

# USER INSTRUCTION, SAFETY AND TRAINING GUIDE



## NFPA 1970 (1971) Structural Fire Fighting Protective Gloves

7200 POE AVE.  
DAYTON, OHIO 45414  
[www.LIONprotects.com](http://www.LIONprotects.com)

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### **DANGER**

**You MUST read this Guide and all Safety, Cleaning, and Information labels before wearing.**

Burns are a function of time and temperature. First degree skin burns can occur when skin reaches a temperature of as low as 118° F (47.8° C).

Fire burns at temperatures up to 2000° F (1093.3° C) or higher.

These Gloves provide limited protection against heat and flame in compliance with NFPA 1970 (1971).

While wearing these Gloves, you may be burned without heat sensation or warning in some circumstances, and without any sign of damage to the Gloves.



1. Model and Certification Labels



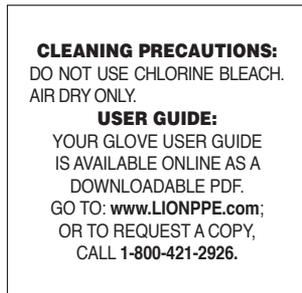
1a. Model and Certification Label for Only AS/NZS 2161.6:2014 Certified Gloves



2. Content Label\*



3. Date of Manufacturing Label



4. Cleaning Label

\*Please note: VForce®, Commander, Commander Ace and Primus® glove models contain recognized components: - 5.5oz Para-Aramid/Modacrylic/Meta-Aramid – Kovenex® M- Proprietary Gore Film

**⚠ WARNING**  
This guide provides information on the use and limitations of this product. Do not use your Gloves until you have read and understood this User Instruction, Safety and Training Guide and all of the attached labels.



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## 1. INTRODUCTION

Your NFPA 1970 (1971) Compliant Gloves (referred to throughout this Guide as the “NFPA 1970 (1971) Compliant Glove” or “Glove”) are designed to provide limited protection in structural fire fighting operations when worn in conjunction with other specified elements of the structural fire fighting ensemble. The gloves are manufactured and certified under the performance requirements of the NFPA 1970 (1971), Standard on Protective Ensembles for Structural and Proximity Firefighting, Work Apparel, Open-Circuit Self-Contained Breathing Apparatus (SCBA) for Emergency Services, and Personal Alert Safety Systems (PASS).

This User Instruction, Safety and Training Guide gives important instructions regarding the use, inspection, care, maintenance, storage and retirement of your NFPA 1970 (1971) Compliant Gloves. No one except you, the fire fighter, should remove this Guide. Immediately upon receipt of your NFPA 1970 (1971) Compliant Protective Gloves, you should carefully read and save this Guide for future reference.

Fire fighting is an extremely dangerous profession. The circumstances of each hazardous situation are unique and often impossible to predict. LION Protective Gloves are designed to provide limited protection against injuries to the hand when properly maintained and worn by trained firefighters during normal structural firefighting activities. This Guide is a training tool to help you understand your NFPA 1970 (1971) Compliant Structural Fire Fighting Gloves and how to use them in the safest possible manner during dangerous fire fighting operations. Please take the time to read it.



For your personal safety, be alert for important safety messages in this training guide:

 **DANGER**

**DANGER** Indicates immediate hazards that will result in serious personal injury or death if not avoided, or if instructions, including recommended precautions, are not followed. The signal word “**DANGER**” is highlighted in red, in this training guide to indicate the extreme hazard of the situation.

 **WARNING**

**WARNING** Indicates potentially hazardous situations that could result in serious personal injury or death if not avoided, or if instructions, including recommended precautions, are not followed. The signal word “**WARNING**” is highlighted in black in this training guide.

 **CAUTION**

**CAUTION** Indicates potentially hazardous situations or unsafe practices that could result in minor or moderate personal injury or product or property damage if instructions, including recommended precautions, are not followed. The signal word “**CAUTION**” is highlighted in gray in this Guide.

## 2. DEFINITIONS

**AFFF** – Aqueous Film-Forming Foam agents. A foaming agent capable of forming water-solution films on the surface of flammable hydrocarbon liquids.

**ASTM** – Acronym for American Society of Testing and Materials

**Aramid Fibers** – Specially manufactured polymer fibers in which the fiber-forming material consists of linked, long chain-like structures of large molecules. Aramid fibers exhibit higher resistance to flammability, higher strength, and higher elasticity than ordinary synthetic or natural fibers. Fabrics made from aramid fibers maintain their integrity at high temperatures and are used in protective clothing and other industrial applications.

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

**Body Substance Isolation** – A concept practiced by emergency response personnel whereby blood and ALL other body fluids are considered a risk for transmission of bloodborne diseases.

**Biological Agent** – Biological materials that could be capable of causing disease or long-term damage to the human body.

**Biological Terrorism Agents** – Liquid or particulate agents that can consist of a biologically derived toxin or pathogen to

inflict lethal or incapacitating casualties.

**Bloodborne Pathogen** – Pathogenic microorganisms that are present in human blood and can cause disease in humans. These include, but are not limited to: Hepatitis B, Hepatitis C, HIV and Syphilis.

**Body Fluids** – Fluids produced by the body including, but not limited to, blood, semen, mucous, feces, urine, vaginal secretions, breast milk, amniotic fluid, cerebrospinal fluid, synovial fluid, and pericardial fluid.

**Body Fluids-Borne Pathogen** – An infectious bacterium or virus carried in human, animal, or clinical body fluids, organs or tissue.

**CBRN** – An abbreviation for chemicals, biological agents and radiological particulates hazards.

**Chemical Terrorism Agents** – Liquid, solid, gaseous and vapor chemical warfare agents and toxic industrial chemicals used to inflict lethal or incapacitating casualties, generally on a civilian population, as a result of a terrorist attack.

**Component** – Any material, part or subassembly used in the construction of the NFPA 1970 (1971) Compliant Glove or element of the NFPA 1970 (1971) Compliant Glove.

**Composite** – The layer or combination of layers of the protective ensemble, or any elements of the protective ensemble, providing the required limited protection.



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

**Entry Fire Fighting** – EXTRAORDINARILY specialized fire fighting operations that can include the activities of rescue, fire suppression, and property conservation at incidents involving fires producing extreme levels of 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 EXTRAORDINARILY specialized operations and because direct entry into the flames is made. Your NFPA 1970 (1971) Compliant Gloves are NEVER to be used for entry fire fighting or any direct contact with flames or molten metals, and do not provide the required level of protection.

**Exposure Incident** – Specific contact of the following with blood or O.P.I.M.: 1) eye; 2) mouth or other mucous membranes; 3) non intact skin; or 4) parenteral contact.

**Facecloth** – Lining fabric that is used to cover inner surfaces.

**Flame Resistance** – The property of a material whereby the application of a flaming or non-flaming source of ignition and the subsequent removal of the ignition source results in the termination of combustion. Flame resistance can be an inherent property of the material or it can be imparted by specific treatment.

**Flame Retardant** – A chemical compound that can be incorporated into materials or a textile fiber during manufacture or treatment to reduce its flammability.

**Flash Fire** – A fire that rapidly spreads through a diffuse fuel, such as a dust, gas, or the vapors of an ignitable liquid, without the production of damaging pressure.

**Fluorescence** – The process by which radiant flux of certain wavelengths is absorbed and reradiated, nonthermally in other, usually longer, wavelengths.

**Fluorescent Trim** – Trim that absorbs and re-radiates light of certain wavelengths, making a surface highly visible to the human eye in order to provide daytime visibility.

**Glove** – The term Glove used throughout this Guide refers ONLY to NFPA 1970 (1971) Compliant Fire Fighter Gloves.

**Guide** – Means this User Instruction, Safety and Training Guide.

**Heat Flux** – The thermal intensity indicated by the amount of power per unit area. The heat flow rate through a surface of unit area perpendicular to the direction of heat flow.

**ISP (Independent Service Provider)** – An independent third party utilized by an organization (fire department) to perform any one or any combination of advanced inspection, advanced cleaning, or repair services.

**Interface Area** – An area of the body where the protective garments, helmets, gloves, footwear, or SCBA facepiece meet. i.e., The protective coat--helmet--SCBA facepiece area, the protective coat--protective trouser area, the protective coat--protective glove area, the protective trouser--protective footwear area.

**Moisture Barrier** – The portion of the Gloves composite designed to prevent the transfer of liquids.

**NFPA** – Acronym for National Fire Protection Association. A private sector, volunteer-based standard-making organization in the United States that develops guidelines related to fire protection and prevention.

**NFPA 1970 (1971) Compliant Gloves** – Means Gloves certified by a private, third-party certification organization (for example, Underwriters' Laboratories) to meet at the time of manufacture the design and performance requirements of the NFPA 1970 (1971) standards.

**OPIM** – Acronym for Other Potentially Infectious Materials. Includes semen, vaginal secretions, cerebrospinal fluid, synovial fluid, pleural fluid, pericardial fluid, amniotic fluid, and peritoneal fluid.

**OSHA** – Acronym for Occupational Safety and Health Administration. A government-based standard-making body that develops public health and safety standards for the workplace.

**Parenteral** – Piercing through the skin barrier, such as a needlestick injury, human bite or a cut or scrape.



**PASS Device** – Acronym for Personal Alert Safety Systems. A device that emits an audible signal to summon aid in the event the fire fighter or emergency responder becomes disabled.

**PKP or Purple-K** – a common name for a dry chemical extinguishing agent based on potassium bicarbonate with a purple dye added.

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

**Protective Ensemble (Structural)** – Multiple elements of Garments and other equipment designed in accordance with the NFPA 1970 (1971) Standards to provide a limited 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.

**Retroreflection/Retroflective** – The reflection of light in which the reflected rays are preferentially returned in the direction close to the opposite of the direction of the incident rays, with this property being maintained over wide variations of the direction of the incident rays.

**Retroreflective Markings** – A material that reflects and returns a relatively high proportion of light in a direction close to the direction from which it came.

**RPP (Radiant Protective Performance)** – A test to determine the ability of an outer shell to withstand a measured amount of radiant heat.

**SAFER** – Acronym for Southern Area Fire Equipment Research. An established body of fire equipment users with expertise in the research and evaluation of fire fighting personal protective equipment.

**SCBA** – Acronym for Self-Contained Breathing Apparatus.

**SDS** – Acronym for Safety Data Sheets.

**Sewn Seam** – A series of stitches joining two or more separate pieces of material(s) of planar structure, such as textile fabrics.

**Spunlace** – A nonwoven fabric formed by entangling the fibers about each other in a repeating pattern.

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

**TPP** – Acronym for Thermal Protective Performance. A test in the NFPA 1970 (1971) Standards to determine the ability of a Garment composite to protect against a measured amount of thermal and radiant heat.

**Trim** – Retroreflective and fluorescent materials attached to the outermost surface of the protective ensemble for visibility enhancement. Retroreflective materials enhance nighttime visibility, and fluorescent materials enhance daytime visibility. “Trim” is also known as “visibility markings”.

**Useful Life** – Useful life can be as long as 3-5 years if Gloves have been subject to relatively lower levels of wear and tear and have been consistently maintained in a regular cleaning and maintenance program and stored properly. Gloves more than five years old and made to earlier versions of the NFPA 1970 (1971) standard are highly likely to have exceeded their useful life and should be retired.

In compliance with NFPA 1850, Gloves must be retired no more than 10 years from the date of manufacture.

**UV (Light or Radiation)** – Acronym for Ultraviolet Light. A type of radiated electromagnetic energy commonly found in the sun’s rays.

**Universal Precautions** – Under universal precautions, blood and certain body fluids of all patients are considered potentially infectious for human immunodeficiency virus (HIV), hepatitis B virus (HBV), and other bloodborne pathogens.

**Verified ISP** – An Independent Service Provider that has been verified by a certification organization (such as UL or ITS) to perform moisture barrier repairs and major repairs.



### 3. SAFETY CHECKLIST

Do not use these gloves until you have checked “YES” to the following:

1. Have you completed formal training in structural fire fighting compliant with the approved standard recognized by the Authority Having Jurisdiction, and on the proper use of all equipment, including gloves?  
 Yes  No
2. Have you read and understood all the instructions and warnings throughout this Guide, as well as all the safety, cleaning and information labels on the Gloves?  
 Yes  No
3. Will you regularly inspect the Gloves inside and out for any tears, holes, thin spots, worn areas, dirt, contaminants, embrittlement, or any other conditions as discussed in Section 5 of this Guide?  
 Yes  No
4. Have you studied the limitations of your Gloves as described throughout this Guide?  
 Yes  No
5. Have you checked to make sure that your Gloves fit you properly?  Yes  No
6. Do you understand that when your skin reaches a temperature as low as 118° F (47.8° C) you will be burned, and that, in some situations, you may not feel a heat sensation or pain while wearing your Gloves, or receive damage to your Gloves prior to being burned?  Yes  No
7. Have you read, do you understand, and do you agree to assume the risks and responsibilities listed in the Personal Responsibility Code? See FIG. 1 and back cover of this Guide.  Yes  No

If you answered **NO** to any of the questions, **DO NOT WEAR THESE GLOVES** until you have read the appropriate sections in this guide and have been properly trained by qualified instructors.

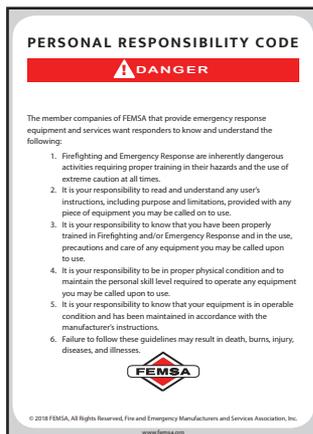


FIG. 1 Personal Responsibility Code. Also shown on back cover of this Guide.



## 4. PURPOSE, LIMITATIONS AND USE

These Gloves are designed to provide **LIMITED** protection under the requirements of the NFPA 1970 (1971) Standard against hazards arising from STRUCTURAL FIRE FIGHTING OPERATIONS AND NON FIRE RELATED RESCUE OPERATIONS, INCLUDING:

- heat and flame;
- liquid splash of six common fireground chemicals, including AFFF, battery acid, hydraulic fluid, surrogate gasoline fuel H, swimming pool chlorine (65% chlorine solution) and automobile antifreeze;
- penetration of blood and other bodily fluids;
- cold weather and other environmental conditions;
- physical hazards, including cuts and abrasion;
- water from hose streams and other sources;

### **DANGER**

**DO NOT use this Gloves for the following:**

- **Proximity or Entry fire fighting operations (see definitions)**
- **Activities requiring direct contact with flames or molten metal**
- **Hazardous Materials Emergency Operations**
- **Protection against all hazardous material, chemical, biological, radiological, or nuclear agents, or CBRN terrorism agents (see definitions)**
- **Wildland Fire Fighting**



Do not use for entry fire fighting.



Do not use for direct contact with flames or molten metal.



Do not use for protection against hazardous radiological agents.



Do not use for protection against hazardous biological agents.



Do not use for protection against hazardous chemical agents.

### **DANGER**

Fire fighters who are exposed to a flashover, backdraft, or other flame and high heat environments are at **EXTREME** risk for extensive burn injuries and death, even while wearing their NFPA 1970 (1971) Compliant Structural Fire Fighting Gloves.

Emergency response personnel can encounter many common liquids during normal performance of their duties. The reference to limited protection from liquid splash from 6 common fire ground chemicals should not be interpreted to mean that the Gloves are suitable or are permitted to be used for protection for the wearer during any hazardous materials situation.

The moisture barrier in the gloves has not been evaluated for protection against all chemicals that can be encountered during firefighting operations. Gloves that have been exposed to chemicals should be inspected in accordance with Chapter 6 of this Guide and in accordance with NFPA 1850 to evaluate for any adverse effects.



 **WARNING**

Controlled laboratory tests in the NFPA 1970 (1971) Standard “shall not be deemed as establishing performance levels for all situations to which personnel can be exposed”. You should always use extreme caution in any fire fighting situation to avoid the risk of injuries. See NFPA 1970 (1971).

 **WARNING**

Protective properties in a new NFPA 1970 (1971) Compliant Glove will diminish as the product is worn and ages. To reduce the risk of injuries, you **MUST** follow the recommendations in this Guide for inspection and retirement of your Glove to ensure that the Glove is not used past its Useful Life.

 **WARNING**

- Choose the size glove that will provide comfort, protection and dexterity. A sizing chart is available from LION.
- If a glove is too loose, you may be unable to pick up or handle small objects. If a glove is too tight, it will reduce its ability to protect your hand from heat. Protective equipment worn by firefighters should be properly sized and adjusted to overlap and eliminate gaps during use.
- Do not alter your gloves in any way. Changes to the gloves may increase your risk of injury or death.
- For marking an individual’s name, or other identifying mark, an indelible laundry marker may be used on the outer shell or in a blank space on a label inside the glove.

 **WARNING**

Many fire fighters attempt to push the limits of their Personal Protective Equipment (PPE) by performing exercises in burn buildings or training centers for prolonged periods of time. This may result in damage to the PPE and its components, as well as a shortened useful life due to continuous exposure to extreme, nonroutine fire training conditions. Damage caused by use under these conditions may void warranty.



 **DANGER**

Never wear Gloves that fit improperly. If you have a question, or there is a problem with the fit of the Gloves, contact your safety officer for assistance. Wearing Gloves that do not fit properly could reduce protection and result in severe burns, cuts, or abrasions, or dangerously restrict your ability to avoid injuries in an emergency situation.

 **DANGER**

Burns are a function of time and temperature. The higher the temperature of the heat source and the longer the exposure time, the greater the severity of burns.

**FIRST DEGREE BURNS**

begin when skin temperature reaches approximately **118° F (47.8° C)**.

**SECOND DEGREE BURNS**

occur when skin temperature reaches approximately **131° F (55° C)**.

**THIRD DEGREE BURNS**

occur when skin temperature reaches approximately **152° F (66.7° C)**.

You may have **very little or no warning** time from feeling heat or pain before skin begins to burn at 118° F (47.8° C). You need to be constantly aware of the buildup of heat in the surrounding environment and in your Gloves and be ready to escape to a cool area where you can remove hot Gloves quickly to help prevent or reduce the severity of burns.

 **DANGER**

Moisture in Gloves can reduce insulation and lead to scalding burns! Always make sure your Gloves are dry before wearing them in any emergency situation. Dry your Gloves between runs to reduce the risk of serious burn injuries.

 **DANGER**

Minimize compression of your Gloves at all times. Compression of Gloves against hot objects can severely reduce insulation and result in scalding and burning without heat sensation or warning in some circumstances. If you feel tingling, immediately move to a cooler location. Failure to react immediately could cause you to be burned.



## 5. INSPECTION

Your Gloves should be cleaned, inspected, and repaired in a frequency and manner consistent with your department's protocol, NFPA 1850 and NFPA 1970 (1971).

### 5.1 PREPARATION

Read all Safety, Cleaning, and Information Labels. If any labels are missing, return the Gloves to the manufacturer immediately.

### 5.2 FREQUENCY

Routine Inspection:

Inspect your Gloves:

- upon receipt of your new Gloves;
- after each use or at least monthly (whichever is greater) during the useful life of the Gloves;
- after exposure to heat, flames, chemicals, or fire fighting agents (including AFFF foam and water);
- after exposure to body fluids (including blood); and
- after washing, repair or decontamination.

Advanced Inspection:

Your Gloves should undergo a regular advanced inspection by an expert in the Fire Department who has been trained by LION, LION TotalCare® or a verified Independent Service Provider (ISP) at least annually, or whenever you have a question about whether Gloves are fit for use.

### 5.3 INSPECTION PROCESS AND CRITERIA

#### 1. Preparation for Inspection

- A. Ensure that Gloves are clean. If any have been contaminated by hazardous materials or biological agents, make sure they have been decontaminated. This is important for your safety, and for assurance that potential problems are not masked by incidental residue.
- B. Place Gloves on a clean surface in a brightly lighted area.

#### 2. Inspection of the Outer Shell and Inner Liner (Routine and Advanced Procedure)

- When inspecting your gloves, check thoroughly for:
  - ◇ Cuts or worn areas in the leather shell or lining material
  - ◇ Separation of inner liner from the shell
  - ◇ Integrity of wristlets
  - ◇ Torn seams or cut threads which may allow seams to separate
  - ◇ Chemical contamination in the leather or liner which has not been removed
  - ◇ Brittleness, discoloration or other evidence of damage from heat or sun
  - ◇ Leaks or signs of liquid penetration
- If your gloves are excessively worn, damaged, contaminated, or otherwise do not pass inspection, do not use them. Turn in the damaged gloves and obtain a replacement pair of LION Protective Gloves from your fire department. Do not attempt to repair the gloves yourself.



## **WARNING**

Most performance properties of the Gloves and their components cannot be tested by the user in the field.

### **THE WATER INTEGRITY FIELD TEST (ADVANCED INSPECTION ONLY)**

Your NFPA 1970 (1971) Compliant Gloves should be tested for water resistance as part of the regular test procedures defined by your fire department. The Water Integrity Test defined in NFPA 1970 (1971) provides a method for testing gloves for leaks. Put on a water marker glove (a thin glove that will stain when touched by water) underneath your LION Protective Glove. Immerse your gloved hand into a container of tap water to within one inch of the top. Clench your fist every 10 seconds, for 2 minutes. Remove your gloved hand from the water, take off the Protective Glove, and check the marker glove for signs of water marks. If your gloves show signs of water penetration, obtain a replacement pair of LION Protective Gloves from your fire department.

#### **5.4 RECORDKEEPING**

LION TotalCare® Centers offer recordkeeping services. For manual records, record all inspections and your results on the Inspection, Cleaning, Repair, Retirement, and Disposal Record located in the back of this Guide. Maintain this form unless your organization has provided you with a comparable recordkeeping method for this purpose.

## **6. DONNING AND DOFFING**

- Pull on your LION Protective Gloves after putting on your other protective equipment.
- Pull the gloves completely onto the hands.
- Check to be sure the gloves fit properly.
- Ensure the gauntlet or wristlet of the glove is outside the coat wristlet and inside of the coat cuff.
- You must check to ensure that your gloves interface properly with the sleeves of your turnout coat and that no gap appears between the glove and your turnout coat.
- In all ranges of motion, your hand, wrist and arm should remain covered by the glove or turnout coat.
- To remove your gloves, grasp the palm and carefully pull off of the hand. Do Not pull from the fingertips.
- If your gloves have been exposed to hazardous materials, such as chemicals, acids or blood, avoid contact with the contaminated portions of the glove. You should isolate and bag the gloves in a sealable, leak-proof bag.



## 7. USING YOUR GLOVES SAFELY: HOW TO MINIMIZE THE RISK OF INJURY

### 7.1 PREPARATION

Before beginning any emergency operation where there is fire or a threat of fire, your Gloves should be donned according to the procedures in Section 6 of this Guide.

#### **DANGER**

Always wear clean and thoroughly dry Gloves used in any structural fire fighting operation. Soiled or contaminated Gloves may be combustible, causing serious burns to the wearer.

### 7.2 FIRE CHARACTERISTICS

Fires are inherently dangerous, unpredictable environments. **Temperatures can range upwards to more than 2000° F (1093° C) in a matter of seconds.** It is important to understand these conditions in order to maximize your protection and to understand the limited ability of your Gloves to protect you from all hazards that may be present in a fire.

### 7.3 BURN HAZARDS: TYPES OF HEAT TRANSFER

There are three types of heat transfer in a fire that could cause burns: conduction, convection, and radiation. **Conduction** is the direct transfer of heat through contact with a hot object. **Convection** is the transfer of heat through a medium; for example, air. **Thermal radiation** is the transfer of heat in the form of light energy. Fire fighters experience all three types of heat in a fire, and must understand their effects on NFPA 1970 (1971) Compliant Gloves.

**Conduction:** The danger of being burned by conductive heat while wearing NFPA 1970 (1971) Compliant Gloves is frequently underestimated. This very real hazard is significantly increased if your Gloves are wet or compressed. Water can provide a conductive bond between surfaces that might not otherwise touch, increasing the chances of heat conduction by displacing insulating air between and within the layers of the Gloves. Water is a very poor insulator; it conducts heat with dangerous and totally unpredictable efficiency.

**Always use your NFPA 1970 (1971) Compliant Gloves properly and in a manner that is consistent with NFPA 1550, *Standard for Emergency Responder Health and Safety* and Title 29, *Code of Federal Regulations*, Part 1910.132, General Requirements of Subpart I, *Personal Protective Equipment*.**



## **DANGER**

Moisture in Gloves can reduce insulation and lead to scalding burns! Always make sure your Gloves are dry before wearing them in any emergency situation. Dry your Gloves between runs to reduce the risk of serious burn injuries. Inspect your Gloves for holes and other damage, and always secure all the closures to prevent the penetration of moisture from the fire environment.



Radiant heat from hot surfaces and flames can cause burns

**Convection:** Convective heat travels through the air, even if there is no immediate appearance of fire. Convective heat can elevate the temperature of your Glove to a point at which conductive heat burns can easily occur. Convective air can also travel into your Glove interior by entering into gaps at interface areas.

**Thermal Radiation:** Thermal Radiation is the transfer of heat in the form of light energy into a material, directly from flames or reflected from hot objects. Factors that affect the speed of radiant heat transfer include the temperature difference between two surfaces, their distance from each other, and the reflectivity of each surface.

### 7.4 BURNS

Burns are a function of time and temperature. The higher the temperature of the heat source and the longer the exposure time, the greater the severity of burns.

FIRST DEGREE BURNS begin when the temperature of skin reaches **118° F (47.8° C)**.

SECOND DEGREE BURNS occur when the skin reaches approximately **131° F (55° C)**.

THIRD DEGREE BURNS occur when skin temperature reaches approximately **152° F (66.7° C)**.

**In terms of heat flux, unprotected skin will receive a second-degree burn after only a 30-second exposure at .45 watts per square centimeter.** Studies have shown that flame temperatures of low intensity wastebasket fires can reach almost 1300° F (704.4° C), with a heat flux in excess of over four watts per square centimeter, and with air temperatures ranging up to 750° F (398.9° C). Thus, even small fires can generate several times the level of heat to cause severe burns to fire fighters who do not wear ALL their protective ensemble in a secure manner.



 **DANGER**

Prolonged or repeated exposures to heat will increase Glove temperatures and can cause burns even after the fire fighter is no longer exposed to high temperatures. Minimize exposure to heat by using water to cool the environment, or by escaping quickly after a short period of time. Failure to follow these instructions will result in burns beneath your Gloves.

 **DANGER**

The buildup of heat in NFPA 1970 (1971) Compliant Gloves can lead to burns without any sign of damage to the Gloves. Never wait for signs of Glove damage to warn of imminent burns. Always be aware of your surrounding environment and be ready to escape if you begin to feel tingling or burning sensations.

 **DANGER**

Fire Fighters who are exposed to a flashover, backdraft, or other flame and high heat environments are at **EXTREME** risk for extensive burn injuries and death even while wearing their NFPA 1970 (1971) Compliant Fire Fighter Gloves!

 **WARNING**

Do not confuse the component testing requirements that are part of NFPA Standards with the conditions in which fire fighters work. For example, the requirement that certain components must not melt, drip, or separate when exposed to convected heat temperatures of 500° F (262° C) for 5 minutes is in no way intended to indicate that fire fighters face that condition in their work, or could be expected to withstand that condition **EVEN WHILE WEARING AN NFPA 1970 (1971) COMPLIANT GLOVES CORRECTLY** without suffering serious injury or death.



## 7.5

### HEAT STRESS: A SIGNIFICANT CAUSE OF FIRE FIGHTER INJURIES

Physical work in a warm or hot environment causes a rise in the temperature inside the body. To protect the body against heat, the heart begins to beat faster so more blood can be moved to the skin surface. Blood vessels near the skin dilate so they can carry more blood. In this way, blood in the interior of the body can be brought out near the body's surface and cooled. Most importantly, the body produces sweat that evaporates off the skin to provide cooling. Those natural responses do not work very well for any or all of the following conditions: the ambient air temperature is at least 75° F (23.9° C) or higher, the PPE Elements insulation blocks the transfer of heat away from the body, it blocks the evaporation of sweat, or the exertion of the muscles produces more heat than the system can remove. When the body temperature gets elevated too high, the results can be heat strain, heat exhaustion, or heat stroke.

#### **WARNING**

**Overexertion in hot conditions while wearing NFPA 1970 (1971) Compliant PPE, including Gloves, can lead to heat exhaustion, or heat stroke.** Symptoms of heat exhaustion are a general feeling of weakness, dizziness, rapid pulse, low blood pressure while standing or sitting, and/or a headache. The skin may feel moist or clammy. If you feel symptoms, get to a cool place, remove your Gloves and other PPE, and drink fluids. Failure to seek attention could lead to coma or death.

#### **WARNING**

Symptoms of heat stroke are hot, dry skin with no sweating, very high body temperatures, weakness, dizziness, rapid breathing, nausea, unconsciousness, and sometimes mental confusion. If you feel any of the above symptoms at any time, get to a cool area immediately, remove your Ensemble, drink fluids and seek medical attention. Failure to seek attention could lead to coma or death. Immediate cooling is essential for survival in heat stroke cases.



## 7.6 HEART ATTACKS: A RESULT OF OVEREXERTION

During fire fighting operations, the heart beats faster because of the need to move more blood to the working muscles. This blood carries more oxygen to the muscles so that they can handle the increased workload.

Another factor in increasing the rate of the heart is the presence of adrenaline, the “fight or flight” hormone, in the fire fighter’s body during an emergency.

The adrenaline present in your system causes the heart to pump even faster than during normal activity.

All of these stress factors could place too much strain on the heart, leading to a heart attack. The heart simply cannot handle the load placed on it.

### **WARNING**

You must be physically fit to safely perform strenuous work under stressful conditions. Regular cardiovascular exercise, abstaining from cigarette smoking, proper training, a healthy diet, and avoidance of obesity, can help to reduce the risk of heart attack.

## 7.7 LIQUID PENETRATION AND HAZARDOUS MATERIALS

### **LIMITED Protection against liquid penetration from 6 common chemicals**

Your NFPA 1970 (1971) Compliant Gloves moisture barrier is tested for resistance against penetration from liquid splash by only 6 common fireground chemicals after 1 hour exposures. These chemicals are 1. AFFF; 2. battery acid; 3. hydraulic fluid; 4. surrogate gasoline fuel H; 5. swimming pool chlorine (65% chlorine solution); and 6. automobile antifreeze. These liquids are tested because they are considered to be the most common chemicals encountered in structural fire fighting operations. The purpose of the Gloves is to provide limited protection against incidental contact with these materials encountered during routine operations.

### **No Protection Against Hazardous Materials Exposure**

### **WARNING**

Over time, as the Gloves are worn and ages, the moisture barrier’s protection against penetration of the 6 common fireground chemicals will become more limited. See Useful Life section of this Guide, and NFPA 1970 (1971).

In addition, fire fighters face potential exposure to an almost unlimited number of other potentially hazardous chemicals in their operations. **Your NFPA 1970 (1971) Compliant Gloves are NOT designed to protect against exposures to hazardous material operations. You MUST use appropriate protective equipment in situations involving CBRN, liquid or vapor hazardous materials.**



## **WARNING**

Exposure to smoke particulates produced by combustion may affect cardiovascular health. You must secure all interfaces properly to minimize entry of hazardous fireground contaminants.

## **WARNING**

If you experience accidental or incidental exposure to a hazardous material, you need to follow the precautions in Section 8 of this Guide regarding Washing and Decontamination, in order to limit exposure to yourself and others.

### 7.8 ELECTROCUTION

## **WARNING**

Your Gloves are NOT designed to protect you against electrocution. When entering a building, you should NEVER touch live wiring, especially if your Gloves are wet. Never allow hoses, nozzles, or other fire equipment you are operating to contact live wiring.

### 7.9 BLOODBORNE PATHOGENS

Your Gloves are designed to protect your body from the hazards of exposure to bloodborne pathogens present in body fluids. Exposure incidents are specific contact of the following with blood or OPIM (Other Potentially Infectious Materials): eye; mouth or other mucous membranes; non-intact skin; or parenteral contact. Make sure face, mouth, eyes, nose, and non-intact skin are covered. Avoid contact with hypodermic needles and other sharp objects. Use Body Substance Isolation Procedures when handling Gloves exposed to body fluids. Washing Gloves according to the Procedures in Section 8 of this Guide will generally eliminate hazards of exposure to body fluids arising from incidental contact. For heavier levels of exposure, disinfecting Gloves will substantially reduce hazards arising from exposure of Gloves to potentially hazardous body fluids. See Section 8 of this Guide for more information.

### 7.10 ADDITIONAL FACTORS AFFECTING SAFETY

The following additional factors may affect the limited protection provided by the Gloves:

- conditions on the fireground or other site of emergency operations that are beyond the scope of the limited purposes of these Gloves;
- unauthorized modifications, repairs or replacement of components of the Gloves not otherwise in compliance with LION's specifications; and
- the addition of accessories that are not approved by LION as compatible with NFPA 1970 (1971) Compliant Gloves. If you have questions about whether accessories will degrade the performance of your Gloves below the NFPA 1970 (1971) Standards, contact LION or a LION TotalCare® Center.



## 8. WASHING, DECONTAMINATION AND STORAGE

### 8.1 HAZARDS OF DIRTY GLOVES: WHY WASHING AND DECONTAMINATING ARE IMPORTANT

You can be exposed to many hazardous substances on the job. These substances can contaminate your Gloves, and cause harm to you after your body contacts your Gloves. This section tells you how to wash and decontaminate your Gloves to reduce these hazards.

**Routine Fireground Contaminants:** Many fire combustion products — including hydrocarbons, polynuclear aromatic compounds, metals such as cadmium and chromium, acids and soot — are hazardous to the fire fighter. These substances can become embedded in the fibers of your Gloves, penetrate inner layers, and enter the body through ingestion, absorption, inhalation, and parenteral contact. In addition, particulates and other products of combustion can reduce the flame resistance of your Gloves and increase your Gloves' ability to conduct electricity. To reduce the risk of long-term harm from hazardous substances present in the products of fire combustion, or hazardous chemicals, you **MUST** wash your Gloves.

**Hazardous Chemicals:** If you experience accidental or incidental exposure to a hazardous chemical, follow all precautions in this Section to limit exposure and risk of harm to yourself and others.

You should hose down contaminated Gloves at the scene to limit further exposure to hazardous chemicals, to reduce exposure to others, and to prevent chemicals from settling into your Gloves.

### **WARNING**

Decontamination of protective clothing and equipment is a complicated process for which there is no guarantee that protective elements are free from contamination. While the purpose of decontamination is to remove all contaminant(s) from the element, decontamination procedures or cleaning processes are not always 100% effective in removing all contamination. See NFPA 1850.

**Bloodborne Pathogens:** Your Gloves may be exposed to body fluids that may contain bloodborne pathogens. The washing procedures described later in this section will reduce your risk of infection from these hazards.

### 8.2 FREQUENCY

Clean Gloves at least annually or as soon as possible after contamination or exposure to smoke, blood or body fluids, or hazardous substances.



### 8.3 CLEANING PRODUCTS

#### Routine Washing:

- A. Commercially available detergents. Use commercially available detergents with a pH greater than 6.0 and less than 9.5. Many household cleaning products fall within this range.
- B. Specialty Cleaners. StationCare 1851 from LION TotalCare® is designed for NFPA 1970 (1971) Gloves. Always read SDS sheets before use.
- C. Spot cleaning and pre-treating. Use commercially available detergents with a pH greater than 6.0 and less than 9.5. Many household cleaning products fall within this range.

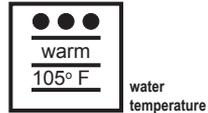


### **WARNING**

Never use chlorine bleach or chlorinated products to clean your Gloves. Even small amounts of chlorine will seriously reduce your Gloves' protective qualities. Non-chlorinated bleaches are acceptable.

### 8.4 HAND WASHING

A common technique for washing your gloves is to put them on your hands and rub them together, using a mild cleaning product. A soft bristle brush may help remove some of the imbedded combustion products. Rinse thoroughly in warm water.



### 8.5 MACHINE WASHING

Gloves may also be machine washed at warm temperature using normal or gentle wash cycles in non-agitating machines.



Do not wash gloves in top-loading, industrial or agitating washing machines. The force of the machines may weaken the protective properties of the gloves.



### 8.6 DRYING

Gloves should be air dried or tumble dried in cool air dryers.

Drying racks in well-ventilated areas assist in drying. Do not turn the gloves inside out to dry, this may tear or damage the moisture barrier layer or inner lining.



Do not lay the gloves on radiators or dry them in hot air dryers. Hot air drying will stiffen the leather and severely shorten the service life of the gloves.

Do not dry the gloves in direct or indirect sunlight, or in fluorescent light. Light will severely reduce the strength and protective qualities of the gloves.

Do not wring dry your gloves; wringing may tear the Moisture Barrier Layer. The gloves may be gently squeezed to remove excess water from the leather shell.

#### 8.7 DO NOT DRY CLEAN

Never dry clean your Gloves. Dry cleaning will damage the gloves and reduce their protective qualities

#### 8.8 DECONTAMINATION AND DISINFECTION

**Applicable Standard.** You must read and have facilities and procedures in compliance with NFPA 1580, Standard for Emergency Responder Occupational Health and Wellness.

### **WARNING**

To reduce risk of harm from hazardous substances present in products of fire combustion, hazardous chemicals, and body fluids, you **MUST** wash, decontaminate and/or disinfect your Gloves after each exposure to such hazardous substances.

**Preparation:** Remove contaminated and infected Gloves from wearer and from service before beginning. Gloves should remain out of service until decontaminated and disinfected. Wear protective gloves and appropriate protective clothing and equipment while decontaminating and disinfecting.

#### **A. Hazardous Substances Present in the Products of Fire Combustion (Soot, Smoke, and Debris).**

To reduce the risks associated with exposure to the hazardous substances found in the products of fire combustion, you **MUST** wash, dry, and store your Gloves according to the procedures in this section.

#### **B. Hazardous Chemicals**

1. **KNOWN MATERIALS:** Contact the source of the materials, your local HAZMAT Team, or the Health Department to determine whether the contaminants are hazardous materials. If the contaminant is known, contact a LION TotalCare® Center or verified ISP to determine the feasibility of decontamination.
2. **UNKNOWN MATERIALS:** If the contaminant is not known, Gloves should remain out of service until the materials are identified. Always demand SDS information and be prepared to share your findings with the LION TotalCare® Center or verified ISP to decontaminate the Gloves. **If your Gloves cannot be decontaminated, they must be retired and disposed of in accordance with federal, state, and local regulations.**



### **C. Blood and Body Fluids**

1. **Disinfecting Products.** You must use disinfectants that are compatible with NFPA 1970 (1971) Compliant Gloves.
2. **Disinfecting Procedure for Blood and Body Fluids**  
**Small incidental areas:** Always follow the instructions of the manufacturer regarding product usage.  
**Large areas:** If Gloves have large areas of coverage of blood or body fluids, place and transport Gloves in bags to prevent leakage. Contact a LION TotalCare® Center or verified ISP to arrange for disinfection.

### **8.9 LAUNDRY SAFETY**

Laundry and Housekeeping Personnel are considered to be among those at risk to not only hazardous materials, but also to bloodborne pathogens primarily by exposure to sharp objects. Your Fire Department should have a Bloodborne Pathogens Written Exposure Control Plan. Part of this plan is decontamination, disinfection, and washing of Gloves, and it should include LAUNDRY ROOM SAFETY PROCEDURES and HOUSEKEEPING SAFETY PROCEDURES. You should follow all appropriate federal, state, and local regulations.



## 9. STORAGE

- Store your gloves safely away from:
  - ◇ Sharp edges or objects that could cut or tear the gloves
  - ◇ Direct or indirect sunlight or fluorescent light that could weaken or damage the leather and other components
  - ◇ Extreme temperatures that could dry or weaken the gloves
  - ◇ Excessive moisture that could promote rot or mildew

### **WARNING**

Avoid storing your Gloves in temperature extremes. Repeated cycles of heating and cooling can reduce the protective qualities and useful life of the Gloves.

### **WARNING**

NEVER STORE YOUR GLOVES IN DIRECT SUNLIGHT, INDIRECT SUNLIGHT OR IN FLUORESCENT LIGHT. Exposure to light (particularly light in the sun's rays and fluorescent light) will severely weaken and damage the components in your Gloves after only A FEW DAYS. Install UV filters on fluorescent lights. Damage caused by exposure to light cannot be repaired, nor will the manufacturer cover such damage in its warranty. See the Warranty Section of this Guide for more information.

### **CAUTION**

Do not store your Gloves in contact with contaminants such as oils, solvents, acids or alkalis as these can damage the Gloves.

### **CAUTION**

Do not store Gloves in air tight containers unless the Gloves are new and have not been issued.

### **CAUTION**

Never store your Gloves in living quarters with personal belongings, or within the passenger compartment of a vehicle. Prolonged exposure to contaminants remaining in the Gloves may increase the risk of cancer or other diseases.



## 10. REPAIR

To inquire on whether a damaged Glove may be repairable, contact a LION TotalCare® Center or verified ISP. REPAIRS SHOULD ONLY BE MADE BY LION TOTALCARE® OR BY A VERIFIED ISP.

### **WARNING**

Before any repairs are made to your NFPA 1970 (1971) Compliant Structural Fire Fighter Gloves, they must be washed, decontaminated, and disinfected in accordance with this Guide to protect workers who alter or repair Gloves from exposure to soils and contaminants.

All major repairs to Gloves should be done by LION TotalCare® or a verified ISP. Major repairs made by any other entity invalidates all warranties and may expose the wearer to hazardous or life threatening conditions.

For a list of LION TotalCare® Centers, visit [www.lionprotects.com/totalcarelocations](http://www.lionprotects.com/totalcarelocations). Call LION at (800) 421-2926 for an updated list of verified ISPs.

## 11. USEFUL LIFE AND RETIREMENT

NFPA 1970 (1971) performance requirements are based on new, unworn gloves and composites. Useful life is the period of time that the gloves that have been properly cared for can be expected to provide reasonable limited protection. Useful life for Gloves is normally 1 year depending on the conditions of wear, maintenance and storage. Useful life can be as long as 3-5 years if Gloves have been subject to relatively lower levels of wear and tear and have been consistently maintained in a regular cleaning and maintenance program and stored properly. Gloves more than 5 years old and made to earlier versions of the NFPA 1970 (1971) standard are highly likely to have exceeded their useful life and should be retired.

In compliance with NFPA 1850, Gloves must be retired no more than 10 years from the date of manufacture.

You must retire gloves that have been exposed to hazardous materials or that fail to pass the inspection procedures defined by NFPA 1850, your fire department and that, in the judgment of your fire department, cannot economically be repaired.

**The useful life of Gloves will vary according to the following factors:**

- Age and frequency of use
- Number and type of previous repairs
- Type of work the wearer performed
- The length of exposure to extreme heat, and the intensity of the heat
- The length of exposure to hazardous chemicals
- The length of exposure to direct or indirect sunlight, or other light sources such as fluorescent light



- Improper wear
- Improper use
- Gloves more than 5 years old
- Accelerated wear and tear caused by exposure to frequent, repeated training exercises.

Your Gloves should be assessed by trained professionals at each regular Advanced Inspection to determine whether they have exceeded their useful life and must be retired. Your Gloves must be removed from service when they can no longer be safely used, and when the cost of repair would exceed 50% of the cost of replacement. Trained professionals with in-depth knowledge of Gloves and their limitations should handle the details of a retirement program. If you have any questions about the useful life and retirement of your Gloves, get assistance before wearing your Gloves into any emergency situation! Contact a trained expert within your department, LION, a LION TotalCare® Center or a verified ISP.

## 12. DISPOSAL

Retired uncontaminated Gloves must be destroyed to prevent their unauthorized or mistaken use. Cut them into several pieces and dispose of properly. One suggested method of disposal is a landfill.

Retired Gloves that are contaminated with blood or body fluids or hazardous chemicals should be placed in a plastic bag and properly disposed of. Follow federal, state, and local regulations governing disposal of contaminated materials.



### 13. LIMITED WARRANTY INFORMATION

Please use this QR code to access the limited warranty information for all LION products.

Contact LION Customer Support at 800-421-2926 or [customersupport@lionprotects.com](mailto:customersupport@lionprotects.com) for questions.





## PERSONAL RESPONSIBILITY CODE



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

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



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