comply with visibility requirements for working on a roadway. It will not protect you if you are struck by a vehicle or in a vehicle accident. You should receive training in proper firefighting and emergency operations conducted on or near roadways and the appropriate protective equipment for doing so. Be constantly alert to the possibility of vehicle hazards.

Always remain seated and wear a seat belt while riding in a moving vehicle. Failure to do so may lead to death, burns or injuries.

Physical Hazards

Physical hazards include, but are not limited to, falling heavy objects, flying debris, projectiles, abrasive or rough surfaces, sharp or jagged edges, pointed objects, slippery surfaces, and excessive vibration.

Different portions of your ensemble may provide limited protection from some hazards and reduce your risk of death, burns, injuries, diseases, and illnesses for some physical hazards under some conditions. Various objects on the fireground can penetrate, wear away, cut, or puncture portions of your protective ensemble, exposing your skin or underlying layer to physical trauma. You may also lose traction while walking, running or crawling, or have your body or parts of your body exposed to excessive vibration. You may sustain injury or be killed from physical hazards that overwhelm the protective qualities of your ensemble. For example, you must avoid building collapses and falls. In the event portions of a building or debris falls on you, you may be at risk of death, burns, injuries, diseases, and illnesses.

Despite being evaluated for cut and puncture resistance to physical trauma to your hands, the forces and types of sharp or pointed objects can still overwhelm the protective capabilities of your gloves.

DANGER

Your protective ensemble may not protect you from all physical hazards. Be constantly alert to the possibility of physical hazards. Failure to do so may lead to death, burns or injuries.

Electrical Hazards

DANGER

Your protective ensemble, wet or dry, may not protect you from electrical shock. Avoid coming into contact with energized electrical wires and equipment, and otherwise avoid electrical current. Failure to do so may lead to death, burns or injuries.

If your protective ensemble comes in contact with a source of electricity, you may be killed, burned or injured due to electrical shock. Similarly, some forms of high voltage equipment can arc flash causing exposure to extremely high forms of electrical energy. Even if your protective ensemble is dry, clean and properly maintained, you may be electrocuted or injured from an electrical shock. Water and other fluids conduct electricity. Wet, dirty and/or contaminated protective elements may increase your risk of death, burns and injuries due to electrical shock.

Your protective gloves have not been subjected to electrical hazard resistance testing. If you touch a live electrical circuit, you could be electrocuted. Many electrical hazards can exceed the protective capabilities of your gloves as part of your ensemble and therefore, you must avoid touching on or coming in contact with open electrical sources directly with your gloves.

Hazards Caused by the Wearing or Use of PPE

The wearing of your protective ensemble creates a variety of hazards affecting your body or your ability to safely perform required activities at a firefighting or emergency operation. These hazards are a byproduct of the tradeoffs between providing protection and allowing you to function with restriction. The wearing of any PPE entails these tradeoffs, and the balance between protection and functionality and comfort is a decision made in the selection of your protective ensemble by your fire department or employer.

Hazards created by the wearing or use of personal protective equipment include, but are not limited to:

- Heat stress
- Loss of functionality
- Wet, soiled, contaminated or damaged personal protective equipment
- Allergic reactions when contacting certain materials

DANGER

Wearing your protective ensemble, elements, or any PPE may increase your risk of heat stress, which may cause heart attack, stroke, dehydration, or other conditions resulting in death, injury or illness. At the first sign of heat stress, immediately seek medical help.

Heat Stress

Heat stress is one of the leading causes of firefighter death and injury. Heat stress is an increase in human body temperature and metabolism caused by physical exertion and/or a heated environment which can lead to exhaustion, mental confusion, disorientation, dehydration, loss of consciousness, heart attack, stroke, and other fatal illnesses. Exerting yourself while wearing your protective ensemble (garments, helmets, gloves, footwear, and hoods or shrouds) may increase your level of heat stress. Performing strenuous tasks in the heated environment of a fire scene or in warm and/or humid weather may also increase your heat stress.

To reduce your risk of heat stress, you must:

- Know your physical limitations. Consult your physician; be in top physical condition.
- Make sure your protective ensemble and equipment fit properly to allow adequate freedom of movement.
- Avoid undue exertion and/or prolonged exposure to heated environments.
- Recognize and be constantly alert for signs of heat stress. Signs of heat stress include rapid heart rate, labored breathing, weakness, and excessive sweating, or hot, flushed dry skin. Consult your safety officer or physician to learn and recognize the signs of heat stress.
- Be particularly alert for signs of heat stress during warm and/or humid weather.
- At the first sign of heat stress, immediately seek medical help.

DANGER

Wearing your protective ensemble, elements, or any PPE may increase your risk of heat stress, which may cause heart attack, stroke, dehydration, or other conditions resulting in death, injury or illness. At the first sign of heat stress, immediately seek medical help.

Loss of Mobility or Function

Wearing of your protective ensemble, even when worn correctly, may limit your ability to move easily, manipulate objects, see clearly, and communicate with others. You must be aware of the effects of your protective ensemble on your ability to perform certain tasks and compensate in ways that do not compromise your safety or increase your risk of death, burns, injuries, diseases, or illnesses.

You must also be aware that your protective ensemble or portions of your protective ensemble may prevent you from entering certain confined spaces, restrict your movement in other ways, or result in you becoming caught on or entangled in equipment, implements, or rough areas of the response environment.

While wearing gloves for your protection, your specific abilities to use tools and undertake other actions requiring dexterity, tactility, grip, and other functions with your hands will be hampered. You must avoid removing your hands from your gloves even for an instant while on the fireground or substituting lesser gloves when firefighting hazards are present.

DANGER

Wearing your protective ensemble, elements, or any PPE may increase your risk of losing mobility, functioning, or cause entanglement that can impair your ability to operate that can lead to death or injury. Understand and recognize how your protective ensemble or ensemble elements can potentially impair your mobility and function.

Wet, Soiled, Contaminated, and Damaged Protective Elements

Wet, dirty and/or contaminated protective elements can be a breeding ground for germs, bacteria, fungus, and other microorganisms that can cause disease and illness. Your protective ensemble elements must be kept as dry and clean as possible to reduce the risk of infections, diseases, and illnesses. Protective clothing that has been exposed to biologically contaminated water, such as flood water that may contain sewage, must be sanitized after exposure to prevent further growth of microbial contamination.

If your protective element becomes even slightly dirty or contaminated, do not use it. Dirt or contaminants reduce your protective element's protective qualities and increase your risk of death, burns, injuries, diseases, and illnesses. Many soils on the exterior and interior layers permit material to reflect less and absorb more heat. These soils can also lead to clothing being easier to contaminate. Clean your protective element in strict compliance with NFPA 1850 (1851), 2026 Edition, with this guide, with manufacturer's instructions, and with all Federal, state and local government environmental regulations and health codes. Do not use chlorine bleach or low pH (< 6.0) or moderately high pH (>9.5) detergents or cleaning agents when cleaning your protective element, as their use may reduce the strength of or degrade your protective element. If you are unsure whether your protective element is free of contaminants or dirt, do not use it. Do not use elements that are not thoroughly clean and dry.

DANGER

Do not use your protective ensemble element if it is wet, soiled, or contaminated. Such use may result in death, burns, injuries, diseases, or illnesses. Arrange for proper cleaning and sanitization or decontamination before use.

If your protective ensemble element becomes even slightly torn, worn, cracked, or abraded, or has holes, missing stitches, soft spots or other signs of degradation, do not use it. Tears and worn or abraded spots greatly decrease your protective ensemble's protective qualities and increase your risk of death, burns, injuries, diseases, and illnesses.

Common damage to protective gloves includes cuts, punctures, and abraded (scuffed) areas on exterior layers, thermal damage in the form of burn holes or melting, torn or snagged knit wristlet materials, missing stitches in seams, and loss of liquid integrity (observed leakage). Permanent stains or melted debris on the exterior of gloves should not be accepted.

You and your department or employer should regularly inspect your protective ensemble for signs of wear and tear and to ensure that the protective element has not been modified or altered in any way. Even the most harmless looking changes to the protective element may increase your risk of death, burns, injuries, diseases, and illnesses.

Skin Allergies

The wearing of your protective ensemble may produce skin allergies if you are allergic to specific substances used in the materials of protective ensemble elements or become sensitized to these substances over time. The susceptibility of each individual is different; most individuals do not experience any allergic effects. The wearing of your protective ensemble may cause changes in your skin health and make your skin more susceptible to effects by fireground contaminants. Further, the accumulation of different contaminants in your protective ensemble elements may become a source of skin reactions and allergies if your protective clothing is not kept clean. If you experience any unusual skin reactions or allergies that you cannot explain, contact your supervisor and seek medical help.

Hazards Based on Your Position and Operating Area

In addition to the hazards described above, which are by no means an all-inclusive list of potential hazards that you might face, you need to be aware that you can encounter hazards that are specific to the circumstances under which you are performing firefighting or emergency operations. Specific hazards include, but are not limited to:

- **Bodies of water.** Exercise extreme caution around bodies of water. Your protective ensemble does not float and may make swimming difficult.
- **Elevated areas.** Exercise extreme caution when operating on roofs, balconies, ladders, and other elevated areas. Your protective ensemble does not protect you from falls.
- **Moving machinery.** Exercise extreme caution when working around moving machinery. Even with high visibility materials as part of your protective ensemble, you may not be seen by approaching equipment. Your operating conditions may further prevent adequate visibility to equipment operators. Also be alert to the potential that part of your ensemble element may be caught in operating machinery.

Ensuring Proper Fit

DANGER

Your protective ensemble must fit properly and interface with your other safety equipment so that the protective layers overlap in all body positions as required by NFPA 1550. There should also not be any gaps in your protective ensemble at any interface areas between different elements. Any gaps or tightness in your protective layers may result in death, burns, injuries, diseases, or illnesses.

Selecting Gloves for Proper Fit and Function

Before each use of your protective ensemble, make sure that it is sized and adjusted to fit properly. Your protective ensemble is made to fit you so that it is not restrictive against your body and does not unduly restrict your movement (see "Loss of Mobility or Function" above). Your protective elements should fit together with your other equipment so that the protective ensemble's protective layers overlap in all body positions. Do not allow gaps in coverage of your body by your protective equipment. As you change your body position, check to make sure that your protective ensemble's protective layers continue to overlap. If your weight or body size changes, your protective ensemble must be refitted or adjusted accordingly.

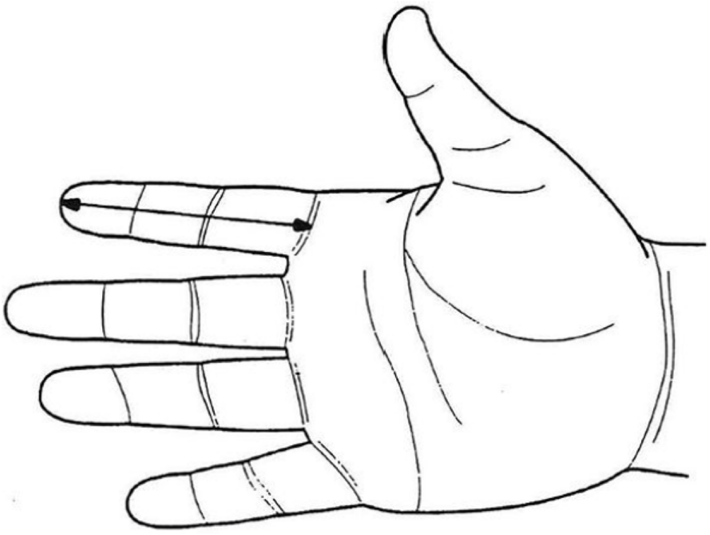
DANGER

Your protective ensemble is designed to be used as a unit. All elements, layers and accessories must be used and be properly in place and adjusted when being used. Failure to do so may result in death, burns, injuries, diseases, or illnesses.

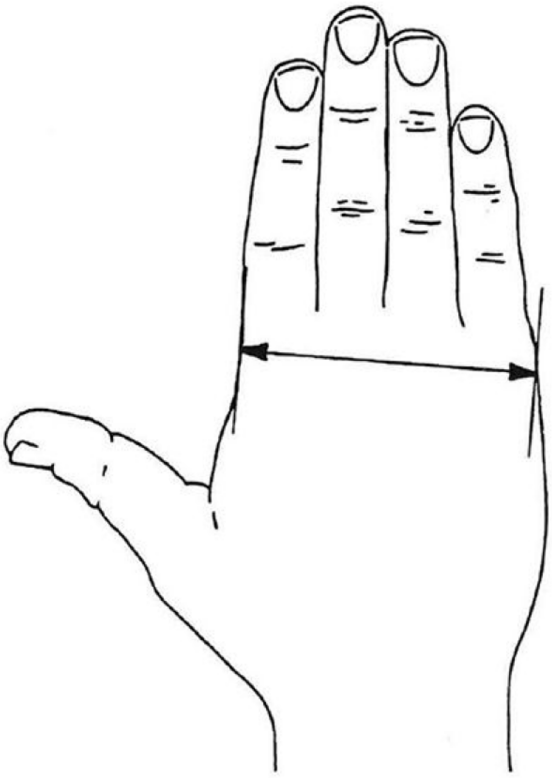
Your protective gloves must properly fit your hands and allow for adequate hand function when engaged in emergency operations. Ensure that you select a size that comfortably fits your hands and allows appropriate levels of hand function to permit safety undertaking anticipated emergency activity while wearing your gloves.

In selecting the correct size of gloves for your protection, you must go through an assessment process to ensure that the gloves provided for you will provide optimized fit, hand function, and protection. Use the following procedures to choose the best size of gloves for those gloves that are available to your organization:

1. Initially choose a size based on information provided by the manufacturer for relating the glove size to the size of your hand or specific hand dimensions. Manufacturers use a variety of sizing systems, and some provide a hand chart to help compare certain measurements of your hands with the most appropriate glove size. The NFPA 1970 sizing system is based on index finger length and hand breadth measured with a flexible tape measure as shown in the figures below. While manufacturers of gloves meeting the 2025 edition of this standard are required to label gloves using this system, they may also provide alternative approaches for labeling their glove sizes or offer additional types of glove sizing.

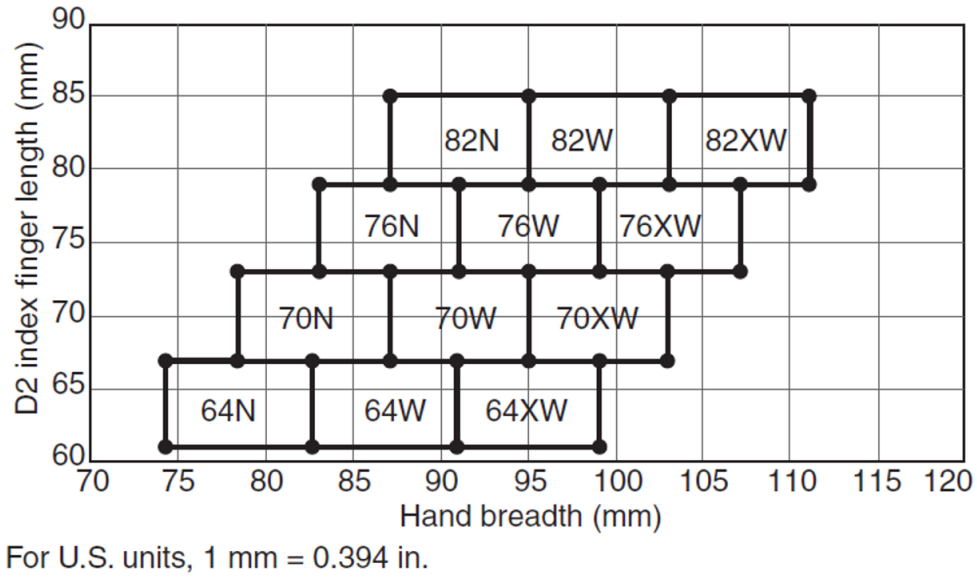


Index Finger Length [Figure 7.7.4(a) from NFPA 1970-2025]



Hand Breadth [Figure 7.7.4(b) from NFPA 1970-2025]

2. Using the measurements above, select your initial size based on the box where the two measurements fall in the chart below.



NFPA 1970 Standard Hand Sizes [Figure 7.7.4.1 from NFPA 1970-2025]

If this system is not used by the manufacturer, it is important that you follow their instructions for how to determine if you are wearing the correct size.

3. Once you have selected a glove size, put on the gloves and move and bend your hands to check for comfortable fit for all hand positions. Perform manual functions with your hands for the types of actions that you would be expected to perform on the fire ground (e.g., operating a radio, grasping certain tools) to assess how the gloves permit or impede your ability to successfully complete these tasks.
   Your gloves should not fit too tight such that they restrict hand movement that may also make certain tasks difficult. Gloves that are too tight will also reduce the air layers between your hands and the glove interior, which results in less insulation since the trapped air inside the glove helps to protect against heat. It is also important that gloves not be too loose on your hands since they can make it more difficult to grasp objects and perform other types of tasks.

4. Further examine glove fit by assessing how your fingertips extend to the end of each finger and thumb inside the gloves as well as determining how the "crotches" of the gloves between fingers seat on your hands. Ideally, you should ensure that your fingers comfortably extend to the ends of the glove finger tips while there are no significant gaps for the glove crotches fully seating on hands for attaining optimum levels of hand function (e.g., dexterity, tactility, and grip).

5. If your gloves do not fit well or allow adequate fit, try wearing a larger or smaller set of gloves and repeat the above steps to assess glove fit and function.

Requirement for Overlap

NFPA 1550, Standard on Fire Department Occupational Safety and Health Program, requires firefighters to wear protective equipment such as helmet, hood, footwear, upper and lower torso clothing, and gloves, sized to the individual user, properly overlapped so that no gaps occur during use, and meeting relevant NFPA performance standards (i.e., NFPA 1970 [1971]).

According to NFPA 1550, 2024 edition:

- The protective coat and the protective trousers shall have at least a 2 inch (50 mm) overlap of all layers so there is no gaping of the total thermal protection when the protective garments are worn.
- The minimum overlap shall be determined by measuring the garments on the wearer, without SCBA, in both of the following positions:
    1. Position A—standing, hands together and reaching as high over-head as possible.
    2. Position B—standing, hands together reaching overhead, with body bent forward at a 90-degree angle, to the side (either left or right), and to the back.

Consult your fire department or employer for information concerning these and other applicable standards and become familiar with their requirements. You must wear and properly use such equipment to minimize your risk of death, burns, injuries, diseases, and illnesses. Only use protective elements that fit properly. Never borrow or loan protective elements unless they properly fit you or the intended individual wearer.

For your gloves, as explained above, assess that your gloves stay in place for covering all portions of your lower arms, wrists, and hands in combination with the coat sleeves during all likely arm and body movements. If the interface between your gloves and your coat sleeves permits gaps or comes open during wearing, then contact your supervisor to determine if alternative gloves can be obtained that achieves the appropriate wrist, lower arm, and hand area coverage.

Components and Layers

Your protective ensemble may also have additional layers, patches, inserts, or protective components at various points, such as the toes, ears, elbows, knees, shoulders, etc., that your manufacturer provides. You must use your protective elements as a unit. Never use your protective ensemble without all layers and components provided by the manufacturer being properly in place. Use all components or layers of the protective ensemble elements (outer shell, moisture barrier, thermal barrier, reinforcements, inserts, etc.) together. Failure to do so may result in death, burns, injuries, diseases, and illnesses.

Most gloves are provided as a complete and non-separable item of protective clothing but should remain intact when worn. Though there is a test to ensure a lower likelihood of liner separation from the glove shell, be alert to any difficulties you encounter where your liner begins to pull out of your glove shell.

Closures

You must fasten all closures (flaps, buttons, hooks, zippers, collars, etc.) on your protective ensemble to reduce your risk of death, burns, injuries, diseases, and illnesses. If you do not fasten all closures, there will be gaps in your protection. For example, an open collar may permit hot debris to get under your protective ensemble and burn you. Similarly, an unfastened protective coat may open up and expose you to radiant heat or toxic substances. Failure to fasten all closures and utilize all components may result in death, burns, injuries, diseases, and illnesses.

Some types of gloves may include adjustments that allow the gauntlets of gloves to close more tightly against the wearer's wrists or lower arms. For these types of products, the individual manufacturer instructions for proper adjustment must be followed.

Chapter 3

Use and Limitations of Protective Clothing

OSHA places the responsibility for selection, approval, maintenance, inspection, and training in the proper use and limitations of safety gear on your fire department or employer (Title 29, Code of Federal Regulations, Section 1910.132). By doing this, OSHA recognizes a simple truth: how you use your protective ensemble is beyond the manufacturer's control. Your fire department or employer controls the circumstances under which you use the protective ensemble and is in the better position to assess the hazards at the fire or emergency scene and to direct the appropriate selection and use of safety equipment including protective ensembles.

Consistent with the OSHA regulations, manufacturers offer your protective ensemble for your fire department (paid or volunteer) or employer to evaluate and decide whether or not the protective ensemble provides an acceptable level of protection for any particular fire or emergency operation. Your department or employer should ensure proper fit and conduct its own testing, evaluation and training in conjunction with qualified safety experts before issuing protective ensemble elements for use by its firefighters.

Matters that your department or employer at the fire scene should consider on a case by case basis include:

- Whether to use a protective ensemble in fighting a particular fire or emergency response
- Whether to enter a particular burning building
- Whether to remain in a particular burning building
- What to enter certain parts of the building

Because the manufacturer of your protective ensemble element cannot predict the many varying conditions existing at each fire or emergency scene, your department or employer must decide the appropriate use of your protective ensemble and its suitability for that use at each fire scene. The manufacturer makes no guarantees or warranties, expressed or implied that your protective ensemble is fit for a particular purpose. (See Warranty Information on inside back cover.)

Use your protective ensemble only under the direct supervision of your fire department or employer in a manner consistent with applicable versions of NFPA 1550 Standard on Emergency Responder Health & Safety, other relevant NFPA standards, and 29 CFR 1910.132.

NFPA Label

The NFPA label on your protective ensemble element states that your protective element is a structural (or proximity) firefighting protective element, such as protective gloves, and is compliant with the NFPA 1970 (1971), 2025 Edition standard. This does not mean that you cannot be seriously injured if you use the protective ensemble only for structural firefighting (or proximity firefighting). Even if you limit yourself to structural (or proximity) firefighting, you are still at risk of death, burns, injuries, diseases, and illnesses as described on the element's label and in this guide. As previously explained, there is no such thing as a "routine" or "ordinary" structural (or proximity) fire, and you must realize that you are at risk at all times during firefighting operations.

DANGER

Your structural or proximity ensemble will not protect you for entry fire fighting applications. Use of structural or proximity ensembles for entry fire fighting applications may lead to death, burns, injuries, diseases, and illnesses.

Your structural or proximity protective ensemble alone may not provide protection for fire entry applications or for protection from chemical, radiological or biological agents. You must not use your structural protective ensemble for proximity or entry firefighting applications. If you use your structural protective ensemble for proximity or entry firefighting applications, you will be at great risk of death, burns, injuries, diseases, and illnesses.

You must not use your proximity ensemble for entry firefighting applications. If you use your proximity protective ensemble for entry firefighting applications, you will be at great risk of death, burns, injuries, diseases, and illnesses.

Similarly, your protective ensemble does not protect you from all of the diseases and illnesses caused by poisons, toxins, carcinogens, radioactivity, germs, infectious bodily fluids, bloodborne pathogens, and similar chemical, radiological and biological hazards routinely found at fire scenes or during extraordinary events where chemical, biological, radiological, or nuclear (CBRN) terrorism agents have been accidentally or intentionally released.

The label on your protective element will include certain information:

- The name of the manufacturer and their address, including their country
- An element identification number, which may be a unique serial number or a lot number
- The month and year of manufacturer (some labels may provide also provide the day)
- The model element name, number, or design
- The size or size range of the element
- Identifications for the principal materials of construction
- Cleaning precautions or a notification or QR code for accessing these precautions

Some protective elements may include additional certification statements when the protective element is also certified to one or more additional NFPA or other standards. This guide applies to the use of protective gloves that are certified to NFPA 1970 (1971), 2025 Edition for structural or proximity firefighting and the associated requirements that also involve NFPA 1951 technical rescue requirements of NFPA 1950, 2025 edition and the NFPA 1992 liquid splash requirements of NFPA 1990, 2022 Edition.

Donning and Doffing

WARNING

How you don and doff your protective gloves affects your life and safety. You must wear the protective ensemble properly for it to reduce your risk of death, burns, injuries, diseases, and illnesses. You must also exercise caution when you remove your protective ensemble to avoid contaminating yourself and others with hazardous substances.

Do not wear your gloves if they have not been cleaned or is damaged. Seek replacement gloves if your gloves are soiled or damaged. Wearing an unclean or damaged gloves will increase your risk of death, burns, injuries, diseases, and illnesses.

Donning Your Protective Gloves

1. After donning your protective coat, slip on protective gloves so that all layers or components of each protective coat cuff completely cover and overlap the upper part of each glove. Be sure that the overlap of protection remains in all body positions and extensions of your arms encountered during use.
2. Move and bend your hands and arms as you would expect to wear the complete ensemble.
3. Make sure that all components, layers, accessories, and other items provided by the manufacturers of all elements are in place.

Doffing Your Protective Gloves

Doffing procedures vary depending on whether your protective gloves have been contaminated during use.

When emergency doffing is required, immediately seek assistance to remove your gloves as quickly as possible, taking care to avoid compressing the gloves or any garments against the fire fighter's body to avoid contamination.

No Contamination

1. If there is no contamination, remove your protective gloves in reverse order from that described above for donning the protective gloves.
2. Inspect your protective gloves for any damage or change in condition.
3. If you see damage or change in condition, bring this to the immediate attention of your fire department or employer. Such damage or changes in condition must be corrected before you use your protective gloves.

If you do not see any damage or change in condition, store your protective gloves as recommended in this guide under "Storage."

Contaminated Protective Gloves

Doff protective gloves contaminated with fireground soils, blood, body fluids, toxins, radioactivity, chemicals, and/or hazardous materials with special care by taking the

- Avoid unprotected bodily contact with any contaminated area of your protective ensemble, including your gloves.
- One method to remove contaminated gloves involves initially removing the first glove only partly with your opposite hand and then to remove the opposite hand glove with your hand on which the partially doffed glove without having your fingertips or any exposed skin from contacting the exterior surfaces of either the gloves, protective coat, or any other parts of the ensemble.
- Another technique for removing contaminated gloves is to have another individual, who is at least wearing disposable examination or other appropriate gloves remove the gloves from your hands.
- Use appropriate protective clothing for handling contaminated gloves (See current versions of NFPA 1950 [1999] and 1581 for procedures and types of garments and equipment to be used in handling protective gloves contaminated with biologically hazardous materials. See current version of NFPA 1990 for similar information concerning chemical hazards.)
- Avoid spreading the contaminants from your protective gloves to your personal belongings, your living quarters and/or interior spaces in buildings and vehicles.
- Place contaminated protective gloves in a sealable, leak-proof, airtight bag.

WARNING

Avoid unprotected bodily contact with contaminated areas of your protective gloves.

Avoid contact between contaminated protective gloves and your personal belongings, your living quarters and/or interior spaces in buildings and vehicles. Such contact may increase your risk of death, burns, injuries, diseases, and illnesses.

Modifications, Alterations and Markings

WARNING

Modifying, changing, adding to, marking, painting, or altering your protective element in any way may affect its protective qualities and increase your risk of death, burns, injuries, diseases, and illnesses.

Do not modify, change, mark, paint, or alter your protective elements without the manufacturer's written authorization.

Do not write over top of any printed information on the protective glove product label. Do not remove your protective glove label. If your protective glove label becomes damaged or unreadable, contact the manufacturer for a replacement label.

Chapter 4

Inspection

General Inspection Requirements and Warnings

WARNING

You must inspect your protective gloves regularly for evidence of damage or changes. If you are uncertain about the condition of your protective gloves, do not wear it and seek assistance from the appropriate person in your fire department or organization.

Failure to regularly inspect your protective gloves increases your risk of death, burns, injuries, diseases, and illnesses.

Inspect your protective gloves regularly in accordance with NFPA 1850 (1851), 2026 Edition.

Universal PPE Handling Precautions

NFPA 1850 (1851) requires that universal precautions be observed when handling ensemble elements. This means that you should always assume the protective element you are handling is contaminated, even when it does not appear soiled or has obvious visible contamination. At a minimum, individuals conducting inspections should wear examination gloves or cleaning/utility gloves certified to NFPA 1950 (1999).

If you have the potential for extended or repeated contact with heavily soiled or contaminated ensemble elements, you should wear:

- An apron with sleeves or coverall that meets the multi-functional garment requirements of NFPA 1950.
- An N95 or higher filtering facepiece respirator approved by NIOSH.
- A faceshield is also recommended.

Similarly, if the gloves is contaminated blood or other potentially infectious fluids (including flood water), wear a sleeved apron or coverall, respirator, and facemask.

Types of Inspections

NFPA 1850 (1851) establishes requirements for both routine inspections and advanced inspections:

- Individual users routinely inspect their own protective gloves when obtained, at the beginning of each duty period and before and after each use.
- Independent service providers (ISP) or personnel in your fire department or organization who have received training in the inspection of protective gloves should conduct advanced inspections at a minimum of once every 12 months or whenever routine inspections indicate that a problem could exist.

Independent service providers (ISP) must receive verification according to the criteria in NFPA 1851, 2020 edition. Personnel conducting inspections of protective gloves must have written verification of training from the original manufacturer or verified ISP.

Routine Inspections

You and your fire department or employer should inspect your protective gloves upon receipt. You are responsible for inspecting your gloves upon issue, at the beginning of each duty period, after each cleaning, and before and after each use of any kind. Your protective gloves should be inspected for:

- Soiling
- Contamination
- Physical damage such as, but not limited to, rips, cuts, tears, and punctures
- Thermal damage such as charring, burn holes, melting, or discoloration of any layer
- Inverted glove liner
- Overall shrinkage (may be indicated by poorer fit over time)
- Loss of elasticity or flexibility
- Loss of seam integrity and broken or missing stitches

Remember, whenever you have a question about the condition of the protective gloves, you should temporarily remove the gloves from service and refer to the manufacturer or verified independent service provider (ISP) for evaluation.

Your fire department or employer must develop and use standards and guidelines for determining whether your protective ensemble elements pass inspection and can continue to be used for firefighting and emergency operations.

If inspection discloses any damage or deterioration to any protective element, do not use it and do not attempt to repair it. Consult your fire department or employer as to the proper steps to be taken in dealing with the damaged protective element.

Advanced Inspections

Advanced inspections are the responsibility of your fire department or organization. Only trained individuals from either your fire department or organization or a verified ISP can perform advanced inspections. ISPs must be verified by meeting requirements established in NFPA 1850 (1851), 2026 Edition.

Qualified personnel should conduct advanced inspections at a minimum of every 12 months and whenever routine inspections determine potential damage. Advanced inspections should be performed more frequently as deemed necessary based on the condition of your protective gloves or decisions made by your fire department or organization.

Advanced inspections involve a more detailed and thorough examination of your protective gloves for different types of damage or changes. In addition to the items identified above for routine inspections, the assessment includes examining the label for continued legibility and determining that any accessories are still compliant. A leakage test is applied to gloves to determine if the gloves retain liquid integrity.

Limitations of Inspection

Though most performance properties of the protective ensemble cannot be tested adequately in the field, OSHA regulations require your department or employer to regularly inspect your protective ensemble and other safety equipment. Your fire department or employer should have a systematic, routine and regularly scheduled inspection of your protective ensemble and other equipment. Full documentation and records of these inspections should be kept.

Record Keeping

NFPA 1850 (1851), 2026 edition requires that your fire department or employer compile and maintain records on your protective gloves. The following records must be kept:

- Person to whom the protective gloves is issued
- Date and condition of the gloves when issued
- Manufacturer name and model name or design
- Manufacturer's identification number, lot number or serial number
- Month and year of manufacture
- Date and findings of advanced inspections
- Dates and findings of advanced cleaning, disinfection or sanitization, or specialized cleaning
- Reason for and who performed advanced cleaning, disinfection or sanitization or specialized cleaning
- Dates of repairs, who performed repairs and brief discussion of repairs
- Date of retirement
- Date and method of disposal

Chapter 5

Cleaning and Decontamination

General Cleaning Requirements and Warnings

DANGER

You must keep your protective gloves clean and free of contamination. If you do not keep your protective gloves clean, you increase your risk of death, burns, injuries, diseases, and illnesses.

The fire service and manufacturers have been working very hard to get the message across that contaminated and soiled protective clothing and equipment put firefighters at a grave and unnecessary risk of death, burns, injuries, diseases, or illnesses. Recent studies have concluded that cleaning the gear is a very important step towards helping protect the firefighter.

You are responsible to keep your protective gloves clean and maintain them as set forth in the gloves label(s) and this guide.

This is not merely a question of style, neat appearance and comfort, it is a matter of life and death.

In everyday use, personal protective equipment becomes dirty by absorbing sweat from the wearer and soils, soot, and so forth from the outside environment. Cleaning of ensembles and ensemble elements will assist in removing these substances. Ensembles and ensemble elements can also become contaminated with other substances, principally hazardous materials, particulates, and body fluids or other potentially infectious materials. In order to clean structural and proximity firefighting clothing and equipment, preliminary exposure reduction, advanced cleaning, decontamination, sanitization and specialized cleaning of ensembles and ensemble elements might all be needed.

Health Risks of Soiled or Contaminated Protective Gloves

Soiled or contaminated protective gloves can expose firefighters to toxins and carcinogens that enter the body through ingestion, inhalation or absorption. Repeated small exposures to some contaminants can add up over time and cause health problems. Although safety is important to avoid injury or inhalation hazards while working on the fireground, you can inadvertently carry many of the contaminants that lead to health risks away from the fire scene on your protective clothing and equipment.

Contaminants you may encounter at a fire scene can absorb and permeate into or become trapped within the materials of the soiled protective gloves. Contact with soiled protective gloves increases the risk of contaminants being introduced into the body. Protective gloves contaminated with body fluids present a potential risk of a communicable disease being transmitted to persons coming into contact with the contaminated protective gloves.

Reduced Performance Hazards of Contaminated Protective Clothing

When protective gloves become laden with particles, contaminants and chemicals, other problems besides exposure to these contaminants are introduced that include, but not limited to, the following:

- Soiled protective clothing typically reflects less radiant heat. After materials are saturated with hydrocarbons, they tend to absorb rather than reflect the radiant heat from the surrounding fire.
- Protective clothing heavily contaminated with hydrocarbons is more likely to conduct electricity, increasing the danger when entering a building or vehicle where wiring can still be live.
- Protective clothing impregnated with oil, grease and hydrocarbon deposits from soot and smoke can ignite and cause severe burns and injuries, even if the materials are normally flame resistant. Individual firefighters can still encounter various chemicals in their normal firefighting activities, even if they are not involved in a response as part of a specialized hazardous materials response team. Exposures to oils, fuels and lubricants can also occur around fire station vehicles.
- During responses, exposures to liquids ranging from pesticides to acids to chemical solvents can occur, with or without the firefighter's knowledge.
- These contaminants, in addition to being hazardous, can also degrade ensembles and ensemble elements in the following ways:
  - ☑ Clothing fabrics and other materials can become weakened and tear more easily.
  - ☑ Thread or seam sealing tape can become loose.
  - ☑ Flame retardant or water repelling treatments (if present) can be removed.

Any exposure of protective ensembles and elements to CBRN terrorism agents warrants immediate disposal of the protective clothing and equipment in accordance with all applicable Federal, state and local regulations. Protective gloves that have been exposed to CBRN terrorism agents should not be inspected, cleaned or repaired.

Other General Warnings

Do not wear or have soiled or contaminated clothing inside in the living quarters of the fire station. Do not take soiled or contaminated elements home. Do not wash soiled or contaminated elements in home laundry or in public laundry unless the public laundry has a dedicated business to handle protective clothing, including protective gloves.

Do not transport soiled or contaminated elements in the passenger area of an apparatus or personal vehicle.

Do not commercially dry clean your protective clothing, including your protective gloves. Commercial dry cleaning involving hazardous chemical solvents is generally not recommended for cleaning protective gloves. Some drycleaning and other solvents can damage components of protective gloves. Consult with the protective glove manufacturer prior to dry cleaning to learn whether or not dry cleaning will damage your protective gloves.

WARNING

Soiled or contaminated protective clothing ensembles can expose not only you, but also fellow firefighters, family members and others to the contaminants and carcinogens described in this guide. To reduce the risk of death, injuries, diseases, and illnesses to you and others, do not take soiled or contaminated elements home or into living quarters in your firehouse.

Types of Cleaning

NFPA 1850 (1851), 2026 Edition defines several different types of cleaning:

- **Preliminary Exposure Reduction** is done on the fire scene and provides techniques for reducing soiling and contamination levels on the exterior of the ensemble or ensemble elements following incident operations.
- **Cleaning.** The act of removing soils and contamination from ensembles and ensemble elements by mechanical, chemical, thermal, or combined processes.
- **Advanced Cleaning.** The act of removing both soiling and contamination generally associated with products of combustion. Advanced cleaning requires protective elements including gloves to be temporarily taken out of service.
- **Specialized Cleaning** The act of removing hazardous materials, soiling associated with body fluids, or other forms of contamination.
- **Cleaning Facility.** An entity, location, or site engaged in the cleaning of ensemble elements that includes an element manufacturer verified in cleaning, a verified cleaner, a verified organization or a verified ISP.
- **Contract Cleaning** is cleaning conducted by a facility outside the fire department or organization that specializes in cleaning protective clothing.
- **Decontamination.** The act of removing contamination from or neutralizing contamination in protective clothing and equipment.
- **Disinfectant.** A type of antimicrobial agent that destroys or irreversibly inactivates fungi and bacteria, but not necessarily their spores, on inanimate surfaces and objects.
- **Sanitizer.** A type of antimicrobial agent that is used to reduce, but not necessarily eliminate, microorganisms from the inanimate environment to levels considered safe as determined by public health regulations.

Preliminary Exposure Reduction

In the 2020 revision of NFPA 1851, the term routine cleaning was replaced with preliminary exposure reduction to provide a means for reducing your exposure to exterior contamination on your protective clothing and equipment. You are responsible for the preliminary exposure reduction of your protective ensemble, including your protective gloves immediately after exiting the emergency scene at an incident where elements could have become soiled or contaminated. As part of this process, you should examine the manufacturer's label, consult these instructions and refer to NFPA 1850 (1851), 2026 Edition for additional information to carry out the preliminary exposure reduction of your protective ensemble.

Performing preliminary exposure reduction immediately after the termination of an incident can remove substantial amounts of surface contaminants before they have a chance to "set in." This can also help to limit the transfer of contaminants to apparatus and stations. Preliminary exposure reduction of your protective ensemble as soon as possible after exposure to harmful contaminants can assist in the removal of those contaminants.

You, your fire department, or employer should evaluate the contamination levels of your protective ensemble and initiate appropriate preliminary exposure reduction at the emergency scene, while remaining on air from your self-contained breathing apparatus.

Dry and Wet Mitigation

Techniques for both wet and dry mitigation are provided in this document, to be performed prior to removal of any protective ensemble elements. As part of the preliminary exposure reduction, adhere to the following steps, using either dry mitigation or wet mitigation techniques:

Dry Mitigation

1. Perform dry mitigation by brushing debris from the exterior with a soft brush prior to removing the ensemble elements.
2. Brush beginning at the top of the ensemble and work your way down towards the gloves, brushing any soils to the ground.
3. Do not use a leaf blower or fan as this will simply disperse to soils into the air and increase the likelihood of exposing personnel to inhalation of these contaminated particles.
4. While dry mitigation helps remove solid or particulates from the exterior of the protective ensemble, it is not as effective as wet mitigation.

Wet Mitigation

1. Perform wet mitigation by gently rinsing the exterior of the ensemble elements using low-pressure and low-volume flow water prior to removing the ensemble elements.
2. Ideally, use a mild detergent in a bucket of water with a moderate stiffness bristle brush to scrub the ensemble starting at the helmet and work down the sides of the firefighter.
3. Follow up with a gentle rinsing.
4. Do not use heavy scrubbing or spray with high velocity water jets such as a power washer as these actions may simply transfer exterior contamination to interior layers of the clothing.
5. If both wet and dry mitigation techniques are being used, perform dry mitigation prior to wet mitigation.
6. Following mitigation, isolate and bag the protective clothing and equipment
7. Ensure that the protective clothing and equipment is subjected to appropriate advanced or specialized cleaning procedures as necessary.

Advanced Cleaning

Submit your protective gloves for advanced cleaning at least once every six months, resulting in a minimum of two advanced cleanings in a 12-month period. One of the advanced cleanings should occur at the time of annual inspection. NFPA 1850 (1851), 2026 Edition includes the words "elements that are issued and used shall receive the advanced cleaning every six months", clarifying that elements that have not been used are not required to follow this minimum cleaning schedule. Once again, following this schedule will result in a minimum of two cleanings in a 12-month period for used and issued elements.

NFPA 1950 (1851), 2026 Edition requires advanced cleaning to be performed by an element manufacturer verified in cleaning, a verified cleaner, a manufacturer trained organization for its own clothing, a verified organization, or a verified ISP. Verification must be in accordance with NFPA 1850 (1851), 2026 Edition. The original manufacturer of the protective gloves, a verified ISP, or a verified organization will determine the level of training for individuals in the fire department or organization necessary for conducting advanced cleaning.

Advanced cleaning should involve the following:

- Soiled or contaminated protective gloves must receive advanced cleaning prior to reusing.
- Subject elements that have been exposed to blood or other body fluids to sanitization or disinfection prior to advanced cleaning.
- Advanced cleaning is permitted prior to sanitization or disinfection if the procedures for advanced cleaning have proven effective for sanitization or disinfection.
- Protective gloves that have been exposed to bulk chemicals, unusual biological contaminants, or other substances of a highly hazardous or unusual nature should be subjected to specialized cleaning in lieu of advanced cleaning.
- Examine the manufacturer's label of your protective gloves to determine if there are any unique instructions on cleaning and drying that the manufacturer has provided with this element. In the absence of unique manufacturer's instructions or manufacturer's approval of alternative procedures for the protective gloves, use the advanced cleaning and drying procedures, as well as the instructions for sanitization, disinfection, and specialized cleaning provided in this section.

NFPA 1850 (1851), 2026 Edition primarily indicates both the use of hand washing of gloves but does permit machine and alternative forms of cleaning gloves such as ultrasonic cleaning. Hand washing procedures are described below.

Hand Washing

NFPA 1850 (1851), 2026 specifies hand washing of gloves in the absence of other acceptable cleaning techniques according to the following procedures:

1. Use a utility sink or container of suitable size that is large enough to submerse the majority of gloves at a water level that does not have water enter the gloves.
2. Observe universal procedures and put on a pair of examination gloves, an apron and protective sleeves or coveralls, and a pair of safety glasses or goggles.
3. Fill the sink with warm water that is not hotter than 120oF (49oC) and a mild detergent using the detergent manufacturer's recommended amount of detergent for every gallon or water.
4. Put on the firefighting protective gloves over the examination over the examination gloves and briskly rub the gloves together, ensuring cleaning of all exterior surfaces. You can also use a soft bristle brush to scrub the exterior of the gloves.
5. Remove the gloves, drain and refill the utility sink with clean water.
6. Thoroughly rinse the interior and exterior of the gloves with clean water.
7. Do not wring out the gloves. Instead, slightly squeeze the gloves to remove excess water.
8. In the absence of specialized drying equipment, suspend the gloves with the opening facing down, with attention that water runoff does not create a slip hazard to those individuals in the area.

WARNING

Using water at 120°F (49°C) can scald skin after approximately 4 minutes. Either limit your time contacting water at this temperature or ensure use of cleaning/utility gloves to reduce your exposure to this wash water.

Due to their radiant reflective (aluminized) exterior shell surfaces, proximity firefighting gloves must not be exposed to any mechanical action during cleaning, including the use of brushes or scrubbing. Instead, carefully wipe exterior aluminized surfaces with a moist soft cloth or sponge.

The wastewater from the washing machine must be handled and disposed of in accordance with Federal, state and local law.

Alternative or Machine Cleaning

NFPA 1850 (1851), 2026 permits alternative cleaning processes, including different forms of machine-based cleaning. In any cleaning process, ensure that the wash temperature is not hotter than 120oF (49oC). Do not use any alternative or machine-based cleaning procedures that have not been validated for the item and that do not cause damage or alter the performance of the protective gloves. Ask the specifier or supplier of the alternative or machine cleaning process for evidence of its effectiveness. Also check with the glove manufacturer to see if the application of the process affects the warranty for the gloves.

Drying Procedures

Examine the manufacturer's label for any unique instructions on drying procedures specific to your protective gloves. Where there are no unique manufacturer's instructions or manufacturer's approval of alternative procedures, use either air drying or a drying cabinet as the preferred methods, especially. While machine drying is generally not recommended, air drying or a drying cabinet are the most appropriate methods for drying protective gloves.

For air drying, the most efficient method involves forced air ventilation. For this method of drying, simply use fans to re-circulate air inside a room where protective gloves items suspending with the opening facing down. Gloves may also be placed on equipment that directs airflow to the interior.

The basic drying room should include floor drains, a method to exchange the air to the outside environment, and drying racks for suspending protective gloves with the opening facing down to allow drainage.

Overall drying time is dependent on the efficiency of the drying room and the ambient conditions. Heating of the room or the inlet air at temperatures up to 105°F (40°C) can further improve the efficiency of the drying process. Drying protective gloves in ambient air, as opposed to drying cabinets or drying rooms, can take a relatively long time depending on the ambient environmental conditions.

Machine drying of protective gloves is not recommended. During operation, dryers can reach very high basket temperatures that may damage gloves. Machine drying also includes mechanical action that can cause damage to protective gloves.

Air Drying

1. Place gloves in an area with good ventilation
2. Do not dry in direct or indirect sunlight, under fluorescent light, or under UV light.
3. Do not allow area used for drying to exceed temperature of 105°F (40°C).

Use of Drying Cabinet

1. Place elements in drying cabinet to allow good air circulation between each element.
2. Use a specific drying temperature and duration to provide sufficient drying time.
3. Do not allow area used for drying to exceed 105°F (40°C).

Contract Cleaning

If an independent service provider (ISP), a manufacturer trained in cleaning, a verified cleaner or a verified organization cleans your protective gloves rather than trained personnel of your fire department or employer, it is the responsibility of your fire department or employer to ensure that the contract cleaner is knowledgeable enough to provide adequate service and not cause damage to your protective gloves. Contract cleaners must be able to provide documentation of their verification to effectively clean protective gloves. Specific guidelines for making this determination are provided in Annex A (Section A.8.4.1) of NFPA 1850 (1851), 2026 revision.

Sanitization, Disinfection, and Specialized Cleaning

WARNING

If your protective ensemble is contaminated, you must follow procedures mandated by Federal, state and local law for handling and/or decontaminating your protective elements. Failure to do so may increase your risk of death, burns, injuries, diseases, and illnesses. Protective elements that are contaminated by CBRN terrorism agents must be immediately retired after confirmed exposure and shall not be subjected to cleaning or decontamination.

Read and follow the doffing warnings and instructions in this guide to reduce your risk of death, burns, injuries, diseases and illnesses.

NFPA 1850 (1851), 2025 Edition provides two decision trees:

1. Approach for Deciding the Handling, Cleaning, and Disposition of Ensemble Elements.
2. Approach for Addressing Specific Types of Contamination.

The second decision tree supplies an approach for addressing the specific types of contamination and includes actions for elements that have been contaminated with:

- Bulk chemicals.
- Asbestos and other designated hazardous substances.
- Body fluids and other microbial contamination.
- Fires where Lithium-ion batteries that include mobile or station energy storage systems.
- Products of combustion.

Members of the fire department are highly encouraged to review this portion of the NFPA 1850 (1851), especially the aforementioned decision trees and the related narrative and annex guidance information.

Specific guidance as to the decision of whether advanced cleaning, sanitization or disinfection, or specialized cleaning is provided in second decision tree with the following general recommendations.

Bulk Chemicals

- For protective clothing items that are known or suspected to have been exposed to bulk chemicals, undertake preliminary exposure reduction and then isolate, tag, and bag the items at the scene.
- Have the type of bulk chemical assessed by a hazmat team or other qualified expert to determine if cleaning or decontamination is possible.
- When contaminant has been identified, consult with the manufacturer or supplier of the contaminant to determine an appropriate decontamination agent and process.
- If cleaning or decontamination are not possible, condemn and retire the protective clothing item and dispose of it as hazardous waste in accordance with federal, state, and local regulations.
- If cleaning or decontamination is possible, have the affected protective clothing item(s) undergo specialized cleaning.

Asbestos and other Designated Hazardous Substances

- For protective clothing items that are known or suspected of having been exposed to asbestos or other designated hazardous substances, undertake preliminary exposure reduction and then isolate, tag, and bag the items at the scene.
- Have the organizations hazmat team or other qualified expert determine if cleaning or decontamination is possible.
- If cleaning or decontamination are not possible, condemn and retire the protective clothing item(s) and dispose of them as hazardous waste in accordance with federal, state, and local regulations.
- If cleaning or decontamination is possible, have the affected protective clothing item(s) undergo specialized cleaning.

Body Fluid and other Microbial Contaminations

- For protective clothing items that are known or suspected of having been exposed to body fluid or other microbial contaminants, undertake preliminary exposure reduction and then isolate, tag, and bag them at the scene.
- Have protective clothing items evaluated by the qualified individuals or experts to determine if disinfection or sanitization and cleaning is possible.
- If disinfection or sanitization and cleaning is not possible, the condemn and retire protective clothing Item(s) and dispose of them as hazardous waste in accordance with federal, state, and local regulations.
- If disinfection or sanitization and cleaning is possible, have the affected protective clothing item(s) undergo disinfection or sanitization procedures, followed by advanced cleaning.

Lithium-Ion Battery and Related Device Contamination

- For protective clothing that are known or suspected to have been exposed to decomposition products of lithium-ion battery and related device fires, undertake preliminary exposure reduction and then isolate, tag, and bag the items at the scene.
- Following preliminary exposure reduction, determine if advanced cleaning or specialized cleaning should be applied based on the following factors:
  - ☑ The total proportion of the fire contents involving lithium-ion batteries or related products.
  - ☑ The degree to which firefighters were exposed.
  - ☑ The environmental conditions of the fire scene.
  - ☑ The availability of any exposure data at the fire scene.
  - ☑ Prior experience cleaning protective elements at similar fires.
  - ☑ The availability of documentation for cleaning to remove this contamination.
  - ☑ The ability to test pre- and post-wash gear for cleaning effectiveness.
- If advanced or specialized cleaning is not judged as not possible, condemn and retire the protective clothing items and dispose of as hazardous waste in accordance with federal, state, and local regulations.
- If advanced or specialized cleaning is possible, have the affected protective clothing item(s) should undergo advanced or specialized cleaning as appropriate.

Products of Combustion Cleaning

- Protective clothing items that have been exposed to products of combustion should undergo preliminary exposure reduction and then isolated, tagged, and bagged at the scene.
- Following preliminary exposure reduction, the protective clothing item(s) should undergo advanced cleaning.

Disinfection or Sanitization

- Processes for disinfection, sanitization, cleaning and decontaminating protective clothing items that have been contaminated with body fluids or other potentially infectious materials must be performed by a manufacturer verified in cleaning, a verified cleaner, a manufacturer-trained organization, a verified organization or a verified ISP.
- Organizations that engage in disinfection or sanitization of protective clothing items contaminated with body fluids or other potentially infectious materials should comply with applicable regulations in 29 CFR 1910.1030, "Bloodborne Pathogens."
- Have advanced cleaning or specialized cleaning should be performed after sanitization, unless disinfection or sanitization is part of the advanced cleaning.
- Disinfectants and sanitizers must be registered with the EPA for efficacy for hard surfaces or fabrics and textiles, as applicable.
- Use spot disinfection or spot sanitization, followed by spot cleaning, if the area of contamination is limited and clearly visible.

Specialized Cleaning

- Specialized cleaning should only be employed when advanced cleaning, or sanitization, or disinfection is inadequate, and must be performed by a manufacturer verified in cleaning, a manufacturer trained organization, a verified organization, a verified cleaner or a verified ISP.
- Relying upon the expertise of hazmat teams, infection control specialists, verified ISP's or other individuals knowledgeable about contaminants, the organization should designate specific substances or contaminants that require specialized cleaning, and determine the exact approach.
- Apply disinfection or sanitization with specialized cleaning for the removal of body fluids or other infectious materials that cannot be removed using disinfection or sanitization with advanced cleaning.
- Where appropriate for specialized cleaning, wash water temperature of 140°F is permitted.
- If it has been determined that contaminants cannot be removed, condemn and retire the protective clothing item(s) and dispose of in accordance with federal, state, and local regulations.
- If it has been determined that the contaminant can be removed, conduct specific procedures for cleaning or decontaminating the protective clothing items.
- It may be important to provide evidence that the selected specialized cleaning procedures are effective for the removal of the specific contaminants of concern. This evidence can come from verified entities with documentation of having successfully passed the effectiveness of cleaning required by verification, or by conducting testing of contaminated clothing that provides results showing the absence of contamination or levels of contamination that have been deemed to be safe.
- When specialized cleaning is applied, consideration the disposition of the effluent from the cleaning process and whether disposal into the local sewer system is acceptable according to federal, state, and local regulations.

Chapter 6

Repair

You must maintain your protective gloves. The maintenance of your protective gloves may require repair, if possible. All repairs to gloves must be performed by the gloves manufacturer or its designated independent service provider (ISP).

Protective gloves must be subjected to advanced cleaning, when necessary, before any repair work is performed.

DANGER

Do not attempt to repair your protective gloves. Only the original manufacturer, a verified ISP, or member of your fire department or organization that has been trained by a manufacturer of the same element type or an ISP should repair your protective gloves. Improper repair of your protective gloves may increase your risk of death, injuries, diseases, and illnesses.

Chapter 7

Storage

Store your protective gloves properly to maximize its service life, minimize effects that may diminish its performance and reduce potential health hazards. Improper storage may result in permanent damage to your protective gloves and increase your risk of death, burns, injuries, diseases, or illnesses.

WARNING

Ensembles or ensemble elements not is use shall not be exposed to lighting that emits UV rays.

Do not store your protective gloves:

- **In fluorescent lighting, direct or indirect light, especially sunlight or expose your protective gloves to direct light when not being worn**
- **When wet or with any layers that are moist**
- **Under temperature extremes**

Improper storage may reduce the effectiveness of your protective gloves and increase your risk of death, burns, injuries, diseases, and illnesses.

Storage Limitations

Prolonged exposure to direct light, especially sunlight, can degrade the performance properties of materials used in your protective gloves.

The presence of moisture in your protective gloves can promote the growth of mildew, fungus, bacteria, or other harmful microorganisms that cause skin irritation, rashes, diseases, or illnesses, and may also reduce the performance properties of your protective gloves. It is important to keep your protective gloves away from contact with potential contaminants, including but not limited to oils, solvents, acids, or alkalis. These substances can also create health hazards for wearing protective gloves and reduce the performance properties of your protective gloves.

Your protective gloves must not be stored at temperatures below –32°C (–25°F) or above 82°C (180°F). Prolonged storage of your protective gloves to temperature extremes can reduce the performance properties of your protective gloves.

Sharp objects, tools or other equipment can physically damage your protective gloves and reduce the performance properties of your gloves. If protective gloves must be stored or transported in environments where there are items that can potentially cause physical damage, use a protective case or bag to prevent damage.

WARNING

Do not store or transport your protective gloves in compartments or trunks with sharp objects, tools or other equipment that could damage your protective gloves. A damaged protective gloves can increase your risk of death, burns, injuries, diseases, and illnesses.

Recommended Storage Area and Conditions

Soiling and other substances on protective gloves can lead to increased exposure and cause contamination of personal items if not segregated from personal areas. If protective gloves must be transported or stored inside living quarters or within the passenger compartment of personal vehicles, the protective gloves must be placed in a protective case or bag to prevent cross-contamination.

Issued gloves items are not allowed in living quarters. Contaminated or soiled protective elements must not be transported in the cab of a fire department apparatus when not being worn for operational duties unless placed in an airtight protective case or bag to prevent cross contamination. If placed in a protective case or bag, the contaminated or wet protective gloves should be removed from such environments as soon as possible following transport.

When protective gloves items are being transported to a verified ISP or cleaning facility, use a plastic bag that is at least 2 mil (0.05 mm) thick that allows for ease of identification and ensures that items are not accidentally discarded.

Store your protective gloves in an area that is:

- Clean, dry and well ventilated
- Out of direct sunlight or not exposed to other sources of ultraviolet radiation (such as fluorescent lights)
- Not subject to temperature extremes
- Away from sharp objects, tools or other equipment that can physically damage gloves
- Free of potential contaminants

WARNING

Do not store your protective gloves inside living quarters or with personal belongings. Do not transport your protective gloves within the passenger compartment of personal vehicles. Failing to properly store and transport your protective gloves can expose you and others to toxic and carcinogenic contaminants and increase the risk to you and others of death, injuries, diseases, and illnesses.

Chapter 8

Retirement and Disposal

WARNING

Do not wear your protective gloves any longer than 10 years past the manufacture date on the gloves label. Do not wear your protective gloves at any time if it should be retired and replaced earlier than 10 years past the manufacture date on the gloves label. Failure to retire your protective gloves when needed may increase your risk of death, injuries, diseases, and illnesses.

Pursuant to OSHA regulations, your fire department or employer must determine whether your protective ensemble is ready for retirement and replacement. The actual service life of each protective element varies depending on the amount of use and how well it has been cleaned and maintained. NFPA 1850 (1851), 2025 Edition requires that you must retire your protective element if is older than 10 years past the date the gloves were manufactured.

Your protective gloves may require retirement earlier than the mandated 10 years. The service life of your gloves depends on many factors, including, but not limited to, how you and your fire department or employer use, care for and maintain your protective gloves. The frequency and conditions under which your protective gloves are used will further affect the service life of your gloves. The responsibility for deciding when to retire and replacing your protective gloves rests with your fire department or employer.

This decision must be made by trained personnel working under the direct supervision of your fire department or employer.

Methods to Determine Need for Retirement

According to NFPA 1850 (1851), 2026 edition, your organization or employer must develop specific criteria for the removal of firefighting protective elements, which include, but are not limited to, issues that are specific to gloves that you are using, the manufacturer's instructions and your organization's experience with the respective elements.

Your protective element must be retired if:

- Your organization or employer determines that the protective element is worn or damaged to the extent that your organization or employer is unable to or it is not cost effective to provide appropriate repairs.
- The protective element was not in compliance with the 2025 edition of the NFPA 1970 (1971) or past editions of NFPA 1971 when it was manufactured.
- Your organization or employer determines that the protective element is contaminated to the extent that your organization or employer is unable to or it is not cost effective to provide appropriate decontamination.
- Your protective element has been contaminated by CBRN terrorism agents.
- Your protective element is more than 10 years old based upon manufacture date on the label.

DANGER

Retire your protective gloves immediately if it has been contaminated by chemical, biological, radiological, or nuclear (CBRN) terrorism agents after any confirmed exposure. Failure to do so will increase your risk of death, burns, injuries, diseases, and illnesses.

Acceptable Methods of Glove Disposal

If retired, your protective element must be destroyed or disposed of in a manner that ensures that the element cannot be used in any firefighting or emergency activities, including live fire training. Acceptable methods of disposal include, but are not limited to, cutting the clothing in pieces or stapling the clothing together in a way the staples cannot be removed and the clothing cannot be worn.

If your protective element has been retired and your organization or employer determines that the protective element is not contaminated, defective or damaged, the protective element may be used in training that DOES NOT INVOLVE LIVE FIRE provided that your organization or employer clearly marks on the protective element that it is for training only and not for use in live fires.

DANGER

Retired protective gloves that are not suitable for firefighting and emergency activities. Do not use any protective gloves that have been retired for any firefighting or emergency activity. Doing so increases your risk of death, burns, injuries, diseases, and illnesses.

Chapter 9

Special Incident Exposures

NOTE: If you are involved in firefighting or other emergency activity where serious firefighter injuries or fatalities occur, contact your supervisor to determine the disposition of your protective clothing and equipment, including your protective gloves, before using these items following the incident.

Your organization or employer must have procedures in place for handling and maintaining the custody of protective elements that are directly related to serious firefighter injuries or fatalities that include at least the following:

- Immediate removal from service and preservation of the protective element(s) involved.
- Custody of the protective element(s) involved in a secure location with controlled, documented access.
- Non-destructive tagging and storage of protective element(s) in paper or cardboard containers (plastic containers must not be used).
- Examination of protective element(s) by qualified members of your organization or employer, the gloves manufacturer or outside experts.

Your fire department or employer must set a specific time period for how long the protective elements, including protective gloves, must be retained.

Chapter 10

Other Information

Warranty

Your protective ensemble, including your protective gloves, is warranted by the manufacturer to be free from defects in material and workmanship. This warranty does not cover normal wear or unusual exposures. This warranty is in lieu of all other warranties, expressed or implied, including, but not limited to, implied warranties of marketability and/or fitness for a particular use. Repair or replacement for breach of this warranty shall be the exclusive remedy available. The manufacturer shall not be liable for incidental or consequential damages.

Replacement Guides

Keep this Official User Information Guide in a safe place and refer to it regularly. Replacement guides for your protective garments may be obtained from the manufacturer. Contact the manufacturer if you lose this guide.

You can also obtain a User Guide online by going to https://www.femsa.org/uig/categories/view/?id=3

Keyword: **1970gloves**

Text Keyword to: **63975**

Contact Information

The manufacturer contact information is provided on the protective gloves label. If you need further information to reach a manufacturer, contact the Fire and Emergency Manufacturers and Services Association, Inc. (FEMSA) online at info@femsa.org.

References

NFPA Standards. NFPA standards may be obtained from the National Fire Protection Association (NFPA), 1 Batterymarch Park, Quincy, MA 02269 (800-344-3555 or 617-770-3000); standards may also be ordered on line at www.nfpa.org. Below is a sample of some, but not all, available NFPA standards:

- NFPA 1550, Standard on Standard for Emergency Responder Health and Safety
- NFPA 1581, Standard on Fire Department Infection Control Program
- NFPA 1850, Standard on Selection, Care, and Maintenance of Protective Ensembles for Structural and Proximity Firefighting and Open-Circuit Self-Contained Breathing Apparatus (SCBA)
- NFPA 1851, Standard on Selection, Care, and Maintenance of Protective Ensembles for Structural Fire Fighting and Proximity Fire Fighting [consolidated into NFPA 1850]
- NFPA 1891, Standard on Standard on Selection, Care, and Maintenance of Hazardous Materials, CBRN, and Emergency Medical Operations Clothing and Equipment
- NFPA 1950, Standard on Personal Protective Equipment for Technical Rescue Incidents, Emergency Medical Operations, and Wildland and Urban Interface Firefighting
- NFPA 1951, Standard on Protective Ensembles for Technical Rescue Incidents [consolidated into NFPA 1950]
- NFPA 1970, Standard on Protective Ensembles for Structural and Proximity Firefighting, Work Apparel, Open-Circuit Self-Contained Breathing Apparatus (SCBA) for Emergency Services, and Personal Alert Safety Systems (PASS)
- NFPA 1971, Standard on Protective Ensembles for Structural and Proximity Fire Fighting
- NFPA 1977, Standard on Protective Clothing and Equipment for Wildland Fire Fighting and Urban Interface Fire Fighting [consolidated into NFPA 1950]
- NFPA 1990, Standard on Protective Ensembles for Hazardous Materials and CBRN Operations
- NFPA 1999, Standard on Protective Clothing for Emergency Medical Operations [consolidated into NFPA 1950]

Federal Regulations. Copies of Federal regulations may be obtained from the U.S. Government Printing Office, Washington, DC 20402 (202-512-0000). Free copies of government regulations may be obtained on line at www.gpoaccess.gov

- Title 29, Code of Federal Regulations, Section 1910.120, “Hazardous Waste Operations and Emergency Response”
- Title 29, Code of Federal Regulations, Subpart I — Personal Protective Equipment, Sections 1910.132 through 1910.140
- Title 29, Code of Federal Regulations, Section 1910.156, “Fire Brigades”
- Title 29, Code of Federal Regulations, Section 1910.1030, “Bloodborne Pathogens”

Glossary

Accessories/Accessory. An item or items that could be attached to a certified product, but are not necessary for the certified product to meet the requirements of the standard.

Advanced Cleaning. See definition of Cleaning.

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

Carcinogen/Carcinogenic. A cancer-causing substance which is identified in one of several published lists, including, but not limited to, those prepared by the U.S. National Toxicology Program, the International Agency for Research on Cancer (IARC), the National institute for Occupational Safety and Health (NIOSH) and the American Conference of Governmental Industrial Hygienists (ACGIH).

Care. Cleaning and storage of protective clothing and equipment.

CBRN. An abbreviation for chemicals, biological agents and radiological particulate hazards. (See also CBRN Terrorism Agents)

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 a specific standard(s), authorizes the manufacturer to use a label on listed products that comply with the requirements of that standard(s) 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 that standard(s).

Char. The formation of a brittle residue when material is exposed to thermal energy.

Cleaning. The act of removing soils and contamination from ensembles and ensemble elements by mechanical, chemical, thermal, or combined processes.

Advanced Cleaning. The act of removing both soiling and contamination generally associated with products of combustion.

Specialized Cleaning. The act of removing hazardous materials, soiling associated with body fluids, or other forms of contamination.

Cleaning Facility. An entity, location, or site engaged in the cleaning of ensemble elements that includes an element manufacturer verified in cleaning, a verified cleaner, a verified organization or a verified ISP.

Contamination. The accumulation of products of combustion and other hazardous materials on or in an ensemble element that includes carcinogenic, toxic, corrosive, or allergy-causing chemicals, body fluids, infectious microorganisms, or CBRN terrorism agents.

Cross Contamination. The transfer of contamination from one item to another or to the environment.

Decontamination. The act of removing contamination from or neutralizing contamination in protective clothing and equipment.

Disinfectant. A type of antimicrobial agent that destroys or irreversibly inactivates fungi and bacteria, but not necessarily their spores, on inanimate surfaces and objects.

Elements. See definition of Ensemble Elements.

Emergency Medical Operations. Delivery of emergency patient care, including patient transportation when provided, prior to arrival at a hospital or other health care facility. Patient care includes, but is not limited to, first aid, cardiopulmonary resuscitation, basic life support, and advanced life support.

Ensemble. See Structural Fire Fighting Protective Ensemble and Proximity Fire Fighting Protective Ensemble.

Ensemble Elements. The compliant products that provide protection to the upper and lower torso, arms, legs, head, hands, and feet..

Entry Fire Fighting. Extraordinarily specialized fire fighting operations that can include the activities of rescue, fire suppression and property conservation at incidents involving fires producing extreme levels of radiant, conductive and convective heat. NOTE: Neither Structural fire fighting nor Proximity fire fighting is Entry fire fighting.

Fit. The quality, state and manner in which clothing and equipment, when worn, relate to the human body.

Flame Resistance. (Protective Clothing and Equipment).The property of a material whereby combustion is prevented, terminated or inhibited following the application of a flaming or nonflaming source of ignition, with or without subsequent removal of the ignition source.

Functional. The ability of an element or component of an element to continue to be utilized for its intended purpose.

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

Hazardous Materials. A substance (solid, liquid or gas) that when released is capable of creating harm to people, the environment and property. Hazardous materials are any solid, particulate, liquid, gas, aerosol, or mixture thereof that can cause harm to the human body through

respiration, ingestion, skin absorption, injection, or contact.

Hazardous Materials Emergencies. Incidents involving the release or potential release of hazardous materials.

Independent Service Provider (ISP). An independent third party utilized by an organization to perform advanced cleaning, advanced inspection, and repair services. In order to comply with NFPA 1851, an ISP must be verified. See also Verified Independent Service Provider (ISP).

Integrity. The ability of an ensemble or element to remain intact and provide continued minimum performance.

Interface Area. An area of the body where the protective garments, helmet, gloves, footwear, or SCBA facepiece meet. Interface areas include, but are not limited to: the coat/helmet/SCBA facepiece area, the coat/trouser area, the coat/glove area, and the trouser/footwear area.

Maintenance. The inspection, service and repair of protective clothing and equipment including the determination for removal from service.

Manufacturer. The entity that directs and 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.

Manufacturer-Trained Organization. A non-verified organization trained by an element manufacturer of the same element type to conduct any one or a combination of advanced cleaning, advanced inspection, and basic repair on the organization's elements.

Melt. A response to heat by a material resulting in evidence of flowing or dripping.

NFPA. National Fire Protection Association.

Organization. The entity that provides the direct management and supervision for the emergency services personnel. See also Manufacturer-Trained Organization and Verified Organization.

OSHA. The United States Occupational Safety and Health Administration.

Particulates. Finely divided solid matter that is dispersed in air.

Preliminary Exposure Reduction. Techniques for reducing soiling and contamination levels on the exterior of the ensemble or ensemble elements following incident operations.

Products of Combustion. The end product when fuels, such as hydrocarbons and materials, remain after the process of combustion in a fire.

Proximity Fire Fighting. Specialized fire fighting operations that can include the activities of rescue, fire suppression and property conservation at incidents involving fires producing high levels of radiant heat as well as conductive and convective heat.

Retirement. The process of permanently removing an element from emergency operations service in the organization.

Sanitizer. A type of antimicrobial agent that is used to reduce, but not necessarily eliminate, microorganisms from the inanimate environment to levels considered safe as determined by public health regulations.

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

Selection. The process of determining what protective clothing and equipment (PCE) is necessary for protection of fire and emergency services response personnel from an anticipated specific hazard or other activity, the procurement of the appropriate PCE and the choice of the proper PCE for a specific hazard or activity at an emergency incident.

Separate/Separation. A material response evidenced by splitting or delaminating.

Service Life. The period for which compliant product may be useful before retirement.

Soiling. The accumulation of sweat, dust, dirt, debris, and other nonhazardous materials on or in an ensemble or ensemble element that could degrade its performance or cause hygiene issues.

Specialized Cleaning. See definition of Cleaning.

Structural Fire Fighting. The activities of rescue, fire suppression and property conservation in buildings, enclosed structures, vehicles, marine vessels, or like properties that are involved in a fire or emergency situation.

Universal Precautions. An approach to infection control in which human blood and certain human body fluids are treated as if known to be infectious for HIV, HBV and other bloodborne pathogens. Under circumstances in which differentiation between body fluids is difficult or impossible, all body fluids shall be considered potentially infectious materials.

Verified Cleaner. An independent cleaning service verified by a third-party certification organization to conduct advanced cleaning and sanitization.

Verified Independent Service Provider (ISP). An independent service provider verified by a third-party certification organization to conduct advanced inspection, advanced cleaning and sanitization, basic repair, and advanced repair service.

Verified Organization. An organization verified by a third-party certification organization to conduct any one or a combination of advanced cleaning, advanced inspection, basic repair, and advanced repair on any organization's elements.

Notes

PERSONAL RESPONSIBILITY CODE

DANGER

The member companies of FEMSA that provide emergency response equipment and services want responders to know and understand the following:

1. Firefighting and Emergency Response are inherently dangerous activities requiring proper training in their hazards and the use of extreme caution at all times.
2. It is your responsibility to read and understand any user's instructions, including purpose and limitations, provided with any piece of equipment you may be called on to use.
3. It is your responsibility to know that you have been properly trained in Firefighting and/or Emergency Response and in the use, precautions and care of any equipment you may be called upon to use.
4. It is your responsibility to be in proper physical condition and to maintain the personal skill level required to operate any equipment you may be called upon to use.
5. It is your responsibility to know that your equipment is in operable condition, fits properly, and has been maintained in accordance with the manufacturer's instructions.
6. Failure to follow these guidelines may result in death, burns, injury, diseases, and illnesses.

FEMSA

www.femsa.org

COPY OF PRODUCT LABEL

DANGER

DO NOT USE THESE PROTECTIVE GLOVES IF YOU HAVE NOT READ AND UNDERSTOOD THE ENTIRE *FEMSA OFFICIAL USER INFORMATION GUIDE* AND ALL LABELS FOR FIREFIGHTING PROTECTIVE GLOVES!

Firefighting and other emergency activities where these protective gloves may be used are ULTRAHAZARDOUS, UNAVOIDABLY DANGEROUS activities. Neither these gloves nor any other will protect you from all burns, injuries, diseases, illnesses, conditions, or hazards, any of which may cause death. No protective gloves can replace proper training and constant practice in firefighting/emergency activity tactics and safety. Consistent with OSHA regulations, you, your department or employer must conduct a hazard assessment and determine if these gloves provide an acceptable level of protection for your operations in firefighting or any emergency activity.

- You will increase your risk of DEATH, BURNS, INJURIES, DISEASES OR ILLNESSES if you do not strictly comply with the entire FEMSA OFFICIAL USER INFORMATION GUIDE and all LABELS. These consequences may occur with NO WARNING and NO SIGN of damage to these gloves.
- Wearing these or any protective gloves may increase your risk of heat stress which may cause heart attack, stroke, dehydration, or other conditions resulting in DEATH, INJURIES OR ILLNESSES.
- You may NOT feel heat under these gloves before suffering a BURN, even when contacting a hot surface. These gloves will lower your ability to feel heat and you may be burned underneath the gloves with NO warning and NO sign of damage to the gloves. Be constantly alert to the possibility of exposure to heat and other hazards.
- Do NOT use these gloves if they are soiled, contaminated, damaged, worn out, or altered from their original condition. Do NOT use these gloves unless they have been properly inspected and maintained by your fire department or employer consistently with the edition of NFPA 1850.
- Wear these gloves ONLY with all layers and components in place and ONLY with all glove closures secured (if appropriate). These gloves may include special features or be part of an overall ensemble of clothing and equipment. You MUST properly deploy all features and wear ALL ensemble components consistent with the specific manufacturer instructions.
- These gloves are NOT warranted to be fit for a particular purpose. Read carefully the “Warranty Information” in the FEMSA OFFICIAL USER INFORMATION GUIDE.

If you do not have a FEMSA OFFICIAL USER INFORMATION GUIDE, contact the manufacturer.

FEMSA

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