

Pyrolon™ CRFR



Lakeland 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.



- Combines Flame retardancy to EN 14116 (Index 1) with Type 3 & 4 chemical protection.
- 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.
- Primarily designed to be worn over Thermal Protective Garments (TPG's - garments certified to EN 11612) without compromising thermal protection - as standard chemical suits will do
- 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.
- Stitched and taped seams.
- 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. Other styles available.
- Lakeland 'Super-B' styling - features 3-piece hood, 2-piece crotch gusset and inset sleeves, Ergonomically styled for superior freedom of movement, comfort and durability.

Physical Properties			
Property	EN Standard	Result	CE Class
Abrasion Resistance	EN 530	>2000 cycles	6
Flex Cracking	ISO 7854	>40,000 <100,000 cycles	6
Trapezoidal Tear	ISO 9073	48 / 34.3 N	3
Tensile Strength	EN 13934	168 / 110N	3
Puncture Resistance	EN 863	19.2N	2
Anti-static (Surface Resistance)	EN 1149-1	Pass* (<2.5 x 10 ⁹ Ω)	
Seam Strength	EN 13935-2	186.80	4
Flame Retardancy	EN 14116	Index 1 : Should not be worn next to the skin	

* according to EN 1149-5

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/cm ² / CE Class	Normalised Breakthrough @ 0.1µg/min/cm ²	Penetration according to ASTM F903*
Acetic Acid	64-19-7	98%	45 min / Class 2	40 min	NT
Acetone	8006-64-2		NT	12 min	>60 min
Acetonitrile	75-05-8	90%	NT	Imm	>60 min
Benzene	71-43-2	99%	NT	Imm	>60 min
Crude oil	8002-05-9	neat	NT	9	>60 min
Diesel Fuel	N/A	neat	NT	15 min	>60 min
Ethyl Acetate	141-78-6	99%	NT	16 min	>60 min
Formic Acid	64-18-6	99%	120 min / Class 4	120 min	NT
n-Hexane	2493-44-9		>480 min / Class 6	NT	>60 min
Hydrofluoric Acid	7664-39-3	48%	20 min / Class 1	NT	>60 min
Methanol	67-56-1	50%	>480 min / Class 6	NT	>60 min
N-Butyl Acetate	123-86-4	99%	NT	NT	>60 min
Nitric Acid	7697-37-2	70%	NT	129 min	>60 min
Phosphoric Acid	mixture	85%	>480 min / Class 6	NT	>60 min
Sodium Hydroxide	1310-73-2	40%	>480 min / Class 6	>480 min	>60 min
Sulphuric Acid	7664-93-9	60%	>480 min / Class 6	NT	NT
Sulphuric Acid	7664-93-9	96%	>45 min / Class 2	38 min	>45 min
Toluene	108-88-3	99%	NT	6 min	>60 min

Normalised Breakthrough is provided at rates of 0.1µg/min/cm² and 1.0µg/min/cm². Note that 'Normalised breakthrough' 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.

Pyrolon™ CRFR Styles

Style code 428
Coverall with elasticated hood, cuffs, waist & ankles
Size: SM - 3X

Style code 101
Lab coat with 2 hip pockets, 4 stud fastening
Size: MD - XL

Style code 514
Jacket with elasticated cuffs
Size: SM - 3X

Style code 016
Trousers with elasticated waist.
Size: SM - 3X

Style code 019
Rear entry gown with elasticated cuffs
Size: MD - XL

Style code 022NS
Overshoes with anti-slip soles
Size: One size

Style code 023NS
Overboots with anti-slip soles and ties
Size: One size

Bespoke styles available subject to MOQ's.

Available in: Grey Orange

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



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.

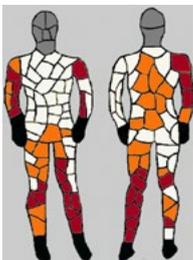
Lakeland Pyrolon™ garments use a unique viscose based fabric which will not ignite and are certified to EN 14116

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 suits perform in this test when worn over a Thermal Protective Garment.

Predicted Body Burn (PBB) Results for various Type 3 & 4 Coveralls

TPG coverall only	TPG with Standard Chemical Coverall	TPG with Pyrolon™ CRFR Coverall	TPG with Pyrolon™ CBFR Coverall
PBB = 37% NO 3rd degree burns	PBB = 53% including 3rd degree burns	PBB = 24% NO 3rd degree burns	PBB = 9.02% NO 3rd degree burns
The results show that wearing a standard chemical suit over a TPG not only increases predicted body burn compared against the TPG suit alone, it also results in 3rd degree burns. Wearing a Pyrolon™ chemical suit over the same TPG REDUCES predicted body burn and produced no 3rd degree burns.			

Pyrolon™ garments provide a range of protection	EN 14116	Pyrolon™ Plus 2	Pyrolon™ XT	Pyrolon™ CRFR	Pyrolon™ CBFR	Pyrolon™ Cool Suit	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.
	Type 6	✓ Index 1	✓ Index 1	✓ Index 1	✓ Index 3	✓ Index 1	
	Type 5	✓	✓				
	EN 1073	✓	✓				
	Type 4			✓	✓	✓	
	Type 3			✓	✓		
	EN 11612						
EN 1149-5	✓	✓	✓	✓	✓		