

FEMSA OFFICIAL USER INFORMATION GUIDE

PROTECTIVE GARMENTS FOR EMERGENCY MEDICAL OPERATIONS

DANGER

- *Do not use your Protective Garment until you have read and understood all labels and this Official User Information Guide.*
- *Only end user shall separate this guide from the element. Remove guide from the element prior to using the element for emergency operations.*

Fire and Emergency Manufacturers
and Services Association, Inc.

www.femsa.org



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Read this guide and all labels before using your protective garments. Review this guide on a regular basis.

FEMSA acknowledges with thanks the input of the fire service in developing, reviewing and refining this work (especially the fine work of CAFER, NAFER, SAFER & FIERO on their “*PPE Care & Use Guidelines*”).
#EMO200BG

FEMSA Official User Information Guide

**Protective Garments
For Emergency Medical Operations**

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Chapter 1: Introduction



Do not use your protective clothing or equipment until you have been thoroughly trained by your EMS department or employer in emergency medical procedures, safety procedures and the proper use of your protective clothing and equipment.

Providing emergency medical operations is an **ultra hazardous, unavoidably dangerous** activity. To reduce your risk of death, blood borne pathogen infection, injuries, diseases and illnesses, you must carefully read and strictly follow this **entire** Official User Information Guide and all labels on your protective clothing and equipment.

When engaging in emergency operations, you are constantly at risk of death, blood borne pathogen infections, burns, injuries, diseases, and illnesses. There is no such thing as a “routine” or “ordinary” emergency operation. While use of safety equipment such as protective clothing can reduce your risk of death, blood borne pathogen infections, injuries, diseases or illnesses, it will not make emergency operations completely safe. Even with the use of your protective clothing and equipment, emergency operations will be **unavoidably dangerous**.

How to Reduce Your Risk

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

- Proper training and constant practice in emergency medical tactics and safety;
- Proper selection, maintenance and use of safety equipment;
- Exercising extreme caution at all times. Your protective clothing and equipment will not make you completely safe from death, blood borne pathogen infections, burns, injuries, diseases or illnesses;
- Use of “Universal Precautions”;
- A thorough knowledge of the design, performance and use limitations of NFPA 1500, NFPA 1581, NFPA 1999, OSHA 29 CFR 1910.132 and 1910.1030. You must be knowledgeable of the content of these publications.

Training by Your Fire Department or Employer

This Guide will not discuss tactics and safety procedures. Proper training and constant practice in tactics and safety procedures must be provided by your department or employer consistent with its knowledge and basic approach to emergency operations.

Your department or employer is in the best position to know and respond to the dangers presented by any emergency operation. Accordingly, the type of safety gear (including protective ensemble) to be used and how it is used must be decided by your department or employer at each and every scene or emergency medical operation.




This Guide will tell you how to maintain and wear elements of your protective ensemble. It will also tell you about the limitations of protection given by your protective ensemble. No protective ensemble or any other safety equipment will protect you from all blood born pathogen infections, injuries, diseases, conditions or hazards.

To reduce - but not eliminate - your risk of death, blood borne pathogen infections, injuries, diseases or illnesses, you must carefully read, fully understand and strictly follow this entire Guide and all labels on your protective ensemble, the NFPA standards and OSHA regulations. All of the information contained in this Guide and on the labels in your protective ensemble deals directly with your life and safety.

But remember: even with the best protective ensemble, safety procedures and training, during emergency medical operations, you are constantly at risk of death, blood borne pathogen infections, burns, injuries, diseases and illnesses.

Chapter 2: Signal Words and Definitions

No one section of this Guide is more important than another. Within each section, however, warnings will be given. “Signal words” will be used to attract your attention to selected warnings as follows:

Danger	Warning	Caution
This indicates a situation which, if not avoided, could result in death or serious injury.	This indicates a hazardous situation which, if not avoided, could result in death or serious injury.	This indicates a hazardous situation which, if not avoided, could result in minor or moderate injury.
This red and red border represents Safety Red 	This grey and grey border represents Safety Orange 	This white and black border represents Safety Yellow 

Certain terms used in the Guide may be unfamiliar. This Guide has made an attempt to be consistent with NFPA and OSHA definitions. Please refer to NFPA 1999 for additional definitions.

Burn Curve: Burns are a function of time and amount of heat transferred to the body. You can be burned in relatively low temperature environments if you are exposed for a long enough period of time. Similarly, you can be burned over a very short period of time if you are exposed to relatively high temperatures. It is theoretically possible to plot out the times at which different amounts of heat will cause human skin to burn. This plot or graph is called the “burn curve”.

Barrier Layer: The layer of garment material, glove material, or face protection device material designated as providing biopenetration resistance.

Biological Agents: Biological materials that are capable of causing an acute disease or long term damage to the human body.

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

CAFER: Central Area Fire Equipment Research, Aubery, Ca. Telephone: 209-385-6891.

Element(s): Items that comprise emergency medical protective clothing including garments, gloves, and face protection devices.

Emergency Medical Operations: Delivery of emergency patient care and transportation prior to arrival at a hospital or other health care facility.

Emergency Medical Protective Clothing: Multiple elements including garments, gloves, and face protection devices designed for the purpose of isolating parts of the wearer’s body from contact with liquid-borne pathogens during delivery of emergency patient care and other emergency medical operations.

FEMSA: Fire and Emergency Manufacturers and Services Association, Inc., Lynnfield, MA. Telephone: 781-334-2771.

FIERO: Fire Industry Equipment Research Organization, Acworth, GA. Telephone: 404-974-1152.

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

Footwear: An element of the protective ensemble designed to provide minimum protection to the foot, ankle and lower leg.

Garment(s): The coat, trouser, or coverall elements of the protective ensemble designed to provide minimum protection to the upper and lower torso, arms, and legs, excluding the head, hands, and feet.

Gloves: An element of the protective ensemble designed to provide minimum protection to the fingers, thumb, hand, and wrist.

HBV: Hepatitis B Virus.

HIV: Human Immunodeficiency Virus (causes AIDS or Acquired Immune Deficiency Syndrome).

Hazardous Chemical: Any solid, liquid, gas, or mixture thereof that can potentially cause harm to the human body through respiration, ingestion, skin absorption, or contact.

Heat: Energy (usually measured in calories, BTUs or joules) that flows from one body to another because of a temperature difference between them.

Heat Flux: The rate of transfer of heat energy through a medium.

Heat Stress: 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 or injuries.

Liquid-Borne Pathogen: An infectious micro-organism contained within a body fluid or liquid.

NAFER: Northern Area Fire Equipment Research, Redwood City, CA. Telephone: 650-286-3350.

NFPA: The National Fire Protection Association, Quincy, MA. Telephone: 617-770-3000.

OSHA: The Occupational Safety and Health Administration of the U.S. Department of Labor, Washington, D.C. Telephone: 202-401-0721.

PPE Care & Use Guideline: A precursor document from NAFER, CAFER, SAFER & FIERO. This document is highly recommended as further background (please see definitions of NAFER, CAFER, SAFER & FIERO for contact phone numbers).

Protective Ensemble or Equipment: Multiple elements of clothing and equipment designed to provide a degree of protection for emergency responders from adverse exposures to the inherent risks of emergency medical operations. The elements of the protective ensemble may include coats, trousers, coveralls, earflaps, faceshield, gloves, aprons, sleeve protectors and shoe covers.

Radiant Heat: Energy transferred by radiation. Examples: getting a sunburn or cooking meat in a broiler or energy felt while near a large fire.

Radiological Agents: Radiation associated with X-rays, alpha, and gamma emissions from radioactive isotopes, or other material in excess of normal radiation background levels.

SAFER: Southern Area Fire Equipment Research, San Diego, CA. Telephone: 619-523-2911.

Single Use Element: Elements that are designed to be used one time and then disposed of in accordance with applicable local, state, and federal guidelines.

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

Chapter 3: Intended Use of Protective Ensemble Elements

The Occupational Safety and Health Administration (OSHA) of the U.S. Department of Labor places the responsibility for selection, approval, maintenance, inspection and training in the proper use and limitations of safety gear on your department or employer. (*Code of Federal Regulations Volume 29, Section 1910.132*). By doing this, OSHA is recognizing a simple truth: how you use your protective clothing is beyond the manufacturer's control. Your department or employer controls the circumstances under which the protective ensemble will be used and is in the better position to assess the hazards at the emergency scene and to direct the appropriate selection and use of safety equipment including protective ensembles.

Consistent with the OSHA regulations, your protective ensemble is offered for your department (paid or volunteer) or employer to evaluate and decide for itself whether or not the protective ensemble will provide an acceptable level of protection for any particular emergency operation. It is recommended that your department or employer conduct its own testing, evaluation and training in conjunction with qualified safety experts before issuing protective ensemble elements for use by its members. Whether to use a protective ensemble in a particular incident, whether to enter a particular situation, whether to remain in a particular situation, and similar decisions are matters to be decided by your department or employer at the scene on a case by case basis.

Since, obviously, the manufacturer of your protective ensemble element cannot know in advance all of the many conditions existing at each scene, the appropriate use of your protective ensemble and its suitability for that use must be decided by your department or employer at each and every scene. The manufacturer makes no guarantees or warranties, express or implied, that your protective ensemble is fit for a particular purpose. (See Warranty Information on inside back cover).

Your protective ensemble must be used only under the direct supervision of your department or employer in a manner consistent with NFPA 1500, (*Standard on Fire Department Occupational Safety & Health Program*) and 29 CFR 1910.132 referenced earlier.

Protection from Blood (Liquid) Borne Pathogens

The National Fire Protection Association (NFPA) Technical Committee on Fire Service Protective Clothing and Equipment wrote NFPA 1999, *Standard on Protective Clothing for Emergency Medical Operations*, to provide comprehensive design and performance requirements for protective garments, gloves, and facewear worn by emergency responders who may be exposed to bloodborne pathogens. It is intended to establish a minimum level of protection to help prevent blood and other potentially infectious fluids from reaching the responder's skin or underclothing.

The purpose of NFPA 1999 is entirely consistent with the Occupational Safety and Health Administration (OSHA) *Final Rule on Occupational Exposure to Bloodborne Pathogens* (29 CFR 1910.1030) which establishes regulations for the protection of health care workers from HIV, Hepatitis, and other infectious diseases. OSHA has defined health care workers to include fire fighters, emergency medical technicians, and other first responders who, in the course of their duties, can be reasonably expected to come in contact with blood and other potentially infectious fluids (OSHA Publication 3130, 1992). Under the OSHA standard, employers are required to provide "appropriate" protective clothing and equipment for their workers. Appropriate protective clothing is further defined as clothing which prevents blood and other potentially infectious liquids from passing through onto the wearer's skin or underclothing under normal conditions of use and for the duration of time which the protective clothing will be used. Clearly, OSHA has determined that there is always risk where bloodborne pathogen exposure may be possible and intends that some form of protective clothing be worn.

NFPA 1999 includes several requirements for protective clothing which define minimum performance in several key clothing areas. Foremost among these are tests for material viral penetration resistance and overall clothing integrity which establish the barrier characteristics of protective products. These requirements were developed to address end user concerns identified in an industry survey and were supported by a U.S. Fire Administration Research Study (*Contract EMW-90-C-3346 Final Report, 1992*). The viral penetration test used in NFPA 1999 was adopted by the American Society for Testing and Materials (ASTM F 1671) and is the same method which the U.S. Food and Drug Administration requires in its review of medical product claims for determining barrier effectiveness and has been recommended by the Association for the Advancement of Medical Instrumentation in its Technical Information Report (No. 11-1994) on "*Selection of Surgical Gowns and Drapes in Health Care Facilities*".

Use of NFPA 1999 reduces the risks of exposure to the emergency responder by specifying clothing performance which is commensurate with the protection needed in the pre-hospital area. As OSHA requires, NFPA 1999-compliant clothing is designed to prevent blood or other body fluid contact with the wearer's skin. It is not enough to be wearing protective clothing since clothing materials and designs may not adequately provide a barrier or that barrier may become easily damaged in use.

Until NFPA 1999 was developed, there were no comprehensive standards which assisted the emergency responder in his or her choice of protective clothing. OSHA 1910.1030 recognizes that protective clothing should be selected on the basis of expected exposure conditions, but this standard is applied to a wide range of uses. NFPA 1999-defined levels of performance were set based on the emergency nature of pre-hospital care which involves potential physical hazards as well as bloodborne pathogen exposure. It is also likely that emergency responders may not always be able to control how intact their skin may be. As such, NFPA 1999 offers a consensus-based standard which can be applied for choosing the appropriate protective clothing that OSHA requires.

NFPA 1999-compliant protective clothing alone cannot prevent emergency responder exposure to bloodborne pathogens, but must be combined with a comprehensive infection control program which includes skin washing, use of disinfectants, proper disposal practices, and “universal precautions” to provide the highest level of protection. This approach has been further recognized in a related standard, NFPA 1581, *Standard on Fire Department Infection Control Program*.

NFPA Label

The NFPA label on your protective ensemble element states that your protective element is an emergency medical protective element. This does not mean that you cannot be seriously injured as long as you use the protective ensemble only for emergency medical operations. Even if you limit yourself to emergency medical operations, you are still at risk of death, liquid borne pathogen infections, burns, injuries, diseases and illnesses as described on the element’s label and in this Guide. As will be explained later, there is no such thing as a “routine” or “ordinary” scene, and you must realize that you are at risk at all times during emergency operations.

Your emergency medical protective ensemble alone may not provide protection for fire applications or for protection from chemical, radiological or all biological agents. If you use your protective ensemble for proximity, approach, or fire fighting applications, you will be at great risk of death, burns and other injuries. Similarly, your protective ensemble will not protect you from all of the diseases and illnesses caused by poisons, toxins, carcinogens, radioactivity, micro organisms, infectious body fluids, liquid borne pathogens and similar chemical, radiological and biological hazards routinely found at emergency scenes.

Chapter 4: Specific Safety Considerations

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 ensemble element, how you put it on and take it off and how well it fits, directly impact your life safety and well-being. While this chapter discusses certain specific safety considerations, it is equally important to read and heed the rest of this Guide to reduce your risk of death, liquid borne pathogen infections, burns, injuries, diseases and illnesses.



Your protective ensemble may not protect you from chemical, radiological or biological hazards which can cause death, injuries, diseases, and illnesses!

Biological, Chemical and Radiological Hazards:

Bloodborne pathogens, infectious body fluids, germs, poisons, toxins, carcinogens, radioactivity, etc.

Chemical, radiological and biological hazards (poisons, toxins, carcinogens, radioactivity, germs, infectious bodily fluids, bloodborne pathogens, etc.), if encountered by emergency personnel, are a matter of life and death. You are at risk of death, injuries, diseases and illnesses as a result of these hazards. As an emergency medical responder, 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 these hazards. This Guide does not address all of these hazards or how to protect yourself from them. This Guide 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). There are numerous federal, state and local environmental regulations and health codes on how to clean your protective elements and limit your exposure to these hazards.

Bloodborne pathogens are bacteria, viruses, germs and similar harmful substances carried in blood which can cause death, diseases and illnesses. The fact that this protective element is certified to NFPA 1999 does not mean that it will protect you under all circumstances from bloodborne pathogens. Even when wearing protective elements certified to NFPA 1999, you are still at risk of death, diseases and illnesses due to contact with such pathogens. The fact that your protective element may be water resistant does **not** mean that it will protect you from viruses, pathogens or chemicals. Your pathogen barrier will degrade over time, with use, and maintenance.

To learn more about bloodborne pathogens, you should read and understand OSHA's *Bloodborne Pathogen Standard* and its booklet entitled *Occupational Exposures to Bloodborne Pathogens: Precautions for Emergency Responders*. Similar publications exist for chemical, toxic, radiological and other biological hazards.

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



Wearing your protective ensemble elements or any protective equipment 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:

A leading cause of fire fighter 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 equipment such as a protective ensemble (boots, gloves, garments, hoods or helmets) may increase your level of heat stress. Performing strenuous tasks in the heated environment of an emergency scene or in warm and/or humid weather may also increase your heat stress. Heat stress is a leading cause of death and a cause of serious illness and injury among emergency personnel.

To reduce your risk of heat stress, you must

- know your physical limitations. Consult your physician and be guided by his advice;
- be in top physical condition;
- make sure your protective ensemble and equipment fit properly to allow adequate freedom of movement;
- choose protective garments which offer a high level of breathability as demonstrated in total heat lost measurements;
- avoid undue exertion and/or prolonged exposure to heated environments;
- recognize and be constantly alert for signs of heat stress. Some signs of heat stress may be rapid heart rate, labored breathing, weakness, excessive sweating. 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.

Burns:

The constant threat regardless of conditions



Your protective ensemble may not have been manufactured from heat or flame resistant materials. NFPA 1999 does not require performance to heat or flame resistant tests. Your protective ensemble may burn and it may melt.

Your protective ensemble may or may not have been manufactured from heat or flame resistant materials. NFPA does not require performance to heat or flame resistant tests. Your protective ensemble may burn and it may melt causing severe injuries if contacted by heat or flame.

Your protective ensemble will not protect you from burns and injuries. There are limits to the protection given by your protective ensemble. Though your protective ensemble may reduce your risk of burns or injuries, because it may be heat and flame resistant, 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 long enough. Similarly, you can be burned over a very short period of time if your protective ensemble is exposed to relatively high temperatures. The times at which different amounts of heat will cause human skin to burn have been plotted by scientists on what is called the “burn curve”. Whether or not your skin ever reaches the “burn curve” will be a function of the many variables discussed below.



Your emergency medical protective element may be part of another protective system used for other purposes. Unless your emergency medical protective element is also a heat and flame resistant protective element, it should never be used in a high heat or flame environment.

Miscellaneous Hazards and Warnings:

Emergency medical personnel operate in **unavoidably dangerous, ultra hazardous** surroundings. The numbers and types of hazards confronted at emergency scenes are limitless and constantly changing. It is impossible to list all types of hazards which you will confront. You must exercise extreme caution at all times to avoid hazards. **But**, even extreme caution, the best possible safety equipment, and the best training and safety procedures will not eliminate your risk of death, liquid borne pathogen

infections, burns, injuries, diseases and illnesses. Emergency operations remain **unavoidably dangerous, ultra hazardous** activities.

There is no such thing as a “routine” or “ordinary” emergency

You can be seriously injured underneath your protective ensemble even though emergency scene conditions may not appear to be extreme.

Wetness

Getting your protective ensemble wet can, under certain circumstances, increase your risk of injury.

Wet, dirty and/or contaminated protective elements can be a breeding ground for germs, bacteria, fungus and other harmful substances that can cause disease and illness. Your protective ensemble elements must be kept as dry and clean as possible in order to reduce the risk of fungus, infections, diseases, and illnesses.

Reuse

Some protective elements certified to NFPA 1999 are labeled as and intended for a single use only. These elements may in some physical environments breakdown before a “normal” single use is complete.



Your protective ensemble wet or dry may not protect you from electrical shock!

Electricity

If your protective ensemble comes in contact with a source of electricity, you may be killed, burned or injured due to electrocution. Even if your protective ensemble is dry, clean and properly maintained, you may be electrocuted. Water and other fluids conduct electricity. Wet, dirty and/or contaminated protective clothing may increase your risk of death, burns and injuries due to electrocution.

No such person as “ordinary” emergency responder

Just as there is no such thing as a “routine” or “ordinary” emergency, there is also no such thing as an “ordinary” emergency responder. **Each person reacts differently to pain, excitement, adrenaline rush and danger.**

Wear, tear, dirt and contamination

If your protective ensemble element becomes even slightly torn, worn, cracked or abraded, do not use it. Tears, worn or abraded spots will greatly decrease your protective ensemble’s protective qualities and will increase your risk of death, burns, liquid borne pathogen infections, injuries, diseases and illnesses. Your department or employer should regularly inspect your protective ensemble for signs of wear and tear as well as to make sure 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, liquid borne pathogen infections, burns, injuries, diseases and illnesses.



Do not use your protective ensemble element if it is torn, worn, cracked, abraded or altered from its original condition. Such use may result in death, liquid born pathogen infections, burns, injuries, diseases or illnesses!



Do not use your protective ensemble element if it is soiled or contaminated. Such use may result in death, liquid borne pathogen infections, burns, injuries, diseases and illnesses!

Soiled or contaminated elements

If your protective element becomes even slightly dirty or even slightly contaminated, do not use it. Dirt or contaminants will reduce your protective element's protective qualities and will increase your risk of death, liquid borne pathogen infections, burns, injuries, diseases and illnesses. Your protective element must be cleaned in strict compliance with this Guide, manufacturer's instructions, and all federal, state and local government environmental regulations and health codes. Chlorine bleach may reduce the strength of your protective element and must not be used to clean your protective element unless its use is suggested by the manufacturer. If you are unsure whether or not your protective element is free of contaminant, or dirt, do not use it. Do not use elements that are not thoroughly cleaned and dry. **Clean protective ensemble elements are a matter of life and death!**



Your protective ensemble must fit properly and interface with your other safety equipment so that the protective layers overlap in all body positions. Any gaps in your protective layers may result in death, liquid borne pathogen infections, burns, injuries, diseases or illnesses!

Sizing, fit and adjustment

Before each use of your protective ensemble, make sure that it is sized, fits and adjusted properly. Alternatively, be sure to select the right size of the protective element of the sizes available from the manufacturer. Your protective ensemble is made to fit you so that it will not be restrictive against your body and will not unduly restrict your movement (see "heat stress"). Your protective elements should fit together and 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.

Consult your 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, liquid borne pathogen infections, burns, injuries, diseases and illnesses. **Only use protective elements that fit properly. Never borrow or loan protective elements unless they properly fit the individual.**



Your protective ensemble is designed to be used as a unit. All elements, layers and accessories must be used. Failure to do so may result in death, liquid borne pathogen infections, burns, injuries, diseases or illnesses!

Components and layers

Most emergency medical protective garments will have one or more layers which are principally responsible for barrier performance of the garment. The condition of this layer, also known as the barrier layer, is critical to the overall performance of the garment in preventing the penetration of liquids which may contain bloodborne pathogens. This layer should be carefully inspected on a periodic basis. In some cases, it may be difficult to inspect this layer and you must rely on other tests to determine if the layer is properly functioning as a barrier (see first bullet on page 4-6). 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., provided by the manufacturer. Your protective elements must be used as a unit. Never use your protective ensemble without all layers and components provided by the manufacturer being in place. All components or layers of the protective ensemble elements (patches, inserts, etc.) must be used together. Failure to do so may result in death, liquid borne pathogen infections, injuries, diseases and illnesses!



All closures and components on your protective ensemble (flaps, buttons, hooks, collars, etc.) must be fastened and in place when the protective ensemble is in use. Failure to do so may result in death, liquid borne pathogen infections, burns, injuries, diseases and illnesses!

Closures

In order for your protective ensemble to reduce your risk of death, liquid borne pathogen infection, injuries, diseases and illnesses, you must fasten all closures (flap, buttons, hooks, collars, etc.) on your protective ensemble. Otherwise, there will be gaps in your protection. An unbuttoned coat may open up and expose you to body fluids or hazardous liquids. Failure to fasten all closures and utilize all components may result in death, liquid borne pathogen infections, injuries, diseases and illnesses!



Do not modify, change or alter your protective ensemble in any manner. Any changes to your protective ensemble may result in death, liquid borne pathogen infections, burns, injuries, diseases and illnesses!

Modifications, alterations and markings

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, liquid borne pathogen infection, injuries, diseases and illnesses. Do not modify, change, mark, paint or alter your protective elements without the manufacturer's written authorization. Any changes to your protective ensemble may result in death, liquid borne pathogen infection, injuries, diseases and illnesses!

Be especially cautious to any changes which will affect the barrier layer of the garment or other element. Do not attempt to puncture, sew, or attach items directly to the barrier layer unless in accordance with specific manufacturer instructions. Any alteration of the barrier layer can diminish or eliminate the barrier properties of the protective element.

Mounting, storing or affixing equipment or other items not approved by the manufacturer on your protective ensemble may affect its protective qualities and increase your risk of death, liquid borne pathogen infection, injuries, diseases and illnesses. Do not mount, store or affix any items on your protective ensemble which may degrade the protective qualities of the ensemble.

Below are listed some other - but by no means all - miscellaneous hazards you may confront.

- Before and after every use, each element of your protective ensemble must be inspected carefully for cleanliness, tears, cracks, holes, leakage, missing stitches, soft spots and any physical damage of any type. Protective gloves, garments, and footwear should be regularly tested in a similar manner as prescribed by the NFPA 1991 *Water Integrity Test*, using tap water. However, continued water resistance may not indicate continued viral and chemical resistance. If any condition indicating damage, degradation or weakening of the element's protective capabilities is detected -DO NOT USE THE ELEMENT.
- Your protective element will age. The usable service life of your equipment is dependent on the number, type, and degree of exposures, the work environment, frequency of use and maintenance of the element. **It is the responsibility of both you and your employer to determine when this garment should be taken out of service and to do so.** Any garment showing signs of damage, weakening or degradation of any protective quality required in NFPA 1999 should not be used.
- Some protective elements are intended and labeled for one use and must be disposed of in accordance with federal, state and local regulations following a single wearing. The conditions of a single wearing will vary with the organization and the particular circumstances of use. Evaluate the suitability of single use garments for each use.
- You must avoid cryogenics or liquefied gas exposure.
- You must avoid flammable vapor exposures.
- This garment may absorb hazardous and/or flammable vapors and/or liquids which may later ignite.
- Your protective garment can be penetrated by objects, especially sharp objects. All types of materials can be propelled by explosion, gravity or other means with sufficient force to penetrate your protective garment and cause death or injury.
- You must exercise extreme caution around bodies of water. Your protective ensemble will not float and will make swimming difficult.
- You must avoid collapses and falls. In the event an object falls on you, you will be at risk of death, burns, liquid borne pathogens infections, injuries diseases and illnesses. When on elevated surfaces, use appropriate fall protection devices.

- Sunlight, ultraviolet light, chlorine bleach, ozone, and other gases may weaken the protective qualities of your protective ensemble. Be particularly careful to avoid these hazards when you store your protective element between uses.
- Never use your protective elements in emergency operations unless you are at the peak of mental alertness and physical fitness. Do not engage in fire fighting or emergency operations while under the influence of drugs, alcohol or other conditions or factors that would impair your physical and mental abilities.
- Different areas of your protective elements may react to heat and other hazards in different ways. Depending on the different types of materials and construction used at different areas of your protective ensemble, one part of your body may have more or less protection than another part.
- 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, NFPA and OSHA standards). You must avoid exceeding these limitations at all times.**

Conclusion

The foregoing 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 an emergency responder you work in an ultra hazardous environment. Even using your protective ensemble, extreme caution, the best training and supervision, your emergency activities remain **unavoidably dangerous**.

Chapter 5: Donning and Doffing Your Protective Garments



WARNING

How you don and doff your protective garments will affect your life and safety. You must wear the protective ensemble properly in order for it to reduce your risk of death, liquid borne pathogen infections, injury, illness and disease. You must also exercise caution when you remove your protective ensemble to avoid contaminating yourself and others with hazardous substances!

Donning your protective trousers

- Slip on protective trousers and footwear so that all components or layers of each trouser cuff completely cover and overlap the upper part of each shoe or boot. Be sure that the overlap remains and no gap occurs in protection in any body position encountered during use.
- Sit and bend over to check and adjust for comfortable fit.
- Fasten fly and all covers leaving no openings or gaps. Fasten all snaps and other closures.
- Make sure that all components, layers, accessories and other items provided by the manufacturer are in place.

Donning your protective coat

- Slip on protective coat so that the coat front flap is properly aligned and fasten all closures so that the closure area is smooth with no openings or gaps.
- Place your coat collar in the fully extended, “up” position. Secure collar closure completely covering the collar opening and make sure there are no gaps in coverage.
- Make sure that all components, layers, accessories and other items provided by the manufacturer are in place.
- Make sure that all layers of your protective coat overlap all layers of your protective trousers by at least 2 inches in all body positions. (See NFPA Standard 1500 regarding garment overlap), which can be applied to NFPA 1999 garments. You may measure for adequate overlap by assuming the following body positions:

Position A - standing, hands together reaching overhead as high as possible.

Position B - standing, hands together reaching overhead and bending body at waist to the front, the sides and to the back as much as possible.

Donning your protective coveralls

- Slip on trouser portion as above
- Slip on coat portion as above

Doffing your protective garments

Doffing procedures vary depending on whether or not your protective garment has been contaminated during use.

Other protective elements

Donning and doffing of other protective elements should be accomplished as intended by the manufacturer. Special care must be exercised as in donning and doffing trousers and coats.

No contamination

- If not contaminated, remove your protective garments in reverse order from that described above for donning the protective garment.
- Inspect each item of protective ensemble for any damage or change in condition.
- If damage or change in condition is noted, bring this to the immediate attention of your fire department or employer. Such damage or change in condition must be corrected before you may use your protective element.
- If no damage or change is noted, store your protective garments as recommended in this Guide under “Storage”.
- If element is labeled and intended for a single use only, dispose of element as recommended in this Guide under “Retirement”.

Contaminated protective elements

Protective elements contaminated with blood, bodily fluids, toxins, radioactivity, chemicals, and hazardous materials must be handled using special procedures.



WARNING

Avoid unprotected bodily contact with contaminated areas of your protective garments. Avoid contact between contaminated protective garments and your personal belongings, your living quarters and/or interior spaces in buildings and vehicles. Such contact may increase your risk of death, injury, disease and illness!

- Avoid unprotected bodily contact with any contaminated area of your protective ensemble. (See NFPA Standard 1999 and 1581 for procedures and types of garments and equipment to be used in handling protective ensembles contaminated with biologically hazardous materials. See NFPA Standard 1993 for similar information concerning chemical hazards). Avoid spreading the contaminants from your protective elements to your personal belongings, your living quarters and/or interior spaces in building and vehicles.
- Place contaminated protective garments in a sealable, leak-proof, air tight bag.
- Dispose of in accordance with applicable federal, state and local laws.
- If a protective element is to be reused and is NOT intended and labeled a single use garment, it must be decontaminated in accordance with the instructions which follow before you or anyone may have unprotected bodily contact with it.

Note: See “*PPE Care & Use Guidelines*” for further discussion of donning and doffing issues. (From NAFER, CAFER, SAFER and FIERO: contact phone numbers are provided in “Signal Words and Definitions” section of this Guide).

Chapter 6: Cleaning Your Protective Equipment

WARNING

You must keep your protective equipment clean. If you do not keep your protective equipment clean, you will increase your risk of death, liquid borne pathogen infections, burns, injuries, diseases & illnesses!

You must keep your protective equipment clean. If you do not keep them clean, their protective qualities will be reduced. Failure to keep your protective ensemble clean will increase your risk of death, liquid borne pathogen infections, burns, injuries, diseases and illnesses.

Some emergency responders prefer the appearance of well-used, discolored, “salty” and/or dirty protective equipment as an indicator of their experience and status as veteran responders. These individuals are at **grave and unnecessary risk** of death, liquid borne pathogen infections, burns, injuries, illnesses and diseases. **You must keep your protective equipment clean and maintain them as set forth in their labels and this user information guide.** This is not merely a question of style, neat appearance and comfort, **it is a matter of life and death.**

You must clean your protective equipment thoroughly and keep it clean. Contaminants not removed from your protective equipment may present health hazards, shorten the protective equipment’s effective life and/or reduce its protective qualities. If you are unsure whether or not your protective equipment has been thoroughly cleaned, do not use it.

Soiled protective equipment may expose wearer to infectious bodily fluids, bloodborne pathogens and other harmful substances that can enter the body through ingestion, inhalation and/or absorption.

Clean your protective equipment as soon as possible after an incident where it has been soiled or exposed to blood or body fluids, tars, fuels, resins, paints, acids, by-products of combustion or other hazardous materials. When possible, flush the protective equipment with water after emergency operations are completed. This will remove some but not all of the contaminants. Avoid spreading these contaminants beyond the scene. Ambulances and stations may become contaminated by contact with your unclean protective equipment and other equipment after an emergency operation.

For detailed cleaning instructions, consult “*PPE Care and Use Guidelines*” published by SAFER, CAFER, NAFER, & FIERO.

NFPA Standard 1581 *Fire Department Infection Control Program* offers information on cleaning and decontamination of protective equipment. This standard should be followed by you and your department or employer for cleaning and decontaminating your protective equipment. Chemical and radiological contamination requires special considerations, see discussion at end of this section.

General cleaning

Do not commercially dry clean. Commercial dry cleaning is generally not recommended for cleaning some protective equipment. Some dry cleaning solvents that are used can damage components of the protective equipment. Consult with the protective element’s manufacturer prior to dry cleaning to learn whether or not dry cleaning will damage your protective equipment.

DO NOT USE GARMENTS THAT ARE NOT THOROUGHLY CLEANED AND DRY.

Hand washing

Hand washing of protective equipment should be performed in a utility sink located away from living areas. The water temperature should range between 105-110° F to help avoid hand burns. Protective gloves must be worn during washing. Avoid inhaling vapors from the wash water. Avoid contact of the wash water with skin.

The waste water from the utility sink must be handled according to federal, state and local law. You must avoid the use of chlorine bleach, water temperatures greater than 110° F, heavy abrasion and/or scrubbing, water and/or cleaning solutions with a pH greater than 10.5.

Machine cleaning

To prevent the spread of contamination to other laundry or clothing items, home washing machines and public washing machines should not be used to clean contaminated protective equipment. Your department or employer should provide cleaning facilities for the sole purpose of cleaning protective equipment.

Top loading agitating washing machines may reduce the service life of protective equipment due to damage caused by mechanical agitation. Front loading machines or machines specially designed for cleaning protective equipment should be used.

The waste water from the washing machine must be handled and disposed of in accordance with federal, state and local law.

You must avoid using chlorine bleach, water temperatures greater than 130° F, chlorinated solvents, heavy abrasion and/or scrubbing, water and/or cleaning solutions with a pH greater than 10.5, high velocity power washers.

Hand and machine washing

For multi layered protective garments, the outer shell should be separated, when possible, and cleaned separately from the other layers or components of your protective equipment. This will avoid spreading the contamination from the outer shell to the other layers or components. Also, the moisture barrier will limit the flow of water through the outer shell fabric. Therefore, separating the outer shell from the other components will result in a cleaner outer shell.

Drying guidelines

In deciding how to dry your protective equipment, you must keep two primary factors in mind: Time constraints and the ability to minimize shrinkage. You should separate the outer shell from the other protective garment components or layers to reduce drying time.

- **Forced ventilation air drying:** Air drying causes little or no shrinkage. Forced ventilation air drying can be achieved by using fans to re-circulate air inside the drying room. The basic drying room should include floor drains, a method to exchange the air with the outside environment, and drying racks for hanging protective garments to provide maximum air exposure.

You may dry protective equipment without using fans or a drying room. The use of racks providing maximum air exposure is recommended. Do not dry protective equipment in direct sunlight.

- **Machine drying:** Machine drying is **not** recommended since the dryer's mechanical action can degrade the equipment. If you use a dryer, you should fasten all closures including pocket closures, hooks and loops, snaps, zippers, and any other closures on the equipment. The equipment should be turned inside out and placed in a mesh laundry bag.

Do not use heat in machine drying. Such heat can cause damage to the protective equipment including excessive shrinkage and potentially cause premature failure and early retirement of the protective equipment.

Decontamination



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, injuries, illnesses and diseases!

If your protective equipment becomes contaminated with biological, chemical, radiological or hazardous materials, special steps must be followed in handling your protective equipment and decontaminating them. This should be done in consultation with appropriate health department, hazardous material "hazmat" team or authority having jurisdiction.

Contaminated protective equipment should be isolated and the contaminants should be identified, if possible. Avoid bodily contact with contaminated protective equipment, use protective gloves (at least certified to NFPA 1999). (See "Contaminated Protective Elements"). Decontamination should be performed by a decontamination professional who has established procedures for the removal of blood and other potentially infectious or other hazardous materials and uses techniques developed to minimize damage to your protective equipment. The decontamination professional must adhere to all applicable federal, state and local laws regarding the decontamination of medical, radiological and chemical contaminated products.

Isolation of the protective equipment, identification of the contaminants and the handling of the protective equipment must be in accordance with federal, state and local law and should be undertaken under the guidance of decontamination professionals.

Chapter 7: Maintenance and Repairs

Before and after every response or training use, equipment should be inspected. Maintenance should be performed as needed on worn areas, tears, missing stitches on all layers, hardware detachment, changes in coloration, etc. Any loose stitches, any ripped areas, any detached trim or loose pockets should be repaired before the elements next use. Include the testing of the reflective trim in a darkened area by use of a flashlight (where applicable). You are cautioned that some trim may have lost its reflectivity (by being clogged with dirt or affected by heat and/or water) and the deterioration is not visible under normal daylight conditions. Any changes in outer shell or pathogen barrier suppleness, color or weave irregularities should be immediately referred to competent personnel to determine if the protective qualities of the equipment have been in any manner compromised.

Pathogen barriers should be examined at high wear areas (elbows, under the arms, seat areas and knees) frequently to insure there has been no abrasion or deterioration in the pathogen resistant coating of same. In the event of either questionable appearance or characteristics, caution should prevail and the equipment should be returned to the manufacturer for expert analysis to determine whether the equipment's protective qualities have been altered. Never repair single use protective elements unless specifically allowed by the manufacturer.

Remember, whenever there is a question about equipment condition, the equipment should be at least temporarily retired from service and referred to the manufacturer for evaluation. Please review the SAFER, NAFER, CAFER, FIERO "PPE Care and Use Guidelines" for more detail.

Inspection of Your Protective Ensemble Elements

Though most performance properties of the protective ensemble can not be tested adequately in the field, OSHA regulations require your department or employer to regularly inspect your protective ensemble and other safety equipment. Your 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. See "PPE Care and Use Guidelines" for further discussion of this issue.



Never use damaged protective elements. Even if the damage appears to be minor, it may increase your risk of death, liquid borne pathogen infections, burns, injuries, illnesses and diseases!

Frequency of Inspections

Your protective ensemble should be inspected by you and your department or employer upon its receipt, and thereafter at least once a month, after each cleaning, and after each use of any kind. Your protective ensemble should be inspected for cleanliness, contamination, fabric or material damage, thread or seam damage, discoloration, dye loss, continued reflectivity of reflective trim, damage to reflective trim, worn areas, etc. Your department or employer must develop and use standards and guidelines for determining whether or not your protective ensemble elements pass inspection and can continue to be used for emergency operations.

Protective elements labeled and intended for a single use should be inspected upon receipt and prior to use. This garment will age and degrade. The fact that your protective element may be water resistant does NOT mean that it will protect you from viruses or pathogens.

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

Record Keeping - For each piece of the protective ensemble, the following records should be kept: Date put into service, date cleaned, date out of service, date returned to service, days out of service, ID of the item of element, age of the element, who cleaned the element, type of cleaning performed, type of repairs performed, who performed the repairs. See "PPE Care and Use Guidelines" for further discussions of this issue.

Storage

Proper storage of your protective ensemble can extend its life, maintain its performance and reduce potential health hazards. Improper storage may result in damage to your protective ensemble and increase your risk of death, liquid borne pathogen infections, burns, injuries, diseases and illnesses.

Do not store your protective elements in direct sunlight since this will cause the materials in the protective ensemble to deteriorate.

Do not store wet or moist protective elements since this will promote the growth of mildew, fungus and bacteria and other harmful substances which can lead to skin irritation, rashes, diseases or illnesses. Mildew and bacteria growth may also affect the strength of your protective element's materials.

Do not store your protective ensemble in extreme temperatures, in abrasive environments or in contact with sharp objects.

Protective elements should be clean and dry before storage. This storage area should be clean, dry and well ventilated. The protective ensemble should be kept out of direct sunlight or other sources of ultraviolet radiation. You should avoid exposing the protective ensemble to temperature extremes for extended periods, sharp objects, contact with chemicals, tools, and other equipment.

Never store wet, soiled or contaminated protective elements. (See "Contaminated Protective Elements" in this Guide, and "*PPE Care and Use Guidelines*" for further discussion of this issue).

Retirement of Protective Elements

Pursuant to OSHA regulations, your department or employer must determine whether or not your protective ensemble is ready for retirement and replacement. For any retirement program to be effective, your protective ensemble must be evaluated by trained personnel working under the direct supervision of your department or employer.

The actual service life of each protective element will vary depending upon how much it has been used and how well it has been cleaned and maintained.

Protective elements labeled and intended for a single use must be retired after a single use. Each department or employer must define a single use which may include wearing during training exercises.

If you are unsure whether your protective elements should be retired, do not use them. Consult your department or employer. (See "*PPE Care and Use Guidelines*" for further discussion of this issue).

Chapter 8: Warranty Information

Your protective ensemble is warranted by the manufacturer to be free from defects in material or 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 purpose. 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 and Labels

Keep this Official User Information Guide in a safe place and refer to it regularly. Replacement guides and replacement labels for your protective ensemble may be obtained from the manufacturer. If you lose this Guide or if any label becomes unreadable, contact the manufacturer.

PERSONAL RESPONSIBILITY CODE



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

1. Fire Fighting 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 Fire Fighting 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 and has been maintained in accordance with the manufacturer's instructions.
6. Failure to follow these guidelines may result in death, burns or other severe injury.



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Fire and Emergency Manufacturers and Services Association, Inc.

www.femsa.org

COPY OF PRODUCT LABEL

 **DANGER**

DO NOT USE THIS GARMENT IF YOU HAVE NOT READ AND UNDERSTOOD THE ENTIRE FEMSA OFFICIAL USER INFORMATION GUIDE AND ALL LABELS FOR EMERGENCY MEDICAL PROTECTIVE CLOTHING AND EQUIPMENT!

Emergency Medical Operations are ULTRA HAZARDOUS, UNAVOIDABLY DANGEROUS activities. Neither this protective garment or any other will protect you from all liquid borne pathogen infections, injuries, diseases, conditions or hazards. You may be KILLED, LIQUID-BORNE INFECTED, BURNED, INJURED OR SUFFER DISEASE OR ILLNESS with NO WARNING and NO SIGN of damage to this protective garment.

- You will increase your risk of DEATH, LIQUID-BORNE PATHOGEN INFECTION, INJURY, DISEASE OR ILLNESS if you do not strictly comply with the entire USER INFORMATION GUIDE and all LABELS.
- Wearing this or any protective element may increase your risk of heat stress which may cause heart attack, stroke, dehydration, or other conditions resulting in DEATH, INJURY or ILLNESS.
- This emergency medical garment may burn and melt if exposed to high heat or flames. It has not been required to meet a flammable performance requirement for NFPA 1999 compliance.
- Do NOT use this protective garment if it is soiled, torn, abraded, worn or altered from its original condition. Do NOT use this protective garment unless it has been properly inspected and maintained by your department or employer, such use may result in DEATH, BURNS, INJURY, DISEASE OR ILLNESS.
- Contamination of this garment may warrant its disposal.
- Maintain only in accordance with manufacturer's instructions.
- This emergency medical protective garment is NOT warranted to be fit for a particular purpose. Read carefully the "Warranty Information" in the USER INFORMATION GUIDE.
- If you do not have a USER INFORMATION GUIDE, contact the manufacturer.

DO NOT REMOVE THIS LABEL

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