USER INSTRUCTION, SAFETY AND TRAINING GUIDE

Starfield LION NFPA 1951/NFPA 1977 Compliant Garments for Technical Rescue and Wildland Firefighting

Starfield™
ready for action

23 BENTON RD.
TORONTO, ONTARIO
CANADA M6M 3G2
www.lionprotects.com

February 2025

⚠ DANGER

You MUST read this Guide and all Garment 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.

This Garment provides limited protection against flame, in compliance with NFPA 1951 and NFPA 1977, and limited protection against thermal and radiant heat in compliance with NFPA 1977. While wearing this Garment, you may be burned without heat sensation or warning in some circumstances and without any sign of damage to the Garment.

This Garment does NOT include an inner thermal liner. ADDITIONAL PROTECTIVE CLOTHING MUST BE WORN FOR ANY STRUCTURAL FIREFIGHTING OPERATIONS.

⚠ DANGER

You must read these warnings and instructions. Failure to follow these warnings and instructions will result in serious injury or death. Wear this garment for Technical Rescue Incidents and Wildland Fire Fighting. Additional garments are required for Structural Fire Fighting.

- Before wearing this garment, you must read and understand the User Instruction, Safety and Training Guide provided with this garment. The guide explains 1. critical safety information and protective clothing limitations. 2. proper sizing/adjustment. 3. procedures for putting on and removing protective clothing. 4. how to wash, decontaminate, inspect and store this garment. 5. use consistent with NFPA 1500. 6. limitations on useful life and retirement procedures.
- You should wear this garment only if you have been properly trained in **Technical Rescue Incidents and Wildland Fire Fighting** and have knowledge of the proper selection, fit, use, care and limitations of protective clothing and equipment.
- To reduce the risk of injury or death, ALWAYS ensure the proper overlap and that all items fit with adequate looseness. Tight fit lowers insulation protection and restricts mobility.
- **This garment provides limited protection against flame and no protection against heat or compression.** Minimize exposure to heat. You may be burned without warning or without receiving damage to garment. Avoid contact with hot objects. Skin burns occur when skin reaches a temperature of 118°F. Fires burn at temperatures up to 2000°F.
- Exertion in hot conditions may result in heat exhaustion or poor judgement. If you feel dizziness, dehydration, loss of focus, or shortness of breath, get to a safe area, remove this garment, and seek medical attention.
- **Do not use this garment if it is damaged or dirty**, garments will NOT provide the intended protection. ALWAYS follow manufacturer's cleaning instructions.
- **This garment has limited useful life.** You must inspect regularly and retire when appropriate according to the User Instruction, Safety and Training Guide.
- Download User Guide at: www.LIONppe.com

DO NOT REMOVE OR WRITE ON THIS LABEL! CLFI-LB05 Rev. 1.0 5/2024

1. Garment Safety Label

Starfield™ CLFI-LB02 WL-2024

PROTEC ™
23 BENTON RD.
TORONTO, ONTARIO M6M 3G2
800-473-5553
GARMENT MADE IN CANADA.
FABRIC MADE IN USA.
FABRIC CONTENT

☐ 45% META-ARAMID /32% LENZING FR®/17% POLYAMIDE/ 6% PARA-ARAMID

☐ 93% META-ARAMID /5% PARA-ARAMID /2% ANTISTAT

☐ 47-48% LENZING™ LYOCELL/38-40% MODACRYLIC/12-15% ARAMID

☐60SY ☐70SY ☐7.50SY ☐90SY

LOT/STYLE#:_____
W.O#: _____
DATE OF MFG:_____
SIZE:_____
_____

2. Garment Label Information

Starfield™ **QUESTIONS, WRITE OR CALL IMMEDIATELY: INFOSTARFIELD-LION@LIONPROTECTS.COM 416-789-4354 / STARFIELD LION 23 BENTON ROAD, TORONTO, CANADA. M6M 3G2**

CLEANING AND STORAGE INSTRUCTIONS

- USERS MUST CLEAN, INSPECT, MAINTAIN, STORE AND ALTER ONLY IN ACCORDANCE WITH THE USER INSTRUCTION, SAFETY AND TRAINING GUIDE - **DOWNLOAD USER GUIDE AT: WWW.LIONPPE.COM**
- NEVER USE CHLORINE BLEACH. CHLORINE BLEACH WILL SIGNIFICANTLY COMPROMISE THE PROTECTION AFFORDED BY TEXTILE MATERIALS USED IN THE CONSTRUCTION OF THIS GARMENT.
- MACHINE WASH, WARM WATER, USING ONLY LIQUID DETERGENT AND IF NEEDED, LIQUID NON-CHLORINE BLEACH.
- NEVER USE FABRIC SOFTENERS. NEVER DRY CLEAN.
- DRY BY HANGING IN OPEN AREA, OUT OF DIRECT OR INDIRECT SUNLIGHT AND FLUORESCENT LIGHT, OR TUMBLE DRY LOW.
- STORE OUT OF DIRECT OR INDIRECT SUNLIGHT AND FLUORESCENT LIGHT.

UL CERTIFIED SAFETY CA MH26321

THIS TECHNICAL RESCUE PROTECTIVE ENSEMBLE GARMENT ELEMENT MEETS THE REQUIREMENTS OF NFPA 1951, STANDARD ON PROTECTIVE ENSEMBLES FOR TECHNICAL RESCUE INCIDENTS, 2020 EDITION.

THIS WILDLAND FIRE FIGHTING PROTECTIVE GARMENT MEETS THE REQUIREMENTS OF NFPA 1977, STANDARD ON PROTECTIVE CLOTHING AND EQUIPMENT FOR WILDLAND FIRE FIGHTING AND URBAN INTERFACE FIRE FIGHTING, 2022 EDITION.

DO NOT REMOVE THIS LABEL CLFI-LB04 Rev. 1.0 5/2024

3. Cleaning Labels

Copies of labels used only in NFPA 1951 and NFPA 1977 Dual-Certified Garments

TABLE OF CONTENTS

1. INTRODUCTION

Congratulations on purchasing your new Starfield LION product! Your NFPA 1951/ NFPA 1977 Garments for Technical Rescue and Wildland Firefighting (referred to throughout this Guide as the "NFPA 1951/NFPA 1977 Garments", "Technical Rescue/Wildland Firefighting Garments" or "Garments") is designed to provide limited protection against physical, environmental, flame hazards to emergency responders involved in search, rescue, extrication, site stabilization and other mitigation operations at or involving Technical Rescue and/or Wildland incidents. The garment is designed for limited protection to thermal or radiant heat. It and its components are manufactured and certified under the performance requirements of the current editions of NFPA 1951 Standard on Protective Ensemble for Technical Rescue Incidents and NFPA 1977 Standard on Protective Clothing and Equipment for Wildland Firefighting and Urban Interface Firefighting.

This User Instruction, Safety and Training Guide gives important instructions regarding the use, inspection, care, maintenance, storage and retirement of your Garments.

Immediately upon receipt of your Garment and this User Instruction, Safety and Training Guide, carefully read and save this Guide for future reference.

This Guide is a training tool to help you understand your NFPA 1951/NFPA 1977 Garments and how to use it in the safest possible manner during Technical Rescue/Wildland operations. Please take the time to read it.

For your personal safety be alert for important safety messages in this 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, both in this Guide and on labels affixed to your Garment, 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 orange on applicable labels and in black in this 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

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 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.

Certification/Certified – A system whereby a certification organization determines that a manufacturer has demonstrated the ability to produce a product that complies with the requirements of this standard, authorizes the manufacturer to use a label on listed products that comply with the requirements of this standard, and establishes a follow-up program conducted by the certification organization as a check on the methods the manufacturer uses to determine continued compliance of labeled and listed products with the requirements of this standard.

Component(s) – Any material, part or subassembly used in the construction of the NFPA 1951/NFPA 1977 Certified Garment.

Composite – The layer or layers of materials or components.

Entry Firefighting – EXTRAORDINARILY specialized firefighting 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 EXTRAORDINARILY specialized operations and because direct entry into the flames is made. NFPA 1951/ NFPA 1977 Certified Garments are NEVER to be used for entry firefighting or any direct contact with flames or molten metals and do not provide the required level of protection.

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.

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.

Garment – (Also referred to as NFPA 1951/NFPA 1977 Certified Garment.) The term Garment used throughout this Guide refers ONLY to NFPA 1951/NFPA 1977 Certified Garments for Technical Rescue/Wildland Firefighting operations.

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.

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

MSDS – Acronym for Material Safety Data Sheets.

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

NFPA 1951/NFPA 1977 Certified Garment – (Also referred to in this Guide as Garment). Means a Garment 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 1951/NFPA 1977 Standards.

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

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

Proximity Firefighting – Specialized firefighting operations that can include the activities of rescue, fire suppression and property conservation at incidents involving fire 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 well as thermal protection from conductive and convective heat, is necessary for persons involved in such operations. NFPA 1951/ NFPA 1977 Certified Garments are NEVER to be used in proximity firefighting and do not provide the required level of protection.

Radiant Protective Performance (RPP) – A numerical value indicating the resistance of materials to a radiant heat exposure.

Reinforcement – The addition of extra material for enhanced protection in areas prone to compression or abrasive wear such as knees, elbows and shoulders.

Responder/Emergency Responder – Emergency personnel involved in Technical Rescue and/or Wildland Firefighting Operations.

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

SCBA – Acronym for Self-Contained Breathing Apparatus.

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

Stabilization – Those activities directed at mitigating the dangerous elements of an emergency incident.

Structural Firefighting – 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. NFPA 1951/NFPA 1977 Certified Garments are NEVER to be used in proximity firefighting and do not provide the required level of protection.

Technical Rescue Incidents – Complex rescue incidents requiring specially trained personnel and special equipment to complete the mission.

Technical Rescue Protective Ensemble – A protective ensemble that includes but is not limited to garments, helmets, goggles, gloves, and footwear..

Technical Rescue Protective Garment Element – The coat, trouser or coverall element of the certified rescue and recovery technical rescue protective ensemble that provides protection to the upper and lower torso, arms and legs.

TPP – Acronym for Thermal Protective Performance.

Trench/Cave-In Rescue – The activity of rescue during the collapse or cave-in of a trench. A trench is deeper than it is wide.

Useful Life – The period of time that NFPA 1951/NFPA 1977 Certified Garments, which have been properly cared for, can be expected to provide reasonable limited protection.

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

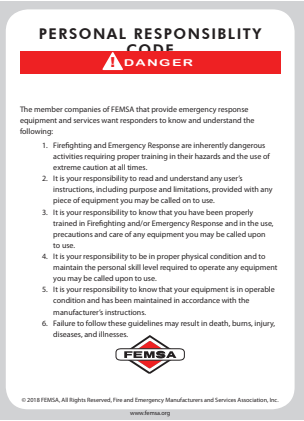
Universal Precautions – Under universal precautions, blood and certain body fluids of all patients are considered potentially infectious for human immunodeficiency virus (HIV), hepatitis B virus (HBV) and other bloodborne pathogens.

Urban Interface Firefighting – Activities of fire suppression and property conservation within areas of housing or other structures/improvements that are either intermingled or about vegetation or forest.

Vehicle/Machinery Functional Capability – The activity of removing a victim from a vehicle or machine at an emergency incident.

Wildland Firefighting Protective Garments – The coat, pants, or coverall of the certified Wildland Firefighting protective garment that provides protection to the upper and lower torso, arms and legs.

Wildland/Urban Interface (WUI) – The line or zone where structures and other development meet or intermingle with undeveloped wildland or vegetative fuels and the area within or adjacent to private and public property where mitigation actions can prevent damage or loss from wildfire.



PERSONAL RESPONSIBLITY CODE

DANGER

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

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

FEMSA

www.femsa.org

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

3. SAFETY CHECKLIST

Do not use this Garment until you have checked "YES" to the following:

1. Have you completed a formal training course in Technical Rescue and/or Wildland Firefighting techniques, the proper use of Technical Rescue and/or Wildland Firefighting equipment and NFPA 1951/NFPA 1977 Certified Garments?

   ❑ 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 Garment?
   ❑ Yes ❑ No

3. Will you regularly inspect your Garment inside and out for any tears, holes, thin spots, worn areas, color change, dirt, contaminants, leaks, embrittlement or any other conditions discussed in Section 6 of this Guide? ❑ Yes ❑ No

4. Have you studied the limitations of your Garment as described throughout this Guide? ❑ Yes ❑ No

5. Have you checked to make sure that your Garment fits you properly in accordance with Section 8 of this Guide? ❑ Yes ❑ No

6. Have you, your safety officer or another appropriate person made plans to ensure that your Garment is used, inspected, maintained, stored and retired according to instructions in this Guide? ❑ Yes ❑ No

7. Do you understand that when your skin reaches a temperature of 118° F, you will be burned and that in some situations you may not feel a heat sensation or pain while wearing your Garment, or receive damage to your Garment prior to being burned?

   ❑ Yes ❑ No

8. 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 THIS GARMENT** until you have read the appropriate sections of this Guide and have been properly trained by qualified instructors.

4. PURPOSE AND LIMITATIONS

This Garment is designed to provide LIMITED protection under the requirements of the NFPA 1951 and NFPA 1977 Standards to the upper and lower torso against hazards TO EMERGENCY RESPONDERS INVOLVED IN SEARCH, RESCUE, EXTRICATION, TREATMENT, RECOVERY, SITE STABILIZATION AND OTHER MITIGATION OPERATIONS AT OR INVOLVING TECHNICAL RESCUE AND/OR WILDLAND FIREFIGHTING, INCLUDING:

- Flame resistance,
- Physical hazards, including cuts and abrasion.

⚠ DANGER

DO NOT use this Garment for the following:

- **Structural, Proximity and Entry Firefighting (see Definitions)**
- **Activities requiring direct contact with flames or molten metal**
- **Protection against all hazardous materials and all biological or radiological agents.**

Do not use for ANY firefighting.

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

⚠ DANGER

Technical Rescue and/or Wildland Firefighting personnel who are exposed to a flashover, backdraft or other flame and high heat environments are at **EXTREME** risk for extensive burn injuries and death while wearing their NFPA 1951/NFPA 1977 Certified Technical Rescue/Wildland Firefighting Garment!

Do not use for protection against hazardous radiological agents.

Risk Assessment

The authority having jurisdiction (see Definitions) should perform a risk assessment to identify the hazards present and to determine the suitability of the NFPA 1951/NFPA 1977 Certified Garment. For each of the activities described as Technical Rescue/Wildland Firefighting rescue incidents, the authority having jurisdiction should determine if protection provided by this Garment is commensurate with the level of protection needed as deemed by the hazards present. For example, in an automobile extrication the decision for using Technical Rescue/Wildland protective ensembles versus structural firefighting protective ensembles can be dependent on the level of fire risk at the incident.

Do not use for protection against hazardous biological agents.

Do not use for protection against hazardous chemical agents.

⚠ WARNING

Controlled lab tests in the NFPA 1951 and NFPA 1977 Standards “should not be deemed as defining or establishing performance levels for protection from all environments”. You should always use extreme caution in any Technical Rescue and/or Wildland Firefighting to avoid the risk of injuries. See NFPA 1951, Para.1.2.3 and NFPA 1977, Para.1.2.3.

⚠ WARNING

Protective properties in a new NFPA 1951/NFPA 1977 Compliant Garment 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 Garment to ensure that the Garment is not used past its Useful Life. See NFPA 1951 and NFPA 1977.

⚠ 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 Garment and be ready to escape to a cool area where you can remove hot Garments quickly to help prevent or reduce the severity of burns.

⚠ WARNING

NFPA 1951/NFPA 1977 Certified Garments should NEVER be used by responders in auto extrication incidents where there is risk of fire.

5. GARMENT CONSTRUCTION, FEATURES and FUNCTION

In order to understand the limits of protection provided by your NFPA 1951/NFPA 1977 Certified Garments, you should study its construction, features and function.

5.1 OVERVIEW

Your Garments help reduce health and safety risks to the Firefighter. It protects the responder because it is made of special heat and flame resistant textiles which when exposed to flash fire, char instead of melt or combust, thereby reducing further injuries that can be caused by the ignition of the materials. Second, the thickness of the fabrics also creates limited insulation which contributes to the limited protection to the wearer against heat and flame.

Your Garment is designed to meet the requirements of NFPA 1977 and the base requirements of NFPA 1951.

Upon request, all documentation required by this standard and data showing compliance with this standard may be provided.

5.2 OUTER SHELL

The outer shell is made of material with limited resistance to the effects of heat, flame, and abrasion.

5.3 OTHER IMPORTANT SAFETY FEATURES

Collar: Your coat has a collar which must be raised up and closed with the Hook and Loop Closure in order to provide limited protection to the neck area from heat, flame and other hazards.

Sleeve Cuffs: Have a closure system that can be adjusted to provide a snug and secure fit around the wrists while wearing protective gloves.

Closure Systems: On the front of the coat and trousers, when properly fastened, keeps the coat and trousers from coming open during Technical Rescue and/or Wildland Firefighting activities.

Retroreflective and Fluorescent Trim: Improves your visibility in low-light conditions, however it does not meet the requirements in ANSI/ISEA 107, *American National Standard for High-Visibility Safety Apparel and Accessories.*

Pockets: Located on coat and pants, provide storage for tools.

Reinforcements: Provide reinforcement at the knees and elbows against flame, cuts and abrasion.

Labels: There are 3 important safety, cleaning and information labels, all located on the inside of the coat and pants. The Garment Safety Label provides critical safety information and directs you to read and understand this Guide. The Cleaning Label explains washing, drying and storage instructions.

Samples of the labels are located on page 2 of this Guide.

6. INSPECTION

Your Garments should be cleaned, inspected and repaired in a frequency and manner consistent with your department's protocol, NFPA 1855 and NFPA 1877.

6.1 PREPARATION

Read all labels first. There are three Safety, Cleaning and Information Labels (See Section 5 of this Guide for location). If any of the labels are missing, return the Garment to the manufacturer immediately.

6.2 FREQUENCY

You should inspect your Garments at the following times: 1.) Upon receipt of your new Garment or replacement component; 2.) At least monthly thereafter during the useful life of the Garment; 3.) After exposure to heat, flames, chemicals; and 4.) After washing, repair or decontamination. You must inspect your Garment as a minimum, at the above frequency intervals to detect more obvious damage and deterioration. Whenever you detect a potential problem through your own inspection, or suspect that the protective qualities might be degraded, your Garments should be inspected by a trained expert at your organization, a LION TotalCare® Center or factory designated facility.

FIG. 2 Test fabric strength with thumbs

6.3 INSPECTION PROCESS AND CRITERIA

1. Preparation for Inspection

A. Place Garment on a clean surface in a brightly lighted area.

2. Inspecting the Garment's coat and pants

A. Fabric: Examine for dirt, discoloration, thin spots, holes, tears, embrittlement, cracking, burns, abrasions and worn spots.

a. Discoloration is a sign of overexposure to light or heat.

b. Embrittlement, cracking or burns are a sign that other parts of the Garment may be worn out or damaged and must be thoroughly inspected.

c. Grasp any part of the fabric that may be damaged or flawed in both hands and try to push your thumbs through the fabric (**FIG. 2**). If the fabric punctures, it must be repaired if economically practical, or the Garment should be retired and disposed of in accordance with Sections 14 and 15 of this Guide.

B. Closure Systems: Examine for functionality and damage.

a. Hook and Loop – Engage and disengage hook and loop attachments to make sure they function well. Examine for worn, abraded, curled or melted pieces that require replacement. Check stitching for loose thread that would require repair.

b. Zippers – Examine all zippers for functionality and corrosion that would require replacement. Check stitching for loose threads that would require repair.

c. Hardware – Examine all hardware (i.e. zippers, hook and loop and buttons) for corrosion or other damage that would require replacement. Check that their attachment to the Garment is secure.

C. Reinforcements, pockets, etc.: Examine all reinforcements and components to make sure they are securely sewn to the Garment. Check all fasteners on pocket flaps for functionality and damage.

D. Accessories: Check all accessory items to ensure that they meet manufacturer's specifications.

E. Stitching and Seams: Examine all seams for loose threads, breaks, skipped stitches or weaknesses

F. Labels

a. Verify that all Safety, Cleaning and Information labels are on the Garments. See p. 2 and Section 5 of this Guide.

b. Make sure that all Safety, Cleaning and Information Labels are legible and securely attached to the Garment.

⚠ WARNING

Most performance properties of the Garment and its components cannot be tested by the user in the field.

6.4 RECORDKEEPING

LION TotalCare® Centers offer recordkeeping services in compliance with NFPA 1855 and NFPA 1877. 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.

7. DONNING AND DOFFING

7.1 PANTS

With the fly closure unfastened, hold open the pants. After pulling the pants to the waist, fasten the fly closure securely. (See **FIG. 5A.**) Cinch take-up straps, if present, so the pants are snug at your waist and adjust them so that the crotch of the Pants is comfortably secure against your crotch. Pants that hang down too low in the crotch will dangerously restrict your mobility and will wear out prematurely in the crotch seams. When properly fitted and correctly donned, the cuffs of your pants should be no less than 2" and not more than 5" off the floor. Step into your protective footwear and if they are adjustable, zip them up or tie the laces. Tighten the pants cuffs by adjusting the take-up straps.

FIG. 5A

7.2 COAT

Pull the coat onto your body. (See **FIG. 5B.**) Tighten coat cuffs by using the take-up straps. Zip up the front closure all the way to the neck and secure the stormflap (if present). (See **FIG. 5C.**)

FIG. 5B

7.3 SECURING THE COMPLETE PROTECTIVE ENSEMBLE

Don your helmet, protective gloves and make sure that your footwear is fastened properly. Raise the collar up and secure the hook and loop fastener to protect your neck.

FIG. 5C

7.4 FINAL INSPECTION BEFORE ENTERING HAZARD AREA

Last and most important, to ensure proper donning before entering a hazard area, **you must have a partner inspect your interface areas for proper overlap and that all closures are secured properly.**

7.5 DOFFING (REMOVING) YOUR GARMENT

A. First, never remove your Garments until you are certain that you are safely removed from the hazard area. Always wear your full ensemble during all phases of Technical Rescue and/or Wildland Firefighting operations.

B. After a strenuous emergency operation is completed and you are in a safe area, it is important to ventilate your body as quickly as possible in order to cool down. You should open the front of the coat to allow cool air to penetrate.

C. When you are ready to remove your Garments, you should first remove your gloves and helmet.

D. Next, begin to remove your Garments. Remove the coat first. Loosen the take-up straps at the coat wrist and the pants waist. Next, disengage the fly closure on trousers and remove them.

E. If your Garments are contaminated with hazardous chemicals, you should remove them, carefully avoiding any contact with contaminated parts. Hose the Garments down at the scene. Be sure to place the Garments in plastic bags to allow safe handling by laundry personnel. A Garment exposed to body fluids can be washed and disinfected to reduce the risk of exposure to bloodborne pathogens. See Washing, Decontamination and Disinfecting Procedures in Section 11 of this Guide.

F. During and after doffing, always look for signs of chemicals, body fluids or other contamination and for signs of wear or damage. See Washing, Decontamination and Disinfecting Procedures, Section 11 and Inspection Procedures, Section 6 of this Guide.

8. COMPATIBILITY AND PROPER FIT

⚠ WARNING

Wearing a coat and pants with inadequate overlap could result in serious injury. If you have questions about whether your Garments have the adequate overlap, contact your nearest Starfield LION dealer.

8.1 OVERLAP

You must make sure that there is adequate overlap between the coat and the trousers, before using the Garments. You will need the assistance of a partner to check these key areas.

Your Height Affects Overlap

Special care should be given to long-bodied Technical Rescue and/or Wildland Firefighting personnel of any size to ensure that adequate overlap is provided.

To check overlap, the following tests should be performed while wearing your complete protective ensemble:

A. NFPA 1500 Standard Position A **(FIG. 6A)**. While standing, reach over head as high as possible with your hands together. The inner liner of the coat must overlap the top of the trousers by no less than 2 inches (5 cm).

B. NFPA 1500 Standard Position B **(FIG. 6B)**. While standing with your hands together and reaching overhead as far as possible, bend forward to a 90° angle, to the left or right and backward. The coat must overlap the top of the trousers by no less than 2 inches (5 cm).

C. The lower edges of your trousers must overlap the tops of your boots by 4-6 inches (10-15 cm). Gloves and wristlets must overlap each other by 3 inches (7.5 cm) and leave no gaps where wrists might be exposed.

FIG. 6A
NFPA Position A

FIG. 6B
NFPA Position B

8.2 CHECKING PROPER FIT

All Garments must have adequate looseness in the torso, arms and legs to ensure that insulated air spaces are maintained. If the Garment bunches at the shoulders or binds in the shoulders, arms, thighs or crotch area, it is probably too small. Garments also should not be too loose, as this could hinder mobility or dexterity and place stress at the wrong places in the Garments. Upon receiving new or replacement Garments, make sure that there are at least a few inches of loose material around the arms and shoulder area. Then test the mobility by climbing stairs and crawling or duck walking.

8.3 CHECKING THE SIZE

Coat. The chest size shown for a coat should NEVER be smaller than the circumference of your own chest, measured under your arms. Coats are designed with an overage for better fit over clothing. The end of the sleeve should reach beyond your wrist when arms are at rest.

Pants. The waist size shown for a pair of trousers should NEVER be smaller than the circumference of your own waist, measured at your navel. Make sure the lower edges of your pants overlap the tops of your footwear by four to six inches (4"-6").

If the Garment does not seem to fit properly, you should check the size in the label to make sure it is your size as measured and to make sure it is your Garment.

⚠ *DANGER*

Never wear a Garment that fits improperly. If you have a question or there is a problem with the fit of the Garment, contact your safety officer for assistance. Wearing a Garment that does 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.

9. MARKING CONSIDERATIONS

For marking an individual's name or other identifying mark, an indelible laundry marker may be used. Starfield LION recommends marking the Garment in the following manner:

9.1 First, check the Garment Information Label to determine whether adequate identifying information was already printed by the manufacturer.

NEVER MARK ON THE SAFETY, CLEANING OR INFORMATION LABELS ON YOUR GARMENT!

10. USING GARMENTS SAFELY: HOW TO MINIMIZE THE RISK OF INJURY

The Garment is designed in compliance with both NFPA 1951 and NFPA 1977 to protect the user against specific hazards associated with Technical Rescue and Wildland Firefighting operations. This section indicates the hazards associated with these activities and specific warnings concerning the proper safe usage of your Technical Rescue/Wildland Firefighting Garment.

10.1 PREPARATION

Before beginning any Technical Rescue and/or Wildland Firefighting operation, your Garments should be donned according to the procedures in Section 7 of this Guide and checked by another person for proper interface.

⚠ DANGER

Always wear clean and thoroughly dry Garments. Soiled or contaminated Garments may be combustible, causing serious burns to the wearer if exposed to a flash fire.

10.2 BURN HAZARDS

There are three types of heat transfer: 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, directly from flames or reflected from hot surfaces.

10.3 FLASH FIRE

Flash fire means fire that rapidly spreads through a diffuse fuel, such as dust, gas or the vapors of an ignitable liquid, without the production of damaging pressure. Flash fires mainly produce hazardous radiant heat, as well as convective heat.

The NFPA 1951 Standard is based on the knowledge that the hazard of flash fires may be present at Technical Rescue operations. Your Garment provides minimal protection against heat and flame from flash fires. The materials are tested to provide limited flame resistance.

⚠ DANGER

Flash Fires are extremely dangerous incidents. The radiant and convective heat produced by a flash fire may be severe enough that you may be burned even while wearing this Technical Rescue/Wildland Firefighting Garment and without sustaining damage to the Garment. If you sense combustible gases or debris in the area, you should escape to a safe area until the dangerous condition has been eliminated.

Always use this garment properly and in a manner consistent with the following:

- The Authority Having Jurisdiction's standard operating procedures;
- NFPA 1500, *Standard on Fire Department Occupational Safety Health and Wellness Program;*
- NFPA 1581, *Standard on Fire Department Infection Control Program;*
- Title 29, Code of Federal Regulations (CFR), Part 1910.132 "General Requirements of Sub part I, Personal Protective Equipment"; and
- Title 29, CFR 1910.1030, "Protecting Health Care Workers from Occupational Exposure to Blood-Borne Pathogens"

10.4 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.**

SECOND DEGREE BURNS occur when the skin reaches approximately **131° F.**

THIRD DEGREE BURNS occur when skin temperature reaches approximately **152° F.**

Compression against hot surfaces can cause burns

Minimal protection against conductive burns: You can be burned by conductive heat when you contact heated surfaces or objects. Your Technical Rescue/Wildland Firefighting Garment does not include a thermal liner and therefore the Garment provides only minimal protection from conductive burns. It is critical to avoid contact with any hot surfaces while wearing the Technical Rescue/Wildland Firefighting Garment.

Minimal protection against convection burns: Convected heat travels through the air, even if there is no immediate appearance of fire. However, convected heat can elevate the temperature of your Garment enough to cause a conductive heat burn when the fabric comes into contact with your skin. Your Garment does not have a thermal liner. Therefore, it should not be used in situations of high temperature.

Radiant heat from hot surfaces can cause burns

⚠ DANGER

This NFPA 1951/NFPA 1977 Certified Technical Rescue/Wildland Firefighting Garment does NOT include a thermal barrier for insulation against heat. To prevent being burned, you must avoid wearing this Technical Rescue/Wildland Firefighting Garment in high temperature environments and avoid contact with any hot surfaces.

⚠ DANGER

You must only use Technical Rescue/Wildland Firefighting Garments in environments where no structural fire is present. In rescue situations where fire is present, responders must only wear NFPA 1971 compliant structural or proximity firefighter clothing.

⚠ DANGER

The buildup of heat in Garments can lead to burns without any sign of damage to the Garment. Never wait for signs of Garment 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

Technical Rescue and/or Wildland Firefighting personnel 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 1951/NFPA 1977 Certified Garment!

⚠ WARNING

Do not confuse the component testing requirements that are part of NFPA Standards with the conditions in which Technical Rescue and/or Wildland Firefighting personnel work. For example, the requirement that certain components must not melt, drip or separate when exposed to convected heat temperatures of 500° F for 5 minutes is in no way intended to indicate that Technical Rescue and/or Wildland Firefighting personnel face that condition in their work, or could be expected to withstand that condition EVEN WHILE WEARING THE GARMENTS CORRECTLY without suffering serious injury or death.

10.5 HEAT STRESS: A SIGNIFICANT CAUSE OF RESPONDER 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 that more blood can be moved to the skin surface. Blood vessels near the skin dilate so that 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 garment's insulation blocks the transfer of heat away from the body, the garment 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.

⚠ DANGER

If you are unavoidably exposed to high temperatures during a Technical Rescue and/or Wildland Firefighting activity, you need to be constantly aware of the buildup of heat in the surrounding environment and in your Garments and be ready to escape to a cool area where you can remove hot Garments quickly to avoid burns.

⚠ WARNING

Overexertion in hot conditions while wearing Garments 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 and clammy. If you feel symptoms, get to a cool place, remove your Garments 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 Garments, 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.

⚠ WARNING

Exposure to smoke particulates produced by combustion may affect cardiovascular health and may increase your risk of cancer. You must secure all interfaces properly to minimize entry of hazardous fireground contaminants. Even small fires produce extremely large amounts of these hazardous products of combustion and firefighters must take care to minimize direct skin contact with products of combustion that are known to penetrate skin, such as Polycyclic Aromatic Hydrocarbons (PAHs) denoted by asterisks(*). **See Products of Combustion table below.**

Products of Combustion**

Substances	
Acetaldehyde	Isoprene
Arsenic	Lead compounds, inorganic
Asbestos	Lead compounds, organic
Benz[a]anthracene*	Naphthalene*
Benzene	2-Nitroanisole
Benzo[b]fluoranthene*	Polychlorinated biphenyls
Benzo[k]fluoranthene*	Polychlorinated dibenzodioxins
Benzofuran*	Polychlorophenols
Benzo[a]pyrene*	Radioactivity
1,3-Butadiene	Silica (amorphous)
Cadmium	Sillica (crystalline)
Carbon black (total)	Styrene
Chrysene*	Sulfuric acid (concentrated mists)
Dibenz[a,h]anthracene*	Tetrachloroethylene
Dichloromethane	Toluene diisocyanates
Ethylbenzene	Trichloroethylene
Formaldehyde	Trichloromethane
Furan	Triphenylene
Indeno-1,2,3-[cd]pyrene*	

⚠ WARNING

If you experience accidental or incidental exposure to a hazardous material, you need to follow the precautions in Section 11 of this Guide regarding Washing and Decontamination, in order to limit exposure to yourself and others.

** Sources and for more information please see: Hwang, Xu, Agnew, Clifton, Malone, Health Risks of Structural Firefighters from Exposure to Polycyclic Aromatic Hydrocarbons: A Systemic Review and Meta-Analysis. 2021, 18 4209 https://doi.org/10.3390; Fent, K.W.; Eisenberg, J.; Snawder, J.; Sammons, D.; Pleil, J.D.; Stiegel, M.A.; Mueller, C.; Horn, G.P.; Dalton, J. Systemic exposure to pahs and benzene in firefighters suppressing controlled structure fires. Ann. Occup. Hyg. 2014, 58, 830–845. International Journal of Environmental Research and Public Health. Fent, K.W.; Eisenberg, J.; Evans, D.; Striley, C.; Snawder, J.; Mueller, C.; Pleil, J.; Stiegel, M.; Horn, G.P. Evaluation of Dermal Exposure to Polycyclic Aromatic Hydrocarbons in Fire Fighters: Report No. 2010-0156-3196, NIOSH Health Hazard Evaluation Program. 2013. Available online: https://www.cdc.gov/niosh/hhe/reports/pdfs/2010-0156-3196.pdf. Monographs on the Evaluation of Carcinogenic Risks to Humans, Volume 98, Painting, Firefighting, and Shiftwork; IARC: Lyon, France, 2010.

10.6 HEART ATTACKS: A RESULT OF OVEREXERTION

During Technical Rescue and/or Wildland Firefighting 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 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 user’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 factors could place too much stress 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.

10.7 LIQUID PENETRATION AND HAZARDOUS MATERIALS

No Protection Against Liquid Penetration or Hazardous Materials

10.8 ELECTROCUTION

⚠ *WARNING*

Your Garment is NOT designed to protect you against electrocution. When entering a rescue site, you should NEVER touch live wiring, especially if your Garments are wet. Never allow equipment you are operating to contact live wiring.

10.9 BLOODBORNE PATHOGENS

Your Garments are not designed to protect against the hazards of exposure to bloodborne pathogens present in body fluids. See Section 11 of this Guide for more information.

10.10 ADDITIONAL FACTORS AFFECTING SAFETY

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

- Conditions at the incident beyond the scope of the limited purposes of this Garment;
- Unauthorized modifications, repairs or replacement of components of the Garment not otherwise in compliance with Starfield LION’s specifications; and
- The addition of accessories that are not approved by Starfield LION as compatible with the Garments. If you have questions about whether accessories will degrade the performance of your Garment below the NFPA 1951 or NFPA 1977 Standard, contact Starfield LION or a LION TotalCare® Center.

⚠ DANGER

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

⚠ WARNING

To reduce the risk of harm from hazardous substances present in the products of fire combustion, or hazardous chemicals, you MUST wash your Garments.

⚠ WARNING

Hazardous fire scene substances and chemicals may penetrate and become absorbed in your Garments. These substances can enter the body through absorption, inhalation, parenteral contact and ingestion. Wipe skin areas near the interfaces of protective clothing and equipment with a wet wipe immediately after doffing. Take a soap and water shower within 1 hour of an incident where an exposure could have occurred.

Reference NFPA 1500, section 14.5.3.1

11. WASHING, DECONTAMINATION AND SANITIZATION OR DISINFECTION

11.1 HAZARDS OF DIRTY GARMENTS: WHY WASHING AND DECONTAMINATING IS IMPORTANT

You can be exposed to many hazardous substances on the job. These substances can contaminate your Garments, and cause harm to you after your body contacts your Garments. This section tells you how to wash and decontaminate your Garments 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 firefighter. These substances can become embedded in the fibers of your Garments, penetrate inner layers, and enter the body through absorption, inhalation, parenteral contact and ingestion. In addition, particulates and other products of combustion can reduce the flame resistance of your Garments and increase your Garments' 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 Garments. ALWAYS wash hands thoroughly after handling or cleaning protective equipment.

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 Garments at the scene to limit further exposure to hazardous chemicals, to reduce exposure to others, and to prevent chemicals from settling into your Garments.

⚠ WARNING

Some contamination may remain even after decontamination procedures and cleaning processes are used. Decontamination and cleaning does not guarantee that protective clothing and equipment will be 100% free of contaminants. See NFPA 1851, NFPA 1855 and NFPA 1877.

11.2 FREQUENCY

NFPA 1951/NFPA 1977 Certified Garments should be cleaned:

1.) after every use and;

2.) as soon as possible after exposure to smoke or hazardous substances.

⚠ WARNING

Never Dry-Clean your Garments. Dry cleaning solvents are made from petroleum products, which may support combustion and negate the fabric's flame resistant properties.

⚠ WARNING

To reduce the risk of harm from hazardous substances present at a building collapse, damaged vehicle or hazardous chemicals, you MUST wash your Garments.

⚠ WARNING

Always wash your Garments separately from other items. Never wash your Garments at home or at public laundry facilities to avoid the spread of chemical contamination or hazardous combustion products to other laundry.

⚠ WARNING

Never use high velocity power washers or pressure hoses for washing Garments. These tools can severely damage the raw materials and seams.

StationCare 1851 is available online at www.lionprotects.com/totalcare.

Contact a LION TotalCare® Center for additional information about the compatibility of cleaning products with protective clothing.

11.3 CLEANING PRODUCTS

Routine Washing:

A. Commercially available cleaners. Use commercially available cleaning products with a pH greater than 6.0 and less than 10.5. Many household cleaning products fall within this range.

B. Specialty Cleaners. StationCare 1851 from LION TotalCare® is designed for NFPA 1951 and NFPA 1977 Garments. Always read SDS before use.

C. Spot cleaning and pre-treating. Spot cleaners and pre-treatments are available from industrial cleaning product suppliers. Always check MSDS and product's instructions before use.

⚠ WARNING

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

no chlorine bleach

11.4 SPOT CLEANING

A. Use a cleaning product that is safe for use on protective clothing fabrics to clean light spots and stains on Garments.

B. Apply the cleaner one or two times on soiled areas according to the cleaning product's instructions on dilution and application.

C. Gently rub the fabrics together.

D. Thoroughly and carefully rinse Garment with cool water.

⚠ *WARNING*

Do not use petroleum-based solvents to spot clean. These products may reduce the limited protective qualities of the Garment.

11.5 PRETREATING

A. Apply pretreating product onto the soiled areas according to the pretreating product's instructions on dilution and application.

B. Thoroughly and carefully rinse the Garment with cool water.

C. Place Garments into washing machine and follow the wash procedures in this section.

11.6 HEAVILY SOILED AREAS

A. Air dry Garments before applying cleaning product.

B. Saturate the heavily soiled and surrounding area according to the cleaning product's instructions on dilution and application. Follow the cleaning product instructions for duration of soaking.

C. Use a soft bristle brush (toothbrush or fingernail-type brush dipped in water) to gently scrub the soiled area for 1 or 2 minutes.

D. Thoroughly and carefully rinse Garment with cool water.

E. Repeat steps B-D if necessary.

F. Place Garment into the washing machine as instructed in the wash procedures in this section.

11.7 MACHINE WASHING

Preparation

Before washing, make sure you comply with all federal, state and local guidelines for handling effluents from utility sinks.

A. Pretreat heavily soiled Garments following steps in the Spot cleaning and Pretreating procedures, in Sections 11.4-11.5 of this Guide.

B. Fasten all closures and place Garments in a large laundry bag that can be tied shut to avoid damage to the wash tub.

C. Fasten all hook and loop closures to each other to reduce the likelihood of damage to delicate parts of your Garment.

Machine Settings

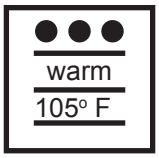
Use a front loading extractor or front loading washing machine with a tumbling action for washing. Do not use a top-loading machine, because it will not wash your Garment as thoroughly and the agitator may damage the Garment and reduce its durability and protective value.

Use the following machine settings:

A. Wash temperature should not exceed 105° F (40° C).
B. Normal Cycle.
C. Use low extractor speeds less than 100 g's.
D. Double Rinse. Double rinsing removes residual dirt and insures detergent removal. If your machine will not automatically double rinse, a complete second rinse cycle should be run without adding detergent.

Wash Procedures

A. Load machine with Garments to be washed. Follow machine manufacturer's instructions for proper load size. Overloading the machine can lead to incomplete cleaning and other poor cleaning results.
B. Add cleaning product per manufacturer's instructions. Never use Chlorine bleach; non-chlorine bleach may be used. Ensure accurate measuring tools are used for correct amount of cleaning product. See Section 11.3 for guidelines on cleaning products.
C. Set washing machine on normal cycle and start the wash cycle.

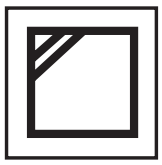


water temperature

machine wash cycle


no chlorine bleach


line dry/ hang to dry


in the shade


never tumble dry


never dry-clean

11.8 DRYING

A. Remove Garments from washing machine. Dry by hanging in a shaded area that receives good cross ventilation or use a fan to circulate the air.
B. Do not use automatic dryers because the mechanical action and excessive heat may damage or shrink your Garments.

⚠ *WARNING*

Do not hang Garments to dry in direct or indirect sunlight, or in fluorescent light. Light will severely reduce the strength of the seams and will discolor and greatly reduce the strength and protective qualities of the components of the Garment.

11.9 DO NOT DRY CLEAN

Never dry-clean your Garment. Dry-cleaning will damage the Garment and reduce its protective qualities.

11.10 DECONTAMINATION AND SANITIZATION OR DISINFECTION

Applicable Standard. You must read and have facilities and procedures in compliance with NFPA 1581 Standard for Fire Department Infection Control Program.

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

⚠ *CAUTION*

Personnel involved in the handling, sorting, bagging, transporting and laundering of contaminated Garments must wear utility gloves and appropriate protective clothing to prevent occupational exposure during these activities.

⚠ WARNING

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

A. Hazardous Substances (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 garments according to the procedures in this section.

⚠ WARNING

Only a trained expert in decontamination should attempt to decontaminate your Garment. Contact a LION TotalCare® Center to seek assistance in determining whether decontamination is possible and the name of the appropriate organization to perform decontamination.

11.11 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 Garments and it should include LAUNDRY ROOM SAFETY PROCEDURES and HOUSEKEEPING SAFETY PROCEDURES. You should follow all appropriate federal, state, and local regulations.

12. REPAIRS

⚠ WARNING

Before any repairs are made to your Garment, it must be washed, decontaminated and disinfected in accordance with this Guide. It is a violation of OSHA guidelines to expect workers to alter or repair soiled and possibly contaminated or infected Garments.

All repairs should be done by LION TotalCare® Centers or a verified ISP. Repairs made to Garments by unlisted companies may invalidate all warranties and may expose the wearer to hazardous or life threatening conditions. For a list of LION TotalCare® Centers, visit www.lionprotects.com/totalcare-locations. Call LION at (800) 421-2926 for an updated list of verified ISPs.

13. STORAGE

Between incidents and for longer-term storage, hang your Garments in a dry location out of light and away from sharp objects that may cause tears or snags in the fabric.

Use fans to provide good ventilation to dry Garments that may have absorbed water or sweat after an incident and to assist in the removal of contaminants that may not have been removed by washing.

Failure to dry your Garments will result in the growth of mildew and bacteria which could lead to skin irritation, rashes or may affect the protective qualities of the fabrics.

Always wash and dry your Garments in accordance with Section 11 of this Guide before hanging in long-term storage. Garments should be stored at temperatures between 25° F and 180° F.

FIG. 8
Never store your Garments in direct sunlight, indirect sunlight or in fluorescent light.

⚠ *WARNING*

Avoid storing your Garments in temperature extremes. Repeated cycles of heating and cooling can reduce the protective qualities and useful life of the Garment. See Section 14 of this Guide for limitations on useful life.

⚠ *WARNING*

NEVER STORE YOUR GARMENT IN DIRECT SUNLIGHT, INDIRECT SUNLIGHT or IN FLUORESCENT LIGHT (FIG. 8). Exposure to light (particularly light in the sun's rays and fluorescent light) will severely weaken and damage the components in your Garment after only A FEW DAYS Damage caused by exposure to light cannot be repaired, nor will the manufacturer cover such damage in its warranty. (See Warranty Information, Section 16 of this Guide.)

⚠ *CAUTION*

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

14. RETIREMENT

14.1 USEFUL LIFE AND RETIREMENT

NFPA 1951 and NFPA 1977 performance requirements are based on new, unworn Garments and Composites. Useful life is the period of time that Garments, which have been properly cared for, can be expected to provide reasonable limited protection. Useful life is normally 5-7 years, depending on the materials and the conditions of wear, maintenance and storage. Useful life is highly unlikely to be more than 15 years. A general rule recommended by SAFER and provided in the appendix of the NFPA 1855 is that Garments should be retired when the costs of repair would exceed 50% of the replacement cost.

HOW LONG IS USEFUL LIFE?

- The period of time that NFPA 1951 and 1977 performance requirements are based on new, unworn garments and Composites. Useful life varies depending on garment materials selected, conditions of wear, maintenance and storage, but is normally 5-7 years.
- Garments more than ten (10) to fifteen (15) years old and made to earlier versions of the NFPA Standard are highly likely to have exceeded their useful life and must be retired!

The useful life of a Garment will vary according to the following factors:

- Weight and type of weave of fabric
- Age and frequency of use
- Type of work the wearer performed
- The length of exposure to extreme heat and the intensity of the heat
- The length of exposure to direct or indirect sunlight or other light sources such as fluorescent light

Your Garments 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 Garments 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 Garments and their limitations should handle the details of a retirement program. If you have any questions about the useful life and retirement of your Garment, get assistance before wearing your Garment into any Technical Rescue and/or Wildland Firefighting operation! Contact a trained expert within your department, Starfield LION, a LION TotalCare® Center or a verified ISP.

14.2 OUTER SHELL COLOR OR SHADE CHANGES

Garment textiles may experience color or shade changes during their useful life as a result of washing and/or exposure to fireground conditions. Shade changes normally do not affect the fabric's protective properties. Nonetheless, inspect your Garments according to section 6 of this guide.

15. DISPOSAL

⚠ CAUTION

Most performance properties of the Garment and its components cannot be tested by the user in the field.

15.1 DISPOSAL

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

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

⚠ WARNING

Never use retired Garments for training purposes. Use of retired Garments in hazardous situations could result in serious injury or death.

16. LIMITED WARRANTY INFORMATION

Starfield LION warrants that its firefighter and emergency responder products meet all applicable NFPA standards in effect at the time of their manufacture and further warrants that such products are free from any defect in workmanship or any patent material defect.

Conditions of use are outside the control of Starfield LION. It is the responsibility of the user to inspect and maintain the products to assure they remain fit for their intended purpose. In order to maximize the useful life of these products and maintain the warranty, the products are to be used only by appropriately trained personnel following proper emergency response techniques and in accordance with the product's warning, use, inspection, maintenance, care, storage and retirement instructions. Failure to do so will void the warranty.

EXCEPT AS SET FORTH ABOVE, Starfield LION MAKES NO OTHER WARRANTIES, EXPRESS OR IMPLIED, INCLUDING, BUT NOT LIMITED TO, ANY WARRANTIES OF MERCHANTABILITY OR FITNESS FOR ANY PARTICULAR USE.

Under the above warranties, Starfield LION will repair or replace, at its option, any product which does not meet the above warranties. Such repair or replacement will be the purchaser's sole remedy and Starfield LION will not be responsible for any incidental, consequential or other damages based upon or arising in any way from any breach of the warranties contained herein or the purchaser's use of such product.

These warranty obligations apply only to any product, part or component which STARFIELD LION agrees to be defective as covered by this warranty and is returned.

The word "product" includes the product itself and any parts or labor furnished by Starfield LION with the sales, delivery or servicing of the product.

USEFUL LIFE: Performance requirements are based on new, unworn Garments and Composites. Useful life is the period of time that Garments, which have been properly cared for, can be expected to provide reasonable limited protection. The useful life will vary according to type and frequency of use, the weight and type of materials used in the product. Useful life is normally 5-7 years, depending on the conditions of wear, maintenance and storage. Useful life is highly unlikely to be more than 10 to 15 years. Garments more than 15 years old and made to earlier versions of NFPA Standards are highly likely to have exceeded their useful life and must be retired! A Garment should be retired when the costs of repair would exceed 50% of the replacement cost

DEFECTS IN WORKMANSHIP AND MATERIALS: Defects in Workmanship and Materials means poorly manufactured items, including seams, stitching or components (for example, loose or broken seams; zippers or snaps that fall off or do not function properly); and fabrics or barriers which have such flaws as holes, uneven spots, weak areas, pilling or other flaws caused by irregularities in their manufacture.

EXCEPTIONS TO LIMITED WARRANTY

This limited warranty does not cover the following items after receipt of products by end user:

A. Claims made after 60 days from the date of shipment for damage to materials;
B. Damage or color change from exposure of materials to direct or indirect sunlight or fluorescent light;
C. Shade variations among textiles used or shade changes to fabrics caused by wear and tear and washing;
D. Color loss due to abrasion (creases, folds, pleats, edges, collar points, etc.);
E. Damage caused by improper washing, decontamination, disinfection or maintenance (for example, use of chlorine or petrochemicals to clean);
F. Damage caused by repair work not performed to factory specification;
G. Damage from routine exposure to common hazards which may cause rips, tears, burn damage or abrasion;
H. Loss of retroreflectivity of reflective trim due to normal wear or heat exposure;
I. Detachment of reflective trim due to thread abrasion or heat exposure;
J. Replacement of zippers or closures worn partially sealed, or damaged by heavy wear and tear;
K. Loss of buttons, snaps or cuff hem seams.

18. INSPECTION, CLEANING, REPAIR, RETIREMENT AND DISPOSAL RECORD

Garment ID_____ **Model**_____ **Date of Garment Manufacture**_____

In the spaces below, note the activities performed on your Garment during its wear life.
Types of activities can include: Routine or Advanced Inspection; Routine or Advanced Cleaning; Decontamination; Repair; Alteration; Removal from Service; Retirement; Disposal, etc.

Date of Activity	Type of Activity	Reason for Activity	Description of Repair, Inspection Findings, etc.	Location on Garment	Inspection/ Cleaning/Repair Site	Activity Performed By	Date Returned to Service

Date of Retirement_____ Date and Method of Disposal_____

Earn your Starfield LION NFPA 1500 PPE Safety and Use Certificate

Fire Academy™
www.lionfireacademy.com

PERSONAL RESPONSIBLITY CODE

DANGER

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

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

FEMSA

www.femsa.org

February 2025

Starfield™
ready for action