

# • Liquid Splash Garments User Manual

Encapsulated and Non-Encapsulated

**RM00457**

**2.0**

Revision 2.0

*For additional copies of this User's Guide, log onto [www.lakeland.com](http://www.lakeland.com)*

**NOTICE!**

This User Guide is to be removed only by the End User.

**CAUTION!**

Most performance properties of this liquid splash protective clothing item or ensemble cannot be tested by the user in the field.

**ATTENTION!**

For Pyrolon® FR family of products, please see Flame Resistant information on pages 1 and 2.



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**Before you use this product, you must read the Warranty Information and Warnings and Limitation sections of this manual.**

# Warranty Information

It is the responsibility of the user to select garments, products and accessories which are appropriate for each intended use and which meet all specified government and industry standards.

**IMPROPER USE OF THESE PRODUCTS MAY RESULT IN PERSONAL INJURY OR DEATH. IMPROPER USE INCLUDES, BUT IS NOT LIMITED TO IMPROPER SELECTION, USE WITHOUT ADEQUATE TRAINING, DISREGARDING THESE WARNINGS AND INSTRUCTIONS SUPPLIED WITH THE PRODUCTS AND FAILURE TO INSPECT AND MAINTAIN THE PRODUCTS. THESE PRODUCTS ARE INTENDED TO BE USED ONLY IN CONJUNCTION WITH THE ENVIRONMENTAL PROTECTION AGENCY (EPA) RULES AND REGULATIONS, ([HTTP://WWW.EPA.GOV/LAWSREGS/](http://www.epa.gov/lawsregs/)) AND THE REQUIREMENTS OF OSHA SAFETY AND HEALTH STANDARD 29 CFR 1910 AVAILABLE FROM THE U.S. DEPARTMENT OF LABOR, OCCUPATIONAL SAFETY AND HEALTH ADMINISTRATION, ([HTTP://WWW.OSHA.GOV](http://www.osha.gov)), AND OTHER PERTINENT NATIONALLY RECOGNIZED STANDARDS, SUCH AS THOSE PROMULGATED BY THE NATIONAL FIRE PROTECTION ASSOCIATION (NFPA) ([WWW.NFPA.ORG](http://www.nfpa.org)), THE AMERICAN SOCIETY FOR TESTING MATERIALS (ASTM) ([WWW.ASTM.ORG](http://www.astm.org)), THE NATIONAL INSTITUTE OF OCCUPATIONAL SAFETY AND HEALTH (NIOSH) ([WWW.CDC.GOV/NIOSH/RPG](http://www.cdc.gov/niosh/rpg)), AND THE U.S. COAST GUARD OR DEPARTMENT OF DEFENSE. IT IS INCUMBENT UPON THE WEARER AND LEGALLY REQUIRED OF AN EMPLOYER TO READ AND UNDERSTAND THESE REGULATIONS.**

**THESE PRODUCTS ARE NOT FLAME RESISTANT AND SHOULD NOT BE USED AROUND HEAT, FLAME, SPARKS, OR IN POTENTIALLY FLAMMABLE OR EXPLOSIVE ENVIRONMENTS EXCEPT WHERE OUR GARMENTS ARE SPECIFICALLY ADVERTISED AS FIRE RESISTANT OR RETARDANT.**

**NO EXPRESSED OR IMPLIED WARRANTIES OF FITNESS FOR A PARTICULAR PURPOSE OR OF MERCHANTABILITY OR OTHERWISE IS MADE.**

Purchaser and all garment users shall promptly notify Lakeland Industries, Inc. of any claim, whether based on contract, negligence, strict liability or otherwise.

The sole and exclusive remedy of the purchaser and all end users and the limit of liability of Lakeland Industries, Inc. for any and all losses, injuries or damages shall be the refund of the purchase price or the replacement or repair of any product found to be defective within 90 days after the product is delivered.

**IN NO EVENT SHALL LAKELAND INDUSTRIES, INC. BE LIABLE FOR ANY SPECIAL, INCIDENTAL OR CONSEQUENTIAL DAMAGES, WHETHER IN CONTRACT OR IN TORT, ARISING OUT OF ANY WARRANTIES, REPRESENTATIONS, INSTRUCTIONS, OR DEFECTS FROM ANY CAUSE IN CONNECTION WITH THE GARMENT, OR THE SALE THEREOF.**

Purchaser and all users are responsible for inspection and proper care of this product as described in any OF OUR care and use manuals and are responsible for all loss or damages from use or handling which results from conditions beyond the control of the manufacturer.

Product safety information is available upon request. This information corresponds to our current knowledge on the subject. It is offered solely to provide possible suggestions for your own experimentations. It is not intended, however, to substitute for any testing you may need to conduct to determine for yourself the suitability of our products for your particular purposes. It is the user's responsibility to determine the level of risk and the proper protective equipment needed for the user's particular purposes. This information may be subject to revision as new knowledge and experience becomes available. Since we cannot anticipate all variations in actual end-use conditions,

**LAKELAND INDUSTRIES, INC. MAKES NO WARRANTIES AND ASSUMES NO LIABILITY IN CONNECTION WITH ANY USE OF THIS INFORMATION.**

Nothing in this publication is to be considered as a license to operate under or a recommendation to infringe any patent right.

# Warnings and Limitations

Lakeland's garments and products are not suitable for use in all situations and environments with all chemical and hazardous materials. All decisions regarding the choice and usage of chemical protective clothing must be done by trained and qualified safety professionals in accordance with all OSHA and EPA Rules and regulations. Failure to follow such regulations absolves Lakeland Industries, Inc. from all liability. It is the user's responsibility to determine the level of exposure and the proper personal protective equipment needed. It is the employer's LEGAL RESPONSIBILITY to provide PROPER protective clothing to employees, and provide adequate care, use and maintenance of these garments as only your employer knows the conditions under which the wearer works. Lakeland has no such knowledge, so ask your employer.

Lakeland protective garments will burn except where our garments are specifically advertised as fire resistant. These garments should not be worn around heat, open flames, sparks or any other possible ignition source nor in potentially explosive or flammable environments.

If the Lakeland protective garment or product is abraded, cut, torn, punctured or otherwise and in any way breached, do not use. The protective garment material has finite resistance to abrasion, cut, tear and puncture. It is the responsibility of the employer and wearer to inspect Lakeland garments prior to use to insure the integrity of the products, garments and components.

If the Lakeland protective product or garment is damaged during use, retreat immediately to a safe environment, thoroughly decontaminate the garment, then dispose of it in a safe manner.

## Limitations of Use

Lakeland protective garments are not intended for protection against radiological hazards.

If the danger of exposure to biological aerosols or chemical warfare chemicals exists, the use of a protective ensemble certified to the optional Chemical and Biological Terrorism requirements of NFPA 1991 (2005 Edition) or garments certified to Class 2 of NFPA 1994 should be considered. Each of these standards provides different levels of performance.

## Chemical Permeation Data

Before using a protective ensemble in a chemical situation, consult the chemical permeation data appropriate to the garment material. Note that seams, visors and closures will generally have lower or different permeation times than the garments' material. This information is to be used as a guide only. The permeation performance of any material depends on a number of factors including chemical concentration, temperature, time and amount of exposure. Due to the large number of variables, it is impossible for all ensemble materials to be tested against all elements, chemicals, all combinations or mixtures thereof, and all temperatures at which the element or chemical might be encountered.

Chemical permeation tests are performed under laboratory conditions -- not actual workplace conditions. They address chemical breakthrough characteristics and do not account for physical performance characteristics that affect a barrier such as abrasion, flex fatigue, puncture, tear, oxidative degradation, or degraded performance due to previous use contaminations.

No single protective material will protect against all chemicals for all situations. The best course of action is to test the primary protective garment materials against the specific chemical hazard, at the

temperature and in the concentrations to be encountered. Lakeland Industries, Inc. will provide free swatches of primary garment materials for testing and can provide you with a list of testing facilities.

## Never Use Pure Oxygen

The use of 100% oxygen with these garments presents serious fire safety and health hazards. Use only properly functioning breathing quality, compressed air or air line supplied breathing air.

Wearing garments made of fire retardant cottons, aramids or modacrylics under or over Lakeland light non-woven, ChemMax® or Interceptor® Plus garments will not reduce burn injury during a flash fire. Our products and garments will burn and possibly melt when exposed to flash fire; this is likely to increase burn injuries even when worn over flame resistant fabrics. This is also true of Lakeland MicroMax® NS, MicroMax® NS Cool Suit, MlcroMax®, SafeGard®, SafeGard® Economy SMS, ZoneGard®, ChemMax®, Interceptor® Plus and other Lakeland light non-woven fabric lines. *However*, Pyrolon® fabrics and garments are intended to be worn over fire retardant cottons, aramids and modacrylics.

Therefore users of any of these flammable garments should not enter an environment in which the concentration of flammable gas (such as paint fumes, hydrocarbon fumes or pure oxygen) has reached a concentration which is within flammable, ignitable or explosive limits, causing a fire or flash fire.

Simply stated, if there is a flash fire, nothing will protect you from severe burns or death. Therefore, it is the user's responsibility to think before working in even a potential flammable gaseous atmosphere.

Lakeland's light non-woven fabrics, ChemMax® and Interceptor® Plus line, are not intended for fire fighting activities, nor for protection from hot liquids, steam, molten metals, welding, electrical arc or thermal radiation. **USE COMMON SENSE! DO NOT SMOKE, OR USE ELECTRICAL MACHINERY, AND INSURE USE OF PROPER BONDING AND GROUNDING** where flammable gas, liquids or solids exist. Anti-static treatments and coatings are not adequate for all environmental conditions. Static electricity in non-humid or winter environments can cause a deadly flash fire where flammables are present in the workplace. Lakeland's garments are intended to help reduce the potential for injury, but no protective apparel alone can eliminate all risk of injury. When dealing with fire, heat, or flames, look to Lakeland's **FIRE RESISTANT/RETARDANT APPAREL LINES**.

## Wear and Use Considerations

### Manage and Prevent Heat Stress

This garment interferes with the natural regulation of body temperature. This can lead to a rise in core body temperature and heat stress. The wearer should be aware of the symptoms and treatment of heat stress. The wearer can take several steps to limit and/or prevent heat stress, such as the use of a cooling system, and implementing a conservative work/rest schedule.

The maximum time the garment can be worn depends on such variables as the air supply, ambient condition, climate inside the garment, physical and psychological condition of the wearer, work rate and work load. The TLV™ pocket guide from the American Conference of Governmental Industrial Hygienists (ACGIH, Cincinnati) provides corrected heat stress limits for totally encapsulated garments. Similar information is available on the federal OSHA web site ( [www.OSHA](http://www.OSHA) ).

gov) . The WBGT correction factor for chemical protective garments is at least 10° C or higher for totally encapsulated garments.

### ***Wearers Must be Physically Fit***

Garments should only be worn by persons who are in good physical condition. Working in chemical protective clothing is strenuous. In an emergency situation or hot environment, the wearer may experience heat stress. Persons who show symptoms of heat stress such as nausea, dizziness, high heart rates, or excessive heat build-up should leave the work area immediately and remove the garment as quickly as possible after decontamination. Persons in doubt about their physical condition should check with a physician before wearing chemical protective garments.

### ***Always Use the Buddy System***

Never enter a contaminated area alone. A minimum of two people should enter contaminated areas together. Two additional people, in equally protective garments should be available to affect rescue of the entry team. All persons entering the contaminated area should wear appropriate protective equipment.

### ***Static Electricity***

Under certain conditions, such as cold and dry weather, it is possible that garments might build and discharge static electricity. Discharges are not normally dangerous except in situations where the generation of an electrical spark could ignite a flammable atmosphere or startle the wearer. When operating around flammable chemicals, steps to eliminate potential static discharges should be used. In these situations, steps have been recommended such as, but not limited to, water spray, the use of an over-cover, raising humidity level of the work area, use of a commercial, anti-static application coating, grounding straps on equipment and personnel, inherently static-dissipating under- and over-garments, and testing of the worker's static dissipation before entry into the classified area.

However, in the case of explosive or flammable atmospheres, even if sophisticated and elaborate steps are taken to manage static formation and dissipate static charge, the risk of severe injury remains if an uncontrolled or accidental ignition occurs. Lakeland chemical protective garments should not be worn in potentially flammable or explosive atmospheres.

### ***Sock Booties***

The socks attached to chemical protective garments are designed to be worn inside outer boots. These sock boots do not have sufficient durability or slip resistance to be worn as outer boots.

### ***Avoid Exothermic Reactions***

Certain chemicals produce a large amount of heat when they react with water. If garments are heavily contaminated with a water-reactive chemical, there is a possibility that the garment may be damaged during field decontamination from the high reactive heat. The excess chemical may have to be removed with dry sand or non-reactive absorbent before water decontamination.

### ***Avoid Continuous Exposure***

This garment should not be immersed in chemicals. This garment should not be exposed to continuous hazardous liquid chemical splash or deluge. Do not wade through liquid pools of hazardous chemicals if it is not necessary. Direct, liquid chemical exposure to the garment should be as limited as possible. If exposed to direct splash or a deluge of hazardous chemicals, leave the area immediately and decontaminate.

### ***Supplied Air Line Applications***

To connect to an external supplied air-line system, encapsulated garments must be equipped with the appropriate, NIOSH approved garment pass-through. This pass through connection should not be relied upon as an anchor for a tether. Excess pull on this fitting may result in permanent damage to the garment.

### ***Avoid Suffocation***

Do not attempt to wear a totally-encapsulated, chemical protective garment without supplied fresh air. This applies to vapor-protective (Level A) and totally encapsulated (Level B) garments. Air may be supplied to the wearer by a self contained breathing apparatus (SCBA), supplied breathing air line, or rebreather system.

Air-purifying respirators (APR) cannot be worn with totally-encapsulated vapor protective (Level A) or liquid protective (Level B) garments.

Air-purifying respirators (APR) cannot be worn under separate protective hoods that extend below the clavicle.

Powered air-purifying respirators (PAPR) cannot be worn with totally encapsulated vapor protective (Level A) or liquid protective (Level B) garments. PAPR's can be worn with garments utilizing separate hoods, if the configuration provides adequate ventilation at the intake of the unit and the unit is adequately protected from contamination.

### ***Provide Hearing Protection***

If noise levels inside this garment exceed regulatory noise levels, hearing protection must be provided. Use hearing protection recommended by a safety professional which does not interfere with the operation or use of the garment.

### ***Communications***

A chemical protective garment hampers communication. The use of a personal communication system should be considered. Users should also consider the use of hand signals to communicate during training, work, and for emergency situations where respirators and chemical protective garments are worn.

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# Safety Considerations

Be sure to read and follow the information in this manual and all applicable federal, state and local occupation safety and health statutes. Serious injury or death may occur from improper use of this garment. Proper use must be consistent with NFPA 1500, Standard on Fire Department Occupational Safety and Health Program, and 29 CFR 1910.132.

This garment is not suitable for use in all situations and environments with all chemical and hazardous materials. All decisions regarding the choice of chemical protective clothing **AND IT'S USE MUST BE MADE BY TRAINED AND QUALIFIED SAFETY PROFESSIONALS**. It is both the employer's and user's responsibility to determine the level of exposure and the proper personal protective equipment (PPE) needed. Most performance properties cannot be tested by the users in the field. Refer to the Lakeland Permeation Guide for chemicals specific to your situation.

If any of the following symptoms develop during use of this garment, immediately leave the contaminated area, undergo field decontamination (if exposed), and doff the garment:

- Fever
- Difficulty breathing
- Nausea
- Excessive Tiredness
- Dizziness
- Numbness
- Any unusual odor or taste
- Eye or skin irritation
- Narrowing or dimming of vision
- Claustrophobia
- Loss of balance or orientation

## **Wearer Qualifications**

This garment should be worn only by persons who are properly trained in the usage of this garment and who are in good physical condition to perform tasks involving the use of this garment. Consult a physician before donning a suit to ensure you are capable of wearing this garment under the expected work conditions and environment.

## **Additional Equipment**

To help protect the wearer and to perform as intended, this chemical protective garment must be worn with several additional items of personal protective equipment (PPE). At a minimum the following components must be worn with the enclosed chemical protective garment:

- Separate, user-supplied, protective footwear. Many, but not all, Lakeland chemical protective garments have socks made of garment material. These socks must be worn inside the protective footwear. These socks are not suitable as outer footwear.
- These garments may also be equipped with outer boot flaps to prevent liquid pooling inside the boot. After the garment is donned, the boots are donned and the outer cover is pulled down over the upper portion of the boot.

- The cuffs of Lakeland chemical protective garments that do not have socks should be worn over the upper portion of the user's boot to prevent run-off and pooling of liquid within the boot. Adhesive taping of the garment cuff to the boot does not provide a leakproof seal. Taping should only be used to hold the garment cuff in position over the boot. If a leak-proof seal is required, then garments with sock and boot covers should be selected.
- The use of footwear with toe crush protection, cut-resistant, and slip-resistant soles is recommended.
- The use of separate cut-resistant gloves may also be considered.
- Liquid-protective Lakeland chemical protective garments may or may not be equipped with attached chemical protective gloves. If not attached, user-supplied chemical protective gloves should be worn with the sleeve of the garment over the gauntlet of the glove. Adhesive taping of the glove to sleeve interface does not provide a leakproof seal. Taping should only be used to hold the sleeve in position over the glove gauntlet. If a leak-proof seal between the glove and sleeve is required, then a garment with attached gloves should be selected.
- Some Lakeland chemical protective garments utilize multiple chemical-resistant gloves to achieve the chemical barrier and physical performance requirements. Removal of one of the glove layers may compromise chemical barrier or glove durability.
- It is the user's responsibility to verify that the glove and the glove/sleeve interface will provide adequate barrier and physical performance for the intended task.
- User-supplied head protection.

Additional personal protective equipment may be required. Consult with a trained and experienced safety professional to determine the additional PPE components required for your specific situation.

- Hearing protection may be required due to high levels of external noise or high noise levels generated by supplied air systems.
- Other protective equipment may be warranted based on the situation to deal with additional hazards which may include, but are not limited to:
  - \_ Flammable or Explosive Environment
  - \_ Decontamination
  - \_ Extreme Heat (Heat Stress)
  - \_ Extreme Cold (Hypothermia)
  - \_ Asphyxiating Atmosphere
  - \_ Physical Hazards (Sharps, Puncture, Rough Surfaces, Falling Debris)
  - \_ Slipping or falling
  - \_ Visibility - of wearer & by wearer
  - \_ Communications

### **EPA Levels of Protection**

When response activities are conducted where atmospheric contamination is known or suspected to exist, personal protective equipment must be worn.

Personal protective equipment is designed to prevent/reduce skin and eye contact as well as inhalation or ingestion of the chemical substance.

Protective equipment to protect the body against contact with known or anticipated chemical hazards has been divided into four categories.

#### **LEVEL A**

Level A protection should be worn when the highest level of respiratory, skin, eye and mucous membrane protection is needed.

##### **Personal Protective Equipment**

- Positive pressure (pressure demand), self contained breathing apparatus (NIOSH approved), or positive-pressure supplied air respirator with escape SCBA.
- Fully encapsulated chemical protective suit.
- Gloves, inner, chemical resistant.
- Gloves, outer, chemical resistant.
- Boots, chemical resistant, steel toe and shank; (depending on suit boot construction, worn over or under suit boot.)
- Underwear, cotton, long-john type.\*
- Hard hat (under suit).\*
- Coveralls (under suit).\*
- Two-way radio communications (intrinsically safe/non-sparking).\*

\* Optional

#### **LEVEL B**

Level B protection should be selected when the highest level of respiratory protection is needed, but a lesser level of skin and eye protection. Level B protection is the minimum level recommended on initial site entries until the hazards have been further identified and defined by monitoring, sampling, and other reliable methods of analysis, and equipment corresponding with those findings utilized.

##### **Personal Protective Equipment**

- Positive-pressure (pressure-demand), self-contained breathing apparatus (NIOSH approved), or positive-pressure supplied air respirator with escape SCBA.
- Chemical resistant clothing (coveralls and long-sleeved jacket, coveralls, hooded two-piece chemical splash suit, disposable chemical resistant coveralls.)
- Coveralls (under splash suit).\*
- Gloves, outer, chemical resistant.
- Gloves, inner, chemical resistant.
- Boots, outer, chemical resistant, steel toe and shank.
- Boot-covers, chemical resistant (disposable).\*
- Two-way radio communications (intrinsically safe).\*
- Hard hat. \*
- Faceshield.\*

\* Optional

#### **LEVEL C**

Level C protection should be selected when the type of airborne substance is known, concentration measured, criteria for using air-purifying respirators met, and skin and eye exposure is unlikely. Periodic monitoring of the air must be performed.

##### **Personal Protective Equipment**

- Full-face or half-mask, air-purifying respirator (NIOSH approved).
- Chemical resistant clothing (one piece coverall, hooded two piece chemical splash suit, chemical resistant hood and apron, disposable chemical resistant coveralls.)
- Gloves, outer, chemical resistant.
- Gloves, inner, chemical resistant.
- Boots, steel toe and shank, chemical resistant.
- Boot-covers, chemical resistant.\*
- Cloth coveralls (inside chemical protective clothing).\*
- Two-way radio communications (intrinsically safe).\*
- Hard hat. \*
- Escape mask. \*
- Faceshield.\*

\* Optional

#### **LEVEL D**

Level D is primarily a work uniform and is used for nuisance contamination only. It requires only coveralls and safety shoes/boots. Other PPE is based upon the situation (types of gloves, etc.). It should not be worn on any site where respiratory or skin hazards exist. Refer to The Office

of Emergency and Remedial Response. Environmental Response, Division. See "Interim Standard Operating Safety Procedures" for full details.

The type of environment and the overall level of protection should be reevaluated periodically as the amount of information about the site increases and as workers are required to perform different tasks.

**Reasons to upgrade to a higher level (D is lowest, A is highest)**

- Known or suspected presence of dermal hazards
- Occurrence or likely occurrence of gas or vapor emission
- Change in work task that will increase contact or potential contact with hazardous materials
- Request of the individual performing the task
- Reasons to downgrade:
  - New information indicating that the situation is less hazardous than was originally thought
  - Change in site conditions that decreases the hazard
  - Change in work task that will reduce contact with hazardous materials
- Keep in mind, the Level A-D classifications are 100% dependant on what kind of respirator is worn with chemical protective clothing garments.

**Level A = SCBA or externally supplied air**

**Level B = SCBA or externally supplied air**

**Level C = APR or PAPR**

**Level D = Dust Mask**

**For example, if you choose to wear a sophisticated chemical coverall, sealed seams with attached hood and boots, and a pair of chemical protective gloves, but only wear a dust mask in conjunction with the other components, you only have a Level D protective outfit.**



# Garment Care and Use

## Inspection of Garment

### Lakeland Chemical Protective Garment Inspection

Lakeland chemical protective garments should be inspected at the following times:

1. Upon receipt from manufacturer (To ensure no damage occurred during shipping.)
2. After the garment is worn and before the garment is worn again. Contaminated or damaged garments should not be re-used.
3. Annually.

Garment inspection is important. It ensures that the integrity of the garment has been maintained. The first inspection should be performed upon receipt to ensure that the integrity was not compromised during transit.

***This inspection should be done immediately upon receipt in order to fall within the warranty period.***

An inspection must also be performed before wearing. Contaminated or damaged Lakeland chemical protective garments should not be re-used. Annual follow-up inspection is recommended for garments in storage.

Inspection of garments should include the following steps:

1. Lay the garment on a clean, smooth surface.
2. Use a flashlight inside and examine the outside of the garment for holes, cuts, or tears. Note: Apparent stitch holes covered by seam sealing tape do not constitute a defect.
3. Examine the seam tape for lifts or inadequate seal.
4. Examine the garment material and seams for signs of damage. Fabrics and seams sometimes have visual blemishes that do not affect barrier performance. Such blemishes can include dullness or white frosted areas adjacent to the seam tape. A breach or rupture of the barrier film is cause for rejection. Tincture of Iodine is used to confirm a physical breach. Apply Tincture of Iodine to the suspect area and wipe off the excess with a dry towel. If a dark brown stain remains, the barrier layer has been breached and the garment should be rejected. Areas immediately adjacent to the seam tape may take a slight yellow stain as a result of heat exposure during manufacture. This slight yellow stain is not a defect. The edges of the seam tape may also develop a thin, but prominent staining of the exposed edge. This is not a defect.
5. Examine the visor (if present) for a tight seal and make sure the visor offers clear vision.
6. Examine the garment air distribution system (if present) to make sure that it is connected properly and appears to be in working order.
7. Examine the garment gloves (if present) to make sure they are in good working order.
8. Examine the interface between the gloves and the garment if gloves are attached to the garment.

9. Examine the interface between the boots and the garment if the boots are attached to the garment.
10. Examine the garment zipper and zipper cover to make sure they are in good working order. Lubricate the zipper using a small amount of paraffin wax.
11. Examine the garment exhalation valves (if present) to make sure they are not obstructed and are in good working order.
12. Examine all garment snaps, closures, adjustment straps and options to make sure they are not obstructed and are in good working order.
13. Examine garment-warning label(s) to make sure they are firmly attached and can be read easily.

### Storage Life

Shelf life is typically quoted for products or materials which contain components that are expected to degrade and/or lose their performance effectiveness after a period of time. Lakeland's ChemMax® 1, 2, 3 & 4 Plus fabrics have been tested for accelerated aging and were determined to have a shelf life of greater than 5 years. The garment may therefore be used as long as it is deemed safe after a visual inspection. It is recommended that downgrading a garment to "Training Use Only" be considered when they no longer pass the visual inspection. This information "**Training Use Only**" should then be clearly marked on the outside of the garment.

Lakeland is not aware of an accepted industry standard for determining shelf life of chemical barrier fabrics, therefore it is the responsibility of the wearer to ensure that all components, including fabric, valves, visors, gloves, zippers, seams, and suit-to component interfaces are in good working condition, and provide adequate protection for the operation and chemicals to be encountered. Any suit which does not pass the visual inspection should be immediately removed from service.

Uncontaminated garments that do not pass a visual inspection should be retired and labeled "For Training Use Only" or be discarded.

### Optimum Storage Conditions

Preferably, garments should be stored in a cool, dark, dry location free of dirt and insects. Sunlight, ozone, high temperatures (>120° F), vehicle exhaust fumes, compression under heavy weights and sharp edges or projections are some conditions known to degrade the materials in these garments. Garments should be stored in boxes, in bags or on hangers.

Never step on chemical protective garments. Never place or store heavy objects on top of chemical garments.

### Visor Antifog Procedures

Condensation may cause visor to fog. Commercially available anti-fog wipes can be used to clean and treat the internal lens. Follow the manufacturers instructions for application.

### **Closure Lubricants**

No additional lubrication of the closure is suggested. If the zipper is difficult to operate, it can be lubricated lightly on the outer and inner components with paraffin (wax). After lubrication, the zipper should be closed and opened a number of times to assure that all excess lubricant has been removed.

### **Marking Suggestions and Restrictions**

The garment can be marked with a permanent, felt tip marker.

### **Suggested Undergarments**

This garment is designed and sized to be worn over standard work clothing. Thick, bulky clothing worn under this garment will affect the fit of the garment and limit the movement of the wearer.

### **Sizing Considerations**

The Lakeland chemical protective clothing sizing chart should be used to determine accurate fit. The correct size garment should be worn. Users should verify sizing by donning the correct size garment and performing a series of exercises to simulate movements that may be required under actual usage conditions. These sizing tests should include outer boots, head protection and, if used, radio equipment and other accessories the wearer may carry during actual use. Such exercises may include:

- read the SCBA gauge
- pick up a box, carry it and set the box down in a separate location
- pick up a wrench from the ground
- open the garment closure
- climb up and down stairs and ladder
- adjust respirator face piece straps
- remove the SCBA without dislodging the full face respirator
- remove and refit full face respirator
- send and receive radio transmissions
- communicate with co-worker wearing the same type of garment and additional equipment

Wearers of vapor-protective garments and totally encapsulated liquid-protective garments may also want to consider a test to remove one hand or both hands from the gloves and wipe the face shield.

### **Donning the Garment**

The wearer should be helped by a second person in donning and doffing a chemical protective garment. A ground cloth should be used to avoid contamination and damage to the garment. A chair free of sharp edges and projections should also be utilized.

### **Totally-encapsulated Garments**

1. Conduct a visual inspection of the garment before you begin donning:
  - garment should be free of discoloration or physical damage
  - inner gloves should be fully inserted into outer gloves
  - inside and outside of exhaust valves should be free of caps and plugs
2. Remove all jewelry and personal items (pens, key rings, badges, pagers, knife cases, etc.) that might damage the garment.
3. Check function of respirator and place near donning location.
4. Visually check size and condition of outer boots and place them nearby.
5. Open garment closure completely.
6. Read garment size label to assure proper fit.
7. Apply anti-fog to inside of visor (where applicable).
8. Remove shoes. If the garment has socks, these socks are worn inside additional outer chemical boots. These socks do not have adequate durability or slip resistance to be worn as the outer footwear covering.
9. An assistant should help the wearer don the garment.
10. While sitting, insert feet into garment legs and down into sock boots, if so equipped. Stretch legs out to maximum extension while pulling garment up around hips. If the garment is fitted with boot flaps, pull boot covers up and don outer boots. Then pull the boot covers down over the boots as far as possible.
11. While standing, connect and adjust garment waist belt (if equipped) until comfortably snug.
12. While standing, with garment at waist level, don respirator harness and back piece.
13. Don respirator face piece and check its function. To conserve SCBA air supply, disconnect the air supply from the face piece, if possible, as long as the closure is open and the wearer has access to fresh air. In the case of an air line breathing system, complete all connections and adjustments.
14. Don protective headgear and communication equipment.
15. If not already done, connect the respirator face piece to the air supply and make sure the respirator is functioning properly and adequate air is being provided to the wearer.
16. Place one hand in the sleeve and pull the garment sleeve to the shoulder. Make sure hand is securely inside the glove.
17. Place other hand in sleeve and glove.
18. If gloves are not attached to the garment, then don gloves. Taping should only be used to hold the sleeve in position over the glove gauntlet. Taping of the glove to sleeve interface does not provide a leak-proof seal. If a leak-proof seal between the glove and sleeve is required, then a garment with attached gloves should be selected.
19. Pull the garment over respirator backpack making sure nothing will constrict or hamper airflow.
20. Have assistant slowly close the closure. After checking that the closure is completely closed, the flaps should be closed and sealed over the closure.

### **Non-encapsulated Garments**

1. Conduct a visual inspection of the garment before you begin donning:
  - garment should be free of discoloration or physical damage
  - inner gloves should be fully inserted into outer gloves
2. Remove all jewelry and personal items (pens, key rings, badges, pagers, knife cases, etc.) that might damage the garment.
3. Check function of respirator and place nearby donning location.
4. Visually check size and condition of outer boots and place nearby.
5. Open garment closure completely.
6. Read garment size label to assure proper fit.
7. Apply anti-fog to inside of visor, if present.
8. Remove shoes. If the garment has attached socks, these socks are worn inside outer chemical boots. These sock boots do not have adequate durability or slip resistance to be worn as the outer footwear covering.
9. An assistant should help the wearer don the garment.
10. While sitting, insert feet into garment legs and down into sock boot, if so equipped. Stretch legs out to maximum extension while pulling garment up around hips.
11. If the garment has outer boot covers, pull the boot covers up and don outer boots. Then pull boot cover down over boots as far as possible. If the garment does not have socks, pull the garment cuff up before donning the boot, then pull the cuff down over the outside of the boot.
12. Place one hand in the sleeve and pull garment sleeve to shoulder. Make sure hand is securely inside the glove, if attached.
13. Place other hand in sleeve and glove, if attached, and pull the garment over that shoulder.
14. If gloves are not attached to the garment, pull up the sleeve, don the gloves and pull the sleeve opening over the gauntlet of the glove.
15. Don respirator face piece and check its function. If using an SCBA, disconnect the air supply from the face piece, if possible, to save air supply.
16. Don protective headgear, if it is worn underneath the garment hood, and communication equipment.
17. Place attached hood over the head and close zipper.
18. After checking that the zipper is completely closed, the flaps should be folded over the zipper and sealed.
19. In the case of an air-line breathing system, complete all connections and adjustments.
20. If not already done, connect the respirator face piece to the air supply and make sure the respirator is functioning properly and adequate air is being provided to the wearer.

### **Doffing the Garment**

#### **Encapsulated Garments**

1. If the garment has been contaminated or is suspected of being contaminated, the wearer should continue to use his respirator until the garment has been doffed and removed.
2. An assistant should help the wearer doff the garment after field decontamination. If the garment has been contaminated, the assistant should wear protective clothing and respiratory equipment.
3. While the wearer stands, the assistant should open the closure and peel the garment down and away from the wearer's shoulders. The assistant should help the wearer remove his arms from the sleeves. External air lines should be disconnected from the garment and from the wearer's respirator, while the wearer switches to his escape bottle.
4. Lower garment below the hips and sit down. Have the assistant remove the boots, pull the garment off the legs and remove the garment to a remote location.
5. Once the garment has been removed, the wearer can doff the respiratory face piece and harness.

#### **Non-encapsulated Garments**

1. If the garment has been contaminated or is suspected of being contaminated, the wearer should continue to use his respirator until the garment has been doffed and removed.
2. An assistant should help the wearer doff the garment after field decontamination. If the garment has been contaminated, the assistant should wear protective clothing and respiratory equipment.
3. If the wearer is wearing an SCBA or PAPR, the assistant should help the wearer remove the respirator straps and rest the respirator in a safe, dry position. While the wearer stands, the assistant should remove the outer hood, then open the closure and peel the garment down and away from the wearer's shoulders. The assistant should help the wearer remove his arms from the sleeves.
4. Lower the garment below the hips and sit down. Have the assistant remove the boots, pull the garment off the legs and remove the garment to a remote location.
5. Once the garment has been removed, the wearer can disconnect and remove the respiratory face piece and harness.

## Decontamination and Cleaning

### Decontamination Solutions

Do not use any oxidative, corrosive or reactive decontamination solutions with this garment. The only decontamination solutions to use with this garment are water and mild, household dish washing liquid.

### Field Decontamination

The purpose of field decontamination is to allow the wearer to doff the garment without being harmed by contaminants on the garment surface. Garments that have been exposed to or that are suspected of being exposed to hazardous chemicals should be thoroughly decontaminated in the field before doffing. Additional cleaning and decontamination, as well as a full inspection, are required before a garment may be re-used.

1. Leave the hot zone with adequate air supply for decontamination and removal of the garment. The wearer should continue to wear the respirator until the garment has been completely doffed and removed from the area.
2. If the garment has been exposed or is suspected to have been exposed, thoroughly scrub the garment using household dish washing liquid and soft scrub brushes, followed by a thorough rinsing in water.
3. If possible, remove the excess rinse water from the garment by individuals wearing gloves, liquid-splash protective clothing and respiratory protection. At a minimum, the rinse water on and near the closure assembly should be removed.

### Decontamination before Re-use

This garment is designed for limited-use applications. It is priced to make disposal after use economically justified when the effectiveness of decontamination is in question. If the garment is contaminated during use, it should be discarded.

***It is the responsibility of the safety professional having jurisdiction over usage of the garment to determine whether the suit has been contaminated and can be safely reused.***

***Contaminated garments should be discarded and are not suitable for training.***

### Cleaning

Garments should be clean and dry before use. Water and mild, household dishwashing liquid should be used to clean this garment. This garment may be scrubbed with a soft brush or hand towel, thoroughly rinsed with clean, fresh water and air-dried. Do not use any oxidative, corrosive or reactive decontamination solutions with this garment. Do not dry-clean this garment. Do not use hot air or a tumbling air dryer to dry this garment. Do not use bleach.

### Retirement Considerations

It is suggested this garment be retired from service if any of the following criteria are met:

- Garment fails to pass inspection.
- Vapor-protective garment fails the inflation test.
- Garment is abraded, cut, torn, punctured, or otherwise and in any way breached.
- Garment has had prolonged exposure to intense heat and/or ultraviolet light.
- Garment has been contaminated.

Retired garments that are not contaminated may be labeled and used "For Training Only". The labeling should be done with a permanent marker.

### Disposal

If not contaminated, this chemical protective garment may be buried or incinerated. Because the chemical protective garment comprises several different plastics - polyolefin, polyester, and vinyl - it is not suitable for recycling. The uncontaminated chemical protective garment may be incinerated in a facility that is capable of handling mixtures containing these plastics. Likewise, an uncontaminated chemical protective garment may be buried in a facility that accepts similar plastic materials.

Contaminated garments that cannot be handled safely without protective equipment may have to be disposed of with other hazardous wastes, either through incineration or burial.

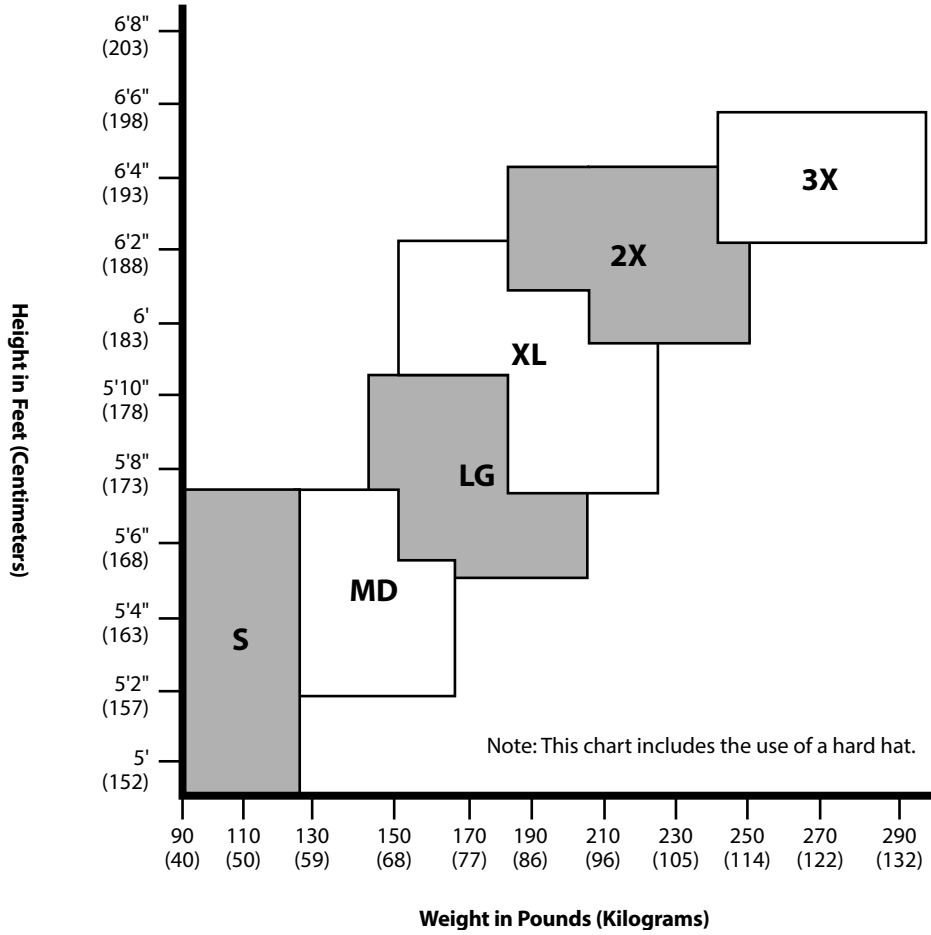
# Inspections

## *Quarterly Inspections Chart*

Inspection Date	Inspected By	Remarks	Inspection/ Air Test Results

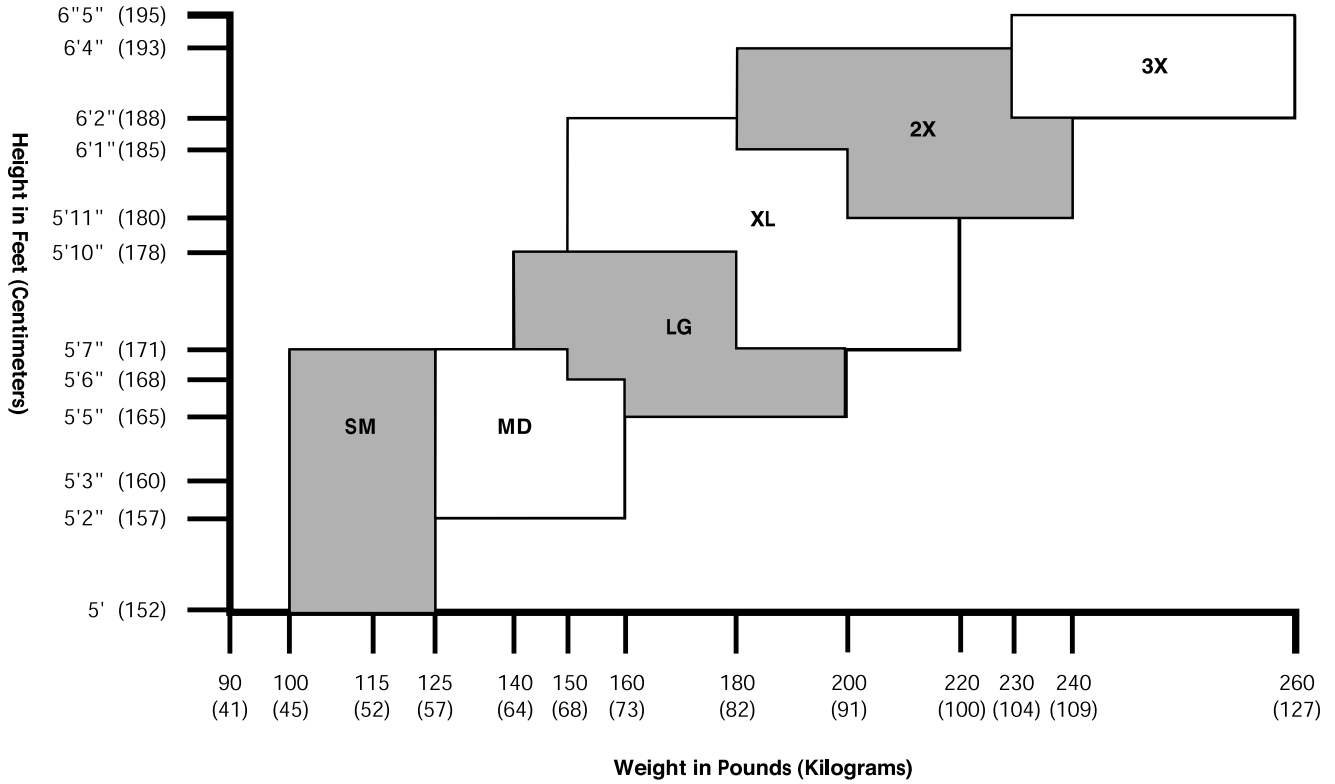
# Sizing Chart - Chemical Protective Clothing

**Recommended Sizing Chart for Total Encapsulated Suits**



# Sizing Chart - Limited Use Clothing

Recommended Sizing Chart for Limited-Use and Disposable Coveralls





**Lakeland Industries, Inc.**

Chemical Protective Clothing Division  
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Decatur, AL 35603

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