
Lakeland®
Protect Your People®

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At Lakeland Industries, our number one priority is creating protective garments that protect your people from fire, hazardous chemicals, and diseases, throughout the world.

We design and manufacture a wide variety of technologically advanced protective products for workers in a number of industries, including:

- Eyes Protection
- Respiratory Protection
- Limited Use Clothing
- Chemical Protective Clothing
- Flame Resistant Clothing
- Heat Resistant Clothing
- Firefighters Turnout Gear
- Arc Flash Protective Clothing
- Hands Protection
- Outdoor Winter Clothing

Lakeland Industries' products have established and maintained a global reputation for overall quality, and are recognized as the field's gold standard.

Founded in Ronkonkoma, New York, in 1982, and now headquartered in Decatur, AL, you can trust in our experience, our expertise, and most importantly, our proven track record of superior garment performance on the job every day.



## Chemical Protective Clothing



## Heat Protective Clothing



## High Visibility Clothing



## Cold Protection



## Eyes and Respiratory Protection



## Hands Protection

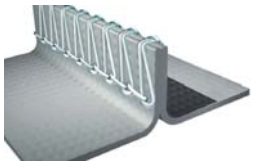
# Chemical Protective Clothing

# Applications and Certification Chart

| Which garments are suitable for which applications and standards? | | | Chemical Protection | | | | | | Type 5 & 6 Protection | | | | | Type 4 Protection and Cool Suits | | | | Chemical Protection with FR | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Whilst the Micromax fabric is tested to EN14126, we would always recommend a garment with sealed seams such as Micromax TS for protection against infectious hazards. | | | ChemMax® 1 | ChemMax® 1 EB | ChemMax® 2 | ChemMax® 3 | ChemMax® 4 Plus | Interceptor® Plus | SafeGard® GP | SafeGard® 76 | MicroMax® NS | MicroMax® | MicroMax® NS Trime | MicroMax® TS | MicroMax® Cool Suit | ChemMax® 1 Cool Suit | ChemMax® 3 Cool Suit | Pyrolon® Plus 2 | Pyrolon® CRFR | Pyrolon® CBFR |
| **Hazardous Chemical Protection** | | | | | | | | | | | | | | | | | | | | |
| Gas and Vapour Protection | | (Type 1) EN943-1 | | | | | | √ | | | | | | | | | | | | |
| Liquid Chemicals: Jet Spray Protection | | (Type 3) EN14605 | √ | √ | √ | √ | √ | | | | | | | | | | | | √ | √ |
| Liquid Chemicals: (Shower-Type) Spray Protection | | (Type 4) EN 14605 | √ | √ | √ | √ | √ | | | | | | | √ | | √ | √ | | √ | √ |
| Hazardous Dust Protection | | (Type 5) EN 13982 | √ | √ | √ | √ | √ | | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | | |
| Liquid Chemicals: Aerosol Spray Protection | | (Type 6) EN 13034 | √ | √ | √ | √ | √ | | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ |
| Nuclear Industry: Protection against Radiation Contaminated Particles | | EN1073-2 | √ | √ | √ | √ | √ | | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | | |
| **Protection against Infective Agents** | | | | | | | | | | | | | | | | | | | | |
| Protection against Infective Agents | | EN 14126 | √ | √ | √ | √ | √ | √ | | | ⚠ | ⚠ | | √ | | √ | √ | | | |
| **Flame and Heat Protection** | | | | | | | | | | | | | | | | | | | | |
| Protection against Heat and Flame | | EN ISO 14116 | | | | | | | | | | | | | | | | √ | √ | √ |
| Protection against Hear, Flame and Molten Metal Splash | | EN 11612 | | | | | | | | | | | | | | | | | | |
| Welding Industry | | EN 11611 | | | | | | | | | | | | | | | | | | |
| Protection against ARC flash | | NFPA 70E | | | | | | | | | | | | | | | | | | |
| **Anti-Static Properties** | | | | | | | | | | | | | | | | | | | | |
| Anti-Static Clothing-Surface Resistance ( <2.5x10⁹ ohms | | EN 1149-1 | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | |
| Anti-Static Clothing - Charge Decay | | EN 1149-3 | | | | | | | | | | | | | | | | | | √ |
| **Seam Type** | | | | | | | | | | | | | | | | | | | | |
| Serged (Overlock Stitch) | | | | | | | | | √ | | √ | | √ | | | | | √ | | |
| Stitched and Bound | | | | | | | | | | √ | | √ | | | √ | | | | | |
| Stitched and Taped (Outer Side) | | | √ | √ | √ | √ | √ | | | | | | | √ | | √ | √ | | √ | √ |
| Stitched and Taped (Both Sides) | | | | | | | | √ | | | | | | | | | | | | |

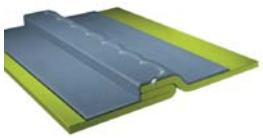
# Seam Methods

## Serged Seam



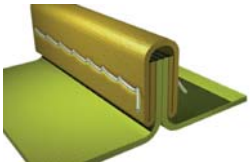
A serged seam joins two pieces of material with a thread stitch that interlocks. This is an economical stitching method for general applications. This stitching method is generally not used for chemical protective clothing. It is more commonly found on limited use clothing where dry particulates are of a concern.

## Heat Sealed Seam



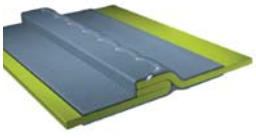
A heat sealed seam is sewn and then sealed with a heat activated tape. This method provides liquid proof seams, and is especially useful for Level A and B chemical protective clothing.

## Sewn and Bound Seam



This seam joins two pieces of material with an overlay of similar material and is chain stitched through all of the layers for a clean finished edge. This provides increased holdout of liquids and dry particulates.

## Heat Sealed Seam Plus



This is the strongest seam that Lakeland offers. The seam is sewn and then heat sealed on the outside and inside to offer the highest strength and chemical resistance.

# Understanding EN 14126 infectious agent protection

## Protection against infectious agents is a vital issue - not only in medical applications such as in hospitals and accident attendance - but also in emergency response projects.

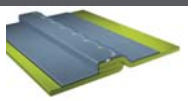

EN 14126

Garments for protection against bacteria, biological contaminants and infectious agents feature this pictogram on the label.

They will also be labelled using the appropriate chemical protection 'Type' with suffix letter 'B' as below:

Type 3-B | Type 4-B | Type 5-B | Type 6-B

## Construction and Seam Requirements



EN 14126 makes no other seam or construction requirements beyond those standard in the different garment types - Type 3, Type 6 etc.

However, we would recommend that all garments for use in applications involving biological or infectious agents should be **at least** Type 4 and be constructed with sealed seams to ensure no penetration can occur through the stitch holes that are inevitable with any stitched seam garment. This might be critical in applications involving highly dangerous viruses such as Ebola.

## The importance of donning and doffing

Donning and especially doffing of a suit is vital in all chemical protective applications - but especially so in infectious agent protection.

When operatives emerge from a critical area they cannot yet relax. The outside of the garment may be contaminated with infected liquids and great care must be taken not to touch any infected area; gloves must be the last to be removed and garments should ideally be removed by a suitably protected colleague, 'peeling' from the top down so any contamination on the outside ends up on the inside of the removed suit bundle.

| Application Example | Critical Test within EN 14126 |
|---|---|
| Emergency Relief effort for Ebola Outbreak - Front line medical staff | With a highly dangerous bacteria transmitted in blood and body fluids it is critical to select a garment that achieves a high class in ISO 16604 test. |
| Hospital Cleaning staff - involved in cleaning contaminated surfaces and equipment. | Subject to the biological hazard, a high class in the ISO 22610 test might be appropriate. |

## EN 14126 contains four relevant, classified tests *(and not five as some claim)*

Five tests are listed, but the first (ISO 16603) is purely used to indicate a starting point for conducting the 'real' test for protection against infected blood and body fluids, ISO 16604.

The classification table for this relates ONLY to the ISO 16604 test; there is NO CLASSIFICATION for EN 16603 and claiming such classification is meaningless; it is not a test that indicates any proof of protection.

## Tests listed in EN 14126

| Standard | Description | Classes | Comments |
|---|---|---|---|
| ISO/ FDIS 16603 | Screening test for ISO 16604 test | None | Uses synthetic blood to indicate the pressure at which strike-through is likely to occur in preparation for The ISO/FDIS 16604 test. **This test does not indicate any level of protection.** |
| ISO/ FDIS 16604 | Protection against blood and body fluids | 1 to 6 (6 is highest) | Uses a bacteriophage to measure the pressure at which a body fluid such as blood will penetrate through the fabric. Class 6 is equivalent to passing the test under a pressure of 20kPa. |
| ISO/ DIS 22610 | Protection against mechanical contact with contaminated surfaces | 1 to 6 (6 is highest) | Measures the protection against mechanical contact with contaminated surfaces by a light mechanical rubbing of the fabric. Class 6 corresponds to no penetration after 75 minutes. |
| ISO/ DIS 22611 | Protection against biologically contaminated aerosols | 1 to 3 (3 is highest) | Measures protection against penetration by a contaminated aerosol spray. Level 3 corresponds with a penetration of less than 0.001%. |
| ISO/ DIS 22612 | Protection against contaminated solid particles | 1 to 3 (3 is highest) | Measures penetration of particles by dusting a fabric sample held on a vibrating plate with a small amount of contaminated powder. Class 3 is the equivalent of less than 10 particles penetrating. |

The above four tests (excluding the first listed which is not an indicative test) indicate a garment fabric's effectiveness in resisting penetration of bacterial contaminants in various hazard types - contaminated blood, contaminated particles, aerosols etc - giving a classification for each of 1 to 6 or 1 to 3.

For users, it is important not just to confirm a garment is certified to EN 14126, but also to assess the classification of different tests according to the requirements of their specific application - such as in the examples shown:-

# Use, Storage, Shelf-life and Disposal

## Use, Storage, Shelf-Life and Disposal

This guide provides advice on the selection of an appropriate chemical suit, suggesting some of the factors that may influence the selection decision. However, selection is often complex involving multiple and sometimes conflicting factors and may involve factors that Lakeland cannot predict.
The final decision on selection of a garment for a specific application is therefore always the users' responsibility.

### Storage

Lakeland chemical suits are manufactured from polymers which are inert materials and are unaffected by normal temperatures and conditions.

Most of garments are supplied individually in vacuum packed PE bags and outer cardboard cartons.
They can be stored in normal storage facilities.
Keep dry and avoid direct sunlight and temperatures below -15°C.

### Shelf-Life

Lakeland chemical suits are generally constructed from inert polymers that are unaffected by normal storage conditions. In unopened bags and in such conditions (-10°C to 50°C, dry and away from direct light) the expected shelf life should be 10 years or more. Some discoloration of fabrics may occur over time, but this merely relates to seepage of dyes and does not affect fabric performance.

However some specific properties of fabrics MAY alter over time. In particular anti-static properties result from a topical treatment which will degrade over time.

We recommend that for any gas-tight garment, a pressure test is carried out after 5 years and should the garment fail the test it should be used for training purposes only thereafter.

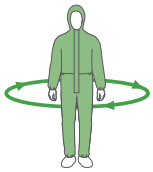
It is vital that all garments, regardless of age, but especially after a longer shelf life, are thoroughly checked for damage or wear immediately before use. Do not use any garment that appears worn or damaged. It is always the end user's responsibility to ensure any garment is fit for purpose.

### Use

Regardless of age, or whether before first use or re-use, all suits should undergo a thorough visual inspection to ensure there are no tears, wear or other damage evident and that zips and elastic are intact and function correctly. Do not use any garment with apparent damage or wear.

Donning and doffing (especially the latter during which suits may be contaminated) is a critical part of the application; correct donning is vital in ensuring correct protection is provided. Lakeland recommends a written donning and doffing procedure is established. Detailed advice on donning and doffing is available from Lakeland separately.

During use where possible monitor suits for damage, wear or contamination. Damaged or heavily contaminated suits should be removed, disposed of and replaced as soon as possible.



### Re-Use

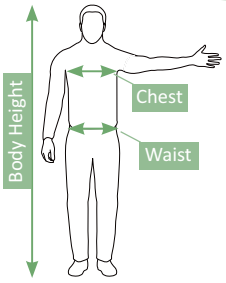
Lakeland garments are designed as single use and should be disposed of after one use. However, if a garment is undamaged and uncontaminated by any chemical, it may be re-used if appropriate.

Note however that any fabric (regardless of whether it is classed as disposable or re-usable) that has been contaminated by a chemical will have a lower breakthrough time than when new. Contaminating chemicals may permeate into the fabric and cannot be removed by a decontamination shower or other cleaning method. It is the entirely the user's responsibility to determine if re-use of a garment is safe.

### Disposal

Uncontaminated garments can be disposed of as standard waste according to local regulations.
However, contaminated garments may require decontamination before disposal and must be disposed according to regulations relating to the chemical concerned.

## Garment Sizing




Lakeland garments are cut and sized generously and according to the Super-B style for maximum freedom.

| Size | Body Height (cm) | Chest (cm) | Waist (cm) |
|---|---|---|---|
| SM | 164-170 | 84-92 | 82-88 |
| MD | 170-176 | 92-100 | 88-94 |
| LG | 176-182 | 100-108 | 94-100 |
| XL | 182-188 | 108-116 | 100-106 |
| 2X | 189-194 | 116-124 | 106-112 |
| 3X | 194-200 | 124-132 | 112-114 |

Selection of the appropriate sized garment is important in maximising comfort, protection and durability.

# Clothing For Protection against Type 5 and 6 Hazards

Clothing for Type 5 & 6 protection

**The 'Type' testing explains these protection types.**

**Type 5**
**EN 13982**
protection against hazardous dry particles

**Type 5- Hazardous Dry Particles**
- Spray cabin filled with dust
- Subject performs exercise on treadmill
- 3 particle counters INSIDE the suit
- Particle "Inward leakage" calculated
- Recorded as % of inward leakage (TIL)

**EN 1073-2**
protection against dust contaminated with radiation

**EN 1073-2**
testing is a variation of the standard Type 5 test.

**Type 6**
**EN 13034**
protection against reduced/light liquid sprays and splashes

**Type 6 - Reduced Liquid (aerosol) Spray**
- Four nozzles - aerosol spray of liquid
- Subject rotates on turntable
- Inside absorbent suit checked for penetration
- Pass or Fail according to test criteria

**Three types of fabric are used to make all Type 5 & 6 garments on the market.**

Flashspun Polyethylene (FSPE)

SMMS - Spunbond-Meltblown-Spunbond **Lakeland SafeGard®**

Microporous Film Laminate (MPFL) **Lakeland MicroMax®**

All Type 5 & 6 garments on the market are one of these or variations of these.

## *How do these fabrics compare?* Three important factors can be considered:

| | | |
|---|---|---|
| **Liquid Protection** | Type 6 CE testing includes liquid repellency and penetration tests against four chemicals.<br>In two of the four chemicals, Lakeland MicroMax® options achieve superior results than the closest alternative. | CE testing for Infectious Agents to EN 14126 includes tests against four types of contamination. In all four tests MicroMax® options achieve superior results and the highest class compared to the FSPE alternative, which is unclassified in the critical ISO 16604 test. |
| **Physical Properties** | Testing as part of CE certification allows comparison of strength properties: abrasion - tensile strength - trapezoidal tear etc.<br>In comparisons of the three fabric types Lakeland SafeGard® or MicroMax® options offer a superior choice compared to the alternative FSPE option in most cases. | |
| **Comfort and Breathability** | Comfort is primarily a result of air permeability.<br>Independent testing indicates the difference between MicroMax® and FSPE is minimal and close to zero. Both have very low air permeability. The Lakeland SafeGard® option has an air permeability over 10 times that of the alternatives and is the superior choice for a comfortable garment. | A common sense approach and simple 'home' tests clearly confirm both the low air-permeability of MicroMax® and FSPE and the superior air-permeability of SafeGard®.<br>**Where protection AND comfort are required, Lakeland Cool Suit® options provide the best of both MicroMax® and SafeGard® fabrics and may be the best choice available.** |

Type 5 and 6 garments can be selected on the basis of a combination of three factors:

1. Protection | 2. Physical Properties | 3. Comfort and Breathability

**For all three factors - Lakeland garments provide the best choice ....**

# Design and Super-B Style for Type 5 and Type 6 Garments

## Protective clothing is used in a wide variety of environments, situations and applications throughout a range of industries. Each one is different and each places garments under a unique set of stresses, strains and physical demands.

Yet most chemical protective clothing is made from polymers and non-woven materials which whilst having the benefit of being inexpensive, feature strength properties that are generally lower than their woven counterparts. So good design is vital in ensuring garments are built to cope with the various physical demands that might be placed on them.

Similarly, whilst comfort is primarily defined by the air permeability of the fabric, even a garment that is breathable will be uncomfortable if it is too tight, restricts movement or is poorly designed.

**So effective ergonomic design is important in both maintaining the comfort of the wearer and in ensuring a garment lasts as long as required by the job.**

### Lakeland 'Super-B' Style

Lakeland CE garments use a specific ergonomically styled pattern that features a unique combination of the key factors, along with other helpful design elements.


### 1 Three-piece hood

Some garments feature a simple 2-piece hood. Such hoods do not fit the head properly, restrict head movement and generally have a poor fit to respirator masks.

Lakeland garments not only feature a 3-piece hood which creates a more 3-D fit and resolves these problems, in addition the centre piece is a 'pointed oval' shape resulting in an even better fitting hood.

### 2 Inset Sleeves

Most garments use the traditional 'bat-wing' style sleeve, in which the body forms a diagonal between the elbow and the waist. This is cheaper to produce as it uses less fabric, but it also restricts movement when a user reaches up. It also explains why some garments need thumb loops – because it results in pulling back of the sleeve and cuff.

Lakeland garments use the more expensive inset sleeve in which the body and arm follows the shape of the body. This allows greater freedom when reaching up and results in much less pulling back of the sleeve – so no thumb loops are required.

** Many Lakeland garments are available in versions with thumb-loops where they are required for other reasons.*

### 3 Two-way zip and storm flap

Lakeland CE coveralls feature a two-way zip and storm flap front fastening for superior protection.

### 4 CE Chest Label

Lakeland CE coveralls feature a chest label containing all the legally required marking for CE certification, so users and supervisors can easily identify the correct garment is being worn.

### 5 Diamond crotch gusset

The crotch is invariably the point where garments split first, partly because this is where most stress is apparent, and partly because on cheaper garments it is the point where four seams – two body and two leg - meet at one point.

Lakeland garments feature an inserted crotch gusset of two dart-shaped fabric pieces. This creates a more shaped body which spreads the stress and allows greater freedom of movement.

# SAFEGard®GP

TYPE 5 TYPE 6 EN1073-2 EN1149 SUPER B

ESGP528

# SAFEGard® 76

TYPE 5 TYPE 6 EN1073-2 EN1149 SUPER B

ES428

**SMMS based hazardous dust (Type 5) and liquid aerosol (Type 6) protective coverall with high comfort level.**

## FEATURES

- SMMS fabric with high breathability and superior level of comfort.
- Air permeability over 10 times that of flash-spun polyethylene or microporous film laminates.
- Air permeability negates generation of the bellows effect which on low-breathable fabrics encourage penetration of particles through seams and closures.
- Lakeland “Super-B” ergonomic styling – unique combination of three design elements to optimise fit, durability and freedom of movement.
- Three piece hood for rounder head shape and greater comfort.
- Inset sleeves – torso shaped to body to mazimise freedom of movement and negate the need for thumbloops.
- Diamond crotch gusset – enhances freedom of movement and reduced crotch splitting.

## KEY APPLICATIONS

- “Dry” applications in GRP manufacture.
- Boatbuilding.
- Wind blade & similar manufacture.
- Wood and plastic processing.
- General manufacturing and maintenance.
- Low level / low hazard sprays.

| Physical Property | Test Method | Test Results |
|---|---|---|
| Abrasion Resistance | EN530:2010 method 2 | 2 |
| Flex Cracking Resistance | ISO7854:1997 method B | 6 |
| Tensile Strength（MD/CD） | EN ISO 13934-1:1999 | 2/1 |
| Trapezoidal Tear（MD/CD） | EN ISO 9073-4:1997 | 3/2 |
| Puncture Resistance | EN863:1995 | 1 |
| Electrostatic properties | EN1149-1:2006/EN1149-5:2008 | Pass |

| Product Style | Color | Seam Method | Sizes | Case Pack |
|---|---|---|---|---|
| ESGP528 | White, Orange, Blue | Serged Seam | SM-3X | 50 |
| ES428 | White, Orange, Blue | Bound Seam | SM-3X | 25 |

# MicroMAX® NS
MICROPOROUS PROTECTIVE CLOTHING SYSTEM

TYPE 5 TYPE 6 EN1073-2 EN1149 EN14126 SUPER B

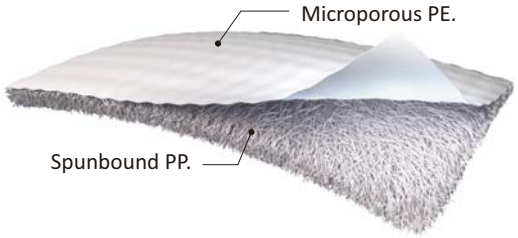
EMN428

## FEATURES

- Microporous polyethylene film laminate coverall with stitched seams, Microporous films feature a high liquid protection and dust barrier whilst allowing moisture vapour to escape through a high Moisture Vapour Transmission Rate (MVTR).
- MicroMAX® NS offers superior liquid and dust protection with good comfort and durability. Microporous film laminate combines superior protection with a comfortable, soft and flexible fabric.
- Lakeland "Super-B" ergonomic styling – unique combination of three design elements to optimise fit, durability and freedom of movement.
- Biological penetration: Fabric has passed the US Test ASTM F1671-97a against penetration of micro-biological bacteria.

## KEY APPLICATIONS

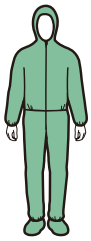
- Protection against light splashes of low hazard liquids and hazardous dry particles.
- Paint spraying (non-linting surface).
- Clean room (may require additional cleaning).
- General cleaning and maintenance applications.
- Asbestos removal and handling.
- Food processing applications.
- Protection against oils and resins.
- Pharmaceutical processing and manufacture.
- Electronic assembly (non-linting and anti-static).




| Physical Property | EN Standard | Test Result |
|---|---|---|
| Abrasion Resistance | EN 530:2010 Method 2 | ＞100，＜500 |
| Flex Cracking | ISO 7854:1997 Method B | ＞15000，＜40000 |
| Flex Cracking（-30℃） | ISO 7854:1997 Method B | ＞4000 |
| Tear Resistance（MD/CD） | EN ISO 9073-4:1997 | 53.51/30.98N |
| Burst Strength | EN ISO 13938-2:1999 | 50.7kPa |
| Tensile Strength（MD/CD） | EN ISO 13934-1:1999 | 82/49N |
| Puncture Resistance | EN 863:1995 | 9N |
| Electrostatic properties | EN1149-1:2006/EN1149-5:2008 | Pass |

## Micromax® NS Styles

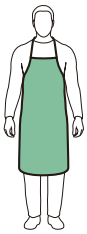
428,Coverall Coverall with hood, elastic cuffs, waist & ankles.



414,Coverall Coverall with hood and attached boot, elastic cuffs, waist & ankles.

145, coat Coat with hood, zipper closure, elastic cuffs & waist.

301,Pants Pants with elastic waist and ankles.

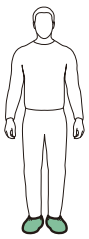


601 Apron Attached ties. Size:71x91cm

527 Smock Long sleeve, attached ties. Size:71x91cm

713 Hood Elastic face, Covers shoulders.

850 Sleeve Elastic ends Size: 18" length



901 Shoe cover 904 Shoe cover (PVC sole)

903 Boot Cover 905 Boot Cover (PVC sole) elastic top.

| Product Style | Color | Seam Method | Sizes | Case Pack |
|---|---|---|---|---|
| EMN428/EMN414 | White, Orange ○ ● | Serged Seam | SM-3X | 25 |

MicroMAX® NS MICROPOROUS PROTECTIVE CLOTHING SYSTEM — COOL SUIT

TYPE 5 TYPE 6 EN1073-2 EN1149 SUPER B

EMNC428

## FEATURES

- The back of the coverall features a large panel of highly breathable Safegard material-in blue for easy identification.
- This enables the suit to breath easily, making MicroMAX NS Cool Suit comfortable in the warmest of working environments.
- MicroMAX NS Cool Suit is constructed using blue bound seams for superior strength properties and improved particle and liquid repellency at the seams.


MicroMAX® TS MICROPOROUS PROTECTIVE CLOTHING SYSTEM

TYPE 4 TYPE 5 TYPE 6 EN14126 EN1073-2 EN1149 SUPER B

EMNT428

**Microporous film laminate fabric with stitched and taped seams for enhanced Type 4 protection.**

## FEATURES

- Lightweight,disposable coverall for Type 4,5&6 applications. Stitched and taped seams provide full seal-no seam holes to allow penetration of dusts and liquids.
- Fabric tested for biolofical penetration using US test ASTM F1671-97a.
- Garment tested for infectious agents and biological hazards to standard EN14126.

## KEY APPLICATIONS

- Mild low hazard chemical liquid splash, spray, drying and harmful dust protection.
- Contact with the patient when working with potentially infectious blood, body fluids, secretions role.

| Product Style | Color | Seam Method | Sizes | Case Pack |
|---|---|---|---|---|
| EMNC428 | White ◯ | Bound Seam | SM-3X | 25 |
| EMNT428 | White ◯ | Heat Sealed Seam | SM-3X | 25 |

# MicroMAX®
MICROPOROUS PROTECTIVE CLOTHING SYSTEM

TYPE 5 TYPE 6 EN1073-2 EN1149 EN14126 SUPER B

EM428

**Type 5 protection against hazardous dry particles, type 6 protection against reduced/light liquid sprays and splashes, anti-static properties, protection against radiation contaminated particles, protection against infective agents.**

## FEATURES

- Enhanced MicroMax Fabric, unique microporous film laminate with "rip-stop" scrim between layers for added strength and durability.
- Lakeland "Super-B" Ergonomic Styling – unique combination of the design elements to optimise fit, durability and freedom of movement.
- Three-piece hood, inset sleeves, diamond crotch gusset, two-way zip and storm flap.
- Orange Bound Seam, high visible orange bound seam increases the seam strength and provides better barrier performance.

## KEY APPLICATIONS

- Protection against light splashes of low hazard liquids and hazardous dry particles.
- Paint spraying (non-linting surface).
- Clean room (may require additional cleaning).
- General cleaning and maintenance applications.
- Asbestos removal and handling.
- Food processing applications.
- Protection against oils and resins.
- Pharmaceutical processing and manufacture.
- Electronic assembly (non-linting and anti-static).

### Enhanced MicroMax Fabric

Unique microporous film laminate with "rip-stop" scrim between layers for added strength and durability.

## Infectious Agent / Biological Hazard Protection

Tested according to EN 14126. This consists of four different tests to assess protection against different forms of classification.

| Test Description | Test No. | CE Class |
|---|---|---|
| Protection against blood and body fluids | ISO 16604: 2004 | 6 |
| Protection against mechanical contact with substances containing contaminated liquids | EN 14126: 2003 Annex A | 6 |
| Protection against biologically contaminated aerosols | ISO 22611: 2003 | 3 |
| Protection against dry microbial contact | ISO 22612: 2005 | 3 |

*Note these tests are on fabric only. We would always recommend a garment with sealed seams such as MicroMax® TS for protection against infectious agent hazards.*

## Physical Properties

| Property | Test Method | CE Class |
|---|---|---|
| Flex Cracking | ISO 7854 | Class 5 |
| Trapezoidal Tear | ISO 9073 | Class 4/3 |
| Tensile Strength | EN 13934 | Class 2/1 |
| Puncture Resistance | EN 863 | Class 2 |

## Chemical Repellency and Penetration EN 6530

| Chemical | Penetration | Repellency |
|---|---|---|
| Sulphuric Acid 30% CAS No. 67-64-1 | 3 | 3 |
| Sodium Hydroxide 10% CAS No. 1310-73-2 | 3 | 3 |
| O-Xylene CAS No. 75-15-0 | 2 | 3 |
| butan-1-ol CAS No. 75-09-2 | 2 | 3 |

| Product Style | Color | Seam Method | Sizes | Case Pack |
|---|---|---|---|---|
| EM428 | White ◯ | Bound Seam | SM-3X | 25 |

# MicroMax®VP

**Passes ASTM F1670/F1671**

MVP428

**Bloodborne Pathogen and Chemical Protection**

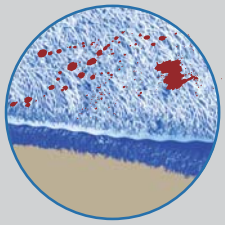
**MicroMax®VP is specifically designed to protect when the risk of blood, body fluids, bloodborne pathogens and viral contamination are the greatest. Ideal for use in crime labs, crime scene clean up and by emergency response personnel, MicroMax®VP passes ASTM F1670/ F1671 testing for blood and viral protection.**

**All MicroMax®VP garments are designed with a seamless front and feature a taped storm flap to provide more protection in the primary exposure area.**

## FEATURES

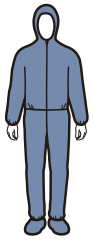
- Seamless front eliminates possible contamination from liquid penetration.
- Taped Storm Flap keeps contaminants away from zipper.
- Elastic back gives a more comfortable fit and helps prevent rip-outs.
- Available with attached boots to help prevent cross-contamination during an event

MicroMax® VP fabric construction creates a protective barrier between the wearer and possible bloodborne pathogen contaminants.



## Micromax® VP Styles

428,Coverall
Coverall with hood, elastic cuffs, waist & ankles.



414,Coverall
Coverall with hood and attached boot, elastic cuffs, waist & ankles.

MicroMax®VP Fabric Properties

| Test Method | Description | Result |
|---|---|---|
| ASTM D1777 | Material Thickness | 15 mil |
| ASTM D5034 | Tensile Strength | 161N/107N |
| ASTM D5034 | Elongation | 59%/71% |
| ASTM E96 | Water Vapor Transmission Rate Procedure B | 16g /$m^2$/24h |
| ISO 13938-1 | Bursting Strength Hydraulic Method | 29.4 psi avg. |
| CPSC16 CFR 1610 | Burn Test 45° | PASS |
| EN 1149-1:2006 | Surface Resistance Requirement for BS EN1149-5:2008 is ≤2.5 x $10^9$ Ω. | The test sample meets the requirement 2.4 X $10^8$ |

Liquid Penetration Test

| Test Method | Description | Result |
|---|---|---|
| ASTM F1670 | Liquid Penetration Using Synthetic Blood | PASS |
| ASTM F1671 | Viral Penetration using ϕX174 bacteriophage suspension | PASS |
| ASTM F903 | Liquid Penetration Test Method D | PASS |
| | Methanol | PASS |
| | Ethyl Acetate | PASS |
| | Sulfuric Acid (97%) | PASS |
| | Tetrahydrofuran | PASS |
| | Sodium Hydroxide | PASS |
| | Acetone | PASS |
| | Hydrofluoric Acid | PASS |
| | Acetonitrile | PASS |

| Product Style | Color | Seam Method | Sizes | Case Pack |
|---|---|---|---|---|
| MVP428/MVP414 | Blue | Serged Seam | SM-3X | 25 |

# Clothing For Protection Against Hazardous Chemicals

**Clothing For Protection Against Hazardous Chemicals**

| Type 4 EN 14605 | Type 3 EN 14605 | Type 1 EN 943-1 |
|---|---|---|
| protection against sprays of hazardous liquids | protection against jet sprays of hazardous liquids | protection against hazardous vapours and gases |
| **Type 4 Garments:**<br>ChemMax® 1 EB<br>MicroMax® TS<br>ChemMax® Cool Suits | **Type 3 & 4 Garments:**<br>ChemMax® 1<br>ChemMax® 2<br>ChemMax® 3<br>ChemMax® 4 ***PLus***<br>Pyrolon® CRFR, CBFR | **Type 1 Garments:**<br>Interceptor® Plus |

Consider three key factors when selecting the most appropriate clothing for an application

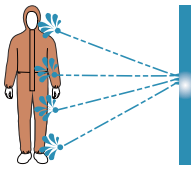
## 1. The chemical

- 'Breakthrough time' provided by (EN 6529 or ASTM F739) permeation tests can be used for comparison of fabrics but provides no information about how long you are safe.
- Consider the hazard presented by the chemical:
  *How toxic is it?*
  *Is it harmful in very small quantities?*
  *Is it carcinogenic or causes long term harm in other ways?*
- Is the application performed in a warm temperature? (permeation rates increase at higher temperatures). What effect does temperature have on the safe use time?
- Calculate a maximum safe use time using permeation rates, temperature & chemical toxicity.

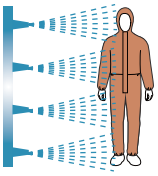
Use **PermaSURE®** to calculate safe-use times for Lakeland chemical suits **ChemMax® 3**, **ChemMax® 4 Plus** and **Interceptor® Plus**. *(Please see page 24)*

## 2. Which hazard / spray type?

- Protection against gases and vapours may require a Type 1 gas-tight suit such as Interceptor® Plus
- The type of spray in the application indicates whether a Type 3, 4 or 6 garment is required.
- However, with a highly toxic chemical even if the spray type indicates a Type 6 garment, a higher level of protection might be appropriate.



**Type 3**
Strong jet sprays



**Type 4**
Shower sprays

Approximately 80% or more applications in the market are Type 4 and not Type 3.

### Type 3 or Type 4?

Determining that the application is Type 4 rather than Type 3 means selecting more comfortable options such as a **ChemMax® Cool Suit.**

## 3. Physical / environment factors

- A variety of factors relating to the task and where it is performed can influence the choice of garment.
- Three groups of factors can be considered.

| Factors relating to : | | |
|---|---|---|
| **The Task** | **The Environment** | **Others** |
| For example:<br>Kneeling / crawling?<br>Climbing?<br>Confined space?<br>Mobility? | For example:<br>Visibility?<br>Moving vehicles?<br>Sharp edges?<br>Heat or flames?<br>Warm conditions?<br>Explosive atmosphere? | For example:<br>Co-ordination with other PPE?<br>Training required?<br>Donning and doffing?<br>Regulatory issues? |
|  |  |  |

All such factors may influence the choice of fabric and garment design: (physical properties, colour, noise level and additional properties such as flammability).

CE standard physical tests can be used to assess comparative performance in terms of durability using abrasion resistance, tear strength etc.

# Design and Super-B Style for Type 3 and Type 4 Garments

**Protective clothing is used in a wide variety of environments, situations and applications throughout a range of industries. Each one is different and each places garments under a unique set of stresses, strains and physical demands.**

Yet most chemical protective clothing is made from polymers and non-woven materials which whilst having the benefit of being inexpensive, feature strength properties that are generally lower than their woven counterparts. So good design is vital in ensuring garments are built to cope with the various physical demands that might be placed on them.

Similarly, whilst comfort is primarily defined by the air permeability of the fabric, even a garment that is breathable will be uncomfortable if it is too tight, restricts movement or is poorly designed.

**So effective ergonomic design is important in both maintaining the comfort of the wearer and in ensuring a garment lasts as long as required by the job.**

## Lakeland 'Super-B' Style

Lakeland CE garments use a specific ergonomically styled pattern that features a unique combination of the key factors, along with other helpful design elements.


### 1 Three-piece hood

Some cheaper garments feature a simple 2-piece hood. Such hoods do not fit the head properly, restrict head movement and generally have a poor fit to respirator masks.

Lakeland garments not only feature a 3-piece hood which creates a more 3-D fit and resolves these problems, in addition the centre piece is a 'pointed oval' shape resulting in an even better fitting hood.

### 2 Diamond crotch gusset

The crotch is invariably the point where garments split first, partly because this is where most stress is apparent, and partly because on cheaper garments it is the point where four seams – two body and two leg - meet at one point.

Lakeland garments feature an inserted crotch gusset of two dart-shaped fabric pieces. This creates a more shaped body which spreads the stress and allows greater freedom of movement.

### 3 Inset Sleeves

Most garments use the traditional 'bat-wing' style sleeve, in which the body forms a diagonal between the elbow and the waist. This is cheaper to produce as it uses less fabric, but it also restricts movement when a user reaches up. It also explains why some garments need thumb loops – because it results in pulling back of the sleeve and cuff.

Lakeland garments use the more expensive inset sleeve in which the body and arm follows the shape of the body. This allows greater freedom when reaching up and results in much less pulling back of the sleeve – so no thumb loops are required.

### 4 Cushioned Knee-Pads

ChemMax® garments and some Cool Suits® feature double-layer cushioned knee-pads which add comfort and durability in applications where crawling or kneeling is required.

### 5 Double zip and storm flap

ChemMax® garments feature a double zip with handy ring-pulls and double storm flap front fastening for superior protection.

### 6 Higher neck line

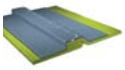
For improved neck protection and better respirator mask fit.

### 7 CE Chest Label

Lakeland CE coveralls feature a chest label containing all the legally required marking for CE certification, so users and supervisors can easily identify the correct garment is being worn.

# ChemMAX® 1

TYPE 3 TYPE 4 TYPE 5 TYPE 6 EN1073-2 EN14126 EN1149 SUPER B



CT1S428

## FEATURES

- High density polyethylene film barrier laminated to spunbonded polypropylene substrate. Very lightweight, soft and flexible fabric.
- Coverall with elasticated hood cuffs and ankles and double zip & storm flap front fastening.
- Low noise level - improved comfort and safety.
- Very cost effective Type 3 & 4 chemical protection.
- Cushioned double-layer knee pads for increased comfort and safety.
- Super-B style coverall: superior fit, wearability and durability.

## KEY APPLICATIONS

- Tank cleaning and liquid chemical storage vessel cleaning.
- Pressure spray applications.
- Agricultural spraying and agricultural chemical applications.
- Chemical spill Handling.
- Acid and Alkali handling.

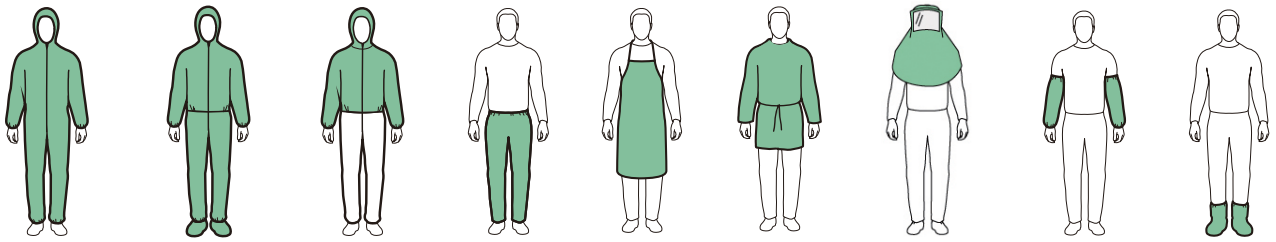
| Physical Property | Test Method | Test Result |
|---|---|---|
| Abrasion Resistance (No of cycles) | EN530:1994 method 2 | 100-500 |
| Flex Cracking Resistance | EN ISO7854:1997 method B | 1000-2500 |
| Tensile Strength (MD/CD) | EN ISO 13934-1:1999 | 120N/73N |
| Tear Resistance (MD/CD) | ISO9073-4:1997 | 81.5N/43.6N |
| Puncture Resistance | EN863:1995 | 13N |
| Burst Strength | ISO13938-1:1999,50cm$^2$ | 63.7KPa |
| Seam Strength | EN ISO 13935-2:1999 | 170N |
| Electrostatic properties | EN1149-1:2006/EN1149-5:2008 | Pass |

## ChemMAX® 1 EB

**ChemMax® 1 EB was specifically designed for a greater choice of options that are more flexible, provide greater comfort and are high cost effective.**

- Type 3&4 certified according to EN 14605.
- Superior ergonomic styling for improved freedom of movement, comfort and durability.
- Three-piece hood, inset sleeves, diamond crotch gusset.
- Single zip with sealable zip flap, thumb loops.

## ChemMAX ® 1 Styles



428,Coverall
Coverall with hood, elastic cuffs, waist & ankles.

414,Coverall
Coverall with hood and attached boot, elastic cuffs, waist & ankles.

145, coat
Coat with hood, zipper closure, elastic cuffs & waist.

301,Pants
Pants with elastic waist and ankles.

650,Apron
Attached ties. Size:122x96cm

019,Smock
Long sleeve, attached ties, Size:135x79cm

Cape hood
PVC face shield.

024,Sleeve
Elastic ends Size: 18" length

905,Boot Cover
anti-skid PE sole, elastic top.

| Product Style | Color | Seam Method | Sizes | Case Pack |
|---|---|---|---|---|
| CT1S428/CT1S414 | Yellow | Heat Sealed Seam | SM-3X | 10 |
| CT1SL428IEB | Yellow | Heat Sealed Seam | SM-3X | 25 |

# ChemMAX® 2

TYPE 3 TYPE 4 TYPE 5 TYPE 6 EN1073-2 EN14126 EN1149 SUPER B

CT2S428

## FEATURES

- Saranex®23P barrier film bonded to a flexible bi-component spunbonded substrate provides excellent chemical protection in a soft and flexible fabric.
- Constructed with stitched and taped seams for superior protection and strength.
- Design features for double zip / storm flap front fastening for improved protection and quick and easy donning and removal.
- Lightweight and flexible material for optimum comfort and protection.
- Reinforced knee-pads for comfort and durability.
- Saranex®film provides excellent protection with strength and flexibility for durability and comfort.
- White color for easy identification.
- ChemMAX 2 is an excellent alternative to the more expensive types of suit available.
- Super-B style coverall: superior fit, wearability and durability.

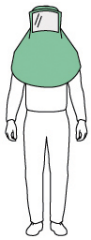
## KEY APPLICATIONS

- Hazardous chemical handling.
- Industrial demolition applications.
- Pressure spray applications.
- Waste disposal.
- Chemical spill handling.

| Physical Property | Test Method | Test Result |
|---|---|---|
| Abrasion Resistance | EN530:2010 method 2 | ＞2000 |
| Puncture Resistance | EN863:1995 | 24N |
| Flex Cracking Resistance | ISO7854:1997 method B | ＞2500, ＜5000 |
| Burst Strength | EN ISO 13938-2:1999 | 145kPa |
| Tensile Strength（MD/CD） | EN ISO 13934-1:1999 | 300N/150N |
| Tear Resistance（MD/CD） | EN ISO 9073-4:1997 | 193.98N/92.09N |
| Seam Strength | EN ISO 13935-2:1999 | 148.3N |
| Electrostatic properties | EN1149-1:2006/EN1149-5:2008 | Pass |

## ChemMAX® 2 Styles

428,Coverall
Coverall with hood, elastic cuffs, waist & ankles.
Double front zip fastening, cushioned kneepads.



Cape hood PVC face shield.

| Product Style | Color | Seam Method | Sizes | Case Pack |
|---|---|---|---|---|
| CT2S428 | White ◯ | Heat Sealed Seam | SM-3X | 10 |

# ChemMAX® 3

TYPE 3 TYPE 4 TYPE 5 TYPE 6 EN1073-2 EN14126 EN1149 EN340 SUPER B


CT3S428

**Limited use coverall made using multi-layer composite technology featuring a proprietary barrier film laminated SBPP to enable an effective high barrier to a wide range of hazardous chemicals.**

PermaSURE

## FEATURES

- Works with Lakeland's PermaSURE®; on-line tool providing instant safe-use times for over 4000 chemicals.
- Extruded fabric construction results in smoother and more consistent fabric than bonded or glued competitors.
- Fabric is tested against a full range of chemical warfare agents for anti-terror and civil defence operations.
- Superior softness and flexibility and more consistent chemical.
- Coverall with elasticated hood, cuffs, waist and ankles. Double zip and storm flap front fastening.
- Very low noise level. Safer and improved comfort.
- Cushioned double-layer knee pads for increased comfort and safety.
- Super-B style coverall: superior fit, wearability and durability.

## KEY APPLICATIONS

- High hazard chemical applications.
- Hazardous waste disposal.
- Industrial demolition applications.
- Petrochemical plant applications.
- Chemical spill handling.
- Military applications requiring chemical protection or protection against chemical warfare agents.

| Physical Property | Test Method | Test Result |
|---|---|---|
| Abrasion Resistance | EN530:2010 method 2 | ＞2000 |
| Puncture Resistance | EN863:1995 | 18N |
| Flex Cracking Resistance | ISO7854:1997 method B | ＞15000 |
| Burst Strength | EN ISO 13938-2:1999 | 112.3kPa |
| Tensile Strength（MD/CD） | EN ISO 13934-1:1999 | 170N/110N |
| Tear Resistance（MD/CD） | EN ISO 9073-4:1997 | 134.44N/72.7N |
| Seam Strength | EN ISO 13935-2:1999 | 165.3N |
| Electrostatic properties | EN1149-1:2006/EN1149-5:2008 | Pass |

## ChemMax 3® Styles

428,Coverall
Coverall with hood, elastic cuffs, waist & ankles.
Double front zip fastening, cushioned kneepads.

527,Smock
Long sleeve, attached ties, Size:135x79cm

430 Coverall
"Plus" version with attached boot flap and double cuffs.

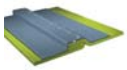
400 Level B encapsulated suit
Rear entry, PVC face shield.
Flat back, which can connect the air tube.

450 Level B encapsulated suit
Rear entry, PVC face shield.
Expanded back for SCBA.

| Product Style | Color | Seam Method | Sizes | Case Pack |
|---|---|---|---|---|
| CT3S428 | Grey, Orange | Heat Sealed Seam | SM-3X | 10 |
| CT3S430G/CT3S400G/CT3S450G | Grey, Orange | Heat Sealed Seam | SM-3X | 1 |

# ChemMAX® 4 Plus

TYPE 3 TYPE 4 TYPE 5 TYPE 6 EN1073-2 EN14126 EN340 EN1149 SUPER B



Throat Tab

Double zipper with double flap

CT4S428PS

**Works with Lakeland's PermaSURE®; on-line tool providing instant safe-use times for over 4000 chemicals. Multi-layer, high barrier films laminated to spunbonded PP substrate. Tough and durable fabric – can be used multiple times if undamaged and un-contaminated.**

PermaSURE

## FEATURES

- Extruded fabric construction. Results in smoother and more consistent fabric than bonded or glued competitors.
- Superior softness and flexibility and more consistent chemical barrier.
- Fabric is tested against a full range of chemical warfare agents for anti-terror and civil defence operations.
- Cushioned double-layer knee pads for increased comfort and safety.
- Coverall with double zip & storm flap front fastening and elasticated hood, cuffs, waist and ankles.
- Super-B style coverall: superior fit, wear-ability and durability.

## KEY APPLICATIONS

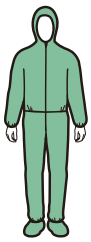
- Petrochemical and refining applications
- Chemical handling and distribution
- Chemical clean-ups and spill management
- Contaminated land clearance
- Military applications requiring chemical protection or protection against chemical warfare agents

Multi-Layer protective barrier that will stand up to the toughest of hazardous chemical.

| Physical Property | Test Method | Test Result | EN Class |
|---|---|---|---|
| Tensile Strength | EN 13934-2 | 218/150 N | 3 |
| Abrasion Resistance | EN 530 | 2000 Cycles | 6 |
| Puncture Resistance | EN 863 | 15.4 N | 2 |
| Burst Strength | EN 13938 | - | NT |
| Flex Cracking | ISO 7854 | 1000 Cycles | 1 |
| Flex Cracking -30°C | ISO 7854 | 200 Cycles | 2 |
| Trapezoidal tear md/cd | ISO 9073 | 101/87 N | 4 |
| Trapezoidal tear-mean | ISO 9073 | 90 N | 4 |
| Resistance to Ignition | EN 13274-4 | - | Pass |
| Seam Strength | EN 13935 | 125 N | 4 |

## ChemMAX® 4 Plus Styles

428,Coverall
Coverall with hood, elastic cuffs, waist & ankles.
Double front zip fastening, cushioned kneepads.



430 Coverall
"Plus" version with attached boot flap and double cuffs.

400 Level B encapsulated suit
Rear entry, PVC face shield.
Flat back, which can connect the air tube.

450 Level B encapsulated suit
Rear entry, PVC face shield.
Expanded back for SCBA.

| Product Style | Color | Seam Method | Sizes | Case Pack |
|---|---|---|---|---|
| CT4S428PS/CT4S430PSG/CT4S450PSG/CT4S400PSG | Yellow, khaki | Heat Sealed Seam | SM-3X | 1 |

# Interceptor® Plus

Powered by PermaSURE®

TYPE 1a-B

INT640

**Interceptor® Plus is Lakeland's gas-tight, Type 1a chemical protective coverall. It should be used with an internally worn SCBA for full protection against a wide range of hazardous chemicals in liquid, gaseous and vapour form.**

PermaSURE

## FEATURES

- Multi-layer film technology creates a light and flexible high barrier against a wide range of high hazard chemicals.
- Weight 365gsm.
- Superior design featuring double-taped seams (inside & out).
- Standard or wide-vision visor options; two-layer visor with unique sealing technology for high chemical barrier.
- Double layer chemical glove system.
- Tested against a full range of chemical warfare agents for antiterror and civil defence operations.
- Very soft and flexible material for enhanced comfort.
- Front and rear entry design options.
- Inner chemical glove with outer 27mil butyl glove.
- Two rear mounted exhaust valves.
- Attached sock boot with boot overflaps.

## EN 6529 Chemical Permeation Test Results

| Chemical | CAS No. | CE Class |
|---|---|---|
| Acetone | 67-64-1 | 6 |
| Acetonitrile | 70-05-8 | 6 |
| Carbon Disulphide | 75-15-0 | 6 |
| Dichloromethane | 75-09-2 | 6 |
| Diethylamine | 209-89-7 | 6 |
| Ethyl Acetate | 141-78-6 | 6 |
| n-Hexane | 110-54-3 | 6 |
| Methanol | 67-56-1 | 6 |
| Sodium Hydroxide (40%) | 1310-73-2 | 6 |
| Sulphuric Acid (96%) | 7664-93-9 | 6 |
| Tetrahydrafuran | 109-99-9 | 6 |
| Toluene | 95-47-6 | 6 |
| **Chemical- gas** | | |
| Ammonia 99% | 7664-41-7 | 6 |
| Chlorine 99.5% | 7782-50-5 | 6 |
| Hydrogen Chloride (99%) | 7647-01-0 | 6 |

EN 6529 measures the time until the rate of permeation of the chemical through the fabric reaches 1.0µg /min/cm², defined as the "Normalised Breakthrough". This is NOT an indication of safe-use time or that a wearer is safe wearing the suit in any specific application. "Safe-use" times can be calculated or see PermaSURE®.

See the web site for more chemicals tested.

## Physical Properties

| Property | EN Standard | CE Class |
|---|---|---|
| Abrasion Resistance | EN 530 | 6 |
| Flex Cracking | ISO 7854 | 2 |
| Trapezoidal Tear | ISO 9073 | 6 |
| Tensile Strength | EN 13934 | 4 |
| Puncture Resistance | EN 863 | 2 |
| Seam Strength | EN 13935-2 | 6 |

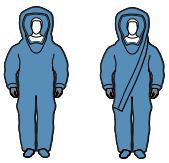
## Chemical Warfare Agents

Interceptor® Plus has been tested independantly against permeation by common chemical warfare agents according to the FINABEL test method. (1 x 50 µg / 37°c / 24H)

| Agent | Acronym | No of tests | Fabric result hours:min | Seam result hours:min |
|---|---|---|---|---|
| Sulfur mustard | HD | 3 | >24:00 | >24:00 |
| Lewisite | L | 3 | >24:00 | >24:00 |
| V-Agent | VX | 3 | >24:00 | >24:00 |
| Sarin | GB | 3 | >24:00 | >24:00 |
| Tabun | GA | 3 | >24:00 | >24:00 |
| Soman | GD | 3 | >24:00 | >24:00 |

Note: that testing has been conducted against the Interceptor® Plus fabric and the seam. In the tests, the challenge was made against the seam with 50% of the fabric only and 50% on the seam. As can be seen no permeation was recorded in 24 hours across 3 tests on each agent.

## Interceptor® Plus Styles



Basic Style Options
ICP640 - Front entry / standard width visor
ICP650 - Rear entry / standard width visor
ICP640W - Front entry / wide vision visor
ICP650W - Rear entry / wide vision visor

Available in: Blue Yellow Orange

Fully encapsulated suit featuring double layer visor, gas-tight zip and attached boots and gloves:

- Expanded back, attached sock boots with boot flaps
- Seams sealed inside and out
- 122cm gas tight zipper with outer storm flaps
- Double layer attached gloves
- 2 exhaust valves
- Inside waist belt
- Storage bag included

| Product Style | Color | Seam Methods | Sizes | Case Pack |
|---|---|---|---|---|
| ICP640/ICP640W | Orange, Yellow, Blue | Heat Sealed Seam Plus | SM-3X | 1 |

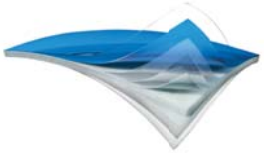
# Interceptor® Plus Design features

**Fully sealed to the external environment, the Interceptor® Plus coverall is worn with SCBA inside the suit - a generous backpack allows use of most portable breathing apparatus. Interceptor® Plus includes as standard a number of design features making it the best choice for gas-tight protection available.**

Unique and patented "etched" sealing system for more secure seal between visor and garment fabric.

Rear pouch for accommodation of internal SCBA

122cm gas-tight zip with front-entry or rear-entry options.



Soft and flexible 365gsm multi-layer fabric... the unique combination of polymers results in a high barrier to a wide range of chemicals.

Attached sock with boot overflap.

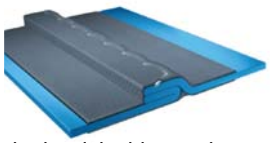
- Anti-mist wipes supplied with each garment.
- All Interceptor® Plus suits undergo an **internal pressure test** to confirm suit is gas-tight before leaving the factory as part of the final quality assurance check.

Double layer face shield:
Outer-0.25mm Teflon
Inner - 1.00mm PVC
Offers superior chemical barrier with flexibility

42cm standard width visor for 640 style.
63cm wide vision visor for 640W style.

Two protected rear mounted exhaust valves: one at the back and one at rear of hood.

Two layer glove system: inner chemical barrier glove and outer Butyl glove - bonded together for improved comfort



Stitched and double taped seams, inside and out.

Lakeland sales staff will also conduct training on donning & doffing and conducting internal pressure tests for your staff on delivery of your initial Interceptor® Plus suits.

**Interceptor® Plus** works with:
PermaSURE®
Safe-Use Time Toxicity Modeller
Contact Lakeland for more details.

# INTERCEPTOR® PLUS

ICP645A

## Fully Encapsulated Gas-Tight Suit For Themal Protection

ICP645A gas-tight suit is designed for chemical flash fire protection FOR ESCAPE ONLY in the event of a chemical flash fire. It offers three-way protection- broad chemical holdout, plus flame resistance and radiant heat protection for the additional hazards encountered in a chemical flash-fire.

### FEATURES

- Outer layer is aluminized fiberglass which can protect against above 95% heat emission; inner layer is level A gas-tight chemical protective coverall;
- Fully encapsulated front entry gas protective suit (Level A), expanded back;
- Sealed seam plus inside and out, 48”zipper, double storm flap with hook and loop closure;
- 2 layers face shield (0.25mm Teflon/1.00mm PVC);
- Include the glove system, 2 exhaust valves, attached sock boots with boot flaps, 15”waist belt with 3 belt loops sewn (inside) and sealed. Storage bag included.

### Aluminized Fiberglass Fabric:

The outer layer fabric is aluminized fiberglass fabric, 375gsm weight and 0.3mm thickness, which provides highly effective heat and flame resistance property.

| Physical Property | Test Method | Test Result |
|---|---|---|
| Breaking Strength(Warp/Fill) | ASTM D5034 | 1557 N/1112 N |
| Tear Strength(Warp/Fill) | ASTM D1424 | CNM N/44 N |
| Flame Resistance (After flame/Char length) | ASTM D6413 | 1 S/1.3 cm |
| Radiant Reflectivity | MIL-C-24929A | 10 S |

## ICP491: Rear Entry ICP497: Front Entry Level A encapsulated training suit

### FEATURES

- Made of interceptor Plus fabric;
- 0.5mm PVC face shield;
- 48”zipper, double storm flap;
- Attached boots sock;
- Training use only.

## Level A / NFPA Test Kit

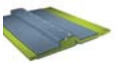
### FEATURES

Maintain your encapsulated suits with this easy to use test kit. Kit features an easy-to-read Magnehelic pressure gauge, digital timer, sturdy brass and steel fittings, hoses and connectors in a waperproof case. Complete instructions included.

Part No. 00220 – Universal test kit for DuPont, Lakeland, and Kapler Level A and NFPA Certified suits. Features an integrated blower for suit inflation.

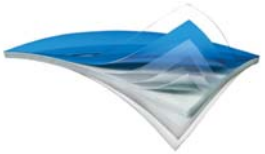
| Product Style | Color | Seam Methods | Sizes | Case Pack |
|---|---|---|---|---|
| ICP645A | Orange, Yellow, Blue | Heat Sealed Seam Plus | SM-3X | 1 |
| ICP491/ICP497 | Orange, Yellow, Blue | Heat Sealed Seam | SM-3X | 1 |
| 00220 | ——— | ——— | ——— | 1 |

# INTERCEPTOR® Plus



## ICP450
## Level B Encapsulated Suit

Encapsulated suit (Level B), rear entry, expanded back, 48'' zipper, storm flap, PVC faceshield, elastic wrists, 2 exhaust ports with shroud, attached sock boots with boot flaps.



Soft and flexible 365gsm multi-layer fabric... the unique combination of polymers results in a high barrier to a wide range of chemicals.

PermaSURE

## ICP400
## Level B Flat Back

Rear entry.
Thickening PVC face shield.
With connector on waist, which can connect all kinds of air tube.
Protection against long-time hazards.

## ICP165
## Level B Coverall

Coverall, respirator fit hood, double storm flap with hook and loop closure, elastic face and wrists, attached boots with boot flaps.

Note: Chemical protective coverall with socks which need to wear chemical boots over it.

| Product Style | Color | Seam Methods | Sizes | Case Pack |
|---|---|---|---|---|
| ICP450/ ICP400/ ICP165 | Orange, Yellow, Blue | Heat Sealed Seam | SM-3X | 1 |

# CHEMICAL PROTECTIVE CLOTHING PERMEATING DATA

| Chemical | CAS Number | Phase | Conc | ChemMAX 1 | ChemMAX 2 | ChemMAX 3 | ChemMAX 4 Plus | Interceptor PLUS |
|---|---|---|---|---|---|---|---|---|
| | | | | EN6529 | EN6529 | EN6529 | EN6529 | EN6529 |
| Acetic Acid | 64-19-7 | Liquid | 99% | 200 | >480 | >480 | >480 | 470 |
| Acetic Anhydride | 108-24-7 | Liquid | 99% | - | >480 | >480 | - | - |
| Acetone | 67-64-1 | Liquid | 95% | Imm | >480 | >480 | >480 | >480 |
| Acetonitrile | 75-05-8 | Liquid | 99% | >480 | >480 | >480 | >480 | >480 |
| Acetyl Chloride | 75-36-5 | Liquid | 98% | - | - | - | >480 | 210 |
| Acrolein | 107-02-8 | Liquid | 90% | - | 11 | >480 | >480 | >480 |
| Acrylic Acid | 79-10-7 | Liquid | 99% | 120 | >480 | >480 | >480 | 430 |
| Acrylonitrile | 107-13-1 | Liquid | 99% | - | >480 | >480 | >480 | >480 |
| Allyl Chloride | 107-05-1 | Liquid | 98% | - | - | - | >480 | >480 |
| Ammonia | 7664-41-7 | Liquid | 99% | - | - | - | - | >480 |
| Ammonia Gas | 7664-41-7 | Gas | 100% | Imm | 15 | >480 | >480 | >480 |
| Ammonium Fluoride | 12125-01-8 | Liquid | 40% | - | - | - | >480 | >480 |
| Amyl Acetate | 628-63-7 | Liquid | 99% | - | - | >480 | - | - |
| Aniline | 62-53-3 | Liquid | 95% | - | >480 | >480 | - | - |
| Benzene | 71-43-2 | Liquid | 100% | - | Imm | >480 | >480 | - |
| Benzonitrile | 100-47-0 | Liquid | 99% | - | - | - | >480 | >480 |
| Benzyl Alcohol | 100-51-6 | Liquid | >95% | - | >480 | - | - | - |
| Benzoyl Chloride | 98-88-4 | Liquid | 98% | - | - | - | - | >480 |
| Bromine | 7726-95-6 | Liquid | 98% | - | Imm | Imm | >480 | 120 |
| Bromochloromethane | 74-97-5 | Liquid | 98% | - | - | - | - | >480 |
| 4-Bromofuorobenzene | 460-00-4 | Liquid | 99% | - | - | - | >480 | >480 |
| Butyl Acrylate | 141-32-2 | Liquid | 99% | - | - | - | - | >480 |
| 1,2 Butylene Oxide | 106-88-7 | Liquid | 99% | - | - | - | - | >480 |
| 1,3-Butadiene | 106-99-0 | Gas | 99% | Imm | >480 | >480 | >480 | >480 |
| n-Butyl Acetate | 123-86-4 | Liquid | 99% | - | - | - | >480 | >480 |
| N-Butanol | 71-36-3 | Liquid | 99% | - | >480 | - | - | - |
| Butyraldehyde | 123-72-8 | Liquid | 99% | - | >480 | - | - | - |
| Carbon Disulfide | 75-15-0 | Liquid | 95% | >480 | >480 | >480 | >480 | >480 |
| Carbon Monoxide | 630-08-0 | Gas | 100% | - | >480 | 320 | - | >480 |
| Carbon Tetrachloride | 56-23-5 | Liquid | 99.9% | - | - | - | - | >480 |
| Chlorine Gas | 7782-50-5 | Gas | 99% | Imm | >480 | >480 | >480 | >480 |
| Chloroacetone | 78-95-5 | Liquid | >95% | - | >480 | - | - | - |
| Chloroacetic Acid (saturated solution) | 79-11-8 | Liquid | saturated solution | - | - | - | - | >480 |
| Chloroacetyl Chloride | 79-04-9 | Liquid | 98% | - | - | - | - | >480 |
| Chlorobenzene | 108-90-7 | Liquid | >95% | - | - | 9 | >480 | >480 |
| Chlorosulforic Acid | 7790-94-5 | Liquid | 99% | - | >480 | - | >480 | >480 |
| Crotonaldehyde | 123-73-9 | Liquid | 99% | - | >480 | - | - | - |
| Cyclohexane | 110-82-7 | Liquid | 99% | - | >480 | >480 | - | - |
| Cyclohexanone | 108-94-1 | Liquid | 99% | - | 48 | - | >480 | >480 |
| Cyclohexyl Isocyanate | 3173-53-3 | Liquid | 99% | - | 5 | - | - | >480 |
| Dichloroacetyl Chloride | 79-36-7 | Liquid | 98% | - | - | - | - | 400 |
| 1,2-Dichloroethane | 107-06-2 | Liquid | 100% | - | >480 | >480 | - | - |
| Dichloromethane | 75-09-2 | Liquid | 99.9% | Imm | Imm | >480 | >480 | >480 |
| 1,2-Dichloropropane | 78-87-5 | Liquid | 99% | - | >480 | - | - | - |
| Diesel Fuel | 68334-30-5 | Liquid | 100% | - | - | >480 | - | - |
| Diethylamine | 109-89-7 | Liquid | 99.5% | Imm | 15 | Imm | - | >480 |
| N, N-Dimethylaniline | 121-69-7 | Liquid | 99% | - | - | - | - | >480 |
| Diethylene Glycol (Dimethyl Ether) | 111-96-6 | Liquid | 99% | - | - | - | >480 | >480 |
| Diethylenetriamine | 111-40-0 | Liquid | 98% | - | - | - | >480 | >480 |
| 2,3-Dichloro-1-Propene | 78-88-6 | Liquid | 98% | - | - | - | >480 | >480 |
| Dimethylamine | 124-40-3 | Liquid | 99% | - | 210 | - | - | - |
| Dimethyl Sulfate | 77-78-1 | Liquid | 99% | - | - | - | - | >480 |
| Dimethyl Disulfide | 624-92-0 | Liquid | 99% | - | - | - | - | >480 |
| Dimethyl Ether (gas) | 115-10-6 | Gas | 99% | - | - | - | - | >480 |
| Dimethyl Sulfoxide | 67-68-5 | Liquid | 99.9% | - | - | >480 | >480 | >480 |
| Dimethylacetamide | 127-19-5 | Liquid | >95% | - | 45 | - | >480 | - |
| Dimethyl Formamide | 68-12-2 | Liquid | 99% | >480 | >480 | >480 | >480 | >480 |
| DI-N-Butyl ether | 142-96-1 | Liquid | 99% | - | - | >480 | >480 | >480 |
| Dinoseb | 88-85-7 | Liquid | 1000ppm | - | - | >480 | - | - |
| Epichlorohydrin | 106-89-8 | Liquid | 99.9% | - | 260 | >480 | - | - |
| Ethanol Amine | 141-43-5 | Liquid | 99% | - | - | >480 | - | - |
| Ethyl Acetate | 141-78-6 | Liquid | 99.5% | Imm | >480 | >480 | >480 | >480 |
| Ethyl Acrylate | 140-88-5 | Liquid | 99% | - | - | - | >480 | >480 |
| Ethyl Methacrylate | 97-63-2 | Liquid | 99% | - | - | - | - | >480 |
| Ethyl Parathion | 56-38-2 | Liquid | 100 µg/mil ethanol | - | - | - | - | >480 |
| Ethyl Vinyl Ether | 109-92-2 | Liquid | 99% | - | - | - | - | >480 |
| Ethylamine (gas) | 75-04-7 | Gas | 97% | - | - | - | - | >480 |
| Ethyl Acrylate | 140-88-5 | Liquid | 99% | - | - | - | >480 | >480 |
| Ethyle Ether | 60-29-7 | Liquid | 98% | - | - | - | >480 | >480 |
| Ethylene Oxide | 75-21-8 | Liquid | 99.7% | >480 | >480 | >480 | >480 | >480 |
| Ferric Chloride | 7705-08-0 | Liquid | saturated solution | - | - | - | - | >480 |
| Fluorine (Sodium Fluoride) | 7681-49-4 | Liquid | 99% | >480 | - | - | - | >480 |
| Fluorobenzene | 462-06-6 | Liquid | 99% | - | - | >480 | >480 | >480 |
| Fluorosilic Acid (25 wt% aqueos sol.) | 16961-83-4 | Liquid | 25% | - | - | - | >480 | >480 |
| Ethylene Glycol | 107-21-1 | Liquid | 99% | >480 | >480 | >480 | - | - |
| Ethyl Benzene | 100-41-4 | Liquid | 98% | - | - | >480 | - | - |
| Ethylene Oxide Gas | 75-21-8 | Gas | 99.7% | >480 | >480 | >480 | - | >480 |
| Formaldehyde | 50-00-0 | Liquid | 37% | - | >480 | >480 | - | - |

- This is a general guide to selecting garments only, and should not be used as the definitive or only tool in garment selection.
- It is the responsibility of the user to select garments or products which are appropriate for each intended use and which meet all specified government and industry standards.
- Some data is not in the table and performance data of ChemMax keeps updating. Please contact Lakeland's sales to get the latest information.
- The test data is supplied by third-party test institution according to EN6529, namely the time it takes chemical penetration rate to achieve 0.1ug/cm$^2$/min at constant 23˚C.

# CHEMICAL PROTECTIVE CLOTHING PERMEATING DATA

| Chemical | CAS Number | Phase | Conc | ChemMAX 1 | ChemMAX 2 | ChemMAX 3 | ChemMAX 4 Plus | Interceptor PLUS |
|---|---|---|---|---|---|---|---|---|
| | | | | EN6529 | EN6529 | EN6529 | EN6529 | EN6529 |
| Formic Acid | 64-18-6 | Liquid | >95% | >480 | >480 | >480 | >480 | >480 |
| Gasoline | 86290-81-5 | Liquid | 100% | - | >480 | >480 | - | - |
| Hexachloro-1,3 butadiene | 87-68-3 | Liquid | 99% | - | - | - | >480 | >480 |
| Hexamethyldisilazane | 999-97-3 | Liquid | >95% | - | >480 | - | - | - |
| N-Hexane | 110-54-3 | Liquid | 99.9% | - | >480 | >480 | >480 | >480 |
| Hexamethylene Diisocyanate | 822-06-0 | Liquid | 99% | >480 | >480 | >480 | - | - |
| Hydrazine Hydrate (64% hydrazine) | 10217-52-4 | Liquid | 100% | - | - | - | - | >480 |
| Hydrochloric Acid | 7647-01-0 | Liquid | 37% | 420 | >480 | >480 | >480 | >480 |
| Hydrofluoric Acid | 7664-39-3 | Liquid | 48-50% | - | >480 | >480 | >480 | >480 |
| Hydrogen Fluoride | 7664-39-3 | Liquid | 100% | - | >480 | >480 | >480 | >480 |
| Hydrogen Fluoride Gas | 7664-39-3 | Gas | 99% | - | >480 | >480 | - | >480 |
| Hydrogen Chloride Gas | 7647-01-0 | Gas | 99% | Imm | 410 | >480 | - | >480 |
| Hydrogen Cyanide | 74-90-8 | Gas | 95% | >480 | - | - | - | - |
| Hydrogen Cyanide | 74-90-8 | Liquid | 95% | - | - | >480 | - | - |
| Hydroiodic Acid | 10034-85-2 | Liquid | 56.5% | - | - | - | >480 | >480 |
| Hydrogen Peroxide | 7722-84-1 | Liquid | 30% | >480 | >480 | >480 | - | >480 |
| Hydrogen Peroxide | 7722-84-1 | Liquid | 50% | >480 | >480 | >480 | - | >480 |
| Isopropanol | 67-63-0 | Liquid | 99% | >480 | - | - | - | - |
| Isobutane | 75-28-5 | Gas | 99% | - | - | - | - | >480 |
| Isobutylbenzene | 538-93-2 | Liquid | 99.5% | - | - | - | - | >480 |
| Isoprene | 78-79-5 | Liquid | 98% | - | - | - | - | >480 |
| Maleic Acid | 110-16-7 | Liquid | saturated solution | - | - | - | - | >480 |
| Maleic Anhydride (solution) | 108-31-6 | Liquid | 65% | - | - | - | - | >480 |
| Jet Fuel A | | Liquid | 100% | Imm | 283 | >480 | - | - |
| Jet Fuel JP-8 | | Liquid | 100% | Imm | >480 | >480 | - | - |
| Lithium Chloride | 7447-34-8 | Liquid | 20% | >480 | - | - | - | - |
| Mecury II Nitriate(1000 ppm solution) | 7483-34-8 | Liquid | 100% | - | - | >480 | - | - |
| Metacrylic Acid | 79-41-4 | Liquid | 99% | - | - | - | - | >480 |
| Methanol | 67-56-1 | Liquid | 99.9% | 210 | >480 | >480 | >480 | >480 |
| Methyl Chloride | 74-87-3 | Gas | 99.5 | >480 | >480 | >480 | >480 | >480 |
| Methyl Iodide | 74-88-4 | Liquid | 99.9% | - | - | - | - | >480 |
| Methyl Mercaptan | 74-93-1 | Liquid | 99% | - | - | >480 | - | >480 |
| Methylamine | 74-89-5 | Liquid | 40% | - | >480 | >480 | >480 | >480 |
| Methylamine | 74-89-5 | Liquid | 99% | - | - | - | - | >480 |
| Methylene Dianaline | 101-77-9 | Liquid | 99% | Imm | Imm | >480 | - | >480 |
| Methylene Diphenyl Diisocyanate | 101-68-8 | Liquid | 99% | >480 | >480 | >480 | - | - |
| Methyl Ethyl Ketone | 78-93-3 | Liquid | 99.5% | - | >480 | >480 | - | - |
| Methylthiopropionaldehyde | 3268-49-3 | Liquid | >97% | - | - | >480 | - | - |
| Methyl Isocyanate | 624-83-9 | Liquid | 100% | - | >480 | - | - | - |
| Nitric Acid | 7697-37-2 | Liquid | 70% | >480 | >480 | >480 | >480 | >480 |
| n-Butyl Acetate | 123-86-4 | Liquid | 99.9% | - | - | - | - | >480 |
| n-butylamine | 109-73-9 | Liquid | 99% | - | - | - | - | >480 |
| Nitrobenzene | 98-95-3 | Liquid | 99.9% | 50 | 150 | 170 | >480 | >480 |
| Nitric Oxide | 10102-43-9 | Gas | 99% | - | - | - | - | >480 |
| Nitrochloro Benzene (ethanol solution) | 201-854-9 | Liquid | saturated solution | - | - | - | - | >480 |
| Nitrogen Tetroxide (<10°C) | 10102-44-0 | Gas/Liquid | 99% | - | - | - | - | >480 |
| Nitrogen Dioxide | 10102-44-0 | Gas | 100% | - | >480 | >480 | - | >480 |
| Oleum | 8014-95-7 | Liquid | 40% | 30 | >480 | >480 | - | >480 |
| Oleum | 8014-95-7 | Liquid | 100% | - | >480 | >480 | - | >480 |
| Oxalic Acid (solution) | 144-62-7 | Liquid | 75% | - | - | - | - | >480 |
| Phenol | 108-95-2 | Liquid | 99% | >480 | >480 | >480 | >480 | >480 |
| Phosphoric Acid | 7664-38-2 | Liquid | 85% | >480 | >480 | >480 | >480 | >480 |
| Potasium Hydroxide | 1310-58-3 | Liquid | 50% | >480 | >480 | >480 | >480 | >480 |
| Propionaldehide | 123-38-6 | Liquid | 99% | - | - | - | - | >480 |
| Propionic Acid | 79-09-4 | Liquid | 99.5% | - | - | - | - | >480 |
| Pyridine | 110-86-1 | Liquid | 99% | - | - | - | - | >480 |
| Phosphorous Trichloride | 7719-12-2 | Liquid | >95% | - | Imm | 20 | - | - |
| Propionitrile | 107-12-0 | Liquid | 99% | >480 | - | - | - | - |
| Sodium Hydroxide | 1310-73-2 | Liquid | 50% | >480 | >480 | >480 | >480 | >480 |
| Styrene | 100-42-5 | Liquid | 98% | - | 12 | >480 | - | - |
| Sulfuric Acid | 7664-93-9 | Liquid | 30% | >480 | >480 | >480 | - | >480 |
| Sulfuric Acid | 7664-93-9 | Liquid | 98% | >480 | >480 | >480 | >480 | >480 |
| Sulfur hexafluoride | 2551-62-4 | Gas | 99% | - | - | - | - | - |
| Sulfur Trioxide | 7446-119 | Liquid | 99% | - | 120 | 80 | - | >480 |
| Tetrachloroethylene | 127-18-4 | Liquid | 99% | - | >480 | >480 | >480 | >480 |
| 1,1,2,2-Tetrabromoethane | 97-27-6 | Liquid | 98% | - | - | - | - | >480 |
| Thionyl Chloride | 7719-09-7 | Liquid | 99% | - | - | Imm | >480 | 30 |
| Tetrahydrofuran | 109-99-9 | Liquid | 99.9% | Imm | 81 | >480 | >480 | >480 |
| Tiethoxysilane | 998-30-1 | Liquid | 95% | - | - | - | - | >480 |
| Titanium Tetrachloride | 7550-45-0 | Liquid | 99% | - | >480 | >480 | - | - |
| Toluene | 108-88-3 | Liquid | 99.8% | Imm | Imm | >480 | >480 | >480 |
| Toluene-2,4-Diisocyanate | 584-84-9 | Liquid | 98% | - | - | - | >480 | >480 |
| 2,2,2-Trichloroethanol | 115-20-8 | Liquid | 99% | - | - | - | >480 | >480 |
| Trichloroethylene | 79-01-6 | Liquid | 100% | - | Imm | >480 | >480 | >480 |
| Trichlorovinylsilane | 75-94-5 | Liquid | 99% | - | 70 | - | - | - |
| Trifluoroacetic Acid | 76-05-1 | Liquid | 99% | - | >480 | >480 | >480 | - |
| Vinyl Acetate | 108-05-4 | Liquid | 99% | - | 29 | >480 | >480 | >480 |
| Vinyl Bromide | 593-60-2 | Gas | 99% | - | - | - | - | >480 |
| Vinyl Chloride | 75-01-4 | Liquid | 99% | - | >480 | >480 | >480 | >480 |
| Xylene | 1330-20-7 | Liquid | 99% | - | - | >480 | - | - |

# PermaSURE®

## What is PermaSURE®?

**Permeation test breakthrough is NOT when the chemical first breaks through the fabric and provides NO information on how long you are safe.**
**Permeation test data can be used for comparison of fabric perfomance but does not indicate safe-use time.**

**Users that rely on permeation test data to indicate how long they are safe may be coming into contact with small amounts of the chemical. This could be critical in the case of highly toxic chemicals or chemicals with long term toxicity.**
**To be safe: users need to calculate a safe-use time.**

To find a safe-use time, calculate volume permeated using permeation rate, exposed area and exposure time:

Manual calculation of safe-use time is problematic because of the difficulty in accessing relevant information such as permeation rates and chemical toxicity.

Permeation Rate
x
Area of Contamination
x
Duration of Contamination
=
Volume Permeated

This can then be compared with published toxicity limits for chemicals:

If volume permeated < chemical toxicity = SAFE

If volume permeated > chemical toxicity = NOT SAFE

## PermaSURE® is an on-line tool and downloadable smartphone app. that calculates permeation rates and volume permeated and provides safe-use times by comparison with chemical toxicity limits as described above.
Http://www.lakeland-permasure.com

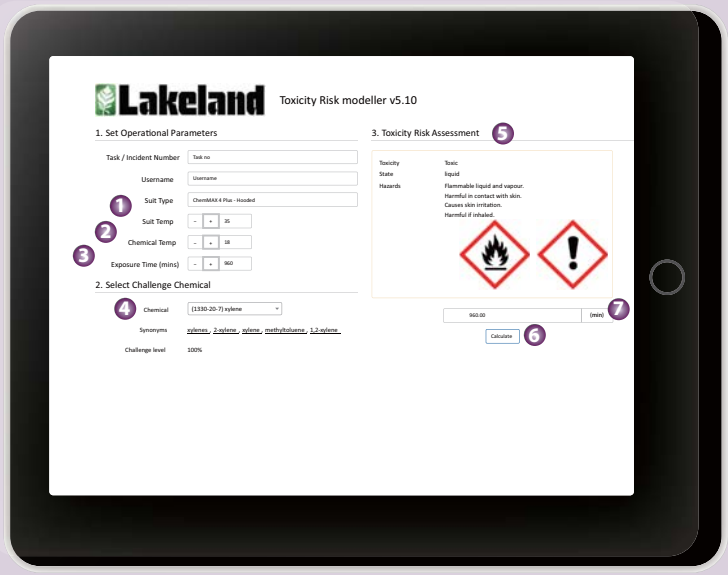
1. **Specify suit type**
ChemMax® 3, ChemMax® 4 Plus or Interceptor Plus® Coverall with hood, collar or encapsulating suit.

2. **Specify temperature**
What temperature is the suit fabric?
*This affects the rate of permeation.*

3. **Specify exposure time**
How long will the task take? This is the maximum possible duration of exposure.

4. **Specify chemical**
Input name or CAS number and select from over 4000 chemicals in the database.

! The molecular model behind PermaSURE® was developed in conjunction with the UK Ministry of Defence for assessing protection against chemical warfare agents.




5. **Basic hazard data**
Basic toxicity level and information on the hazard type.

6. **Click Calculate**
PermaSURE® quickly advises if the toxicity level for the chemical will be reached within the exposure time.

7. **The key information**
Are you safe in the input exposure time?

PermaSURE® allows users to calculate safe-use times for ChemMax® 3 & 4 Plus and Interceptor® Plus garments based on real world data including temperature and exposed area.

PermaSURE®
works on any browser-enabled device

- Works on any browser-enabled device with an internet connection.
- Simple to use. Easy-to-access interface with data input and output fields.
- User inputs suit type, exposure time, temperature and chemical.
  PermaSURE® provides key hazard data and in seconds an assessment of whether the user is safe in the input exposure time.
- Over 4000 chemicals in the database.
- PermaSURE® calculates safe-use times taking into account temperature and the toxicity thresholds of specific chemicals.
- PermaSURE® provides instant basic chemical hazard data and single-click links to detailed online safety data sheets.

# Introduction: Why Use Pyrolon®?

Many applications require both thermal protection and chemical protection. How do you safely provide both?

- Why is wearing standard chemical suits over thermal protective garments a hazard?
- How do FR standards EN 14116 and EN 11612 standards differ?
- What is Thermal Mannequin Testing and how do different garment types perform?

## Why is wearing standard chemical suits over thermal protective garments a hazard?

Currently users often wear a Thermal Protective Garment (TPG) certified to EN 11612 for flame/heat protection and wear a standard chemical suit OVER it for the required liquid or dust protection.

This creates a HAZARD!

**Why?**

Standard disposable suit fabrics are based on polypropylene/polyethylene and in contact with flames will ignite and burn

| | | |
|---|---|---|
| Being thermoplastic they melt and drip, adhering to the TPG fabric below, transferring heat energy to the skin beneath and to other surfaces, thus potentially spreading the fire. | In a flash fire situation this will dramatically increase the heat energy contacting the skin and thus the incidence of body burn. | Even in the case of contact with a small flame, a standard chemical suit fabric may ignite and cause burns. |

Wearing a standard disposable suit over a TPG can dramatically compromise thermal protection.

## How do FR standards EN 14116 and EN 11612 standards differ?

EN 11612

**EN 11612** is the standard for measuring PROTECTION against different types of heat; convective, radiant, contact etc.

EN ISO 14116 INDEX 1/0/0

**EN 14116** does not indicate any PROTECTION against flames or heat but is to indicate a fabric's flammability - the tendency to ignite and burn in contact with flame.

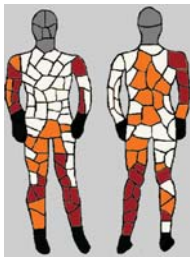

Lakeland Pyrolon® garments use a unique viscose based fabric which will not ignite and are certified to EN 14116

For Flame & Heat Protection a Thermal Protective Garment (TPG) certified to EN 11612 should be worn.

EN 14116 Index 1 garments can be worn over a TPG without compromising protection.

## What is Thermal Mannequin Testing and how do different garment types perform?

Thermal Mannequin Testing provides a method of assessing the effectiveness of heat protective workwear by using a thermal mannequin (a mannequin covered in heat sensors) and simulating flash fires.



This test produces a body map showing Predicted 2nd and 3rd degree burns and so indicates how effectively a garment protects the wearer.

The table indicates how different Type 3 & 4 and Type 5 & 6 suits perform in this test when worn **over** a Thermal Protective Garment.

| **Type 3 & 4 coverall tests** | TPG with Standard Chemical Suit **PBB = 53% including 3rd degree burns** | TPG with Pyrolon® CRFR Coverall **PBB = 24% NO 3rd degree burns** |
|---|---|---|
| Tests show Pyrolon® CRFR results in a much lower incidence of body burn than with standard chemical suits. | | |

| **Type 5 & 6 coverall tests** | TPG with FSPE coverall **PBB = 23.9% including 3rd degree burns** | TPG with Standard SMS Coverall **PBB = 20.5% including 3rd degree burns** | TPG with FR SMS Coverall **PBB = 19.6% including 3rd degree burns** | TPG with Pyrolon® Plus 2 coverall **PBB = 7.4% NO 3rd degree burns** |
|---|---|---|---|---|

Tests show Pyrolon® Type 5 & 6 coveralls result in a much lower incidence of body burn than with standard chemical suits.
Note: there is almost no difference in performance between a standard SMS and an FR SMS. **PBB = predicted body burn**

Pyrolon® garments provide a range of protection

| | Pyrolon® Plus 2 | Pyrolon® CRFR | Pyrolon® CBFR |
|---|---|---|---|
| EN 14116 | √ Index 1 | √ Index 1 | √ Index 3 |
| Type 6 | √ | √ | √ |
| Type 5 | √ | | |
| EN 1073 | √ | | |
| Type 4 | | √ | √ |
| Type 3 | | √ | √ |
| EN 11612 | | | |
| EN 1149-5 | √ | √ | √ |

EN 1149-5

**Superior Anti-Static Properties**

Pyrolon™ garments also feature intrinsic anti-static properties which unlike standard chemical suits do not rub off or erode with time.

# Pyrolon® Plus 2

TYPE 5 TYPE 6 EN1073-2 EN ISO 14116 EN1149 SUPER B

EWP428B

**Pyrolon® Plus 2 is the entry level suit featuring the essential Pyrolon® fabric, lightweight, breathable and much economical, and offers Type 5 and 6 chemical and dust protection combined with excellent FR properties.**

## FEATURES

- Pyrolon Plus 2 garments meet the requirements of EN 14116 (Index 1) for garment for protection against flames and heat.
- Approved to the latest 2015 version of EN 14116 which requires vertical flammability testing on the zip front fastening as well as the fabric – and requires that the zip functions after the test.
- Fabric will not ignite, chars at low temperature and unlike standard disposables does not continue burning after the ignition source is withdrawn.
- Can safely be used over thermal protective garments without compromising thermal protection.
- Note that Pyrolon Plus 2 fabric will not ignite but is designed to wear OVER thermal protective garments and will not provide heat protection if worn alone.
- Intrinsic anti-static properties with very low surface resistance; anti-static does not wear off in use like standard disposables.
- Super-B style coverall: superior fit, wear-ability and durability.

## KEY APPLICATIONS

- Petrochemical & Refining Industries.
- Wear over thermal protective garments without compromising chemical protection.
- Maintenance applications.
- Fuel handling and distribution.

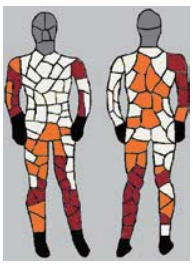
## Physical Property

| Physical Property | Test Method | Test Result |
|---|---|---|
| Tensile Strength | EN 13934 | 76.1/40.1 N |
| Abrasion Resistance | EN 530 | <1500 Cycles |
| Puncture Resistance | EN 863 | 12.2 N |
| Burst Strength | ISO 2960 | 290 kPa |
| Flex Cracking | ISO 7854 | 100000 Cycles |
| Trapezoidal tear md/cd | ISO 9073 | 24.2/26.7 N |
| Trapezoidal tear-mean | ISO 9073 | 25.45 N |
| Seam Strength | ISO 5082 | 63 N |

## Chemical Repellency and Penetration EN 6530

| Chemical | R | P |
|---|---|---|
| Sulphuric Acid 30% CAS No. 67-64-1 | 2 | 3 |
| Sodium Hydroxide CAS No. 1310-73-2 | 3 | 3 |
| O-Xylene CAS No. 75-15-0 | NT | NT |
| Butanol CAS No. 75-09-2 | NT | NT |

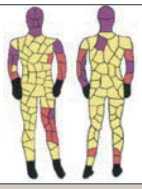
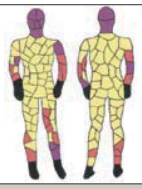
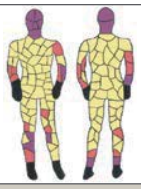
Thermal Mannequin Testing provides a method of assessing the effectiveness of heat protective workwear by using a thermal mannequin (a mannequin covered in heat sensors) and simulating flash fires.



This test produces a body map showing predicted 2nd and 3rd degree burns and so indicates how effectively a garment protects the wearer.

The table indicates how different Type 5 & 6 suits perform in this test when worn **over** a Thermal Protective Garment.

**Predicted Body Burn Results for various Type 5 & 6 Coveralls**

| TPG with FSPE coverall | TPG with Standard SMS Coverall | TPG with FR SMS Coverall | TPG with Pyrolon® Plus 2 coverall |
|---|---|---|---|
|  |  |  |  |
| **PBB = 23.9%** including 3rd degree burns | **PBB = 20.5%** including 3rd degree burns | **PBB = 19.6%** including 3rd degree burns | **PBB = 7.4%** NO 3rd degree burns |

**The results show almost no difference between FSP, Standard SMS and FR SMS, with all three producing 2nd and 3rd degree burns. Pyrolon® Plus 2 coveralls produce much lower predicted burns and no 3rd degree burns.**

| Product Style | Color | Seam Method | Sizes | Case Pack |
|---|---|---|---|---|
| EWP428B | Blue | Serged seam | SM-3X | 25 |

# Pyrolon® CRFR

TYPE 3 TYPE 4 EN1149 EN ISO 14116 SUPER B

ECR428

**Pyrolon CRFR coveralls provide a unique combination of both chemical protection to Type 3 & 4 and meeting the requirements of flame resistance standard EN 14116 - Index 1. Pyrolon garments use fabric that does not burn and unlike standard Type 3 & 4 chemical protective coveralls can be worn OVER thermal protective garments WITHOUT compromising thermal protection.**

## FEATURES

- Approved to the latest 2015 version of EN 14116 which requires vertical flammability testing on the zip front fastening as well as the fabric – and requires that the zip functions after the test.
- Outer FR PVC barrier film laminated to a proprietary nonwoven substrate of viscose rayon.
- Fabric will not ignite, burn or drip molten polymer - chars at a temperature lower than its ignition point.
- Exceptionally soft and flexible fabric for superior comfort - softer and more comfortable than most chemical suits.
- Coverall with elasticated hood, cuffs, waist and ankles. Double zip and storm flap front fastening.
- 'Super-B' styling, ergonomically styled for superior freedom of movement, comfort and durability.

## KEY APPLICATIONS

- Wear over a Thermal Protective Garment to provide chemical spray protection to Type 3 and 4.
- Wear for liquid chemical protection where contact with small flame is possible.
- Petrochemical and refining industries.
- Tank/ pressure cleaning involving flammable liquids.
- Petroleum distribution and processing.

**Physical Properties**

| Property | EN Standard | Result | CE Class |
|---|---|---|---|
| Abrasion Resistance | EN 530 | >2000 cycles | 6 |
| Flex Cracking | ISO 7854 | >40,000 cycles | 5 |
| Trapezoidal Tear md/cd | ISO 9073 | 48 / 34.3 N | 2 |
| Tensile Strength | EN 13934 | 168 / 110N | 3 |
| Puncture Resistance | EN 863 | 19.2N | 2 |
| Burst Strength | EN 13938 | 111.8 kPa | 2 |
| Seam Strength | EN 13935 | 186.80 | 4 |

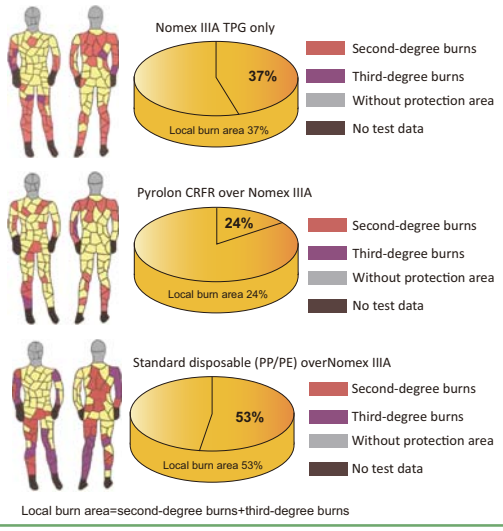
**Permeation Test Data**

Permeation and penetration data is shown for a limited range of chemicals.
More test results are available and tests can be conducted on request.

| Chemical | CAS No. | Conc. | Normalised Breakthrough @ 1.0µg/min/cm² / CE Class |
|---|---|---|---|
| Acetic Acid | 64-19-7 | 98% | 45 min / Class 2 |
| Acetone | 8006-64-2 | | NT |
| Acetonitrile | 75-05-8 | 90% | NT |
| Benzene | 71-43-2 | 99% | NT |
| Crude oil | 8002-05-9 | neat | NT |
| Diesel Fuel | N/A | neat | NT |
| Formic Acid | 64-18-6 | 99% | 120 min / Class 4 |
| n-Hexane | 2493-44-9 | | >480 min / Class 6 |
| Methanol | 67-56-1 | 50% | >480 min / Class 6 |
| Phosphoric Acid | mixture | 85% | >480 min / Class 6 |
| Sodium Hydroxide | 1310-73-2 | 40% | >480 min / Class 6 |
| Sulphuric Acid | 7664-93-9 | 60% | >480 min / Class 6 |
| Sulphuric Acid | 7664-93-9 | 96% | >480 min / Class 6 |

Normalised Breakthrough is provided at rates of 0.1µg/min/cm² and 1.0µg/min/cm² . Note that 'Normalised breakthough' is the time until the permeation RATE (i.e. the SPEED of permeation) reaches these rates. It is NOT an indication of safe-use time and does not indicate when the chemical first breaks through the fabric. For more information about breakthrough times see the Chemical Suit Selection Guide and PermaSURE®. * Note: Penetration breakthrough is given according to US test ASTM F903 which measures the time until the chemical visibly breaks through the fabric. This may be appropriate in cases where chemicals are only harmful in larger volumes.

CRFR are construted from the wood pulp fibres with special FR treatments applied. It can be worn over Thermal Protective Garments without compromising thermal protection.
In fact, not only does Pyrolon provide protection against liquid splashes (Types 3, 4, 5 and 6), but when worn over a TPG can actually increase overall thermal protection.
Thermal Mannequin Testing has shown conclusively that Pyrolon could be the difference between a life and death scenario when worn as a replacement for a standard disposable worn over a TPG.




Local burn area=second-degree burns+third-degree burns

| Product Style | Color | Seam Method | Sizes | Case Pack |
|---|---|---|---|---|
| ECR428 | Gray, Orange | Heat Sealed Seam | SM-3X | 10 |

# Pyrolon® CBFR

TYPE 3 TYPE 4 EN1149 EN ISO 14116 SUPER B

EBR228

**High barrier Type 3 & 4 chemical suit combined with FR properties to EN 14116-Index 3. Can be worn over Thermal Protective (EN11612) Garments without compromising thermal protection as a standard chemical suit would.**

## FEATURES

- Pyrolon base fabric with PVC chemical barrier film laminate for combined FR and chemical protection properties;
- Single zip and double storm flap front fastening with hook and loop seals enabling re-use where appropriate (chemical suits should ONLY be reused if uncontaminated and undamaged. Decision on re-use is the users responsibility;
- Coverall with hood, elasticated cuffs, waist and ankles. Double layer, cushioned kneepads for comfort and durability. Version with attached feet available.
- 'Super-B' styling, ergonomically styled for superior freedom of movement, comfort and durability.

## KEY APPLICATIONS

- Petrochemical & Refining applications
- Maintenance applications during petrochemical clean-downs
- Fabric will not ignite and burn wear over TPG'S
- Fuel handling and distribution

## PHYSICAL PROPERTIES

| EN Standard | Description | Result | Mins |
|---|---|---|---|
| EN 530 | Abrasion Resistance | >2000 Cycles | Class 6 |
| ISO 7854 | Flex Cracking | >5000 Cycles | Class 3 |
| ISO 9073 | Trapezoidal tear md/xd | 82/55.7N | Class 3 |
| EN 13934 | Tensile Strength | 140/110N | Class 3 |
| EN 863 | Puncture Resistance | 10N | Class 2 |
| ISO 2960 | Burst Strength | - | NT |
| ISO 13935-2 | Seam Strength | 190N | Class 4 |

## CHEMICAL PERMEATION EN 6529

| Chemical | CAS No | Result / Mins |
|---|---|---|
| Acetone 99.5% | 67-64-1 | >480 |
| Acetonitrile 99% | 75-05-8 | >480 |
| Ammonia anhydrous 99% | 7664-41-7 | >480 |
| Benzene 99.8% | 71-43-2 | >480 |
| Butadiene 99% | 106-99-0 | >480 |
| Carbon disulfide 99.9% | 75-15-0 | >480 |
| Chlorine 99.5% | 7782-50-5 | >480 |
| Crude oil | VARIOUS | >480 |
| Dichloromethane 99.8% | 75-09-2 | >480 |
| Diesel fuel | VARIOUS | >480 |
| Dimethylformamide 99.9% | 68-12-2 | >480 |
| Ethyl acetate 99.8% | 141-78-6 | >480 |
| Ethylene oxide 99.7% | 75-21-8 | >480 |
| Gasoline | VARIOUS | >480 |
| Hydrofluoric acid 48% | 7664-39-3 | >480 |
| Hydrogen chloride 99% | 7647-01-0 | >480 |
| Methyl chloride 99.5% | 74-87-3 | >480 |
| N-hexane 95% | 110-54-3 | >480 |
| Nitrobenzene | 98-95-3 | >480 |
| Sodium hydroxide 50% | 1310-73-2 | >480 |
| Sulfuric acid 96% | 7664-93-9 | >480 |

## Pyrolon® CBFR Styles

EBR228,Coverall
Coverall with hood, elastic cuffs, waist & ankles.

EBR214,Coverall
Coverall with hood and attached boot, elastic cuffs, waist & ankles.

| Product Style | Color | Seam Method | Sizes | Case Pack |
|---|---|---|---|---|
| EBR228/EBR214 | Blue | Heat Sealed Seam | SM-3X | 10 |

# EPVC

TYPE 3 TYPE 4 SUPER B

EPVC428

**Lakeland New product-Low risk PVC Chemical Protective Garment Reusable with Extra Softness and Durability.**

Double storm flap with velcro and zipper closure.

Drawstring on bottom of Jacket for adjustment.

## FEATURES

- Protection against splashes and sprays of chemical in Type 3 & 4 application.
- Reusable- Long Lasting service life.
- Exceptional comfort with good durability.
- Applicable in wet environment.
- Excellent design for user's comfort.

## KEY APPLICATIONS

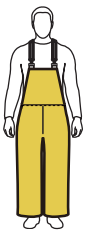
- Petrochemical plant applications.
- Tank cleaning and liquid chemical storage vessel cleaning.
- Agricultural spraying and agricultural chemical application.
- Acid and Alkali handling.

| Items | Standards | Results | EN Class |
|---|---|---|---|
| Weight | - | 310gsm | - |
| Abrasion resistance | EN 530 | <2,000 Cycles | Class 6 |
| Flex cracking resistance | EN ISO 7854 method B | >100,000 Cycles | Class 6 |
| Tear resistance | EN ISO 9073-4 | MD = 37.8N / CD = 34N | Class 2 |
| Tensile strength | EN ISO 13934-1 | MD = 305N / CD = 198.9N | Class 3 |
| Puncture resistance | EN 863 | >22.9N | Class 2 |
| Burst Strength | ISO 2960 | 255kPa | Class 3 |
| Seam strength | EN ISO 13935-2 | 163N | Class 4 |

## EPVC® Styles

EPVC428,Coverall
Zipper, attached hood, elastic wrist and ankle, with zip flap.

EPVCJT02, coat
Zipper, attached hood, elastic wrist and ankle, with zip flap.



EPVCTS02, Bib Pants.

## Chemical Permeation ISO6529/ASTMF739 Breakthrough Time Breakthrough Class*

| Chemicals | Breakthrough Time | Class |
|---|---|---|
| Sodium hydroxide40%, 50% (1310-73-2) | >480min | 6 |
| Hydrochloric acid 30% (7647-01-0) | >480min | 6 |
| Acetic acid 30% (64-19-7) | >480min | 6 |
| Sulfuric acid 50% (7664-93-9) | >480min | 6 |
| Phenol/sodium hydroxide 1:1 (139-02-6) | >480min | 6 |
| Sodium hypochlorite 10%-15% (7681-52-9) | >480min | 6 |

| Product Style | Color | Seam Methods | Sizes | Case Pack |
|---|---|---|---|---|
| EPVC428 | Yellow | Heat Sealed Seam | SM-3X | 5 |
| EPVCJT02/ EPVCTS02 | Yellow | Heat Sealed Seam | SM-3X | 5 |

# ACCESSORIES

## R-2-49 ChemTough® Safety Footwear

### FEATURES

- CE certificate, EN ISO20345:2011 standard. Recommendation: Petro-chemical industry, Mining operations,
- Electric power industry etc.
- Chemical resistance: Oil and corrosion resistance, Resistant towards inorganic acids and alkalis.
- Outer material: High property PVC, promoting the properties by adding stabilizers and resistant chemical additives; Antistatic property.
- Lining material: Comfortable polyester fiber lining.

## A4422B1 ACIFORT® HEAVY DUTY FULL SAFETY Basic chemical resistance and worker protection

### FEATURES

- Strong abrasion resistant outsole for extra durability.
- Easy cleaning and SRA+ rated slip resistant outsole.
- Shock absorbing heel design.
- Protective toecap & midsole.
- Certified according to European standard (EN ISO 20345:2011 S5 SRA).
- Nitrile and polymers enhanced PVC compound for basic chemical protection.
- Reinforced ankle protection.

## 87012/87015 HAZMAX Chemical Protective Boots

### FEATURES

- The finest boots made for hazardous materials handling.
- Meet the requirements of NFPA 1991-2005.
- Steel toecap, shank and midsole.
- Steel toe complies with ASTM F2413-11 and CSA Z195.
- Seamless injection modeling with PVC.
- 87012-16'' boot height.
- 87015-11'' boot height, which is usually used with the chemical protective coverall with socks.

## 82330 HazProof Chemical Protective Boots

### FEATURES

- Made of special polymer, meet the test requirements of NFPA 1991 to high-level chemical-protective material.
- Meet the requirement of ASTM F2413-05 on shock resistant and pressure proof of toecap, and can resist 1400V high voltage.
- Insole is beyond the requirement of ANSI Z41 PT99PR.
- Seamless injection modeling.
- Designed for easy donning and doffing while wearing chemical protective gloves.
- Inflatable EVA nonrattling sole.
- 28cm high, high visible orange.

## Push-Lock® Glove Connection System Unique system to connect chemical gloves to ChemMax® coverall sleeves.

TYPE 3

Tested to Type 3 with ChemMax® 1, 2, 3 and 4 Plus suits

### FEATURES

- Two concentric plastic rings clip together with glove and sleeve between.
- Provides liquid-tight seal tested and approved to Type 3 Jet Spray with ChemMax® 1, 2, 3 and 4 Plus garments.
- Multi-use so more cost effective.
- Simpler and quicker to use and fit compared to traditional taping of sleeve and glove.

| Product Style | Color | Sizes | Case Pack |
|---|---|---|---|
| 87012 | Bright Green | 7-13 | 2 |
| 87015 | Bright Green | SM-XL | 2 |
| 82330 | Bright Orange | 7-10 | 2 |
| R-2-49 | Bright Brown | 36-47 | 5 |
| A4422B1 | Yellow | 39-45 | 6 |
| JFR2 | Black | one size | 50 |

# COOL VEST

**Get comfortable with a Phase Change Cool Vest from Lakeland Industries.**
**Working when wearing a chemical protective suit or other protective clothing especially in summer day or high temperature environment can make anyone lose their cool and reduce their efficiency, and even get heatstroke.**

## How do they work?

These vests create a cooling energy from a unique phase change material that is mechanically sealed in durable inserts. After freezing the inserts in ice water or a refrigerator for 30 minutes or more, the vests deliver the constant cool temperature. This ensures that the wearer receives a constant cooling temperature throughout the entire two to four hours. To achieve continues cooling, additional insert sets are available so the user can rotate each set.

### 00050C Vest

- Two layers polyester-cotton fabric, black elastic mesh fabric on the hem and waist.
- Silvery reflective line on the shoulder and hem.
- Radio equipment loop, resin zipper, LOGO embroidery.
- Black elastic nilon lining, 4 inserts bags, pocket on the waist.

### 00055C Vest

- Polyester-cotton fabric, polyerster fiber filling material.
- Resin zipper, LOGO embroidery.
- Adjustable waist and shoulder velcro belt.
- Black elastic nilon lining, 4 inserts bags.

### Style 00057 – The Phase Change Lower Cool Inserts

- Style 00057 is made of a US imported high polymer proprietary blend of alkanes with unique thermal properties.
- The Phase Change maintains a constant temperature 14˚C for faster frozen in ice water or a refrigerator.
- In a refrigerator for 30 minutes, the insert will be totally frozen.
- Designed for comfort, the Phase Change Material maintains a constant temperature 14˚C.
- Last 2 to 4 hours cool in a high temperature environmental.
- One Cool Vest included 4 cool inserts.

### Style 00059 – Economy Lower Temperature Inserts

- Style 00059 is used of blue icing gel; main content is non-toxic and non-flammable CMC gel.
- The phase change temperature is 0˚C, in a refrigerator for 120 minutes for totally frozen.
- Last up to 2 hours for cooling.
- Every insert comes with an ice cover, keeping surface cool for more comfortable.
- One Cool Vest included 4 cool inserts.

# Cooling wrap

**Model: CW20**
**Size: 85x33cm**
**Color: Light Blue**
**Material: PVA**

**Elastic cooling fabic**

**Portable Package**


**Elastic cooling fabic**

**Portable package**

**Model: CW30**
**Size: 24X40cm**
**Color: Sky blue**
**Material: Essential cooling fiber**

## FEATURES

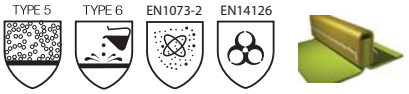
- Poly Vinyl Alcohol (PVA) material can absorb water and sweat efficiently, and natural evaporation provides a cooling sensation delivering comfort in hot environments.
- Three layers: both of inner layer and outer layer are the eco-friendly PVA material, the middle layer is a mesh structure that enhances physical strength.
- Super soft, super thin bubble hole, lint-free and no pilling.
- The material has been gotten the anti-mildew and anti-bacterial treatment.
- Use and Wrap around neck, head, or wipe down other pulse points for an cooling effect.
- Cooling properties can be reactivated for the life of the product; May be used over and over again.

## FEATURES

- Cooling instantly, up to 30% cooler surface temperature.
- Fast wicking, soft, comfortable, breathable.
- Essential cooling fiber, keep cool by recycling.
- Seamless and elastic faric, make different styles.
- UPF 50+ UV protection.

| Code | Product Style | Description |
|---|---|---|
| 00050C | Cool Vest | Two layers polyester-cotton fabric |
| 00055C | Cool Vest | Polyester-cotton fabric, polyerster fiber filling material |
| 00057 | Cool Replacement Inserts | Set of 4 cool vest replacement inserts; create climate of 14℃ for up to 2-4 hours. |
| 00059 | Economy Cool Vest Replacement inserts | Set of 4 cool vest replacement inserts; Every insert comes with an ice cover |
| CW30 | Cooling wrap | Essential cooling fiber |
| CW20 | Cooling wrap | Poly Vinyl Alcohol (PVA) |

# CleanMAX™




## Available in Clean Manufactured or Clean Sterile configurations

Lakeland® Industries has spent over 35 years being an industry leader protecting people in the workplace and now we've extended our expertise to protect both your people and your cleanroom and/or controlled environment. CleanMax® is a high-quality microporous laminate material that is lightweight and breathable but is impervious to liquids, harsh chemicals and microorganisms. Both CleanMax® Clean Manufactured and CleanMax® Sterile meet IEST-RP-C003 Category I particulate cleanliness standards and are ready for immediate use in ISO Class 4 – 8 Cleanrooms. All sterile garments are gamma radiation sterilized to a level of 10-6 SAL (Sterility Assurance Level) . These garments provide excellent comfort as well as protection, so you can easily don and doff your garments to reduce excursions and risk of contamination.

## FEATURES

- Chemical Penetration Resistance to oils, bleach and 50% Sodium Hydroxide.
- Resistant to blood and body fluid penetration.
- Resistant to viral penetration.
- Resistant to Blood Borne Pathogens.
- IEST-RP-CC003 Category I Particle Cleanliness.
- Latex and Silicone Free.
- Compatible with ISO Class 4 -8 Cleanrooms and all Controlled Environments.
- Individually packaged and protective outer bag for ante areas.

## Bound Seams

CleanMax™ garments feature bound seams, which are precisely sewn with an additional outer binding. This increases seam strength and provides a better barrier from particulates than simple serged seams.

| Physical Property | Test Method | Units | Results |
|---|---|---|---|
| Basis Weight | ASTM D3776 | oz/y² | 1.55 oz/y² |
| Grab Tensile MD | ASTM D5034 | lbs. | 22.0 lbs. |
| Grab Tensile XD | ASTM D5034 | lbs. | 14.0 lbs. |
| Trapezoidal Tear MD | ASTM D1117 | lbs. | 9.0 lbs. |
| Trapezoidal Tear CD | ASTM D1117 | lbs. | 5.8 lbs. |
| Ball Burst | ASTM D3787 | lbs. | 19.0 lbs. |
| Air Permeability | ASTM D737 | cfm | <0.562 cfm/ft² |
| Water Vapor Transmission | ASTM 96-80 | g/m²-24hrs | 663.38 |
| Bacterial Filtration Efficiency | ASTM F2101 | % | 99.999% |
| Particle Filtration Efficiency | ASTM F2299 | % | 99.999% |

Both CleanMax® Clean Manufactured and CleanMax® Sterile meet IEST-RP-C003 Category I particulate cleanliness standards and are ready for immediate use in ISO Class 4 – 8 Cleanrooms.

# CleanMAX™

TYPE 5 TYPE 6 EN1073-2 EN14126

## CleanMax® Features and Benefits

### Clean Manufactured Garments

Garments that are clean manufactured offer significantly less particle counts in contrast to garments that are not clean manufactured.

### All bound seams

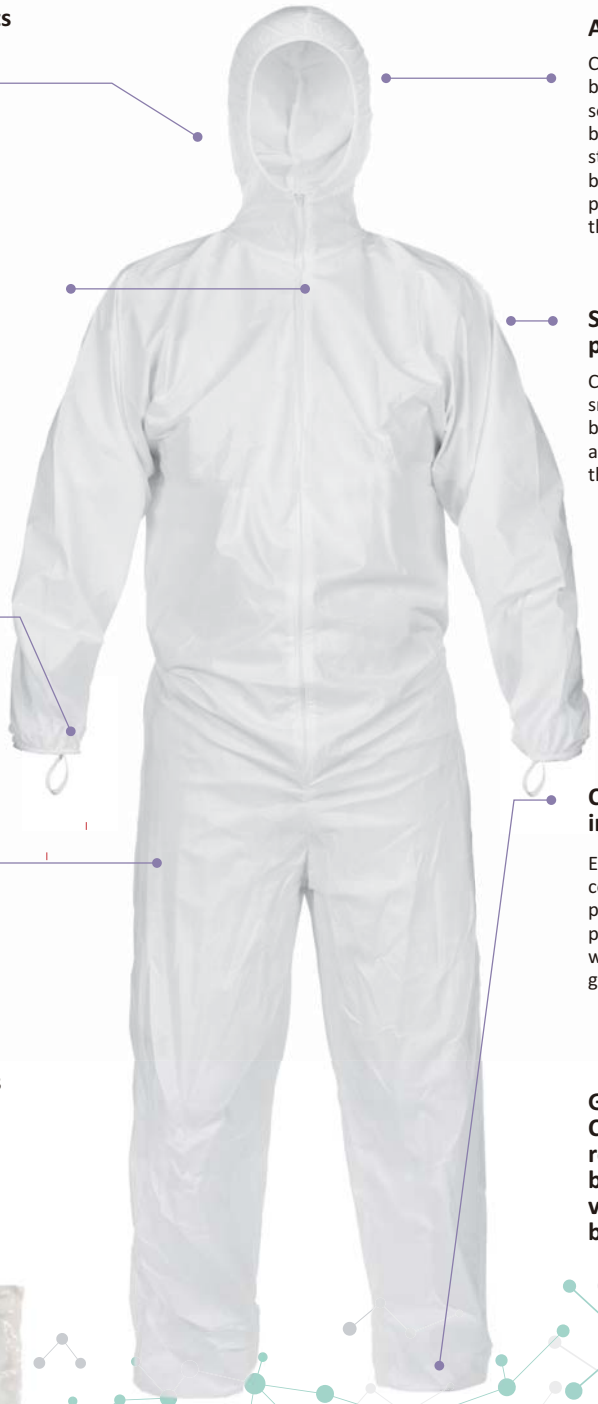
CleanMax® garments feature bound seams, which are precisely sewn with an additional outer binding. This increases seam strength and provides a better barrier from break through and protection from strike through than simple serged seams.

### Smooth Storm Flap for Added Level of Protection

Very few disposable cleanroom garments have the added protection of a placket storm flap. Covering the zipper further protects the critical chest and front area of the garment from potential particulate breakthrough. Additionally, our storm flap has finished seams so there are no exposed raw edges.

### Smooth surface area prevents particles from sticking

CleanMax® garments are smoother than other leading brands, which means particulates are less likely to harbor on the garment surface.



### Thumb Loops

Plastic wrists with thumb loops help secure the coveralls and frocks in place to prevent the potential exposure of skin while worn during normal activities.

### Cuffed ankle allows for six inches of freedom

Expertly folded to reduce surface contamination during the donning process, the cuffed ankle provides six inches of freedom when you are stepping into the gown

### Chemical Penetration Resistance

CleanMax® offers chemical penetration resistance to oils, bleach and 50 percent sodium hydroxide.

### Premium Packaging Means Less Wrinkles, Less excursions

Garments are individually packaged and expertly folded to prevent excessive wrinkling and the potential for increased excursions.

**Get the added safety of CleanMax®, which offers resistance to blood and body fluid penetration, viral penetration and bloodborne pathogens!**

# CleanMAX™

TYPE 5 TYPE 6 EN1073-2 EN14126





## Clean Manufactured Garments

### Frock – CTL191CM

- Mandarin collar.
- Zipper closure.
- No pockets.
- Tunneled elastic wrists with thumb loops.

Sizes: MD – 3X
Case Pack: 30

### Coverall – CTL417CM

- Zipper closure.
- Tunneled elastic on wrists (with thumb loops), ankles, and back half of waist.

Sizes: MD – 3X
Case Pack: 25

### Coverall – CTL428CM

- Zipper closure.
- Attached hood.
- Tunneled elastic on wrists (with thumb loops), ankles, and back half of waist.

Sizes: MD – 3X
Case Pack: 25

### Coverall – CTL414CM

- Zipper closure.
- Attached hood. Tunneled elastic on wrists (with thumb loops), ankles, back half of waist and attached boot.

Sizes: MD – 3X
Case Pack: 25

### Hood – CTL713CM

- Covers shoulders.
- One size.
- Ties to customize fit.

Case Pack: 100

### Boot Cover – CTL903CMP

- Tunneled elastic top.
- 19" high.
- Non-skid Vinyl sole.

Sizes: SM/MD, LG/XL, 2X
Case Pack: 50 pair

### Sleeve CTL850CMP-18

- Bound seams.
- Tunneled elastic.
- Thumb loops.

Size: 18" length
Case Pack: 50 pair

## Clean Sterile Garments

### Clean Sterile

- Certificate of Radiation included.
- Gamma radiation indicator dots on each package.
- IPA resistant ink.

### Coverall – CTL417CS

- Zipper closure.
- Tunneled elastic on wrists (with thumb loops), ankles, and back half of waist.

Sizes: MD – 3X
Case Pack: 25

### Coverall – CTL428CS

- Zipper closure.
- Attached hood.
- Tunneled elastic on wrists (with thumb loops), ankles, and back half of waist.

Sizes: MD – 3X
Case Pack: 25

### Coverall – CTL414CS

- Zipper closure.
- Attached hood. Tunneled elastic on wrists (with thumb loops), ankles, back half of waist and attached boot.

Sizes: MD – 3X
Case Pack: 25

### Hood – CTL713CS

- Covers shoulders.
- One size.
- Ties to customize fit.

Case Pack: 100

### Boot Cover – CTL903CSP

- Tunneled elastic top.
- 19" high.
- Non-skid Vinyl sole.

Sizes: SM/MD, LG/XL, 2X
Case Pack: 50 pair

### Sleeve CTL850CSP-18

- Bound seams.
- Tunneled elastic.
- Thumb loops.

Size: 18" length
Case Pack: 50 pair

## Disposable Cleanroom Suits: Tips for Cleanroom Apparel Selection

Confidence in your cleanroom starts with understanding how to select the right disposable apparel for your unique needs. Part of the benefit of working with Lakeland® is ongoing access to our team of cleanroom industry experts. In just a few minutes, we will work with you to determine the type of garment required for your application and environment, and discuss how we can help you protect your team effectively with clean-manufactured garments.

## Applications for CleanMax® Cleanroom Apparel

### CleanMax® Sterile

- Aseptic or Terminally Sterile Cleanroom Environments.
- ISO Class 4-8 Cleanroom.
- Sterility assurance level of 10-6 SAL.

### Cleanmax® Manufactured

- ISO Class 4-8 or below Non-Aseptic Cleanrooms or Controlled Environments.

## Garment Configurations

| Apparel | ISO 8 | ISO 7 | ISO 6 | ISO 5 Non-Sterile | ISO 5 Sterile (Aseptic) | ISO 4 | ISO 3 | ISO 1 & 2 |
|---|---|---|---|---|---|---|---|---|
| Hair cover | R | R | R | R | R | R | R | AS |
| Barrier gloves | AS | AS | AS | AS | R | R | R | R |
| Facial cover | AS | AS | AS | R | R | R | R | AS |
| Hood | AS | AS | AS | R | R | R | R | AS |
| Frock | R | R | AS | AS | NR | NR | NR | NR |
| Coverall | AS | AS | R | R | R | R | R | R |
| Shoe cover | R | R | AS | AS | NR | NR | NR | NR |
| Boot | AS | AS | R | R | R | R | R | R |
| **Typical Frequency of Change*** | **2X/week** | **2X/week** | **3X/week** | **1X/day** | **Per Entry** | **Per Entry** | **Per Entry** | **Per Entry** |

Chart shows Lakeland® garments relevant to ISO 5. Recommendations from IEST-RP-CC003.
R = Recommended, NR = Not Recommended, AS = Application Specific

# Heat Protective Clothing

# HEAT RESISTANT CLOTHING

## Caution! Do Not Confuse Ambient, Conductive and Radiant Heat!

The following definitions are given as reference in selecting the proper clothing for heat protection.

**Ambient Heat** is surrounding atmospheric temperature in a given situation. Examples are: 65˚F-70˚F (18˚C-21˚C) in an office; 1600˚C in a fire walk.

**Conductive Heat** is generated by direct contact with a hot surface. Examples are: picking up a burning block at 600˚F (315˚C); leaning against a furnace wall at 1000˚F (537˚C).

**Radiant Heat** is generated by the sun or source of fire, such as a fireplace or furnace, and is absorbed by masses of material struck by the heat's rays. This is why it is cooler in the shade on a sunny, hot day.

### EN11611:2015 Requirements

| Program | Test Method | Standard Requirements | |
|---|---|---|---|
| | | 1 class | 2class |
| Flame resistance performance | ISO 15025-A<br>ISO 15025-B | The mean value of after flame time and afterglow time is less 2 seconds. No melt or molten debris, no holes and no flame to the top or the edge. | |
| Resistance to molten metal splash | ISO 9150 | ≥15drops | ≥25drops |
| Radiation heat | ISO 6942 (20kW/m²) | RHTI 24≧7s | RHTI 24≧16s |

EN11611:2015

### EN11612:2015

| Program | Test Method | AHR1000 | 300 suits | 500 suits | 700 Suits |
|---|---|---|---|---|---|
| Limited flame spread | ISO 15025-A | A1 | A1 | A1 | A1 |
| | ISO 15025-B | A2 | A2 | A2 | A2 |
| Convective heat(B) | ISO 9151 | B1 | B1 | B1 | B3 |
| Radiation heat(C) | ISO 6942(20kW/m²) | C3 | C3 | C4 | C4 |
| Molten aluminum splash(D) | ISO 9185 | D1 | D2 | D3 | D3 |
| Molten iron splash(E) | ISO 9185 | E3 | E2 | E3 | E3 |
| Contact heat(F) | ISO 12127 | F2 | F1 | F1 | F3 |

EN11612:2015

### Fabric Structure

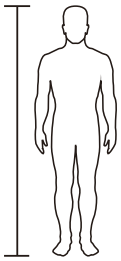
| | | | | | |
|---|---|---|---|---|---|
| AHR1000 Series | Outer Shell | 335g/m² Aluminized aramid | | | |
| | Lining | 7.7 oz/yd² FRC fabric | | | |
| 300 Series | Outer Shell | Aluminized Glass | 900 Series | Outer Shell | Aluminized Glass |
| | Lining | None | | Lining | 1. Fiberglass Insulation |
| 400 Series | Outer Shell | Kevlar Aluminized | | | 2. AL Foil |
| | Lining | None | | | 3. AL Foil |
| 500 Series | Outer Shell | Aluminized Glass | | | |
| | Lining | Neoprene Coated Nylon | | | 4. Fiberglass Insulation |
| 700 Series | Outer Shell | Aluminized Glass | | | |
| | Lining | 1. AL Foil | | | |
| | | 2. Fiberglass Insulation | | | 5. White Fiberglass |
| | | 3. Neoprene Coated Nylon | | | |

### Sizes: (300、400、500、700 Series)

Please select the appropriate size for your chest, girth, and height. Selection of the correct sizes aids comfort and durability of the garment.

| Garment Sizes | Body Height(cm) |
|---|---|
| XS | 165-169 |
| SM | 170-174 |
| MD | 175-179 |
| LG | 180-184 |
| XL | 185-189 |
| 2X | 190-200 |

Body Height



### Sizes: (900 Series)

| Model Numbers | Body Height (cm) | Body Weight(kg) |
|---|---|---|
| 900/SS | 165-175 | 63-75 |
| 900/R | 176-185 | 76-95 |

The 900 suit is tailored to be worn with a self-contained breathing apparatus (SCBA) for protection in hostile atmospheres.

# AHR1000 SERIES HEAT RESISTANT CLOTHING

## MODEL NUMBERS:

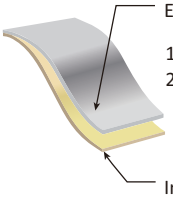
| | | | |
|---|---|---|---|
| AHR1000 | Suit complete | | 1 Suit/ Case |
| AHR1000BA | Suit complete, SCBA accommodation | with SCBA | 1 Suit/ Case |
| AHR1500 | Coverall complete | | 1 Suit/ Case |
| AHR1500BA | Coverall complete, SCBA accommodation | with SCBA | 1 Suit/ Case |

## SUIT COMPONENTS:

| | | |
|---|---|---|
| AHR117 | Hood | |
| AHR120 | Coat | |
| AHR120BA | Coat | with SCBA |
| AHR130 | Pants | with 136RL suspenders |
| AHR122 | Coverall | |
| AHR122BA | Coverall | with SCBA |
| AHR144-02A | Gloves | |
| AHR132 | Chaps | |

## FEBRIC STRUCTURE:

Meet the requirement of EN 11612:2015:B1 C3 D1 E3 F2



Exterior fabric: 335g/m² Aluminized aramid fabric

1. The reflection of radiant heat is more than 85%
2. The base fabric is aramid, with excellent high temperature resistant and breaking strength.

Inner fabric: 7.7oz/yd² FRC fabric, with excellent moisture absorption, feel soft and comfortable.

## FEATURE:

- Suit composition of hood, gloves, chaps, garments and package;
- Series suits are available in coverall or coats and pants styles, with or without SCBA accommodation;
- Series suits come complete with a hood with gold reflective face shield, gloves and chaps.

## KEY APPLICTIONS:

- Firefighting rescue
- Metal smelting industry
- Glass, cement and ceramic industry

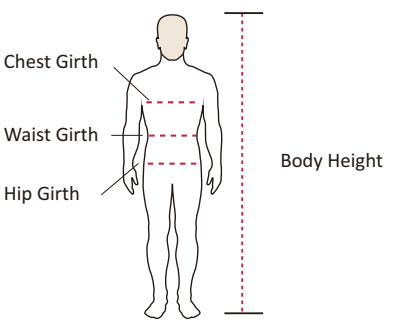
## FABRIC PERFORMANCE TEST:

| | | | |
|---|---|---|---|
| AHR1000 Aluminized outer fabric | Weight | 335 g/m² | |
| | Thickness | 0.50mm | |
| | Breaking strength | MD | 1100N |
| | | CD | 570N |
| | Tearing strength | MD | 85N |
| | | CD | 90N |
| | Flame resistance | After flame time | 0.7s |
| | | After glow time | 0s |
| | | Char length | 50mm |
| AHR1000 fabric | EN 11612 testing result | B1 C3 D1 E3 F2 | |

**Sizes:**

| COAT | SM | MD | LG | XL | 2X | 3X |
|---|---|---|---|---|---|---|
| Body height（cm） | 165 | 170 | 175 | 180 | 185 | 190 |
| Chest girth（cm） | 121 | 125 | 129 | 133 | 137 | 141 |

| PANTS | SM | MD | LG | XL | 2X | 3X |
|---|---|---|---|---|---|---|
| Body height (cm) | 165 | 170 | 175 | 180 | 185 | 190 |
| Waist girth (cm) | 45 | 47 | 49 | 51 | 53 | 55 |
| Hip girth (cm) | 118 | 122 | 126 | 130 | 134 | 138 |



# 300/305 SERIES APPROACH

EN11611:2015
Class1 A1A2
Class2 A1A2

EN11612:2015
A1A2B1C4D1E1F1

**At Left, the 300 Series Approach Suit, featuring a coat and pants. Right, the 305 Series Approach Coverall.**

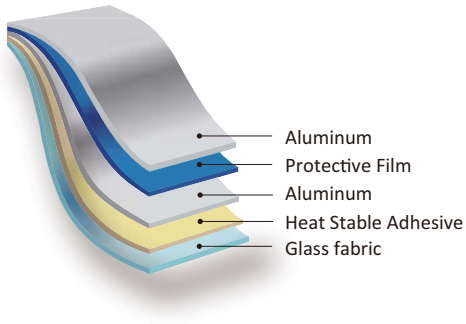
## MODEL NUMBERS

| | | | |
|---|---|---|---|
| 300 BA | Approach Suit complete, SCBA accommodation. | with SCBA | 1 Suit/ Case |
| 300 | Approach Suit complete. | | 1 Suit/ Case |
| 305 BA | Approach Coverall complete, SCBA accommodation. | with SCBA | 1 Suit/ Case |
| 305 | Approach Coverall complete. | | 1 Suit/ Case |

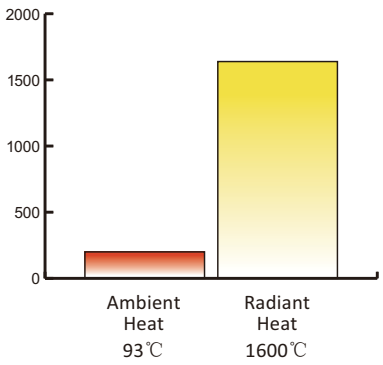
## SUIT COMPONENTS

| | | |
|---|---|---|
| 310 | Approach Hood | |
| 322 BA | Approach Coverall | with SCBA |
| 322 | Approach Coverall | |
| 320-32 BA | Approach Coat | with SCBA |
| 320-32 | Approach Coat | |
| 330 | Approach Pants | |
| 355 | Approach Boots | |
| 344-02A | Gauntlet Glove | |

## FEBRIC STRUCTURE:




## HEAT TOLERANCES




*The graphs above are provided for relative comparison of radiant and ambient heat performance of Lakeland's Industrial Heat Protective Clothing. The temperatures indicated are extrapolated from laboratory tests and ARE NOT intended to indicate suitability for use at these temperatures. Individual physiology, work conditions, and the work being performed are too variable to make recommendations for use based only on temperature and exposure time.*

*The 300 Series Approach Suit are not to be used for fire entry.*

## FEATURES

- 300/305 series suits are made of 16oz/sq.yd aluminized glass fabric which reflects 95% of radiation heat with superior durability.
- 300 /305 series suits meet the requirements of EN11611:2015 and EN11612:2015.
- 300 /305 series suits come complete with a hood with gold reflective face shield, gloves and boots.
- 300 /305 series are available in coverall or coats and pant styles, with or without SCBA accommodation.

## KEY APPLICATIONS

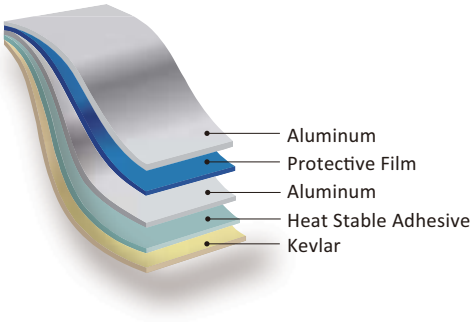
- Metal smelting industry
- Glass, cement and Ceramic industry
- Petrochemical industry

# 400/405 SERIES APPROACH

**At left, the 400 Series Approach Suit, featuring a coat and pant. Right, the 405 Series Approach Coverall.**

The 400/405 Series Approach Suits are not to be used for fire entry.
The 400/405 Series Approach Suits are designed for personal engaged in maintenance, repair and operational tasks in areas where exposure to high radiation heat with low ambient, or molten metal splash risks.

## FEBRIC STRUCTURE:




## FEATURES

- 400/405 series suits are made of 19oz/sq.yd aluminized Kevlar fabric which reflects 95% of radiation heat with superior durability, and high performance against molten metal splash.
- 400/405 series suits come complete with a hood with gold reflective face shield, gloves and boots.
- 400/405 series are available in coverall or coats and pant styles, with or without SCBA accommodation.

## KEY APPLICATIONS

- Firefighting rescue
- Metal smelting industry
- Glass, cement and ceramic industry
- Petrochemical industry

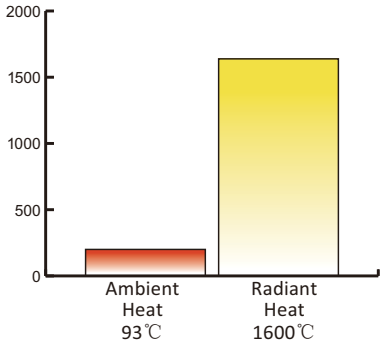
## MODEL NUMBERS

| | | | |
|---|---|---|---|
| 400BA | Approach Suit complete, SCBA accommodation. | with SCBA | 1 Suit/ Case |
| 400 | Approach Suit complete. | | 1 Suit/ Case |
| 405BA | Approach Coverall complete, SCBA accommodation. | with SCBA | 1 Suit/ Case |
| 405 | Approach Coverall complete. | | 1 Suit/ Case |

## FABRIC PERFORMANCE TEST

| | |
|---|---|
| Weight | 645g/m² |
| Thickness | 1.14mm |
| EN ISO11612: 2015 | A1,B1,C4,D3,E3,F1 |

## HEAT TOLERANCES

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*The 400 Series Approach Suit are not to be used for fire entry.*

# 500/505 SERIES APPROACH

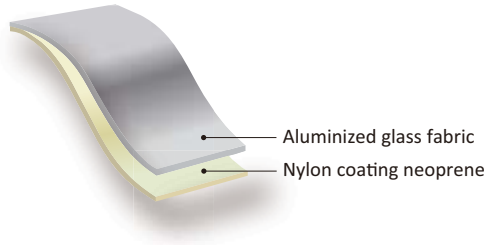
EN11611:2015
Class1 A1A2
Class2 A1A2

EN11612:2015
A1A2B1C4D3E3F1

**At left, the 500 Series Approach Suit, featuring a coat and pant. Right, the 505 Series Approach Coverall.**

The 500 and 505 Series Approach Suits are designed for personnel engaged in maintenance, repair and operational tasks in areas of low ambient, high radiant heat. These superior protective approach suits have two layers, outer shell is aluminized glass fabric, and inner layer is nylon coating neoprene fabric for moisture/steam barrier. Therefore, 500 approach suits can be used in area where exposure to hot liquids, steam, or hot vapor.

## FEBRIC STRUCTURE:




## FEATURES

- 500 /505 series suits meet the requirements of EN11611:2015 and EN11612:2015.
- 500/505 series suits come complete with a hood with gold reflective face shield, gloves and boots.
- 500/505 series are available in coverall or coats and pant styles, with or without SCBA accommodation.

## KEY APPLICATIONS

500 and 505 Series Approach Suits are used by power plants, cement manufacturers, foundries, ceramic, glass and plastic manufacturers, chemical processing. Suits protect employees exposed to extreme radiant heat for relatively prolonged period of time.

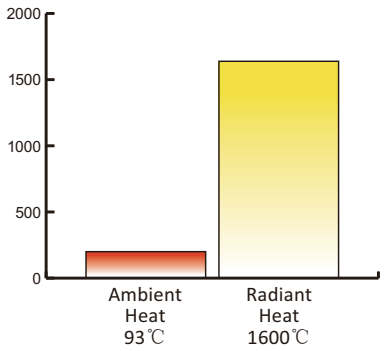
## MODEL NUMBERS

| | | | |
|---|---|---|---|
| 500BA | Approach Suit complete, SCBA accommodation. | with SCBA | 1 Suit/ Case |
| 500 | Approach Suit complete. | | 1 Suit/ Case |
| 505BA | Approach Coverall complete, SCBA accommodation. | with SCBA | 1 Suit/ Case |
| 505 | Approach Coverall complete. | | 1 Suit/ Case |

## SUIT COMPONENTS

| | | |
|---|---|---|
| 510 | Approach Hood | |
| 522BA | Approach Coverall | with SCBA |
| 522 | Approach Coverall | |
| 520-32BA | Approach Coat | with SCBA |
| 520-32 | Approach Coat | |
| 530 | Approach Pants | |
| 555 | Approach Boots | |
| 344-02A | Gauntlet Glove | |

## HEAT TOLERANCES

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*The 500/505 Series Approach Suits are not to be used for fire entry.*

EN11612:2015
A1A2B3C4F3

# 700/705 SERIES PROXIMITY SUITS

**Left, the 700 Series Proximity Suit, featuring a coat and pants. Right the 705 Series Proximity Coverall.**

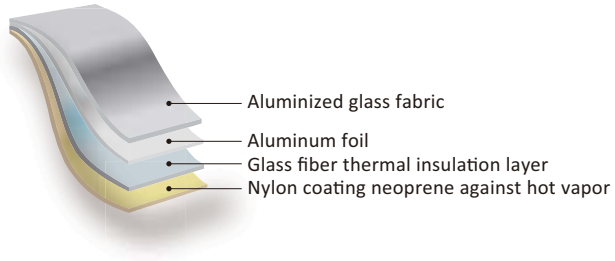
## MODEL NUMBERS

| | | | |
|---|---|---|---|
| 700BA | Proximity Suit complete, SCBA accommodation. | with SCBA | 1 Suit/ Case |
| 700 | Proximity Suit complete. | | 1 Suit/ Case |
| 705BA | Proximity Coverall complete, SCBA accommodation. | with SCBA | 1 Suit/ Case |
| 705 | Proximity Coverall complete. | | 1 Suit/ Case |

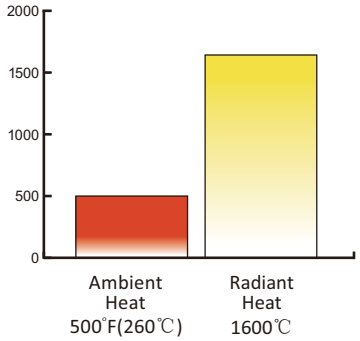
## SUIT COMPONENTS

| | | |
|---|---|---|
| 710 | Proximity Hood | |
| 722BA | Proximity Coverall | with SCBA |
| 722 | Proximity Coverall | |
| 720BA | Proximity Coat | with SCBA |
| 720 | Proximity Coat | |
| 730 | Proximity Pants | |
| 755 | Proximity Boots | |
| 740 | Proximity Mitts | |

## FEBRIC STRUCTURE:




## HEAT TOLERANCES




## FEATURES

700 and 705 Series Proximity Suits are designed for performance of maintenance and repairs in high heat areas. Workers wearing these proximity garments are insulated form harm by Fyrepel's unique, proven multi layer construction, with the outer layer composed of high temperature Aluminized Glass. An additional moisture/steam barrier lining provides protection in areas where exposure to hot liquids,or hot vapor is a possibility. Redesigned for better fit, the 700 and 705 Series Suits are available in coverall or coat and pant styles.

The coverall or the coat and pant styles are available with an SCBA accommodation, if required. The 700 Series Suit comes complete with a hood, gold reflective faceshield, coat, pants, mitts and boots. The 705 Series Coverall comes complete with a hood with gold reflective faceshield, coverall, boots and mitts. Both series are offered in sizes Small, Medium, Large and Extra Large. Individual replacement components are available. Handy duffel/storage bags are also available.

## KEY APPLICATIONS

700 and 705 Series Proximity Suits are used by industries which bake on finishes, such as auto, office furniture, and appliance manufacturers. The Proximity Suits may also be used in oven and conveyor repair.

*The graphs above are provided for relative comparison of radiant and ambient heat performance of Lakeland's Industrial Heat Protective Clothing. The temperatures indicated are extrapolated from laboratory tests and ARE NOT intended to indicate suitability for use at these temperatures. Individual physiology, work conditions, and the work being performed are too variable to make recommendations for use based only on temperature and exposure time.*

*The 700/705 Series Proximity Suits are not to be used for fire entry.*

# 900 SERIES KILN ENTRY SUIT

**The 900 Series is tailored to be worn with a self-contained breathing apparatus (SCBA).**

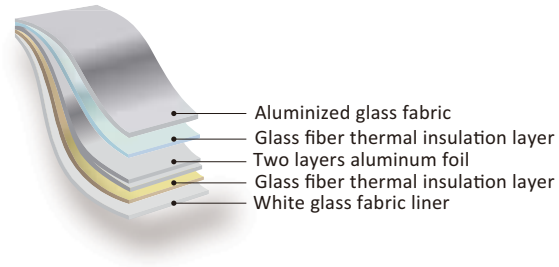
## MODEL NUMBERS

| | | |
|---|---|---|
| 900R | Kiln Entry Suit, complete, SCBA accommodations. | 1 Suit/ Case |
| 900SS | Kiln Entry Suit,Complete SCBA accommodations. | 1 Suit/ Case |

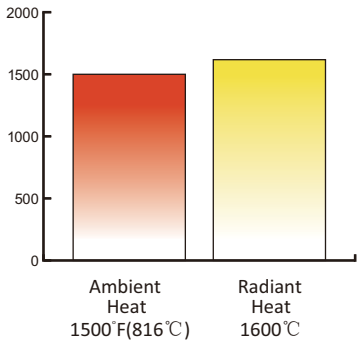
## SUIT COMPONENTS

| | |
|---|---|
| 910 | Kiln Entry Hood |
| 920R | Kiln Entry Coat |
| 930R | Kiln Entry Pants |
| 920SS | Kiln Entry Coat |
| 930SS | Kiln Entry Pants |
| 955 | Kiln Entry Boots |
| 940 | Kiln Entry Gauntlet |

## FEBRIC STRUCTURE:




## HEAT TOLERANCES




*The graphs above are provided for relative comparison of radiant and ambient heat performance of Lakeland's Industrial Heat Protective Clothing. The temperatures indicated are extrapolated from laboratory tests and ARE NOT intended to indicate suitability for use at these temperatures. Individual physiology, work conditions, and the work being performed are too variable to make recommendations for use based only on temperature and exposure time.*

*The 900 Series Kiln Entry Suit is not to be used for fire entry.*

## FEATURES

This Kiln Entry suit is for workers who must function in kiln or other extreme heat situations that do not involve total flame, but require high quality heat protection. Fyrepel's unparalleled insulation capabilities make these 900 Series Suits the top choice for tough jobs, such as furnace repairs at high ambient temperatures in the steel, glass and ceramic industries, or where high pressure steam is a threat in petrochemical and chemical plants.

Fyrepel 900 Series Kiln Entry Suits put multiple layers of glass and an extra layer of aluminized glass between you and dangerous heat or non-ferrous splash. These suits are tailored to be worn with a self-contained breathing apparatus (SCBA) for protection in hostile atmospheres. Faceshield protection is provided by a multi-layered system of tempered glass and reflective gold on a heat resistant lens. The hoods have excellent lateral and vertical visibility.

The 900 Series Kiln Entry Suit comes complete with a hood, coat, pants, mitts and boots. The 900 Series Kiln Entry Suit is available in two sizes; the 900/R fits heights from 5'10" up to 6'1", with weights ranging from 170 lbs. up to 210 lbs. The 900/SS fits heights from 5'5" up to 5'9", with weights ranging from 140 lbs. to 165 lbs. Individual replacement components are available. Note: For safety precautions, two personnel should be suited to aid one another and work in relays.

# ACCESSORIES

**323-42**
**Approach Apron**

**325-48**
**Approach Smock**

These versatile approach aprons offer superior protection against radiant heat. Non-insulated aprons are available in surgeon styles and in various lengths.

**317 Approach Hood**

**310 Approach Hood**

Perfect as replacement items for our 500 and 300 series suits or coveralls, these hoods are designed for maintenance, repair and operational tasks in areas of low ambient, high radiant heat.

**320-50 Approach Coat**

**320-32BA Approach Coat with optional SCBA accommodation**

Non-insulated approach coats are offered in both the 300 and 500 Series styles. The 500 series has the added benefit of a moisture/steam barrier lining. These coats are ideal as replacements for lost or worn suits, or as the primary protector in situations where only a coat is required.

**330 Approach Pants**

**522 Approach Coverall**

Non-insulated approach pants and overalls are available in either the 500 or 300 series. The 500 series added moisture/steam barrier provides protection from environments where exposure to hot liquids, steam or hot vapor is a possibility. The pants are offered in either a big or waist style, and are a compliment to the approach coats. The approach coveralls are offered with the option of SCBA accommodations.

# ACCESSORIES

**454 Aluminized Approach Boots**

Lakeland 454 aluminized approach boots, specially designed for the environment with high temperature, molten metal and mechanical injury risk, provide comprehensive protection.

Kevlar thread in the seams which can resists high temperature.
Aluminized Kevlar fabric upper which can reflects 95% of radiation heat.
Good flame resistant and molten metal splash protection.
Flame retardant copper zipper and velcro closure.
Impact resistance and pressure toecap.
Heat insulating rubber outsole with oil-resistant properties.

**355 / 555 Aluminized Approach boots**

The 300 series approach boots are noninsulated and are useful for maintenance and operational tasks in areas of low ambient, high radiant heat. The 355AG boots offer a texturized anti-skid neoprene sole with a substrate of high temperature glass.

**Chaps 332**

**Spats 334**

**344-02A**
**300 Series Approach Gloves**

**336-18 Aluminized Sleeves**

# Firefighters Turnout Gear

# FIREFIGHTERS TURNOUT GEAR

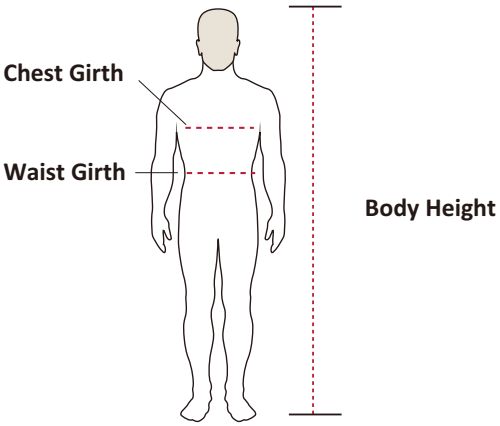
## Measuring Instructions

### US Sizes for Attack, Battalion™ and Stealth™ Series

| Coat Size | SM/34 | MD/38 | LG/42 | XL/46 | 2X/50 | 3X/54 |
|---|---|---|---|---|---|---|
| Body Height | 165 | 170 | 175 | 180 | 185 | 190 |
| Chest Girth | 117 | 127 | 137 | 147 | 157 | 167 |
| Sleeve Length | 83 | 86 | 89 | 93 | 97 | 100 |

| Pants Size | SM/30 | MD/34 | LG/38 | XL/42 | 2X/46 | 3X/50 |
|---|---|---|---|---|---|---|
| Body Height | 165 | 170 | 175 | 180 | 185 | 190 |
| Waist Girth | 87 | 97 | 107 | 117 | 127 | 137 |

Unit: cm




### European Sizes for CEOSX1000 Series

| size | SM | MD | LG | XL | 2X | 3X |
|---|---|---|---|---|---|---|
| Body Height | 165 | 170 | 175 | 180 | 185 | 190 |
| Chest Girth | 128 | 132 | 136 | 140 | 148 | 152 |
| Sleeve Length | 81 | 84 | 85 | 86 | 87 | 89 |
| Waist Girth | 92 | 100 | 104 | 112 | 116 | 120 |
| Pants Length | 103 | 103 | 104 | 104 | 105 | 105 |

Unit: cm

# ATTACK ™ STANDARD FEATURES

Attack

## Coat

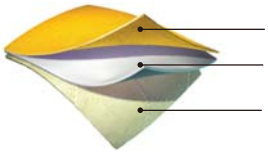
| | |
|---|---|
| 1 | 35” Length Coat |
| 2 | Zipper/Velcro® Closure |
| 3 | NFPA Basic Lime/Yellow Scotchlite® Triple Trim Double Stitched |
| 4 | “Easy Grip” DRD |
| 5 | Low Profile 3” Collar with Hanger Loop |
| 6 | Set-In Pleated Ergonomically Curved Sleeves |
| 7 | 7” Black Kevlar® Thumbhole Wristers |
| 8 | 5” Deep Black Stedprene Sleeve Wells |
| 9 | Black Arashield Coat and Pant Cuff Reinforcements |
| 10 | 2” x 3.5” x 8” Radio Pocket with Velcro® Antenna Opening on each side of Flap |
| 11 | Self Mic Strap above Radio Pocket |
| 12 | Universal Flashlight Holder |
| 13 | 2” x 10” x 10” Coat Expansion Pockets Lined with Kevlar® Twill |
| 14 | Liner Inspection Velcro Opening |

## Pants

| | |
|---|---|
| 15 | Pant Closure: Hook & Dee, Snap with Velcro® Fly Closure |
| 16 | Black Arashield Double Padded Knees with SideKick Extension Panel |
| 17 | Black Arashield Pant Cuff Reinforcements Double Stitched |
| 18 | Lime/Yellow Scotchlite® Triple Trim Double Stitched |
| 19 | Reverse Boot Cut |
| 20 | 135R Black-Ops Multi Adjust Suspenders No Metal Suspender Buttons! |

**Compliant to the new 2018 Edition NFPA 1971**

### Attack Materials




### Outer shell

Nomex®IIIA: 93% Nomex®, 5% Kevlar®, 2% P-140 carbon fiber; plain weave. 7.5 oz. per square yard. Shelltite finish for water resistance.

### Moisture Barrier

Stedair® 3000: 5.2 oz. per square yard spun Nomex® laminated to an ePTFE membrane. A combination of microporous and monolithic barriers.

### Thermal Liner

Q-8®: 8.0 oz/yd² Meta-Aramid / FR Royon batt quilted to a Meta-Aramid / FR Modacrylic plain weave facecloths.

**Thermal Protective Performance(TPP) ≥45, Total Heat Loss(THL):215, Conductive and Compressive Heat Resistance(CCHR) >25, DRD Tensile Strength >7KN**


4. “Easy Grip” DRD

20. 135R

19.

| Available colors | Sizes | Case Pack |
|---|---|---|
| Yellow (normal stock), Black and Red | XS-2XL | 1 Suit/Case |

# BATTALION™ STANDARD FEATURES

Battalion

## Coat

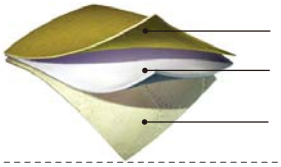
| | |
|---|---|
| 1 | 32” Length Coat |
| 2 | Zipper/Velcro® Closure |
| 3 | NYC Style Lime/Yellow Scotchlite® Triple Trim Double Stitched |
| 4 | “Easy Grip” DRD |
| 5 | Low Profile 3” Collar with Hanger Loop |
| 6 | Set-In Pleated Ergonomically Curved Sleeves |
| 7 | 7” Black Kevlar® Thumbhole Wristers |
| 8 | 5” Deep Black Stedprene Sleeve Wells |
| 9 | Black Arashield Coat Cuff Reinforcements Double Stitched |
| 10 | 2” x 3.5” x 8” Radio Pocket with Velcro® Antenna Opening on each side of Flap |
| 11 | Self Mic Strap above Radio Pocket |
| 12 | Universal Flashlight Holder |
| 13 | 2” x 8” x 8” Coat Expansion Pockets with Hand warmer |
| 14 | Liner Inspection Velcro® Opening |

## Pants

| | |
|---|---|
| 15 | Lo-Rise Waist Design with small 3” Rear Bib for Overlap Protection |
| 16 | Pant Closure: Hook & Dee, Snap with Velcro® Fly Closure |
| 17 | 2” x 10” x 10” Pant Expansion Pocket lined with Kevlar® Twill |
| 18 | Black Arashield Double Padded Knees with Side Kick Extension Panel |
| 19 | Black Arashield Pant Cuff Reinforcements Double Stitched |
| 20 | Lime/Yellow Scotchlite Triple Trim, Double Stitched |
| 21 | Reverse Boot Cut |
| 22 | 135S Black-Ops Multi Adjust Suspenders, No Metal Suspender Buttons! |

**Compliant to the new 2018 Edition NFPA 1971**

### Battalion Materials




### Outer shell

Pioneer®: Twill weave with Kevlar® and Nomex®, 6.6 oz/yd², innovative ENFORCE™ Technology, Super ShelltiteTM finishing for added water and abrasion resistance.

### Moisture Barrier

Stedair® 3000: 5.2 oz. per square yard spun Nomex laminated to an ePTFE membrane. A combination of microporous and monolithic barriers.

### Thermal Liner

Q-8®: 8.0 oz/yd² Meta-Aramid / FR Royon batt quilted to a Meta-Aramid / FR Modacrylic plain weave facecloths.

**Thermal Protective Performance(TPP) ≥42, Total Heat Loss(THL):222, Conductive and Compressive Heat Resistance(CCHR) >25, DRD Tensile Strength >7KN**


4. “Easy Grip” DRD

22. 135S

21.

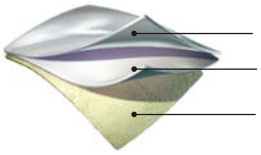
| Available colors | Sizes | Case Pack |
|---|---|---|
| Khaki (normal stock), Gold | XS-2XL | 1 Suit/Case |

# ALUMINIZED ATTACK™

Aluminized Attack

## Compliant to the new 2018 Edition NFPA 1971

### Attack Proximity Gear Materials



- Aluminized PBI or Aluminized Kevlar Outer Shell
- Stedair 3000® Moisture Barriers
- Q-8® Thermal Liner

### Outer shell

Aluminized PBI: 7.0 oz. per square yard, aluminized PBI Ripstop knit.
Aluminized Kevlar: 8.5 oz. per square yard, aluminized Kevlar Ripstop knit.

### Moisture Barrier

Stedair®3000: 5.2 oz. per square yard spun Nomex® laminated to an ePTFE membrane. A combination of microporous and monolithic barriers.

### Thermal Liner

Q-8®: 8.0 oz/yd² Meta-Aramid / FR Royon batt quilted to a Meta-Aramid / FR Modacrylic plain weave facecloths.

**Aluminized PBI Outer Shell** —— **Thermal Protective Performance(TPP) ≥47,Radiant Heat Reflectance >95%, Tensile Strength> 7KN**

**Aluminized Kevlar Outer Shell** —— **Thermal Protective Performance(TPP) ≥48, Radiant Heat Reflectance >95%, Tensile Strength> 7KN**


3. “Easy Grip” DRD


15. 135R

### Coat

| | |
|---|---|
| 1 | 35” Length Coat |
| 2 | Zipper/Velcro® Closure |
| 3 | “Easy Grip” DRD |
| 4 | Low Profile 3” Collar with Hanger Loop |
| 5 | Set-In Pleated Ergonomically Curved Sleeves |
| 6 | 7” Black Kevlar® Thumbhole Wristers |
| 7 | 5” Deep Black Stedprene Sleeve Wells |
| 8 | Black Arashield Coat and Pant Cuff Reinforcements |
| 9 | 2” x 10” x 10” Coat Expansion Pockets Lined with Kevlar® Twill |
| 10 | Liner Inspection Velcro Opening |

### Pants

| | |
|---|---|
| 11 | Pant Closure: Hook & Dee, Snap with Velcro® Fly Closure |
| 12 | Arashield® reinforced knees for increased liquid resistance and maximum durability. |
| 13 | Black Arashield Pant Cuff Reinforcements Double Stitched |
| 14 | Reverse Boot Cut |
| 15 | 135R Black-Ops Multi Adjust Suspenders No Metal Suspender Buttons! |

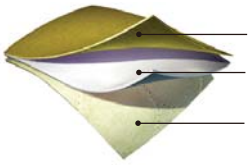
| Available colors | Sizes | Case Pack |
|---|---|---|
| Silver | XS-2XL | 1 Suit/Case |

# STEALTH™ / Premium Turnout Gear

Stealth

## Compliant to the new 2018 Edition NFPA 1971

**STEALTH™ Materials**




### Outer shell

Kombat Flex: 6.9oz. per square yard . Durable fabric, High thermal stability.

### Moisture Barrier

Stedair® 3000: 5.2 oz. per square yard spun Nomex laminated to an ePTFE membrane. A combination of microporous and monolithic barriers.

### Thermal Liner

Defender M NP: 7.0 oz/yd² Two layers flat Kevlar® and Nomex® spun lace quilted to a Lenzing FR® / Kevlar® / Nylon plain weave facecloths.

**Thermal Protective Performance(TPP) ≥42, Total Heat Loss(THL):240, Conductive and Compressive Heat Resistance(CCHR) >25, DRD Tensile Strength >7KN**

### Stealth Coat

| | |
|---|---|
| 1. | Beveled Hem, 29” Front, 35” Back, graded to size. |
| 2. | Zipper/Velcro Closure |
| 3. | NYC Style Lime/Yellow Scotchlite Triple Trim, Double Stitched |
| 4. | Ergonomic Pleated Back/Shoulders |
| 5. | “Easy Grip” DRD |
| 6. | Internal Outer Shell Draw Cord to reduce bulk |
| 7. | Napoleon Pocket under Storm Flap |
| 8. | Low Profile 3” Collar with Hanger Loop |
| 9. | Set-In Pleated Ergonomically Curved Sleeves |
| 10. | 7” Black Kevlar® Thumbhole Wristers |
| 11. | 5” Deep Black Stedprene Sleeve Wells |
| 12. | Black Arashield Coat Cuff Reinforcements – Double Stitched |
| 13. | 2” x 3.5” x 8” Radio Pocket with Velcro® Antenna Opening on each side of Flap |
| 14. | Self Mic Strap above Radio Pocket |
| 15. | Universal Flashlight Holder |
| 16. | 2” x 8” x 8” Coat Expansion Pockets with Hand warmer |
| 17. | Liner Inspection Velcro Opening |
| 18. | LazerMax™ Trim |

### Stealth Pants

| | |
|---|---|
| 19. | Beveled Waist Design – Lo front with slight rise to wards rear |
| 20. | Pant Closure: 2” Wide Black Kevlar® Belt with belt Loop/Handle Grips, Snap and Velcro® Fly Closure |
| 21. | Single Lower Leg Panel with center rear seam – no side seams exposed to abrasion |
| 22. | 2” x 10” x 10” Pant Expansion Pocket lined withKevlar® Twill |
| 23. | Black Arashield Double Padded Knees with Side Kick Extension Panel |
| 24. | Black Arashield Pant Cuff Reinforcements – Double Stitched |
| 25. | Lime/Yellow Scotchlite Triple Trim – Double Stitched |
| 26. | Reverse Boot Cut |
| 27. | Black-Ops Multi Adjust Suspenders – No Metal Suspender Buttons! |
| 28. | Lazer Max Trim |




5. “Easy Grip” DRD

27. 135R

26.

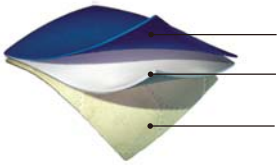
| Available colors | Sizes | Case Pack |
|---|---|---|
| Black, Natural | XS-2XL | 1 Suit/Case |

# CE FIRE FIGHTING SUITS

CEOSX1000

- CEOSX1000 is the new fire fighting gear designed and developed by Lakeland which includes coat and bib pants, and has got the EN469-2005 certification.
- The garment material has three layers, and that is outer shell, moisture and insulation layer and liner for comfort.

### CEOSX1000 Materials




EN469:2005

Xf2, Xr2, Y2, Z2

### Outer shell

Outer shell: Rip-stop fabric, 75%Meta-aramid/23%Para-aramid/2%Anti-static,203g/m²

### Moisture Barrier

Moisture and heat insulation layer: 12%Waterproof breathable membrane on meta-aramid/88%para-aramid felted thermal barrier ,170g/m²

### Thermal Liner

Liner: 50%FR modacrylic /50%Lenzing fabric, soft and comfortalbe with excellent FR resistance 120g/m²


8. DRD Device

10. 136RL

### Coat

| | |
|---|---|
| 1 | Throat tab features scooped design for a better interface with helmet, shroud and SCBA mask. |
| 2 | Radio Pocket with a leaking hole on left chest, has velcro on the top, can hang firefighter badges, Flashlight snap and strap on right. |
| 3 | Ergonomically correct 2-panel curved sleeve follows arm range of movement. |
| 4 | Underarm gusset allows arms to be raised with minimal coat rise. |
| 5 | Flame retardant elastic knitted cuff design, prevent high temperature small objects or burning ashes into the cuff. |
| 6 | Kevlar knit wristers. |
| 7 | Coat pocket(With Drainage grommets). |
| 8 | "Easy Grip" DRD (Drag Rescue Device) can be employed with one hand. |
| 9 | 7.5cm 3M reflective stripe. |
| 10 | Jacket liner inspection port. |

### Pants

| | |
|---|---|
| 11 | 4-piece design. |
| 12 | Double stitched major seams with 8-10 stitchesper inch. |
| 13 | Liner inspection opening. |
| 14 | Nomex twill take up straps. |
| 15 | Pants pockets on both side, Rescue tools can be placed. |
| 16 | Three diamond-shaped gussets can reduce the stress on the crotch and increase abrasion resistance. |
| 17 | Knee reinforcements. Increased water resistance and abrasion resistance. |
| 18 | Waterproof fabric stitched at the end, prevent siphon. |
| 19 | 7.5cm 3M reflective stripe. |
| 20 | 8-point X-back suspenders. |

| Available colors | Sizes | Case Pack |
|---|---|---|
| Navy, Yellow | S-3XL | 1 Suit/Case |

# ACCESSORIES

### Magma Helmet

Chooses your personalized Magma from two unique configurations, Type A (half size shell) or Type B (Three-quarter size shell) with an unified look. Sleek design accommodates a wide variety of accessories and electronic components. Magma can be easily reconfigured for new applications; it offers the lowest weight and the most superior comfort in its class with EN443-2008 certification.

Magma A

Magma B

### LTX Helmet

NFPA1971-2018 certification, Durable heat-resistance thermoplastic shell, Sure-Lock ratchet headband, Rip-stop Nomex ear/neck protector, 4" PPC face shield, Scotchlite reflective stripes retains reflectively to 260 ℃ with no burning, cracking or peeling. Stainless steel D-ring allows you to hang your helmet on virtually any size hook. Three position ratchet height adjuster base of 12-point comfort system.

### 268AX Helmet

**NFPA Aluminized PBI/ Kevlar cover with shroud.**

268AX helmet is designed to perform effectively against adverse the environmental conditions of proximity fire fighting incidents with high level of radiant convective and conductive heat which meets NFPA1971-2018. Fiberglass outer shell is for against chemicals and heat, Aluminized helmet cover features an elastic edge binding and Velcro tabs for easy installation and a secure fit over the outer shell and eight snaps for attaching to the aluminized shroud which is aluminized PBI/Kevlar to block ingress of heat and foreign matter.

### 119NM-NFPA

### 6oz. Nomex® Blend knit hood.

Composed of Two layers throughout, both outer shell and lining are a blend of UL classified to meet NFPA1971-2018 Edition, Compliant with NFPA 70E2004 Edition and meets performance specifications of ASTM F 1506. ARC Rating: 8.8 with Hazard/Risk category 2.

### 119NM-GA

Style number: RMT-L-NMX
Composed of two layers 231gsm nomex fabric. Comply with GA 869-2010 cert. and the weight is only 112g.
Available color: grey, navy blue

# ACCESSORIES

### 344-11SG NFPA Leather
### Glove with knit wristlets and vapor barrier lining.

The glove meets the requirements of the latest NFPA 1971 standards. Outer shell of the glove is 4.0 oz Koala Tanned leather which will remain soft after repeated soakings. Thermal barrier is 8.0 oz modacrylic Fleece laminated to Gore RT7100. Wristlets are 4''long with double 10.5oz Nomex knitting. Sewn with high burst strength Kevlar (30/5) thread, all seams are sealed with a DuPont silicone sealant, which ensures that liquids do not come in contact with the hand or hand area.

### 344-10 NFPA Leather
### NFPA 1971, 2018 EDITION

Outer shell is made from heavy weight, fire retardant 3.5 oz. gold cowhide leather, which is still soft and comfortable after times of washing; Polyurethane film moisture barrier for keeping hands dry; 6.0 oz. non-woven modacrylic thermal layer provides flame resistanceand thermal protection; Double layers Kevlar wristlet for secure fit and carefree protection, leather pull tab on the inner wrist; Leather patch is sewn on palm for heavy duty; Fire retardant cowhide hanger loop; High burst strength Kevlar thread.

### 7993 CE Firefighting Gloves

CE EN659 EN388 EN407

Outer shell is made from high quality cow leather, which is heat and fire resistant.
Leather patch sewn in the crotch area for heavy duty.
Knitted Kevlar fabric liner for extra anti-cutting protection, fire & heat resistant.
Flame retardant water-proof insert bag for keeping hands dry.
Four ply knitted Kevlar wristlet for secure fit & carefree protection.
Leather pull tab on the inner wrist offers special wrist protection & ease donning.
Kevlar stitching enhances durability.

### Black Ops™ Suspenders

Suspenders can be adjusted along the waistband to accommodate any torso. The unique design prevents the suspenders from slipping off the shoulders. Adjustable center sternum strap keeps the suspenders in position. Independent yoke system that curves around neck and front for better fit. Vertical tabs for stowing mic or accessories. Suspenders attach to pants with snap-tabs and segregated MOLLE style loops. Rip-cord style pulls easily adjust length and fit.
135R is for Attack and Stealth styles, 135S is for Battalion style.

# ACCESSORIES


### 12171-2V(Y) CE firefighting boots

Fully waterproof, hand-built rubber structural firefighters' boot. All-purpose Type 2 structural firefighting boot. Complies with EN ISO 20345:2011, EN 15090:2012 Type 2 E, P, HI3, HRO, SRC, and electrically insulating. Specially formulated upper compound provides protection against heat and flame whilst also maintaining excellent physical properties. The outsole is resistant to chemicals as well as heat and flame.

### 9692 NFPA Firefighting Boots

Meets NFPA 1971:2013 standard, 11'' height; Vulcanized rubber upper and sole, resistant towards strong acids and alkalis; Steel toecap and midsole, meets ASTM F2413-11 impact and compression tests; Protects against dry electric hazard up to 14KV; Triple ribbed ladder shank for improved midfoot stability and support, non-woven felt lining.

### PKG15

Sizes:
45cm(H)×45cm(W)×76cm(L)

# Flame Resistant Clothing




# FLAME RESISTANT CLOTHING

## Why to wear flame resistant garment?

It's necessary to wear flame resistant garment in flammable condition. The FR fabric of flame resistant garment can reduce the burning rate and stop burning once away from the fire. FR fabric will carbonize without melting drip when it's on fire, so it will give workers enough time to run away from fire or take off the burning garment to avoid or alleviate burn and scald.

## Which professionals can flame resistant garment be used for?

Workers in the petroleum, petrochemical, fire service, and other professionals that may be exposed to flash fire.

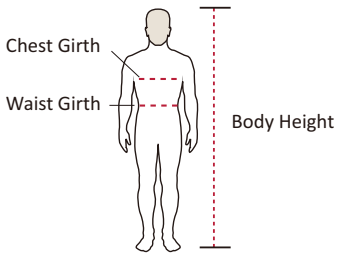
## Standards of flame resistant garment

### American Standards

- NFPA 2112: Standard on Flame-Resistant Garments for Protection of Industrial Personnel against Flash Fire
- ASTM F-1930: Standard Test Method for Evaluation of Flame Resistant Clothing for Protection Against Flash Fire Simulations Using an Instrumented Manikin

### European Standards

| | |
|---|---|
| EN11612 | EN11612: Protective clothing — Clothing to protect against heat and flame |
| EN11611 | EN11611: Protective clothing for use in welding and allied processes |
| EN61482-1-2 | EN61482-1-2: Protective clothing against the thermal hazards of an electric arc |
| EN1149-5 | EN1149-5: Protective clothing —Electrostatic properties |
| Type 6 | Type 6: Suits which offer limited protection against a light spray of liquid chemicals |




**Sizes: (cm)**

| | XS | SM | MD | LG | XL | 2X | 3X |
|---|---|---|---|---|---|---|---|
| Body Height | 153-158 | 158-163 | 163-168 | 168-173 | 173-178 | 178-183 | 183-188 |
| Sleeve Length | 56 | 57 | 58 | 59 | 60 | 61 | 62 |
| Chest Girth | 112 | 116 | 120 | 124 | 128 | 132 | 136 |
| Shoulder Breadth | 44 | 46 | 48 | 50 | 52 | 54 | 56 |
| Outseam | 98 | 100 | 102 | 104 | 106 | 108 | 110 |
| Waist Girth | 78 | 82 | 86 | 90 | 94 | 98 | 102 |

# SELECTION GUIDE FOR FLAME RESISTANT GARMENT

## Step 1 Fabric Selection

- Lakeland supplies multiple choices of fabrics with different features. Please refer to P47 for detailed information.
- Every fabric has different weight for your choice.
  High weight: suitable for autumn and winter
  Low weight: suitable for spring and summer

TENCATE DuPont™ NOMEX®

## Step 2 Styles Selection

Lakeland supplies multiple choices of styles and we also can design according to customers' requirements.

| Fabric | FRC | | TSP | NMX | | DH | TenCate Oasis |
|---|---|---|---|---|---|---|---|
| Fiber Blend | 100% FR cotton | | 100%Tecasafe Plus (48%FR-modacrylic +37%lyocell+15% aramid) | 100%NomexIIIA(93% NOMEX®+5%KEVLAR® +2%P140 antistatic fiber) | | 48%Tencel+ 40%modacrylic +12%aramid | 50% Lenzing FR fiber+40%wool +10%nylon |
| Weight(+5%) grams(sq meters) | 306g | 260g | 238g | 153g | 204g | 220g | 255g |
| oz(sq yd) | 9.0oz | 7.7oz | 7.0oz | 4.5oz | 6.0oz | 6.5oz | 7.5oz |
| Flame Resistant Type | Treatment flame resistant | | Inherently flame resistant | Inherently flame resistant | Inherently flame resistant | Inherently flame resistant | Inherently flame resistant |
| Price | Low | | Medium | High | Medium | | |
| Daily Cost | High | | Low | Medium | | Low | |
| Protection | Flash Fire Arc Flash Antistatic | | Flash Fire Arc Flash | Flash Fire Arc Flash Antistatic | | Flash Fire Arc Flash Antistatic | —— |
| Comfort | ★★★★ | | ★★★★★ | ★★★★ | | ★★★★★ | |
| EN Standards | —— | —— | —— | —— | | EN11612 | EN11612 EN373 |
| NFPA 2112 | √ | √ | √ | √ | | √ | —— |

# Fabric Recommendation

## DH Inherent FR Fabric

### 48%Tencel 40% modacrylic 12% aramid

- Lakeland DH FR Garment is designed to provide a solution that bridges a vast number of industries and adheres to the most important performance standards. FR regulations, such as NFPA 70E, and NFPA 2112.
- Lakeland DH FR Garment is designed with inherent FR properties; protection is built into the fiber. Normal laundry conditions will not adversely affect the performance of the garment.
- The fabric is designed to not melt, stick, or drip when exposed to extreme temperature or flame.
- Under normal wear condition, Lakeland DH FR Garment can provide years of dependable and reliable service.
- Lakeland DH FR Garment is designed to provide comfort with performance and a high level of aesthetics. Natural feel is a result of a high percentage in the blend of Tencel, a hydrophilic fiber that enhances comfort.
- Economic, cost-effective.

## TenCate Oasis Premium Molten Metal Splash Protection

### 50% Lenzing FR fiber+40% wool+10% nylon

TenCate Oasis is an innovative protective fabric that offers incredible softness, has a lightweight feel and is flexible. It is designed to deliver premium protection against molten metal splash, radiant heat, flame and other smelting hazards. An outstanding value and the best choice among thermal resistant, metal-shedding fabrics, it has been chosen by leading aluminum manufacturers, worldwide, for its protection, comfort and durability.

- Inherently flame-resistant – Flame-resistant, metal shedding protection is built into the fabric, so it won't wash or wear out.
- Comfortable to wear – Engineered with an innovative fiber blend, this fabric is designed for excellent softness and flexibility.
- Outstanding value – Long-lasting protection withstands rugged use and repeated industrial launderings.

## FRC 260/306 Economic and Comfortable Flame Resistant Fabric

### 100% FR cotton

- Comfortable and soft
- Antistatic
- Economic and Durable

# FLAME RESISTANT CLOTHING STYLES


## OmegA Coverall

- 2 chest pockets
- Heavy duty, two-way quick release brass zipper
- 2 hip pockets
- Bi-swing back with elasticized waistband
- Adjustable sleeve cuffs
- NFPA certified style

# FLAME RESISTANT CLOTHING STYLES

## Classic Style Shirt

- Turn-down collar
- Resin Button
- Curved hem
- Two Chest Pockets

## Classic Style Jacket

- Brass zipper, front closure with a snap
- 2 chest pockets with flap closure
- Adjustable sleeve cuffs and jacket bottom

## Classic Style Pants

- 2 front hip pockets
- 2 hip pockets
- 2 pockets for tolls can be added in legs' sides

# Arc Flash Protective Clothing

# ARC FLASH PROTECTIVE CLOTHING

## Introduction to Arc Flash Protection

### Arc Flash

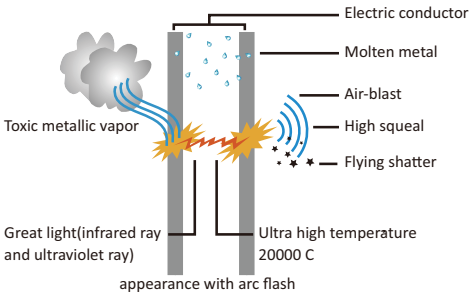
- An arc flash is the light and heat produced from an electric arc supplied with sufficient electrical energy to cause substantial damage, harm, fire, or injury.

### Arc Flash Hazard

- Arc flash temperatures can reach or exceed 35,000 °F (19,400 °C) at the arc terminals. The massive energy released in the fault rapidly vaporizes the metal conductors involved, blasting molten metal and expanding plasma outward with extraordinary force.
- A typical arc flash incident can be inconsequential but could conceivably easily produce a more severe explosion. The result of the violent event can cause destruction of equipment involved, fire, and injury not only to an electrical worker but also to bystanders.

### Arc Flash Accident

- According to NFPA report, 5-10 accidents happen in United States every day, and more than 2000 deaths in Arc Flash accident every year.
- Average annual electrical accidents in France are more than 125 cases. Arc flash accident accounted for 77%, permanent disability accounted for 21%, and deaths from 30 cases.




## Important Safety Recommendations: NFPA70E

Hazard Level 1

Garment description: FR Shirt and FR pants or FR Coverall.

ATPV: 4-8 cal/cm²

Hazard Level 2

Garment description: Cotton underwear, FR Shirt and FR pants.

ATPV: 8-25 cal/cm²

Hazard Level 3

Garment description: Cotton underwear, FR shirt, pants or cotton underwear plus two FR coveralls.

ATPV: 25-40 cal/cm²

Hazard Level 4

Garment description: Cotton underwear, FR shirt, FR pants, Multilayer arc flash suit.

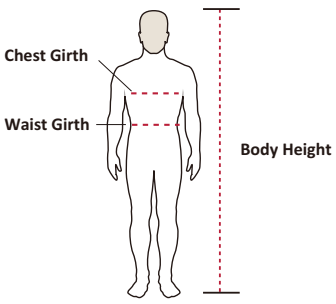
ATPV: >40 cal/cm²

cal/cm² ---------- Thermal Units
1 cal ---------- 1 gram of water temperature rises to 1˚C .
1cal/cm² ----------Equivalent to put a finger on the energy released by burning a cigarette for 1 second.
1~2cal/cm² energy can cause second degree burns.

ATPV (Arc Thermal Performance Value)
----used to characterize arc flash protection capability of fabrics. If the energy produced from electric arc in accident is less than ATPV of the fabric, the garment can protect workers from second and above burns.

Sizes: (cm)

| | XS | SM | MD | LG | XL | 2X | 3X |
|---|---|---|---|---|---|---|---|
| Body Height | 153-158 | 158-163 | 163-168 | 168-173 | 173-178 | 178-183 | 183-188 |
| Sleeve Length | 56 | 57 | 58 | 59 | 60 | 61 | 62 |
| Chest Girth | 112 | 116 | 120 | 124 | 128 | 132 | 136 |
| Shoulder Breadth | 44 | 46 | 48 | 50 | 52 | 54 | 56 |
| Outseam | 98 | 100 | 102 | 104 | 106 | 108 | 110 |
| Waist Girth | 78 | 82 | 86 | 90 | 94 | 98 | 102 |



# ARC FLASH PROTECTIVE CLOTHING

**Selection Guide for Arc Flash Protective Garment**

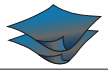
**Lakeland Arc Flash Protective Garment is made of high standard of arc flash resistant fabric.**

- **Lenzing Arc Stopper (LAS) ----** LAS fabric is made of Lenzing FR fiber and aramid fiber. Lenzing FR fiber is produced from nature raw material, which offers protection against heat and flame in a variety of different applications with the features of comfort, soft, breathability and skin-friendliness. It meets the requirements of USDA and Oeko-Tex Standard 100.

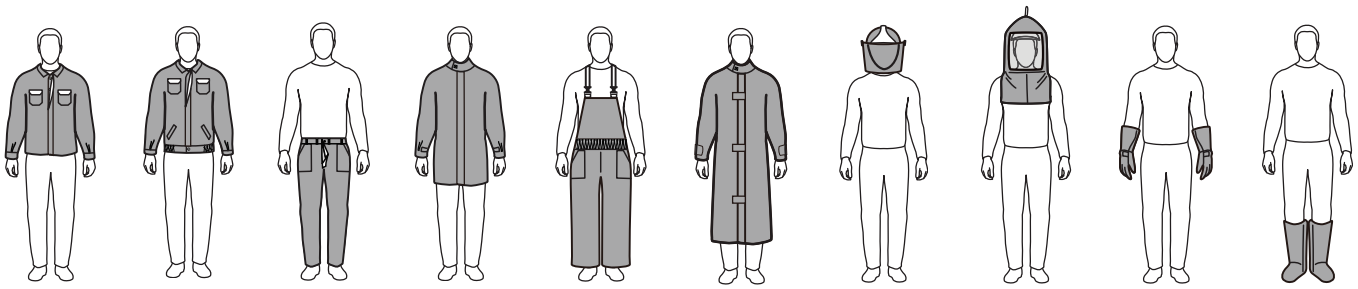
- **Tecasafe Plus (TSP)----** TSP fabric is made of 48% FR-modacrylic, 37% Lyocell and 15% aramid, which offers inherent protection with the features of comfort,softness and breathability. It's tested according to ASTM F 1959 and meets the requirements of NFPA 70E.

- **DH----------** DH fabric is made of 48% Tencel,40% modacrylic and 12% aramid. It's a dual-hazard fabric that protects against both flash fire and electric arc, which meets the requirements of NFPA 2112.
  It's tested according to ASTM F 1959 and meets the requirements of NFPA 70E.

**Hazard Level and Fabric Introduction**

| | CAT Level | Fabric Introduction | Fabric Description(OZ) | ATPV(cal/cm$^2$) |
|---|---|---|---|---|
| AR8 | CAT2 |  | 6.5 oz DH | 8.9 |
| AR16 | CAT2 |  | 8.3 oz LAS | 16 |
| AR26 | CAT3 |  | 6.5 oz DH+6.5 oz DH | 26 |
| AR33 | CAT3 |  | 7.0 oz TSP+7.0 oz TSP | 33.2 |
| AR43 | CAT4 |  | 7.0 oz TSP+7.0 oz TSP+7.0 oz TSP | 43 |
| AR48 | CAT4 |  | 6.5 oz DH+6.5 oz DH+6.5 oz DH | 48 |

**Style:**



Shirt Jacket Pants Long coat Bib pants Robe Face shield Hood Glove Leg cover

Color: Navy Royal

# ARC FLASH PROTECTIVE CLOTHING

## Arc Flash Protective Face Shield

- Made from high polymer and manufactured by injection molding. • With helmet bracket and buckle.
- Ultra-wide field of view(shield size:7.25~10"×18.5~20",thikness:0.06~0.75"). • Up to 60% Visible Light Transmittance.
- Harmful ultraviolet radiation can be absorbed. • With anti-frog coating. • Adequate facial space for head movement and neck protection.

| Product Code | ATPV | Description |
|---|---|---|
| ARC-FS-12 | 12cal/cm² | With mandibular protection. With visor bracket and slot adaptor. |
| ARC-APS-12 | 12cal/cm² | Highly Transparent Arc Flash Protection kit with small profile transparent chin protector & cap bracket for slotted & non-slotted caps. |

## Arc Flash Protective Hood

- Above HRC3. • Arc shield and fabric are connected by flame retardant buckle. Easy to clean. • With hanging ring on the top for easy storage. • With helmet bracket and buckle, helmet can be assembled inside the hood. • Anti-fog coating. • Adequate space for head movement. • Hood overlapped the coat for safety. • ATPV value is on the lower left corner of front side.

| Product Code | ATPV | Description |
|---|---|---|
| AR26HD | 25cal/cm² | Arc shield 50cal/cm², fabric 26cal/cm² |
| AR48HD | 48cal/cm² | Arc shield 50cal/cm², fabric 48cal/cm² |

## Arc Flash Protective Shirt

- Soft, breathable and very comfortable.• Two chest pockets, ATPV value above the left chest pocket.• Resin buttons, curved hem.• Suitable for spring and summer.

| Product Code | ATPV | Description |
|---|---|---|
| AR8-S-DH | 8.9cal/cm² | 6.5 oz DH |

## Arc Flash Protective Jacket

Different protective levels:
- 8.9cal/cm² ,16cal/cm² . • Sewed with Nomex. • Double closure, covered button under outer closure. • Hard resin zipper. • Sandwich design on the front side. • Two chest pockets. • ATPV value above the left chest pocket. • Two side pockets. • Hem elastic design. • Without arc induced metal accessories.

| Product Code | ATPV | Description |
|---|---|---|
| AR8-J-DH | 8.9cal/cm² | 6.5 oz DH |
| AR16-J-LAS | 16cal/cm² | 8.3 oz Lenzing Arc Stopper |

## Arc Flash Protective Pants

Different protective levels:
- 8.9cal/cm², 16cal/cm² . • Sewed with Nomex. • Two side pockets, two back pockets, ATPV value on the right back pocket. • Used in conjunction with Arc Flash Protective Jacket. • Without arc induced metal accessories.

| Product Code | ATPV | Description |
|---|---|---|
| AR8-P-DH | 8.9cal/cm² | 6.5 oz DH |
| AR16-P-LAS | 16cal/cm² | 8.3 oz Lenzing Arc Stopper |

# ARC FLASH PROTECTIVE CLOTHING

## Arc Flash Protective Robe

Different protective levels:
- 16cal/cm², 26cal/cm², 48cal/cm² . • 5cm wide FR velcro front closure with 3 cross Velcro for reinforcement. • Stand-up collar for better protection. • Velcro closure cuff of sleeves. • Can be used with our arc protective hood, gloves and boot covers. • No metal accessories which may induce arc flash accident.

| Product Code | ATPV | Description |
|---|---|---|
| AR16-R-LAS | 16cal/cm² | 8.3 oz Lenzing Arc Stopper |
| AR26-R-DH | 26cal/cm² | 2 layers 6.5 oz DH |
| AR48-R-DH | 48cal/cm² | 3 layers 6.5 oz DH |

Long Coat Bib Pants

## Arc Flash Protective Long Coat and Bib Pants

### Long Coat

Different protective levels:
- 26cal/cm², 48cal/cm². • 32'' length for full coverage. • Stand-up collar for better protection. • FR velcro front closure.
- Raglan sleeves design offers superior freedom of movement. • No metal accessories which may induce arc flash accident.

### Bib Pants

Different protective levels:
- 26cal/cm², 48cal/cm². • Bib style for comfort wearing. • Adjustable loop and buckles on bib strap. • Tear drop style swing pockets hold plenty items. • Velcro leg openings with gussets make for easy on and off. • No metal accessories which may induce arc flash accident.

| Product Code | | ATPV | Description |
|---|---|---|---|
| Long Coat | Bib Pants | | |
| AR26SC | AR26BO | 26cal/cm² | 2 layers 6.5 oz DH |
| AR48SC | AR48BO | 48cal/cm² | 3 layers 6.5 oz DH |

Gloves Leg covers

## Arc Flash Protective Gloves and Leg covers

- 40cm length gloves for full coverage with sleeves. • Leg covers can be used with boots or insulated shoes. • Gloves and Leg covers can be used with coat and pants.

| Product Code | | ATPV | Description |
|---|---|---|---|
| Gloves | Leg covers | | |
| AR16-G-LAS | AR16-C-LAS | 16cal/cm² | 2 layers 6.5 oz DH |
| AR26-G-DH | AR26-C-DH | 26cal/cm² | 3 layers7.0 oz Tecasafe plus |
| AR48-G-DH | AR48-C-DH | 48cal/cm² | 3 layers 6.5 oz DH |

**Color:**

16cal: Navy Blue
26cal: Navy Blue
48cal: Navy Blue, Royal Blue

# ARC FLASH PROTECTIVE CLOTHING

**Lakeland can supply different grades of arc flash protective suits made of different fabric, which can meet the requirements of arc flash protection in different workplaces.**

### Fabric Recommendation

- DH: inherently FR fabric.Soft and comfortable. Excellent protection against arc flash. Low cost.
- Tecasafe Plus(TSP): inherently FR fabric.Excellent protection against arc flash.

### CAT and ATPV

CAT3: 26cal/cm$^2$ (2 layers 6.5oz DH fabric) 33cal/cm$^2$ (2 layers 7.0oz TSP)

CAT4: 43cal/cm$^2$ (3 layers 7.0oz TSP) 48cal/cm$^2$ (3 layers 6.5oz DH fabric)

### Arc Flash Protective Hood

- Arc shield and fabric are connected by flame retardant buckle.
- Easy to clean. With hangingring on the top for easy storage.
- With helmet bracket and buckle, helmet can be assembled inside the hood.
- Anti-fog coating.
- Adequate space for head movement.
- Hood overlapped the coat for safety.
- ATPV values on the lower left corner of front side.

### Long Coat

- 32'' length for full coverage. Stand up collar for betterprotection.
- FR Velcro front closure.
- Raglan sleeve design offers superior freedom of movement.
- No metal accessorieswhich may induct arc flash accident.

### Bib Pants

- Bib style for comfort wearing.
- Adjustable loop andbuckles on bib strap.
- Tear drop style swing pockets hold plenty items.
- Velcro leg openings with gussets make for easy on and off.
- No metal accessories which may induct arc flash accident.

### Arc Flash Protective Gloves

- 40cm length gloves for full coverage with sleeves.
- Can be used with coat.

### Arc Flash Protective Leg covers

- Leg covers can be used with boots or insulated shoes.
- Can be used with pants.

### Carry Bag

Arc flash protective suit can be put into the carry bag.

# ARC TECH® PREMIUM QUALITY

Hi-vis • FR • ARC • Chemical Resistance • Rainproof

## Be Seen, Safe and Dry in ANSI Certified FR/ARC Rated PU/PVC Hi Vis Rainwear.

### Product Specification:

- Fabric: PU coated with FR Cotton
  PVC coated with aramid
- Flame resistance and arc flash protection, meeting the requirements of CAT2.
- Good protection against ordinary chemicals.
- Softness and pliability make it less prone to get caught on branches and brush.
- Superior puncture, tear and abrasion resistance.
- Reinforced HF welded, sealed and taped seams for maximum strength.
- Innovative DRP™ Diamond Reinfroced Patch to prevent crotch "blow out".
- Save money in the long run.

### Certification:

- ASTM1891 • ASTM F2733 • ASTM F903
- ASTM1891: Standard Specification for Arc and Flame Resistant Rainwear
- ASTM F2733: Standard Specification for Flame-Resistant Rainwear for Protection against Flame Hazards
- ASTM F903: Standard Test Method for Resistance of Materials Used in Protective Clothing to Penetration by Liquids
- Jacket: ANSI 107 Class 3
- Bib Overall: ANSI 107 Class E

### Product Code:

**PU coated with FR Cotton**

- Jacket: AJPU10LY
- Bib Overall: ABPU10LY

**PVC coated with aramid**

- Jacket: AJPVC10LY
- Bib Overall: ABPVC10LY

## Jacket and Bib Pants Features:

Jacket and Pant garment seams are stitched and HF sealed to prevent liquid penetration.

3" internal anti-wicking dam on bottom of jacket and pants to prevent internal moisture migration.

Reinforced lanyard opening.

Two oversize 9" x 9.5" lower jacket front pockets with hook and loop closure and pull tabs, plus hand warmer openings.

Non-metallic quick release bib pant strap clips.

Over-size jacket hood with adjustable draw string fits comfortably over a hard hat.

Jacket collar with self stowing hood storage.

Ventilated jacket back.

Innovative DRP™ Diamond Reinforced Patch to prevent crotch "blow out"

One reinforced oversize 9" x 9.5" pant pocket with hook and loop closure and pull tabs

Hook and loop adjustable jacket and pant cuffs for optimal fit and comfort.

Zipper front closure with hook and loop storm flap prevents liquids from sneaking in.

| Product Style | Color | Seam Methods | Sizes | Case Pack |
|---|---|---|---|---|
| AJPU10LY/ ABPU10LY/AJPVC10LY/ ABPVC10LY | Yellow | Heat Sealed Seam | SM-3X | 1 |


# High Visibility Clothing

**ANSI/ISEA HIGH-VISIBILITY 107 VESTS**

**These Lakeland Hi-Viz Garments conform to 107-2010 American National Standard for High Visibility Apparel. Developed to mesh with the demanding requirements of the EN 471 Standard for Three garment classes in ANSI 107:**

***A. ANSI Class 1 "Typical", ANSI Class 2 "Under certain conditions" For occupational activities which:***

Permit full and undivided attention to approaching traffic;
Ensure ample separation of the pedestrian worker from opposing vehicle traffic;
Create maximum viewing in non-complex back-grounds and where;
Vehicle and moving equipment speeds do not top 25 mph.

***B. ANSI Class 2 "Typical", ANSI Class 1 or 3 "Based on certain conditions"***
***For occupational activities where risk levels exceed those in scenario A:***

Greater visibility is desired in bad weather;
Complex backgrounds are involved;
Workers' tasks are drawing attention away from ongoing vehicular traffic;
Vehicle/equipment speeds are greater that in Scenario A;
The job is closer to vehicular traffic.

***C. ANSI Class 2 or 3 "Typical" based on certain conditions***
***For occupational activities where risk levels exceed those of Scenario B, such as where:***

Workers are dealing with higher vehicle speeds and/or shorter sight-distances;
Workers and drivers have great work loads, placing the worker in obvious danger;
The worker-wearer must be highly visible through all his/her motions at a minimum of 390 m (1280 feet), and must be recognized immediately as a human being.

# HIGH VISIBILITY CLOTHING

| | |
|---|---|
| Product Style | V-3A-C2 |
| Grade | ANSI/SEA107-2010 Class 2 |
| Features | Hook and loop front closure.<br>Silver reflective trim.<br>Solid polyester fabric. |
| Sizes | LG-XL |
| Color | Yellow |

| | |
|---|---|
| Product Style | V-3A-C3G |
| Grade | ANSI/SEA107-2010 Class 2 |
| Features | Solid polyester.<br>Silver reflective trim on 4.5'' Gro-grain.<br>Hook and loop front closure. |
| Sizes | LG |
| Color | Yellow/Orange |

Cool Mesh Material

| | |
|---|---|
| Product Style | V-AM-C2 |
| Grade | ANSI/SEA107-2010 Class 2 |
| Features | Hook and loop front closure.<br>Silver reflective trim.<br>Cool Mesh Material. |
| Sizes | LG-XL |
| Color | Yellow |

| | |
|---|---|
| Product Style | V+AF-OSC2GBV-L-R |
| Grade | ANSI/SEA107-2010 Class 2<br>ANSI/SEA 207-2006 |
| Features | Breakaway FR treated solid polyester vest.<br>Open sided adjustable pro-grain, silver mic tab, inside pocket.<br>2'' non-FR silver reflective rim.<br>Front hook & loop closure. |
| Sizes | LG |
| Color | Yellow |

| | |
|---|---|
| Product Style | C-HVRS01 (Coat) P-HVRS01 (Pants) |
| Grade | ANSI 107-2010 Class 3 |
| Features | Polyester fabric with PU coating, waterproof and breathable.<br>Two lower slash pockets, Two pass through slash pockets on pants.<br>Removable hood with cord lock(Back ventilation).<br>Adjustable pant legs. |
| Sizes | SM-4X |
| Color | Yellow |

C-HVRS01 (Coat)

P-HVRS01 (Pant)

The Plus 2 Parka is two jackets in one! The inner fleece shell zips out to become another jacket all on it's own.The outer shell is a versatile jacket you'll reach for day after day. The wind resistant and water repellent nylon shell has plenty of features that take on the elements. The inner jacket is a valuable layering piece, whether it's worn alone or inside the outer shell parka.

| | |
|---|---|
| Product Style | C-ANSIP-2 |
| Grade | Exceeds ANSI/ISEA 107-2010, Class 3 |
| Features | 32" length with removable fleece liner jacket.<br>Water resistant and water repellent.<br>Snap off lined hood with brim.<br>Hood fits over a hard hat.<br>Ventilated mesh under back yoke.<br>Mic tab on each shoulder. |
| Sizes | SM-4X |
| Color | Yellow |

# Cold Protection

Lakeland is always committed to the design and innovation of clothing, and combining outdoor elements and workwear practicability, we can offer you a wide range of quality products, superb designs and attentive service.
The outer fabric is usually multifunctional and composite, with windproof, waterproof, breathable or other functions. The coating or laminating is also used on the different fabrics for the better performance. Meanwhile, the seam is an important factor, for example, the sealed seam is always used on the waterproof clothing. For the different cold environment, Lakeland can offer many types of warm liner material, such as 3M Thinsulate, Fellex fiber, polyester fiber, polar fleece etc.

# Outdoor Clothing


- Wind-cold effect: the cold level is different under the same environmental temperature and different wind speeds.
- How about the cold level under the different wind speeds when the environmental temperature is 10℃.

No wind 10℃
30km/h(Level 5) 1℃
50km/h(Level 7) -2℃


- The body temperature drops as soon as it is drenched.
- Greatly reduce the thermal performance after the insulation liner encounter water.


- Decrease the muggy and promote the comfort.


- The effect against cold depends on the liner material and weight.

# Size Selection

## Size chart for men's winter jacket (cm)

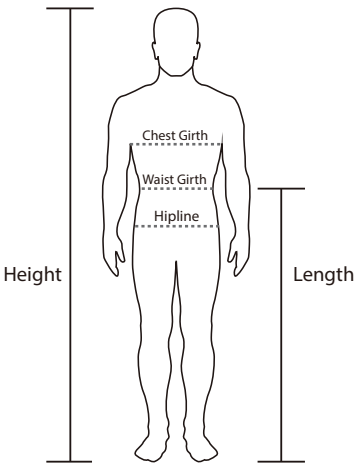
| Size | SM | MD | LG | XL | 2X | 3X | 4X |
|---|---|---|---|---|---|---|---|
| Height | 163~167 | 168~172 | 173~177 | 178~182 | 183~187 | 188~192 | 192-197 |
| Chest Girth | 108 | 112 | 116 | 120 | 124 | 128 | 132 |
| Waist Girth | 104 | 108 | 112 | 116 | 120 | 124 | 128 |

## Size chart for BR203 for women's winter jacket (cm)

| Size | XS | SM | MD | LG | XL | 2X |
|---|---|---|---|---|---|---|
| Height | 156~160 | 161~165 | 166~170 | 171~175 | 176~180 | 181~185 |
| Chest Girth | 96 | 100 | 104 | 108 | 112 | 116 |
| Waist Girth | 88 | 92 | 96 | 100 | 104 | 108 |
| Hipline | 98 | 102 | 106 | 110 | 114 | 118 |

## Size chart for Winter Pants (cm)

| Size | SM | MD | LG | XL | 2X | 3X |
|---|---|---|---|---|---|---|
| Height | 163~167 | 168~172 | 173~177 | 178~182 | 183~187 | 188~192 |
| Length | 103 | 105 | 107 | 109 | 111 | 113 |
| Hipline | 76~92 | 80~96 | 84~100 | 88~104 | 92~108 | 96~112 |



# D140/D141/D145 Outdoor Jacket

## Durable, Breathable

- Nylon fabric, Waterproof treatment, breathable, tough and durable;
- Fabric With antistatic treatment reduces the electrostatic effect in winter;
- 140gsm Fellex filling, which compares favourably with natural down feather;
- Jacket, zipper ffront, two insert pockets, elastic wrist and hem;
- Be applicable in -10℃~+10℃ environment.

D145

Nylon fabric

Attached hood

Insert pocket

D140

D141

Vertical collar

Insert pocket

Portable bag


**Compare favourably with natural down feather, Meet the ecological certification**

Fellex® FS fiber is a kind of ecological insulation of muti-layer structure that appears to have good bulkiness and resilience performance. So, it can compare favourably with natural down feather, durable in use, lightweight, warmth, comfortable and air permeable.

| Product Style | Product Name | Description | Sizes | Package |
|---|---|---|---|---|
| D140 (black) | Outdoor Jacket | Jacket, Nylon fabric, waterproof, anti-static, breathable, durable; 140gsm Fellex filling; zipper front, two insert pockets, elastic wrist and hem. | SM ~ 4X | 12 |
| D141 (blue) | | | | |
| D145 (blue-black) | | | | |

# T200/T300 Winter Inner Jacket

## Warmer, Breathable, Single Wear or Match with Outer Jacket

- Polyester fabric, AC coating for anti-drilling;
- Fills with 3M Thinsulate ™ fiber;
- Collar with lining of polar fleece;
- Meet the requirement of GB/T18398-2001 when matching with the outer jacket;
- T200 is applicable at -10~-20℃, T300 is applicable at -25~-40℃.

Collar with lining of polar fleece

Insert pocket

| Type | Product Style | Product Name | Description | Sizes | Package |
|---|---|---|---|---|---|
| Inner Jacket | T200 | 200gsm 3M Thinsulate ™ | Applicable at -10~-20℃ | SM~4X | 5 |
| Inner Jacket | T300 | 300gsm 3M Thinsulate ™ | Applicable at -25~-40℃ | SM~4X | 5 |

# F280/F281 Polar Fleece Inner Jacket

## Lightweight, sweat-absorption and flash drying, Anti-pilling, Single Wear or Match with Outer Jacket

- 280 gsm polar fleece fabric, double brush fleece, comfortable and breathable;
- Durable, anti-pilling, warm;
- Two insert pockets outside, two pockets inside;
- Applicable at -5~5℃.

F280

F281

| Type | Product Style | Product Name | Description | Sizes | Package |
|---|---|---|---|---|---|
| Inner Jacket | F280 (black) | 280gsm polar fleece | Polar fleece, double brush fleece, applicable at -5~5℃ | SM~4X | 10 |
| Inner Jacket | F281 (green) | | | SM~4X | 10 |

# PR10/11/12 Outer Jacket

## Waterproof & Breathable, Comfortable & Durable

- Fabric: Nylon Taslan fabric coated with PU;
- Waterproof and breathable. 3000mm W/P, 3000g/m²·24h;
- Waterproof seam, storm flap, functional pockets;
- Hemwith elastic drawstring.
- Adjustable elastic cuff with Velcro;
- Can match with a variety of warm liners.

Optional liner


T200/T300


F280/F281


D140/D141


Ventilation underarm


Waterproof fabric and seam


Anti-scratch collar


Pocket on left chest

PR10 PR11 PR12

| Type | Product Style | Product Name | Description | Sizes | Package |
|---|---|---|---|---|---|
| Jacket | PR10 ( Grey ) | Outer Jacket | Nylon Taslan fabric coated with PU, comfortable, soft, durable, waterproof and breathable | SM ~ 4X | 10 |
| | PR11 ( Green ) | | | | |
| | PR12 ( Blue ) | | | | |

# PR20 Outer Jacket

## Durable, Waterproof and Breathable

- Oxford polyester fabric coated with PU;
- Waterproof and breathable, 3000mm W/P, 3000g/m²·24h
- Waterproof seam, storm flap, functional pockets;
- Can match with a variety of warm liners.

Optional liner


T200/T300


F280/F281


D140/D141


Chest pockets for tools


Anti-scratch collar


Front and rear reflective selvage design


Waterproof fabric and seam

| Type | Product Style | Product Name | Description | Sizes | Package |
|---|---|---|---|---|---|
| Jacket | PR20 | Outer Jacket | Oxford polyester fabric with PU coating, comfortable, durable, waterproof and breathable. | SM ~ 4X | 10 |

# BR11 Outer Jacket

## Bright Color, Waterproof, Breathable

- Polyester fabric coated with TPU;
- Waterproof 3000mm W/P, breathable 3000g/m²·24h;
- Waterproof seam, storm flap, functional pockets;
- Hem with elastic drawstring.
- Adjustable elastic cuff with Velcro;
- Can match with a variety of warm liners.

Optional liner

T200/T300

F280/F281

D140/D141

Waterproof pocket

Comfortable anti-scratch collar

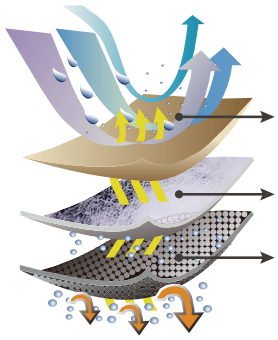
Reflective design on the front, rear chest and arm

| Type | Product Style | Product Name | Description | Sizes | Package |
|---|---|---|---|---|---|
| Jacket | BR11 | Outer Jacket | Polyester fabric coated with TPU, fashionable, waterproof and breathable. | SM ~ 4X | 10 |

# TD150/151 Outdoor Winter Jacket

## MD-LONG STYLE, Teflon and TPU coating, Soft and Comfortable

- Polyester pongee fabric with Teflon coating on the outer layer and TPU coating on the inner layer;
- Water repellency, oil repellency and stain resistance;
- Waterproof 5000mm W/P, breathable 5000g/m² 24h, waterproof seam;
- Detachable hood, waterproof front zipper, functional pockets;
- Fill with 150gsm 3M Thinsulate fiber, High efficiency heat reflective lining system to keep body warm.



Outer layer: Teflon processing and TPU coating, water repellency, oil repellency and stain resistance

Filler: 150gsm 3M Thinsulate fiber

Lining: High efficiency heat reflective lining system to keep body warm

Teflon Coating

Permeability Technology

Three-dimensional Design

Keep Warm

Teflon processing

waterproof zipper

two in one pocket (hand-warmer pocket and vertical pocket)

High efficiency heat reflective lining system to keep body warm

TD150

TD151

| Product Style | Product Name | Description | Sizes | Package |
|---|---|---|---|---|
| TD150 (Black) | Outdoor Winter Jacket | Polyester pongee fabric with Teflon coating on the outer layer and TPU coating on the inner layer; Fill with 150gsm 3M Thinsulate fiber, High efficiency heat reflective lining system to keep body warm. | SM ~ 4X | 5 |
| TD151 (Khaki) | | | | |

# BR203 Outdoor Winter Jacket For Women

## Light & Comfortable, Waterproof & Breathable

- Nylon Taslon fabric coated with PU;
- Waterproof 3000mm W/P, breathable 3000g/m²·24h;
- Waterproof seam, storm flap, functional pockets;
- Hem with elastic drawstring. Adjustable elastic cuff with Velcro;
- Fill with 200gsm 3M Thinsulate™.

Ventilation underarm

Polar fleece liner on collar

Zipper pocket

Left inner pocket

| Product Style | Product Name | Description | Sizes | Package |
|---|---|---|---|---|
| BR203 | Women Outdoor Jacket | Nylon Taslon fabric coated with PU, soft, comfortable, durable, waterproof and breathable, with 200gsm 3M Thinsulate™ liner, applicable at -10℃～-20℃. meet the requirement of GB/T 18398-2001 | XS ~ 2X | 5 |

# AF102 Antistatic and Flame Resistant Jacket

## Extensive Applications: petroleum, mining, chemical industry etc

- High-quality poly oxford fabric, durable;
- Coated with PU, waterproof, >5000mm, breathable, >4850g/$m^2$·24h;
- Fabric meets EN1149-5 antistatic standard;
- Fabric meets EN14116 flame resistance standard;
- 200gsm 3M Thinsulate™ fiber, efficient cold protection;
- Hood can be put into the collar.

Zipper and velcro design

Reflective design

Waterproof fabric and joint

Hidden hood

Reflective design

AF102

AF103

| Product Style | Product Name | Description | Sizes | Package |
|---|---|---|---|---|
| AF102 (navy blue) | Antistatic and flame resistant jacket | High-quality poly oxford fabric, durable, Coated with PU, waterproof, >5000mm, breathable, >4850g/$m^2$·24h; Fabric meets EN1149-5 antistatic standard and EN14116 flame resistance standard; 200gsm 3M Thinsulate™ fiber, efficient cold protection. | SM ~ 4X | 5 |
| AF103 (yellow) | | | | |

# P601 Outdoor Winter Pants

## Elastic Composite Fabric, Waterproof and Breathable

- Polyester 4-way elastic fabric + laminated micro fleece, with TPU coating;
- Waterproof and breathable, 3000mm W/P, 3000g/m²·24h;
- Medium thickness, suitable for autumn and winter;
- Elastic waist, multi-function pockets, reflective stripe on the both sides.

Elastic waist

Reflective stripe

Right pocket

| Art. NO. | Product Style | Product Name | Description | Sizes | Package |
|---|---|---|---|---|---|
| 855000 | P601 | Outdoor winter pants | Polyester 4-way elastic fabric + laminated micro fleece, with TPU coating | S ~ XXXXL | 5 |

# P603 Outdoor Winter Pants

## Durable, Waterproof, Breathable (Removable braces)

- Nylon Taslan fabric coated with PU;
- Waterproof 3000mm W/P, breathable 3000g/m²·24h;
- Elasticated waist, compliable with belt or braces;
- Multi-functional pockets;
- Bottom of leg with zip for cold protection;
- Fill with 3M Thinsulate™ fiber.

Elastic braces, waist, belt

Leg pocket

Leg pocket

Bottom of leg with zip and flap

| Product Style | Product Name | Description | Sizes | Package |
|---|---|---|---|---|
| P603 | Outdoor Winter Pants | Nylon Taslan fabric coated with PU. Soft, comfortable, durable, waterproof and breathable. Filled with Thinsulate which applicable at -10˚C ~-20 ˚C. | SM ~ 3X | 5 |
| P603AF | Outdoor Winter Pants | FR and antistatic Nylon fabric coated with PU, which is same as the outer fabric of AF102. Waterproof and breathable, fill with 3M Thinsulate™ fiber, applicable at -10 ℃~-20 ℃. | SM ~ 3X | 5 |

# Respiratory Protection

# RESPIRATORY PROTECTION & EYES PROTECTION

## Eyes Protection

Eyes protection is designed to help shield your eyes from certain impacts,debris, dust, splashes, and other potential hazards that could present severeinjury to the eyes, including potential blindness.

### SAFETY SPECTACLES

Firstly, temples and nose pads need to be chosen for improving fit and comfort, and even there are other options also available to meet specific needs, such as metalcomponents. Once the style is chosen, the nextconsideration should be the lens technology for the task at hand, which depending on the work environment and lighting conditions.

### GOGGLES

With goggles, the type of venting required for the workenvironment is the most critical consideration. Direct vented goggleshave straight-line perforations that allow direct airflow from thework environment.Indirect vented goggles can be used when there is liquid splash risk.

### Lens Performance and Tint Specifi Cations

To better help you select the lens and tint that best fits your work conditions or application use, please see the chart below, which outlines the approximate performance characteristics of the numerous lens tint options, as well as application and performance benefits:

| Lens Style | Application/Benefit |
|---|---|
| Amber | Blocks blue light for applications where increased visual contrast is needed. Inspection/Quality Control, haze and fog. |
| Blue Flash Mirror | Great general purpose sun lens that reduces sun glare and intense sunlight for outdoor applications. |
| Brown | Great general purpose sun lens with 'blue blocking' properties to reduce outdoor haze and increase contrast. |
| Clear | General purpose impact protection for indoor and outdoor use. |
| Gold Mirror | Excellent for intense outdoor sun glare reduction with 'blue blocking' properties to reduce outdoor haze and increase contrast. |
| Grey | General purpose sun lens that reduces sun glare and intense sunlight for outdoor applications. |
| Light Brown | Modest sun glare reduction with some 'blue blocking' properties to reduce outdoor haze and increase contrast. |

## Respiratory Protection

### Breathing Hazards

Particulates: Can be created from a solid or a liquid. Solid particles are produced by operations such as grinding, crushing, drilling, blasting, sanding and milling. Spraying operations, planting operations, mixing and cleaning operations create liquid particles.

**Fumes**: Created when solid materials vaporize under high heat. Fumes come from operations such as welding, smelting and pouring of molten metal.

**Gases**: Substances similar to air in their ability to diffuse or spread freely throughout a container or area. Examples include oxygen, carbon monoxide, carbon dioxide, nitrogen and helium.

**Vapors**: Formed when a solid or liquid evaporates. Common vapors are gasoline, paint thinners and degreaser solvents.

### OSHA standard, Filter Classes

| Minimum Filter Efficiency | ⩾95% | ⩾99% | ⩾99.97% |
|---|---|---|---|
| N | N95 | N99 | N100 |
| R | R95 | R99 | R100 |
| P | P95 | P99 | P100 |

### Filter Selections

N: Not resistant to Oil Mist
R: Resistant to Oil Mist, with use restricted to one 8-hour shift
P: Oil-resistant, with no time limitation

### Europe standard (oil and non-oil based particles)

| Filter Classes | FFP1 | FFP2 | FFP3 |
|---|---|---|---|
| Minimum Filter Efficiency | ⩾80% | ⩾94% | ⩾99% |

### Chinese Standard GB2626, Filter Classes

| Minimum Filter Efficiency | KN | KP |
|---|---|---|
| ⩾90% | KN90 | KN90 |
| ⩾95% | KN95 | KP95 |
| ⩾99.97% | KN100 | KP100 |

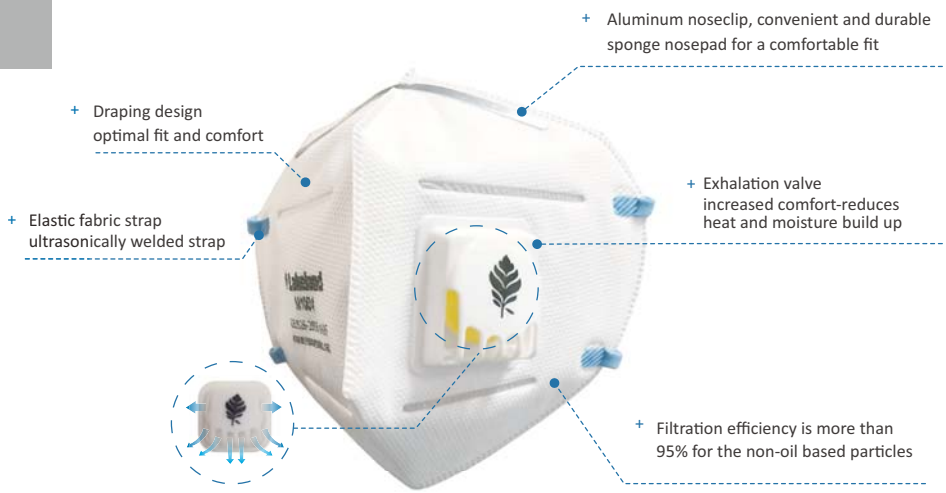
| Minimum Filter Efficiency | ⩾90% | ⩾95% | ⩾99.97% |
|---|---|---|---|
| KN | KN90 | KN95 | KN100 |
| KP | KP90 | KP95 | KP100 |

# M100/M100V PARTICULATE RESPIRATOR

China GB2626-2019

**(Folding • Earloop/Head-strap)**

**CHINA GB 2626-2019 KN95**


M100 M100V

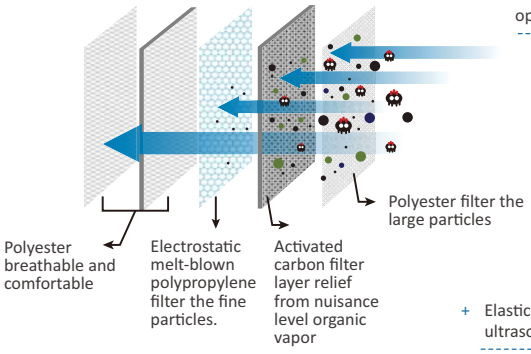
| Product Code | Description | Case Pack |
|---|---|---|
| M100 | Folding, Earloop/Head-strap | 50 pcs/box<br>12 boxes/case |
| M100V | Folding, Earloop/Head-strap, Valve | 20 pcs/box<br>12 boxes/case |

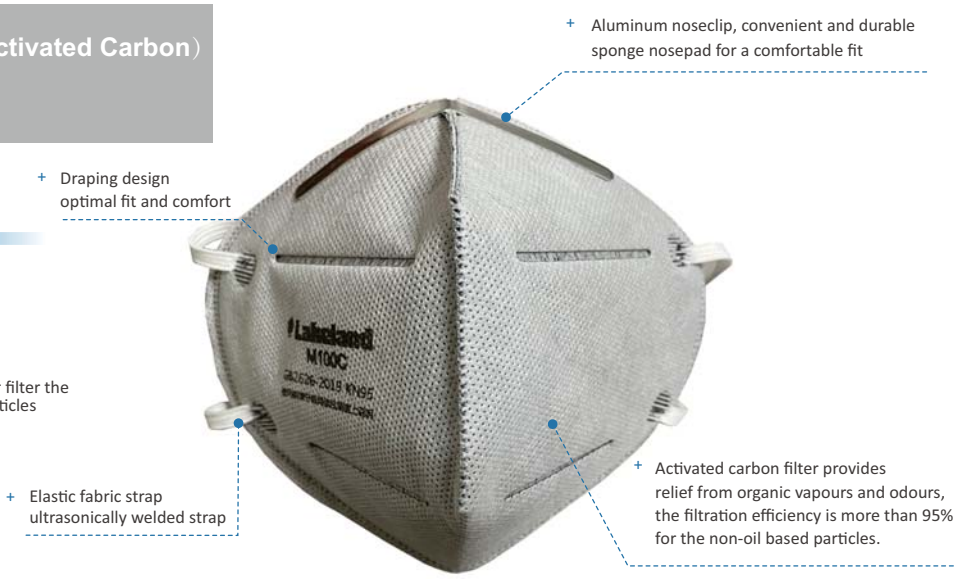
# M100C PARTICULATE RESPIRATOR

China GB2626-2019

**(Folding, Earloop/Head-strap, Activated Carbon)**

**CHINA GB2626-2019 KN95**




| Product Code | Description | Case Pack |
|---|---|---|
| M100C | Folding, Earloop/Head-strap, Activated Carbon | 40 pcs/box<br>12 boxes/case |

# M200/M200V/M200VC PARTICULATE RESPIRATOR

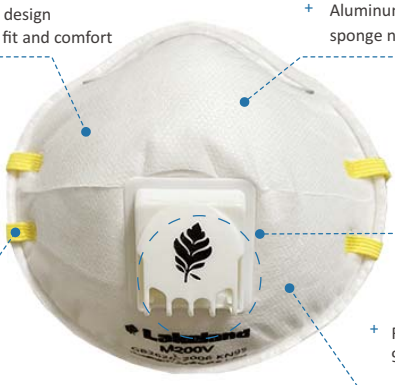
China GB2626-2019

**M200: Head-strap**
**M200V: Head-strap, Valve**
**M200VC: Head-strap, Valve, Activated Carbon**
**CHINA GB2626-2019 KN95**

M200

M200VC

+ Elastic fabric strap ultrasonically welded strap



M200V

+ Draping design optimal fit and comfort
+ Aluminum noseclip, convenient and durable sponge nosepad for a comfortable fit
+ Exhalation valve increased comfort-reduces heat and moisture build up
+ Filtration efficiency is more than 95% for the non-oil based particles

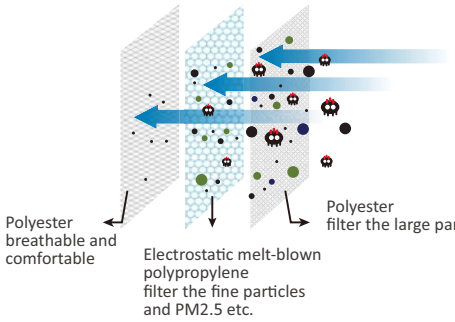
| Product Code | Description | Case Pack |
|---|---|---|
| M200 | Head-strap | 30 pcs/box<br>12 boxes/case |
| M200V | Head-strap, Valve | 15 pcs/box<br>12 boxes/case |
| M200VC | Head-strap, Valve, Activated Carbon | 15 pcs/box<br>12 boxes/case |

# M220V PARTICULATE RESPIRATOR

China GB2626-2019

NIOSH N95 Approved

**(Head-strap, Valve)**
**US NIOSH N95**
**CHINA GB2626-2019 KN95**





+ No noseclip, nosewing design
+ Ultrasonically welded strap
+ Adjustable looping head-strap
+ Exhalation valve
+ Static filter, low respiratory resistance

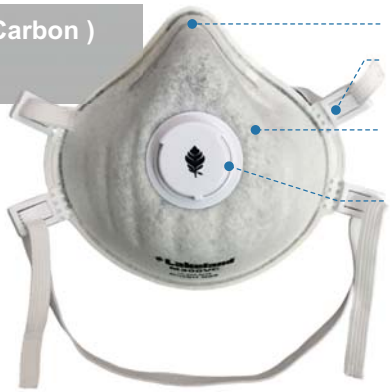
| Product Code | Description | Case Pack |
|---|---|---|
| M220V | Head-strap, Valve | 10pcs/box<br>12boxes/case |

# M300VC PARTICULATE RESPIRATOR

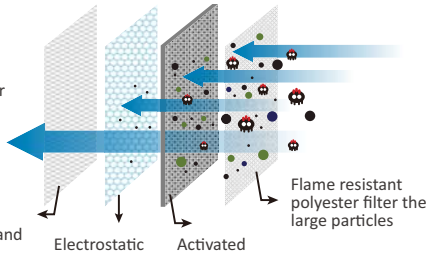
NIOSH N95 Approved

**(Head-strap, Valve, Activated Carbon )**
**US NIOSH N95**

Foam liner, perfect fit and comfortable



+ Adjustable aluminum noseclip
+ Adjustable buckle head-strap
+ Activated carbon filter
+ Exhalation valve




| Product Code | Description | Case Pack |
|---|---|---|
| M300VC | Head-strap, Valve, Activated Carbon | 10pcs/box<br>12boxes/case |

# Eyes Protection

# EYE PROTECTION

## G1580 Safety Goggle

**Lens Color: Clear • Frame Color: Smoke Grey**

- Impact and splash resistant molded lens,Flexible PVC frame;
- Arc panoramic view, Anti-fog and anti-scratch coating;
- Asian face design;
- Angle adjustable headband connector, Indirect ventilation hole;
- Suitable for wearing glasses and wear a half mask at the same time.

ANSI Z87+, CE EN 166, GB14866

| Product Code | Description | Case Pack |
|---|---|---|
| G1580 | Smoke Grey Frame, Clear Lens, Anti-Fog, Indirect Ventilation Hole. | 10pcs/box，9boxes/case |

## G1510 / G1510AF Safety Goggle

**Lens Color: Clear • Frame Color: Light Blue**

- Impact and splash resistant molded lens;
- Anti-cratch, UV protection;
- Asian face design, light weight and comfortable;
- 4 ventilation slots protecting against fog;
- Adjustable headband connector;
- Fits over prescription eyewear with ease;
- G1510(AF) is the anti-fog style.

ANSI Z87+, GB14866

4 ventilation slots

G1510


G1510(AF)

| Product Code | Description | Case Pack |
|---|---|---|
| G1510/G1510AF | Light Blue Frame, Clear Lens,Four Indirect Ventilation Slots. | 12 pcs/box, 9 boxes/case |

# EYE PROTECTION

## G1100 Safety Spectacles

**Lens Color: Clear • Frame Color: Blue**

- Increase the flank protection wide field of vision
- Adjustable length
- 99.9% UV protection
- Soft nose bridge
- Anti-fog and anti-scratch coating

ANSI Z87+, GB14866

| Product Code | Description | Case Pack |
|---|---|---|
| G1100 | Lightweight and comfortable, asian face design, suitable for a long time to wear | 12pcs/box，25boxes/case |

## G1200 Safety Spectacles

**Lens Color: Grey • Frame Color: Grey**

- Orange rubber inserts on the temples
- Increase the flank protection wide field of vision
- Integrated design for lens and frame
- 99.9% UV protection
- Soft nose bridge
- Anti-fog and anti-scratch coating

ANSI Z87+, GB14866

| Product Code | Description | Case Pack |
|---|---|---|
| G1200 | Lightweight and comfortable, asian face design | 12pcs/box，25boxes/case |

# Hand Protection

# STANDARDS OF PROTECTIVE GLOVES

Please read instruction for use.

## EN 388 : 2016 - Mechanical Risks

where
abcde

a = resistance to abrasion (Min. 0 ; Max. 4)
b = resistance to blade cut (Min. 0 ; Max. 5)
c = resistance to tear (Min. 0 ; Max. 4)
d = resistance to puncture (Min. 0 ; Max. 4)
e = Cut ISO 13997:1999

## EN ISO 374-5 : 2016 - Micro-Organisms

Number refers to as acceptable quality level (AQL)

## EN ISO 374-1:2016 - Protective Gloves Against Dangerous Chemicals

where
AJKLOPT

**Table 1 - List of test chemicals**

A : Methanol
B : Acetone
C : Acetonitrile
D : Dichloromethane
E : Carbon disulphide
F : Toluene
G : Diethylamine
H : Tetrahydrofurane
I : Ethyl acetate
J : n-Heptane
K : Sodium hydroxide 40%
L : Sulphuric acid 96%
M : Nitric acid 65%
N : Acetic acid 65%
O : Ammonium hydroxide 25%
P : Hydrogen peroxide 30%
S : Hydrofluoric acid 40%
T : Formaldehyde 37%

| Performance Level | Breakthrough Time, Minutes |
|---|---|
| 0 | ⩽ 10 |
| 1 | > 10 |
| 2 | > 30 |
| 3 | > 60 |
| 4 | > 120 |
| 5 | > 240 |
| 6 | > 480 |

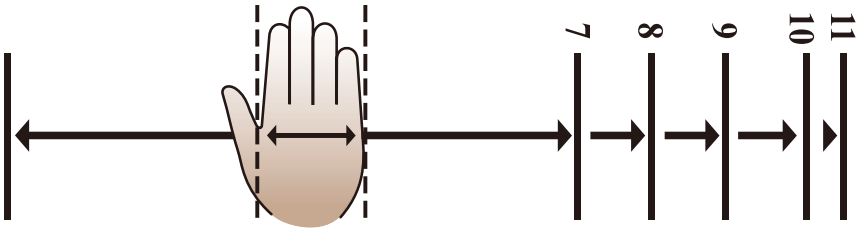
***Note:***
*Type A : The permeation performance shall be at least level 2 against a minimum of six test chemicals in Table 1.*
*Type B : The permeation performance shall be at least level 2 against a minimum of three test chemicals in Table 1.*
*Type C : The permeation performance shall be at least level 1 against a minimum of one test chemical in Table 1.*

## EN374-4: 2013 - Resistance to degradation by chemicals

**Note for Observation (EN 374-4:2013)**

1. No Change
2. Slight Swelling
3. Moderate Swelling
4. Severe Swelling
5. Severe Swelling & Colour Change

Suitable for food contact
* Further information can be obtained from Lakeland Industries, Inc.

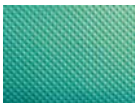



**Lakeland gloves are available in a range of sizes 7-11 according to EN420.**

| Glove Size | Hand Circumference/length |
|---|---|
| 7 | 178/171mm |
| 8 | 203/182mm |
| 9 | 229/192mm |
| 10 | 254/204mm |
| 11 | 279/215mm |

# NITROSOL™ NITRILE

EN388
EN15F: 4,1,0,1,X
CN15F: 3.1.0.1.X
EN22L: 4,1,0,2,X
EN ISO374-1:2016 Type A
AJKLOT
EN ISO374-5:2016



Raised Lozenge Grain

Flocklined

## FEATURES

- Outstanding Chemical Resistance:
  Provides protection both physical and chemical when exposed to solvents... petroleum, aromatic, caustics and fatty acids in food service applications.
- Outstanding Physical Properties:
  Excellent snag, puncture, abrasion and cut resistance.Case hardened to increase wear and chemical resistance.
- Raised Lozenge Grain:
  Easier and safe handling of wet objects. Lozenge Grain for superior wet grip.
- Widest Selection of Styles:
  Choose from unlined or flocklined in various mil thicknesses and various lengths.

## KEY APPLICATIONS

- Paint spraying operation.
- Degreasing.
- Electronics.
- Photo finishing.
- Petrochemicals.
- Refining.
- Handling solvents, alcohols, acids and caustics.

| Product Code | Description | Length | Sizes | Case Pack |
|---|---|---|---|---|
| EN15F | 15 Mil, Flocklined, Raised Lozenge Grain | 13''(33cm) | 8-11 | 144 pairs/carton |
| CN15F | 15 Mil, Flocklined, Raised Lozenge Grain | 13''(33cm) | 8-10 | 144pairs/carton |
| EN22L | 22 Mil, Unlined, Raised Lozenge Grain | 17.7''(45cm) | 8-10 | 36 pairs/carton |

# NATRASOL™ NATURAL RUBBER

EN388
2,0,1,0,X
EN ISO374-1:2016 Type B
KLM
EN ISO374-5:2016



Raised Zig Zag Grain

Flocklined

## FEATURES

- Outstanding Chemical Resistance:
  Provides protection against caustics, detergents, acids, alcohols and many ketones.
- Physical Properties:
  Case hardened for greater abrasion and chemical resistance than other ordinary natural rubber gloves.
- Creature Comforts:
  - Contoured palm and ergonomically designed curved fingers for a soft comfortable fit.
  - Soft flock lining which absorbs perspiration and feels comfortable while exposed to solvents.
  - Raised Zig Zag Grain for improved wet grip.

## KEY APPLICATIONS

- Electronics and Semi-conductor Industry.
- Food Processing.
- Tank Cleaning.
- Handling acids, ketones, alkalies, caustics, epoxies.
- Printing industry.

| Product Code | Description | Length | Sizes | Case Pack |
|---|---|---|---|---|
| ER18F | 18 Mil, Flocklined, Raised Zig Zag Grain | 13''(33cm) | 8-11 | 144 pairs/carton |

# NEOLASOL™ NEOPRENE NATURAL RUBBER

CE EN388 2,1,2,1,X | EN ISO374-1:2016 Type B AKL | EN ISO374-5:2016

Raised Zig Zag Grain

Flocklined

## FEATURES

- Unique Process:
  Our 2 dip process allows for a blend of neoprene and natural rubber over natural rubber, increasing the level of protection in a broad range of chemicals.
- Versatility:
  Provides a level of versatile chemical resistance compared to conventional single dipped gloves.
- Longer Length:
  13” length is longer than most other gloves for added protection.
- Economical:
  An economical option- cost savings idea over other types of chemical resistant gloves.
- Creature Comforts:
  Contoured palm and ergonomically designfingers for a soft, comfortable fit.
- Flock Lined:
  Soft flock lining absorbs perspiration and feels comfortable while exposed to solvents.
- Get a Gip:
  Raised diamond pattern provides a better grip while handling wet or dry areas.

## KEY APPLICATIONS

- Pesticide manufacturing.
- Janitorial.
- Chemical processing.
- Light assembly.
- Food service.

| Product Code | Description | Length | Sizes | Case Pack |
|---|---|---|---|---|
| ECR27F | 27 Mil Flocklined, Raised Zig Zag Grain | 13’’(33cm) | 8-10 | 108 pairs/carton |

# NEOSOL™ NEOPRENE

CE EN388 3,1,3,1,X | EN ISO374-1:2016 Type A AKLMNO | EN ISO374-5:2016

Pebble finish on the palm and back of hand

Flocklined

## FEATURES

- Wide Spectrum Chemical Protection:
  Resists a broad range of chemicals. Acid, caustic, oil and solvent resistant.
- Improved Physical Properties:
  Gloves are case hardened increasing wear, abrasion resistance and chemical resistance over other ordinary neoprene gloves.
- Creature Comfort:
  Contoured palm and ergonomically designed curved fingers make for a soft, comfortable fit.

## KEY APPLICATIONS

- Printing: clean up, graphics arts.
- Electronics: handling of printed circuit boards, semiconductor.
- General manufacturing: fabrication, cutting oils, caustics, dip tanks.
- Aerospace: cleaning solvents, engine fan blades, metal fabrication.
- Auto industry.
- Chemical processing Industry.
- Glass manufacturing.
- Janitorial.

| Product Code | Description | Length | Sizes | Case Pack |
|---|---|---|---|---|
| EC30F | 30 Mil, Flocklined, Pebble finish on the palm and back of hand | 13’’(33cm) | 8-11 | 72 pairs/carton |

# Natrasol ® Natural Rubber Chemical Protective Gloves

EN388:2016 1020X | EN ISO 374-1:2016 Type B KLM | EN374-5:2016

## FEATURES

- Outstanding Chemical Resistance:
  Provides protection against caustics, detergents, acids, alcohols and many ketones.
- Physical Properties:
  1.5 times the thickness of ordinary natural rubber gloves. Case hardened for greater abrasion and chemical resistance than other ordinary natural rubber gloves.
- Creature Comforts:
  - Contoured palm and ergonomically designed curved fingers for a soft comfortable fit.
  - Soft flock lining which absorbs perspiration and feels comfortable while exposed to solvents.
  - Hexagonal Finish for improved wet grip.

## KEY APPLICATIONS

- Pharmaceutical Industry
- Chemical processing
- Mechanical Processing
- Metal handling
- Chemical and Petrol Industry

| Product Code | Description | Length | Sizes | Case Pack |
|---|---|---|---|---|
| ER28F | 28mil (0.70mm) thickness, 12'' (30.5cm) length, Flocklined, Hexagonal Finish | 12'' (30.5cm) | 8-11 | 72 Pairs/Case |

# DISPOSABLE GLOVES

EN ISO374-1:2016 Type B KTPSJ EN ISO374-5:2016

## 8304PF
## Disposable Nitrile Gloves

**8304PF Disposable Nitrile Gloves (Powder Free, Palm-Textured)**
**The glove that contains no latex is very comfortable and dexterity. It is much thicker and more durable than common disposable nitrile gloves. The grip performance is better because of textured surface.**

### FEATURES

- Contains no latex and prevents hypersensitiveness; 0.10mm thickness, 24cm length, comfortable and good dexterity;
- Good chemical and oil resistance;
- Textured surface for good grip;
- Meets CE certification;
  The materials comply with FDA regulations for food contact.

### KEY APPLICATIONS

- Chemical industry;
- Automobile manufacture;
- Small Parts handling;
- Laboratory;
- Light duty maintenance and cleanup;
- Pharmaceutical processing and manufacture.

| Product Code | Description | Sizes | Case Pack |
|---|---|---|---|
| 8304PF | Disposable nitrile gloves, Powder free | SM-XL | 100pcs/box 10boxes/carton |

EN ISO374-1:2016 Type B MTS EN ISO374-5:2016

## 8204PF
## Disposable Latex Gloves

**8204PF Disposable Latex Gloves (Powder Free, Palm-textured)**
**Comfortable, dexterity, Textured surface for good grip and good elasticity for all kinds of demands.**

### FEATURES

- Latex material, better elasticity and biodegradable;
- 0.10mm thickness, 240mm length, powder free, comfortable and dexterity;
- Textured surface for good grip;
- Removable packing, useable with either hand.

### KEY APPLICATIONS

- Food handling;
- Small Parts handling;
- Laboratory;
- Light duty maintenance and cleanup.

| Product Code | Description | Sizes | Case Pack |
|---|---|---|---|
| 8204PF | Disposable latex gloves, Powder free | SM-XL | 100pcs/box 10boxes/carton |

EN ISO374-1:2016 Type A KMTPSJO EN ISO374-5:2016 EN388 2.0.0.0.X

## 8308PF
## Disposable Nitrile Gloves

**8308PF Disposable Nitrile Gloves**
**The gloves are Comfortable, dexterity, and chemical resistance; Much thicker and more durable than common disposable nitrile gloves; Reusable.**

### FEATURES

- Thin nitrile material, better elasticity and dexterity;
- 0.20mm thickness, 305mm length, powder free;
- Textured surface for good grip;
- Removable packing, useable with either hand;
- Good chemical, solvent and low concentration of acid and alkaline resistance

### KEY APPLICATIONS

- Chemical industry;
- Automobile manufacture;
- Small Parts handling.

| Product Code | Description | Sizes | Case Pack |
|---|---|---|---|
| 8308PF | Disposable nitrile gloves, Powder free | SM-XL | 50pcs/box 10boxes/carton |

# SPIDERGRIP® MECHANIC PROTECTIVE GLOVES

Oil proof  Skid proof

7-1506

7-2506

7-1505

## SpiderGrip™

Job fitted for applications where dexterity, flexibility and comfort are desired!

SpiderGrip gloves will make slips a thing of the past! SpiderGrip crinkle dip latex gloves have a textured palm to provide an excellent grip. The palm of the glove is liquid repellent, while the back provides excellent breathability to keep hands cool while on the job.

### FEATURES

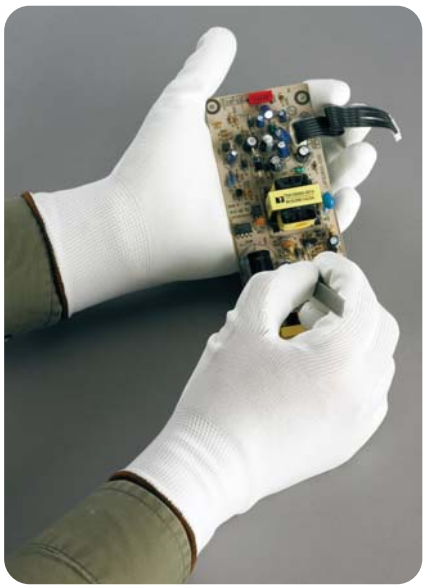
- Seamless design.
- Puncture resistant.
- Ergonomic fit.
- Long wearing.

### KEY APPLICATIONS

- Light to medium fabrication.
- Parts handling.
- General warehousing.
- Maintenance.
- Corrugated manufacturing.
- General purpose handling where light liquids or oils are present.

| Product Code | Description | Sizes | Case Pack |
|---|---|---|---|
| 7-1505 | Polyester cotton latex dipped gloves | LG | 120pairs/carton |
| 7-1506 | Polyester cotton latex dipped gloves | SM-XL | 120 pairs/carton |
| 7-2506 | Lightweight polyester latex dipped gloves | SM-XL | 144 pairs/carton |

Oil proof



7-3101

## SpiderGrip™ 7-3101

When Dexterity Matters!

For the handling of those small parts nothing beats a Polyurethane coated polyester knit liner glove.

### FEATURES

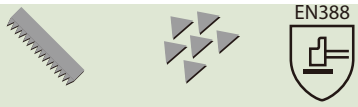
- Non-linting polyester seamless liner.
- Ergonomic fit.
- Superior tactile feel and touch.
- Comfort plus.

### KEY APPLICATIONS

- Intricate parts assembly.
- Inspection.
- Electronics.
- Automotive.
- Material handling.
- Light fabrication.

| Product Code | Description | Sizes | Case Pack |
|---|---|---|---|
| 7-3101 | P/U white polyester polyurethane dipped gloves | SM-XL | 144 pairs/carton |

# SPIDERGRIP® CUT RESISTANT GLOVES





## SpiderGrip ® 22-1601

### FEATURES

- Superfine stainless steel wire and 100% aramid, which has excellent cut-resistant ability;
- PVC dots on palm, which make the gloves skid proof.
- Soft, comfortable, good breathability and long using life.

### KEY APPLICATIONS

- Metal Handling
- Automotive Industry
- Assembly
- Manufacturing

| Product Code | Description | Sizes | Case Pack |
|---|---|---|---|
| 22-1601 | PVC dots on palm, excellent cut-resistant ability | SM-XL | 1 pair/bag, 120 pairs/carton |

## SpiderGrip ® 22-1608

### FEATURES

- Accord with anti-cutting level 5 of EN388
- Latex finish on the palm of gloves, which make the gloves oil and skid proof.
- Accord with contact heat level 2 of EN407. Be able to resist 250 ℃ contact heat.

### KEY APPLICATIONS

- Automotive industry
- Glass Manufacturing
- Metal and Mechanic Handling
- Logistics
- Emergency Rescue

| Product Code | Description | Sizes | Case Pack |
|---|---|---|---|
| 22-1608 | Anti-cutting level 5, Latex finish on the palm of gloves. | SM-XL | 12 pairs/bag 120 pairs/carton |

# SPIDERGRIP® CUT RESISTANT GLOVES

Cut resistant | Oil proof | Skid proof | EN388 4.5.4.3

## FEATURES

- 100% HPPE fiber knit. Excellent cut-resistance performance. Meeting the requirements of EN388.
- Soft, comfortable and breathable.

## KEY APPLICATIONS

- Plastic processing.
- Leather processing.
- Glass products industry.
- Metal processing.

| Product Code | Description | Sizes | Case Pack |
|---|---|---|---|
| 96-5205 | 13 gauge. 100% HPPE fiber knit. Polyurethane dipped gloves | SM-XL | 240 pairs/carton |

# ENHAND-CR®CUT RESISTANT GLOVES

In this magnified view, the positively charged surface of MicroGard® attracts the negative charged bacteria. Due to the electrical attraction, the bacteria is drawn into the molecular spikes which puncture the bacteria membrane, killing it.



## Enhand-CR, Your FIRST line of defense!

- Cut Resistance:
  Highest level on ASTM F1790 standard.
- Dexterity:
  Excellent flexibility, feel and dexterity.
- Launderable:
  Withstands over 40 washings.
- Cost:
  More economical than lesser cut resistant gloves without antimicrobial features.
- Other design features:
  Improve areas of premature wear through a patented design process.

### FEATURES

- Passes ASTM E2149.
- Passes AATCC Test Method 100.
- Microbes Are Killed Instantly.
- Withstands Up to 40 Washings.
- Ionically bonds to fibers to last the life of every fiber in the product.

### KEY APPLICATIONS

- For all food service industries, poultry, chicken or beef processing.
- Passes ASTM E2149.
- Passes AATCC Test Method 100.
- Can be washed with bleach.

| Product Code | Description | Sizes | Case Pack |
|---|---|---|---|
| 96-1754 | Blue Enhand-CR Glove | SM-LG | 12pcs/bag |

# SHURRITE® CUT RESISTANT GLOVES

Twaron®

EN388

1.4.4.X


## Advantages of Twaron® in protective gloves

## Twaron®Fiber

- Teijin promotes a finer 1.5 denier Twaron® fiber for use in protective gloves compared to 2.25 denier fiber commonly used in the market. The benefit for the end user is a longer lasting, more comfortable product with maximum protective properties.
- Greater life cycle compared to competitive products.
- Due to its patented manufacturing process Twaron® is showing less change of color after UV exposure.
- Good Thermal characteristics of Twaron®. Does not burn. Does not melt or drip. Has low heat shrinkage. Retains dimensional stability at high temperatures. Release little smoke under extreme conditions

## FEATURES

- Made from 100% Twaron® fiber;
- Outstanding mechanical protective feature;
- Soft, breathable and comfortable;
- Good dexterity.

## KEY APPLICATIONS

- Automotive
- Metal Handling
- Assembly
- Glass Industry

| Product Code | Description | Sizes | Case Pack | |
|---|---|---|---|---|
| 21-849C | Made from 100% Twaron® fiber | SM-LG | 12 pairs / bag | 120 pairs/carton |

# SHURRITE® CUT RESISTANT GLOVES

EN388

1.5.4.X

- Modern Protective Armor!
- Lakeland ShurRite®safety gloves and sleeves made with DuPont®100% Kevlar®aramid fiber provide excellent cut resistance for hand and arm protection. ShurRite®offers outstanding cut resistance combined with intermittent heat®resistance without affecting their wearers manual dexterity. These tough gloves and sleeves will outlast cotton, leather and coated gloves many times over. They greatly reduce potential injuries to workers' hands and contribute to reducing accident claims and insurance costs. Available in various grip-enhancing coatings and patterns.
- And, where additional protection from heat is required, ShurRite®Kevlar®Terry gloves are the answer. The terry loop construction provides a cushion of air that insulates against high temperature extremes, while Kevlar adds the cut/slash protection.

## FEATURES

- Cut Resistant.
- Heat Resistant.
- Chemical Resistant (organic solvents; diluted acids).
- Lightweight.
- Excellent dexterity and flexibility.
- Breathable.
- Washable.

## KEY APPLICATIONS

- Metal handling.
- Automotive.
- Aerospace.
- Assembly.
- Lumber and paper.
- Office furniture manufacturing.
- Heating and air conditioning.
- Manufacturing.
- Wire and cable industries.
- Glass industry.


21-843C

| Product Code | Description | Sizes | Case Pack |
|---|---|---|---|
| 21-843C | 7 gauge 100% Kevlar® knit gloves | MD-LG | 1 pair / bag 120 pairs/carton |
| 41822THVC | 100% Kevlar®, 2 ply sleeve, 3'' width | 18'' | 1 piece / bag 200 pcs/carton |

## Limited Use Clothing / Chemical Protective Clothing

## Heat Protective Clothing

## Hands Protection / Respiratory Protection / Eyes Protection

## Outdoor Winter Clothing

Lakeland®
Protect Your People®

**Lakeland Asia Pacific**
Email: sales-ap@lakeland.com
Web: www.lakeland.com

Website