## Lakeland Disposable and Chemical Clothing Performance and Selection

### Quick Reference Guide

**General Protection**
- Dirt, Oil and Grease
- Hazardous Dry Particulates
- Non-hazardous Liquids
- Welding, Cutting and Grinding

**Aerosol Spray**
- Non-hazardous Liquids (Aerosol)
- Paint and Hazardous Liquids – Spray
- Dry Particle - Aerosols

**Chemical Splash**
- Low Exposure, Low Risk Chemical Splash
- High Exposure / High Risk

**Hazmat**
- Hazmat, NFPA Certified
- Hazmat, Maritime
- Hazmat, Non-Certified

**Flame Resistance**
- Flammable Environments (Aerosol)
- Flammable Liquids
- Chemical Flash Fire

**Critical Environment / Biohazard**
- Clean Rooms
- Paint Booth
- Bloodborne Pathogens [4]
- Waste Water Treatment

<table>
<thead>
<tr>
<th>Relative Performance</th>
<th>Comfort</th>
<th>Barrier</th>
<th>Durability</th>
</tr>
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<tr>
<td></td>
<td>5</td>
<td>1</td>
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### Chart Key

- Pyrolon® family of products must be worn over thermally protective garments, such as FR Cotton or FR meta aramids
- Interceptor® is available certified for NFPA 1991 and CE Type 1
- Relative Ratings: 1 is lowest, 5 highest, based on EN/ISO test results and relative difference between fabrics
- Lakeland recommends sealed seams for protection against infectious diseases
- = May meet requirements depending on degree of hazard
- = Best seller for application
- Available Seams
  1. **Serged Seam**
     - Joins two pieces of material with a thread that interlocks.
     - Economical stitching method for general applications
     - Generally not used for chemical protective clothing and commonly found on disposable clothing
  2. **Sewn and Bound Seam**
     - Joins two pieces of material with an overlay of similar material
     - Chain stitched through all of the layers for a clean finished edge
     - Provides increased holdout of liquids and dry particulates
  3. **Heat Sealed Seam**
     - Sewn and then sealed with a heat activated tape
     - Provides liquid proof seams, and is especially useful for Level A and B chemical protective clothing.
ZoneGard®
• 38 gram heavy Spunbonded Polypropylene
• Entry level garment for dirty work

SafeGard® SMS
• 45 gram Spunbonded Meltblown Spunbonded Polypropylene
• High breathability
• Good barrier to dry particulates, aerosols and light liquid hazards

MicroMax® NS
• Microporous Film laminated to Polypropylene substrate
• Excellent barrier to dry particulates and liquid hazards
• Blood-borne pathogen/viral barrier tested
• Top seller in the industrial market category; refer to Additional Reference Material [1] [2] [4]

MicroMax®
• Same protection as MicroMax® NS with the addition of a rip-stop scrim for added durability.

MicroMax® Cool Suit:
• Breathable SMS back panel
• Best combination for comfort and barrier

Pyrolon® Plus 2
• Flame Resistant
• Dry and light liquid splash protection
• Meets NFPA 2113 requirements

Pyrolon® XT
• Same as Pyrolon Plus 2 with rip-stop scrim for added durability

Pyrolon® CRFR
• Chemical Resistant and Flame Resistant
• Excellent for protection against flammable liquids
• Specifically designed for petrochemical, refinery and utility applications
• Meets NFPA 2113 requirements
• For further information refer to [2]

ChemMax® 1
• Polyethylene coated Polypropylene fabric
• Good hold out to acids and bases
• Economical and lightweight

ChemMax® 2
• Dow Saranex® 23P film laminated to bi-component spunbond nonwoven
• Moderate to high chemical resistance
• Very good choice for chemical handling and environmental clean-up

ChemMax® 3
• Softer feel
• Excellent choice for Petrochemical and Hazmat operations
• Chemical Warfare Agent tested

ChemMax® 4
• 6 layer protective barrier film protection
• Superior chemical resistance
• Soft flexible feel not found in competitive fabrics
• Excellent choice for Hazmat and Petrochemical operations

Interceptor®
• Lakeland’s highest level of chemical protection
• NFPA 1991 and CE type 1 certified
• Level A configurations for gas/vapor hazards
• Also available in non-level A configurations

Additional Reference Material Available at www.lakeland.com/resources.html

Literature
[4] Disposable Clothing Case Study
[5] Pyrolon® Plus 2 Disposable FR Garments
[6] Pyrolon® Plus 2 vs FR Alternatives
[7] Pyrolon® Plus 2 Repellency

Comparative Chemical Fabric Performance Data

<table>
<thead>
<tr>
<th>Test Method</th>
<th>ChemMax® 1</th>
<th>ChemMax® 2</th>
<th>ChemMax® 3</th>
<th>ChemMax® 4</th>
<th>Interceptor®</th>
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<tbody>
<tr>
<td>Basis Weight</td>
<td>ASTM D3776-90 &amp; D751</td>
<td>2.29 oz/y²</td>
<td>4.3 oz/y²</td>
<td>4.5 oz/y²</td>
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<tr>
<td>Thickness</td>
<td>D1777-75</td>
<td>15 mil</td>
<td>16 mil</td>
<td>16 mil</td>
<td>24 mil</td>
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<tr>
<td>Trapezoidal Tear MD</td>
<td>ASTM D5733</td>
<td>14 lbf</td>
<td>12 lbf</td>
<td>26 lbf</td>
<td>52 lbf</td>
</tr>
<tr>
<td>Trapezoidal Tear XD</td>
<td>ASTM D5733</td>
<td>14 lbf</td>
<td>13 lbf</td>
<td>20 lbf</td>
<td>37 lbf</td>
</tr>
</tbody>
</table>

ASTM F1001 Permeation Times: Green denotes >480 minutes

Chemical | CAS Number | Physical State | Penetration Result
---|---|---|---
Acetone | 64-19-7 | Liquid | >60
Acetonitrile | N/A | Liquid | >60
Anhydrous Ammonia | 7664-41-7 | Liquid | >60
1,3 Butadiene | N/A | Liquid | >60
Carbon Disulfide | 75-18-3 | Liquid | >60
Chlorine | 7647-14-5 | Liquid | >60
Dichloromethane | 75-09-2 | Liquid | >60
Dicylamine | N/A | Liquid | >60
Dimethyl Formamide | 62-93-3 | Liquid | >60
Ethyl Acetate | 141-78-6 | Liquid | >60
Ethylene Oxide | 75-07-0 | Liquid | >60
n-Hexane | 110-54-3 | Liquid | >60
Hydrogen Chloride | 7782-50-5 | Liquid | >60
Methanol | 67-56-1 | Liquid | >60
Methyl Chloride | 75-09-2 | Liquid | >60
Nitrobenzene | 108-95-2 | Liquid | >60
Sodium Hydroxide | 1310-73-2 | Liquid | >60
Sulfuric Acid | 7664-93-9 | Liquid | >60
Tetrachloroethylene | 79-01-6 | Liquid | >60
Tetrahydrofuran | 109-89-5 | Liquid | >60
Toluene | 108-88-3 | Liquid | >60

Pyrolon® CRFR Penetration Data, 2.5 Mil, ASTM F903

Challenge Chemical | CAS Number | Physical State | Penetration Result
---|---|---|---
Acetone | 67-64-1 | Liquid | >60
Benzen | 71-43-2 | Liquid | >60
Diesel Fuel | N/A | Liquid | >60
Crude Oil | N/A | Liquid | >60
Hydrochloric Acid | 7647-01-0 | Liquid | >60
Sodium Hydroxide, 50% | 1310-73-2 | Liquid | >60

Note: A complete listing of all chemicals that have been tested, and their performance data, can be found at: www.lakeland.com/chemmax-chemical-search.html

ATTENTION!
As always, decisions regarding choice and usage of chemical protective clothing for a particular situation must be made by trained and qualified safety professionals in accordance with OSHA and EPA rules and regulations. Please see Warranty and Warnings on pages 20-21 of the Lakeland Disposable and Chemical Protective Clothing Buyers Guide for complete details.

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