FEMSA Official User Information Guide

DANGER

- *Do not use your Protective Ensemble Elements until you have read and understood all labels on your Protective Elements 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

PROTECTIVE HOODS

INTERFACE COMPONENT FOR STRUCTURAL FIRE FIGHTING

2010

Fire and Emergency Manufacturers
and Services Association, Inc.
PO Box 147
Lynnfield, MA 01940-1047

www.femsa.org

Read this guide and all labels before using your protective ensemble. 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*").
#S2000RH

FEMSA Official User Information Guide

Protective Hoods
For Structural Fire Fighting

Contents

Chapter 1: Introduction

Fire fighting is an **ultra hazardous, unavoidably dangerous** activity. To reduce your risk of death, burns, injuries, diseases and illnesses, you must carefully read and strictly follow this **entire** Official User Information Guide and all labels on your protective ensemble.

When fighting fires or engaging 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 can reduce your risk of death, burns, injuries, diseases or illnesses, it will not make fire fighting and emergency operations completely safe. Even with the use of your protective ensemble, fire fighting will be **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:

- Proper training and constant practice in fire fighting and emergency tactics and safety;
- Proper selection, maintenance and use of safety equipment;
- Exercising extreme caution at all times. Your protective ensemble will not make you completely safe from death, burns, injuries, diseases or illnesses;
- A thorough knowledge of the design, performance and use limitations of NFPA-1971, NFPA-1500, NFPA-1581, NFPA-1999, NFPA-1993 and OSHA. You must be knowledgeable of the content of these publications.

Training by Your Fire Department or Employer

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

Your fire department or employer is in the best position to know and respond to the dangers presented by any fire or emergency operation. Accordingly, the type of safety gear (including protective ensemble) to be used and how it is used must be decided by your fire department or employer at each and every fire scene or emergency 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 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 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 firefighting and emergency operations you are constantly at risk of death, 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 1971 for additional definitions.

Alarm Time: This is the time between feeling heat (alarm) and the onset of a second degree burn. Feeling pain or heat on your skin does not necessarily mean that you are burned. You may still have time to remove yourself from the heat source or reduce the heat before getting burned. The time interval between feeling the pain or heat and getting burned is called "alarm time".

Approach Fire Fighting: Limited specialized exterior fire fighting operations at incidents involving fires producing very high levels of conductive, convective, and radiant heat, such as bulk flammable gas and bulk flammable liquid fires. Specialized thermal protection from exposure to high levels of radiant heat is necessary for the persons involved in such operations due to the limited scope of these operations and the greater distance from the fire at which these operations are conducted. Approach fire fighting is not entry, proximity, or structural fire fighting.

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".

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

Compression: A condition usually occurring when the protective element is pressed against a hard surface forcing the components or layers together. Compression may also occur when components or layers are pulled tight by flexing the elbows, knees or other areas of the body. Compression may also be caused by improperly fitting protective elements or S.C.B.A.

Conductive Heat: Energy transferred by direct contact with a heated surface. Examples: pan frying meat or kneeling on a hot floor.

Convective Heat: Energy transferred by heated gases. Examples: roasting meat in an oven or a fire fighter in hot smoke and gases.

Elements: The parts or items that comprise the protective ensemble. The protective ensemble elements are coats, trousers, coveralls, helmets, gloves, footwear, and interface components.

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 very high levels of conductive, convective, and radiant heat such as aircraft fires, bulk flammable gas fires, and bulk flammable liquid fires. Highly specialized thermal protection from exposure to extreme levels of conductive, convective, and radiant heat is necessary for persons involved in such extraordinary specialized operations due to the scope of these operations and because *direct entry into flames is made*. Usually these operations are exterior operations. Entry fire fighting is not structural fire fighting.

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.

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.

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.

Helmet: An element of the protective ensemble designed to provide minimum protection to the head.

Hood: The interface component element of the protective ensemble designed to provide limited protection to the coat/helmet/SBCA facepiece interface area.

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 Guidelines: 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: Multiple elements of clothing and equipment designed to provide a degree of protection for fire fighters from adverse exposures to the inherent risks of structural fire fighting operations and certain other emergency operations. The elements of the protective ensemble are coats, trousers, coveralls, helmets, gloves, footwear and interface components.

Proximity Fire Fighting: Specialized fire fighting operations that can include the activities of rescue, fire suppression, and property conservation at incidents involving fires producing very high levels of conductive, convective, and radiant heat such as aircraft fires, bulk flammable gas fires, and bulk flammable liquid fires. Specialized thermal protection from exposure to high levels of radiant heat, as necessary for persons involved in such operations due to the scope of these operations and the close distance to the fire at which these operations are conducted, although direct entry into flame is NOT made. These operations usually are exterior operations but might be combined with interior operations. Proximity fire fighting is not structural fire fighting but might be combined with structural fire fighting operations. Proximity fire fighting also is not entry fire fighting.

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

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

SCBA: Self contained breathing apparatus typically consisting of an air tank connected to a face mask which enables the fire fighter to breathe smoke-free, cool air at a fire scene.

Structural 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.

Temperature: The degree or intensity of heat of a body or an atmosphere.

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 fire 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 ensemble is beyond the manufacturer's control. Your fire 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 fire or 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 fire 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 fire or 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 fire fighters. Whether to use a protective ensemble in fighting a particular fire, whether to enter a particular burning building, whether to remain in a particular burning building, what parts of the building should be entered and similar decisions are matters to be decided by your department or employer at the fire 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 fire 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 fire 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 fire 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.

NFPA Label

The NFPA label on your protective ensemble element states that your protective element is a structural fire fighting protective element. This does not mean that you cannot be seriously injured as long as you use the protective ensemble only for structural fire fighting. Even if you limit yourself to structural fire fighting, you are still at risk of death, 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" structural fire, and you must realize that you are at risk at all times during fire fighting operations.

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

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, burns, injuries, diseases and illnesses.

DANGER

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 a fire 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 fire fighters.

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;
- 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

DANGER

If your protective ensemble is exposed 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!

Your protective ensemble will not protect you from all burns and injuries. There are limits to the protection given by your protective ensemble. Though your protective ensemble will reduce 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 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 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 in your protective ensemble element to the point where your skin burns. Your skin will burn at temperatures far below the burning point of your protective ensemble. Do not be misled by the absence of burn 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 kneeling on a hot floor, leaning against a hot wall or coming into contact with hot debris. Depending on conditions, this or any sort of contact can burn you underneath your protective ensemble element with no advance warning and no sign of damage to your protective ensemble.

Suppose, for example, you are leaning 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, 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. By the same token, a lesser heat source can burn you the longer you are exposed to it. How quickly this may happen depends on the length of exposure, amount of heat transferred, the particular materials used in the protective ensemble elements, the cleanliness and condition of the protective ensemble element, etc. Depending on conditions, you may not feel the heat build up in your protective ensemble element before you are burned.

DANGER

If your protective ensemble comes in contact with a hot environment or hot object, you may be burned underneath your protective ensemble with no warning and no sign of damage to the protective ensemble!

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 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 you are burned. Even if you were to merely position your body so that the protective ensemble was pulled 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.), you can be burned because of compression.

You do not have to be kneeling or leaning 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 period of time or a low level of radiant heat for a long enough period of time that you may 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 before you are burned.

Convective heat burns

Convective heat is transferred by hot gases. You do not have to come into contact with flames in order 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 information above concerning conductive and radiant heat burns applies to convective burns as well. You should take into account all of the information pertaining to conductive and radiant heat burns when considering the possible effects of convective heat.

Chemical, Radiological and Biological Hazards:

Poisons, toxins, carcinogens, radioactivity, germs, infectious bodily fluids, bloodborne pathogens, etc.

DANGER

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

Chemical, radiological and biological hazards (poisons, toxins, carcinogens, radioactivity, germs, infectious bodily fluids, bloodborne pathogens, etc.), if encountered by fire fighters and 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 a fire fighter, 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. Certain types of protective ensembles are designed to meet the requirements of NFPA 1999 *Protective Ensemble for Emergency Medical Operations*. (Consult your fire department or employer to determine whether or not your protective ensemble is so designed). This 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.

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. Protective ensemble elements can **reduce - but not eliminate -** your risk of death, diseases and illnesses due to these hazards.

Miscellaneous Hazards and Warnings:

Fire fighters and emergency personnel operate in **unavoidably dangerous, ultra hazardous** surroundings. The numbers and types of hazards confronted at fire and 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, burns, injuries, diseases and illnesses. Fire fighting and emergency operations remain **unavoidably dangerous, ultra hazardous** activities.

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 in order to be burned. You can be burned underneath your protective ensemble in many different ways. There are many variable factors at every fire scene which 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 at any moment combine to burn you.

Because there are so many variable factors and those factors are constantly changing, it is impractical to calculate when or if your skin will reach the “burn curve” underneath your protective ensemble at any particular time or location at any particular fire scene. Because of these constantly changing variables, 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 one of the many variables discussed can combine with other variables in completely unexpected ways to seriously burn you.

Wetness

Getting your protective ensemble wet can, under certain circumstances, 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 burns. If the water absorbs enough heat, however, it may - as hot water - transmit heat through your protective ensemble to burn you. How quickly this may happen is a function of 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 particular materials used in the protective ensemble, the cleanliness and condition of the protective ensemble, etc. Depending on conditions, you may not feel the heat build up and pass through your protective ensemble before you are burned.

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.

DANGER

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 elements may increase your risk of death, burns and injuries due to electrocution.

Feeling heat under protective elements

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 burned or injured suddenly and without warning. Be constantly alert to the possibility of exposure to heat and other hazards!

Your protective ensemble will lower 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. If you wear SCBA, ear flaps, or other gear, you may 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.

Before the use of protective ensemble elements, SCBA and other modern safety equipment, fire fighters were unable to stay too long or go too deep into a fire scene without great discomfort caused by heat and smoke. Protective ensemble, SBCA, and other modern equipment have increased the fire fighter's comfort level and level of protection. At the same time, they have reduced the fire fighter's ability to feel heat and be aware of his surroundings. Just because your comfort level may have 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.

DANGER

If you feel heat or some slight discomfort or unusual sensation under your protective ensemble, you may already have been burned or are about to be burned. Be constantly alert to the possibility of exposure to heat and other hazards!

If you do feel heat under your protective ensemble, you may still have time to escape injury. The amount of time between feeling pain and actually 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), 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 with water stream or ventilation.

No such person as "ordinary" fire fighter

Just as there is no such thing as a "routine" or "ordinary" fire, there is also no such thing as an "ordinary" fire fighter. Each person reacts differently to pain, excitement, adrenaline rush and danger. Because of this, some fire fighters will have less alarm time than others. These fire fighters 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. Again, you may be burned underneath your protective ensemble with no advance warning. You must remain constantly alert to your changing environment and not exceed the limitations of yourself or your equipment.

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, 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, burns, injuries, diseases and illnesses.

DANGER

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, burns, injuries, diseases or illnesses!

DANGER

Do not use your protective ensemble element if it is soiled or contaminated. Such use may result in death, 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, 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. If you are unsure whether or not your protective element is free of contaminants 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!

DANGER

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, 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. 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.

NFPA Standard 1971 requires that your protective ensemble fit properly and interface with your other safety equipment so that your body is covered by overlapping protective layers. NFPA Standard 1500 requires fire fighters to wear protective equipment such as helmet, hood, gloves and footwear, sized to the individual user, properly overlapped so that no gaps occur during use, and meeting NFPA performance standards. 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 the individual.

DANGER

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, burns, injuries, diseases or illnesses!

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., 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 (outer shell, moisture barrier, thermal barrier, patches, inserts, etc.) must be used together. Failure to do so may result in death, burns, injuries, diseases and illnesses!

DANGER

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, burns, injuries, diseases and illnesses!

Closures

In order for your protective ensemble to reduce your risk of death, burns, injuries, diseases and illnesses, you must fasten all closures (flaps, buttons, hooks, collars, etc.) on your protective ensemble. Otherwise, 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 unbuttoned 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!

DANGER

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

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, burns, 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 NFPA 1971 *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 hood will age. The usable service life of your hood is dependent on the number, type, and degree of exposures, the work environment, frequency of use and maintenance of the hood. It is the responsibility of both you and your employer to determine when this hood should be taken out of service and to do so. Any hood showing signs of damage, weakening or degradation of any protective quality required in NFPA 1971 should not be used.
- You must avoid cryogenics or liquefied gas exposure.
- You must avoid flammable vapor exposures.
- This hood may absorb hazardous and/or flammable vapors and/or liquids which may later ignite.
- Your protective hood 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 hood 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 building collapses and falls. In the event a building or debris falls on you, you will be at risk of death, burns, injuries, diseases and illnesses.
- Sunlight, ultraviolet light, chlorine bleach, ozone, and other gases will weaken the protective qualities of your protective ensemble. Be particularly careful to avoid these hazards when you store your protective element between uses.
- Do not wear clothing or other items under your protective hood which may melt or transfer heat onto your skin (such as polyester or nylon clothing, or metal jewelry).
- Never use your protective hood in fire fighting or 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 hoods 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 a fire fighter or emergency responder you work in an ultra hazardous environment. Even using your protective ensemble, extreme caution, the best training and supervision, your fire fighting and emergency activities remain **unavoidably dangerous.**

Chapter 5: Donning/Doffing Your Protective Hood

WARNING

How you don and doff your protective hood will affect your life and safety. You must wear the protective ensemble properly in order for it to reduce your risk of death, burns, 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 hood

- Place hood over head with face opening over face, pull hood face opening over the head so hood is around neck.
- Put on SCBA face mask and adjust straps.
- Pull hood up and over back of head, covering mask straps. Assure that SCBA face piece and hood overlap so that no gaps occur in protection in any body position encountered during use. Also assure that the hood does NOT interfere with the SCBA face piece seal to the wearer's face.
- Put on and adjust helmet.

Doffing your protective hood

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

No contamination

- If not contaminated, remove your protective hood in reverse order from that described above for donning the protective hood.
- 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, clean and store your protective hood as recommended in this Guide under "Storage".

Contaminated protective hood

Protective ensembles contaminated with blood, bodily fluids, toxins, radioactivity, chemicals, and hazardous materials

WARNING

Avoid unprotected bodily contact with contaminated areas of your protective ensemble. Avoid contact between contaminated protective elements 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 buildings and vehicles.
- Place contaminated protective elements 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, 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 Hood

WARNING

You must keep your protective ensemble clean. If you do not keep your protective ensemble clean, you will increase your risk of death, burns, injuries, diseases and illnesses!

You must keep your protective ensemble clean. If you do not keep it clean, its protective qualities will be reduced. Failure to keep your protective ensemble clean will increase your risk of death, burns, injuries, diseases and illnesses.

Some fire fighters prefer the appearance of well-used, discolored, "salty" and/or dirty protective hoods as an indicator of their experience and status as veteran fire fighters. These individuals are at **grave and unnecessary risk** of death, burns, injuries, illnesses and diseases. You must keep your protective hood clean and maintain it as set forth in its labels, manufacturer's instructions, 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 hood thoroughly and keep it clean. Contaminants not removed from your protective hood may present health hazards, shorten the protective hood's effective life, reduce its protective qualities and/or catch fire. If you are unsure whether or not your protective hood has been thoroughly cleaned, do not use it.

Soiled protective hoods will expose fire fighters to toxins, poisons, carcinogens, infectious bodily fluids, bloodborne pathogens and other harmful substances that can enter the body through ingestion, inhalation and/or absorption. Repeated small exposures to some contaminants can over time cause serious health problems.

Soiled or contaminated protective hoods reflect less heat and are **less insulative** than clean protective hoods. Contaminated protective elements are more likely to conduct electricity increasing your risk of **electrical shock**. (See "Electricity" under "Specific Safety Considerations" section of this Guide). Moreover, contamination of your protective ensemble increases the risk that it can **catch fire** and injure you.

Fire fighters encounter various chemicals in their normal fire fighting activities. These contaminants, in addition to being hazardous, can also degrade the protective qualities of the protective hood.

Clean your protective hood at least every six months. (See NFPA Standard 1500 and SAFER, CAFER, NAFER, FIERO and "*PPE Care & Use Guidelines*"). Clean your protective hood 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 at the fire scene after emergency operations are completed. This will remove some but not all of the contaminants. Avoid spreading these contaminants beyond the fire scene. Fire apparatus and fire stations may become contaminated by contact with your unclean protective ensemble and other equipment after a fire or 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* and NFPA Standard 1971 *Protective Ensemble for Structural Fire Fighting* offer information on cleaning and decontamination of protective ensembles. Chemical and radiological contamination requires special considerations, see discussion at end of this section. These standards should be followed by you and your department or employer for cleaning and decontaminating your protective ensemble.

Do not commercially dry clean. Commercial dry cleaning is generally not recommended for cleaning protective hoods. Some dry cleaning solvents that are used can damage components of the protective hood. Consult with the protective element's manufacturer prior to dry cleaning to learn whether or not dry cleaning will damage your protective hood. DO NOT USE HOODS THAT ARE NOT THOROUGHLY CLEANED AND DRY.

Hand washing

Hand washing of protective hoods should be performed in a utility sink. The water temperature should range between 105-110º 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.

1. Fill basin with hot water (105 to 115º F), and add detergent. **Do not use chlorine bleach.**

2. Protective gloves must be used for both heat and contaminant protection.
3. Add hoods and soak until thoroughly wet.
4. Hand wash by rubbing together.
5. Rinse thoroughly with clean water.
    - INSPECT BEFORE USE
    - Do **NOT** wring hoods to dry, squeeze hood to remove excess water.
    - Shape & lay flat in a dry, cool, shaded location to dry.

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 110º F, heavy abrasion and/or scrubbing, water and/or cleaning solutions with a pH greater than 10.5, mixing flame resistant and non-flame resistant items in the utility sink.

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 hoods. Your fire department or employer should provide cleaning facilities for the sole purpose of cleaning protective hoods and other protective equipment.

1. Fill machine with hot water (120 to 130º F) and add detergent.
2. Add hoods (up to 20 each per standard washer size).
3. Wash using normal wash cycle, double rinse.
4. Remove hoods from washer and dry in cool, dry, shaded area while laying flat.

•INSPECT BEFORE USE.

Top loading agitating washing machines may reduce the service life of protective hoods 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 130º F, chlorinated solvents, heavy abrasion and/or scrubbing, water and/or cleaning solutions with a pH greater than 10.5, high velocity power washers, mixing flame resistant and non-flame resistant items.

Drying guidelines

In deciding how to dry your protective hood, 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 hood 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 elements to provide maximum air exposure.

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

- **Machine drying:** Machine drying is **not** recommended since the dryer's mechanical action can degrade the equipment.

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

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!

Decontamination

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

Contaminated protective elements should be isolated and the contaminants should be identified, if possible. Avoid bodily contact with contaminated protective elements. (See "Contaminated protective hood"). Decontamination should be performed by a decontamination professional who has established procedures for the removal of blood and other potentially infectious or hazardous materials and uses techniques developed to minimize damage to your protective hood. 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 element, identification of the contaminants and the handling of the protective elements must be in accordance with federal, state and local law and should be undertaken under the guidance of a decontamination professional.

Chapter 7: Maintenance and Repairs

Before and after every fire ground or training use, protective elements should be inspected. All damaged or worn protective hoods must be replaced. Any physical change in any component of your hood should be immediately referred to competent personnel to determine if your protective hood's protective qualities have been in any way compromised. In the event of either questionable appearance or characteristics, caution should prevail and the protective hood should be replaced.

Repair is generally not practical considering the cost of new hoods. If repair is desired, refer to the manufacturer or to a facility capable of making repairs consistent with the original manufacturer.

Whenever there is a question about your hood's condition, the hood should be 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 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. See "*PPE Care and Use Guidelines*" for further discussion of this issue.

DANGER

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

Frequency of Inspections

Your protective ensemble should be inspected by you and your fire 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, heat damage, fabric, leather, or material damage, thread or seam damage, discoloration, dye loss, continued reflectivity of reflective trim, cracks or tears, damage to reflective trim, worn areas, etc. Your fire 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 fire fighting 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 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, 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 fire 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 fire 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.

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

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

DANGER

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.

FEMSA

www.femsa.org

COPY OF PRODUCT LABEL

DANGER

DO NOT USE THIS HOOD IF YOU HAVE NOT READ AND UNDERSTOOD THE ENTIRE FEMSA OFFICIAL USER INFORMATION GUIDE FOR HOODS AND ALL LABELS

- Fire Fighting is an ULTRA HAZARDOUS, UNAVOIDABLY DANGEROUS activity. This hood will NOT protect you from all burns, injuries, diseases, conditions or hazards.
- If this hood is exposed to heat, you may be BURNED with NO warning and NO sign of damage to the hood.
- Use extreme caution for all operations.
- This hood is NOT warranted to be fit for a particular purpose.
- Failure to comply with these warnings may result in DEATH, INJURY, DISEASE or ILLNESS.
- If you do not have a FEMSA Official User Information Guide for Hoods, contact the manufacturer.

DO NOT REMOVE THIS LABEL

FEMSA

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