

# 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 covered 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 (main suit fabric only)

Property	EN Standard	CE Class
Abrasion Resistance	EN 530	6
Flex Cracking	ISO 7854	6
Trapezoidal Tear	ISO 9073	3
Tensile Strength	EN 13934	3
Puncture Resistance	EN 863	2
Anti-Static (Surface Resistance)	EN 1149-1	Pass* (<2.5 x 10 <sup>9</sup> Ω)
Seam Strength	EN 13935	4

\* According to EN 1149-5

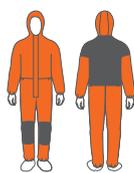
### Permeation Test Data \* (main suit fabric only)

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	Normalised Breakthrough @ 0.1µg/min/cm²	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 Cool Suit Styles



Styles Code: ECRCF428

Coverall with elasticated hood, cuffs, waist and ankles.

Sizes: SM - 3X



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 personnel following a thorough risk analysis.

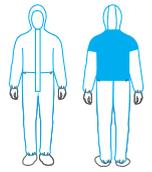
# Introduction: The Cool Suit® Principle - Breathable Protection

## What is a Cool Suit®?

What makes a protective coverall comfortable?

How do Cool Suits® work?

What Cool Suit® variations are available?



## What makes a protective coverall comfortable?

The primary influence on comfort is air-permeability - *the tendency to allow air to circulate in and out of the suit*

The only truly breathable fabric for Type 3, 4, 5 and 6 coveralls is SMS - *primarily suitable for dust and light or low level liquid splash protection.*

Claimed Moisture Vapour Transmission Rate(MVTR) is not air-permeability or true breathability and has only a very limited effect on comfort.  
*Comfort needs air-permeability*

Fabrics with an effective barrier cannot also feature high air permeability.  
*You can have an effective barrier or high air permeability... but not both*

Lakeland Cool Suits are a coverall design which combines high breathability fabrics with high-protection fabrics for Type 4, 5 and 6 protection.

## How do Cool Suits® work?



All Cool Suits® feature a rear panel of highly air-permeable fabric.

Air can circulate in and out of the coverall through the breathable panel, keeping the wearer more cool and comfortable.

In the case of Type 4 Chemical Protective Cool Suits®, the breathable panel is protected by a cover sealed at top and the sides and left open at the bottom.



The critical protection areas - the **torso** front, the **legs**, the **arms** and **hood** use Lakeland's effective range of protective fabrics, depending on protection type.

The 'Bellows Effect', the movement of air inside the suit created by movement helps pump air in and out of the suit through the breathable panel.

**Type 4 Cool Suit Protection:** Most chemical protective applications are Type 4 and NOT Type 3. Distinguishing between the two can have benefits in terms of comfort and cost.  
*See Lakeland 'Guide to Chemical Suit Selection' for more info.*

## What Cool Suits® options are available?



Type 5 & 6 Protection



Type 4 Chemical Protection



Type 4 Chemical Protection with FR



MicroMax® NS Cool Suit



MicroMax® TS Cool Suit



ChemMax® 1 Cool Suit



ChemMax® 3 Cool Suit



Pyrolon™ CRFR Cool Suit