

Pyrolon™ CRFR Cool Suit



The Pyrolon™ CRFR Cool Suit combines the FR properties of Pyrolon™ with the innovative and comfortable Type 4 Cool Suit design and chemical protection of the Pyrolon™ CRFR. A breathable chemical suit certified to FR standard EN 14116-Index 1... the fabric will not ignite and burn.



- Pyrolon™ CRFR coverall with a breathable rear panel of Pyrolon™ Plus 2 overed by a Pyrolon™ CRFR flap sealed at top and sides and with an open overlapped flap at the bottom to allow free circulation of air inside and outside the suit.
- Combines Flame Retardency to EN 14116 with Type 3 chemical protection (equivalent to ChemMax® 1).
- Outer FR PVC barrier film laminated to proprietary nonwoven substrate of viscose rayon (exceptionally soft and flexible fabric)
- Fabric will not ignite or burn: chars at temperature lower than its ignition point.
- Can be worn over woven FR garments without compromising flame and heat protection.
- Orange fabric with grey seams, rear panel and kneepads for easy identification.
- The 'bellows effect' assists in ensuring effective circulation of air.
- Stitched and taped seams for effective protection.
- Suitable for protection against a broad range of hazardous chemicals in applications with Type 4 splashes and sprays*
- Intrinsic anti-static properties with low surface resistance that do not wear off with use - so combined with FR properties Pyrolon™ CRFR is an excellent choice for applications in explosive atmospheres or where contact with flame is a possible hazard.

* Note : Pyrolon™ Cool Suits are for Type 4 applications only. The covered breathable rear panel has a much lower chemical barrier than the main body fabric and so the garment should not be used in any application where there is a possibility of a chemical being sprayed or splashed under the rear flap.

Physical Properties

Flame Retardency EN 14116		Index 1 : Should not be worn next to the skin			
Property	EN Standard	CE Class	Property	EN Standard	CE Class
Abrasion Resistance	EN 530	6	Anti-Static (Surface Resistance)	EN 1149-1	<2.5 x 10 ⁹ ohms
Flex Cracking	ISO 7854	5	Burst Strength	EN 13938	2
Trapezoidal Tear	ISO 9073	2	Seam Strength	EN 13935	4
Tensile Strength	EN 13934	3			
Puncture Resistance	EN 863	2			

Applies to main body only. For properties of breathable panel see Pyrolon™ Plus 2 information.

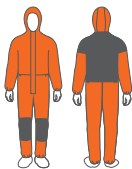
Permeation Test Data *

Chemical	CAS No.	Result / CE Class	Penetration Resistance according to ASTM F903 (see note below**)
Acetone	67-64-1	NT	>60M
Acetonitrile	70-05-8	NT	>60M
Carbon Disulphide	75-15-0	NT	>60M
Dichloromethane	75-09-2	NT	<2M
Diethylamine	209-89-7	NT	NT
Ethyl Acetate	141-78-6	NT	>60M
Hydrofluoric Acid	7664-39-3	1	(at 48% sol'n) >60M
n-Hexane	110-54-3	NT	>60M
Methanol	67-56-1	>480 mins / 6	>60M
Sodium Hydroxide (30%)	1310-73-2	>480 mins / 6	(at 40 and 50% sol'n) >60M
Sulphuric Acid (96%)	7664-93-9	1	45M
Tetrahydrofurane	109-99-9	NT	>60M
Toluene	95-47-6	NT	>60M

* NB = normalised breakthrough. This is the time taken for the PERMEATION RATE to reach 1.0µg/minute/cm² in controlled laboratory conditions at 23°C. It is NOT the point at which breakthrough first occurs. For safe use times see Selection Guide and PermaSURE®.

Because the primary concern for Pyrolon™ CRFR is the COMBINATION of chemical barrier and FR properties, its permeation barrier and testing is limited. However, more extensive penetration testing against a range of chemicals (according to test ASTM F903) is available on request.

Pyrolon™ CRFR Cool Suit Styles



Styles Code: ECRCF428

Coverall with elasticated hood, cuffs, waist and ankles.

Sizes: S - XXXL



Available in: Orange (with grey seams, rear panel and kneepads)



** The primary purpose of Pyrolon™ CRFR is to be worn as secondary FR protection, i.e., worn OVER a primary FR coverall to provide chemical protection whilst maintaining and improving FR protection; because the fabric does not burn or melt it does not compromise thermal protection provided by the primary FR garment worn beneath. Permeation testing measures permeation of a chemical at a molecular level in extremely small quantities (µg; micrograms; 1 microgram is one 1/1,000,000 of a gram). This may be important for chemicals that may be toxic or harmful in very small quantities or over the longer term, but less so for chemicals that have more immediate effect as a result of contact with larger amounts.

The ASTM F903 Penetration Resistance test measures penetration of larger amounts of a chemical, recording the time (up to 60

minutes) until a visible amount of chemical is seen to breach through the fabric.

While Pyrolon™ CRFR has only a limited permeation resistance to many chemicals, its resistance to penetration of larger quantities as identified by F903 is often more than 60 minutes. This might be useful information in determining suitability against some chemicals that are less harmful in smaller quantities. This may also be important where the only other option is a standard chemical suit that will burn and compromise the primary risk of thermal hazards.

Suitability of any garment for an application is solely the users responsibility and should only be determined by suitably qualified personell following a thorough risk analysis.

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.

Why?

This creates a HAZARD!

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 (see page 38).



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.



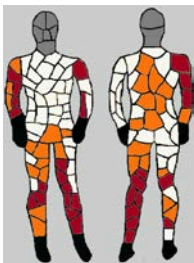
Lakeland Pyrolon™ garments use a unique viscose based fabric which will not ignite and are certified to EN 14116, However, Pyrolon™ TPCR is certified to EN 11612 and, can REPLACE a standard EN 11612 TPG and provides chemical protection to Type 3 & 4.

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	Pyrolon™ TPCR	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	✓	✓	✓	✓			
	Type 5	✓	✓					
	EN 1073	✓	✓					
	Type 4			✓	✓	✓		
	Type 3			✓	✓			
	EN 11612						✓	
	EN 1149-5	✓	✓	✓	✓	✓	✓	