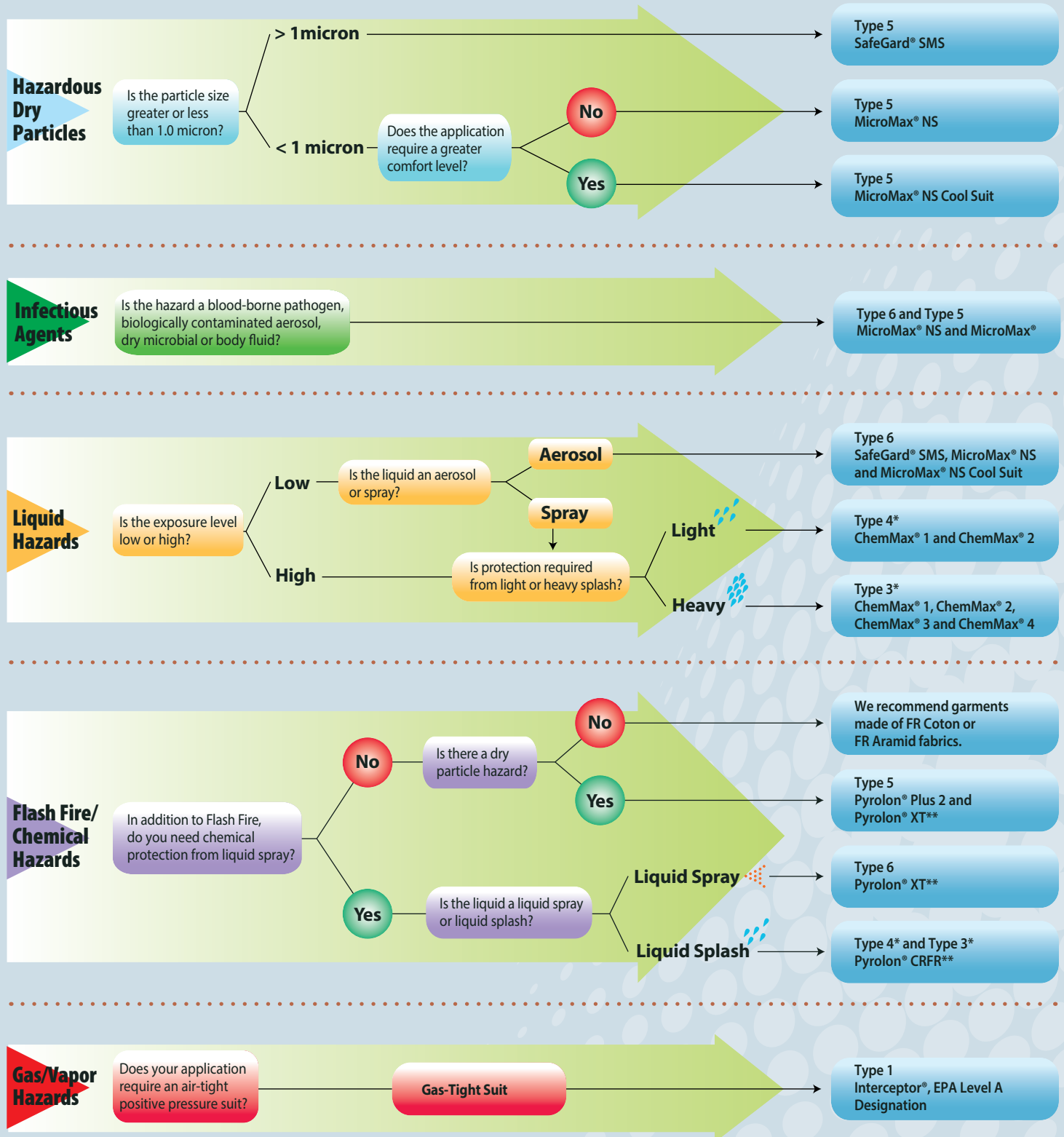


Lakeland Disposable and Chemical Selection Flowchart



* For details on Type 4 and Type 3 solutions, contact your Lakeland Sales Representative or call Customer Service at 800-645-9291.

** Must be worn over thermally protective clothing, such as fire resistant cottons, aramids or modacrylics.

*** Refer to permeation data on next page for which ChemMax® is indicated for a given hazard.

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.



		ZoneGard®	SafeGard®	MicroMax®	MicroMax® NS	Pyrolon® Plus 2 [1]	Pyrolon® XT [1]	Pyrolon® CRPR [1]	ChemMax® 1 Serged Seam	ChemMax® 1 Bound Seam	ChemMax® 1 Heat Sealed Seam	ChemMax® 2 Bound Seam	ChemMax® 2 Heat Sealed Seam	ChemMax® 3	ChemMax® 4	Interceptor® [2]
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			•	•			•	•	★	•	•	•	•	•	•
Relative Performance [3]	Comfort	5	4	2	2	4	4									
	Barrier	1	2	5	5	2	2									
	Durability	1	4	4	3	3	4									

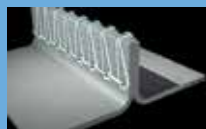
Chart Key

- [1] Pyrolon® family of products must be worn over thermally protective garments, such as FR Cotton or FR meta aramids
- [2] Interceptor® is available certified for NFPA 1991 and CE Type 1
- [3] Relative Ratings: 1 is lowest, 5 highest, based on EN/ISO test results and relative difference between fabrics
- [4] Lakeland recommends sealed seams for protection against infectious diseases
- = May meet requirements depending on degree of hazard
- ★ = Best seller for application

Available Seams

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



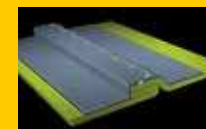
Sewn and Bound Seam

- 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



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.



Lakeland Materials & Chemical Performance Data

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
- See comparison data against Chinese FR Spun-laced and FR SMS products [3] [5] [6] [7]

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

[1] [Disposable and Chemical Protective Clothing Performance and Selection Guide](#)

[2] [Disposable and Chemical Protective Clothing Buyers Guide](#)

[3] [Pyrolon® Plus 2 vs Alternate FR Disposables Guide](#)

Videos

[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

	Test Method	ChemMax®1	ChemMax®2	ChemMax®3	ChemMax®4	Interceptor®
Basis Weight	ASTM D3776-90 & D751	2.29 oz/y ²	4.3 oz/y ²	4.5 oz/y ²	6.5 oz/y ²	9.0 oz/y ²
Thickness	D1777-75	15 mil	16 mil	16 mil	24 mil	25 mil
Trapezoidal Tear MD	ASTM D5733	14 lbf	30 lbf	26 lbf	52 lbf	44 lbf
Trapezoidal Tear XD		14 lbf	13 lbf	20 lbf	37 lbf	58 lbf
ASTM F1001 Permeation Times: Green denotes >480 minutes						
Acetone						
Acetonitrile						
Anhydrous Ammonia						
1,3 Butadiene						
Carbon Disulfide						
Chlorine						
Dichloromethane						
Diethylamine						
Dimethyl Formamide						
Ethyl Acetate						
Ethylene Oxide						
n-Hexane						
Hydrogen Chloride						
Methanol						
Methyl Chloride						
Nitrobenzene						
Sodium Hydroxide						
Sulfuric Acid						
Tetrachloroethylene						
Tetrahydrofuran						
Toluene						

Pyrolon® CRFR Penetration Data, 2.5 Mil, ASTM F903

Challenge Chemical	CAS Number	Physical State	Penetration Result
Acetone	67-64-1	Liquid	>60
Benzene	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

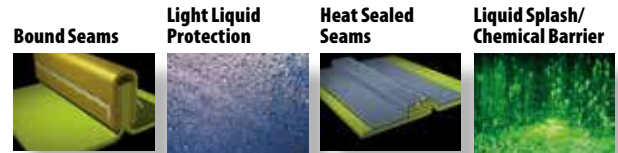
Note: A complete listing of all chemicals that have been tested, and their performance data, can be found at: www.lakeland.com/chemmax-chemical-search.html

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.



ChemMax® 2



ChemMax® 2 offers quality, value, durability and the proven protection of Dow Saranex® 23P barrier film

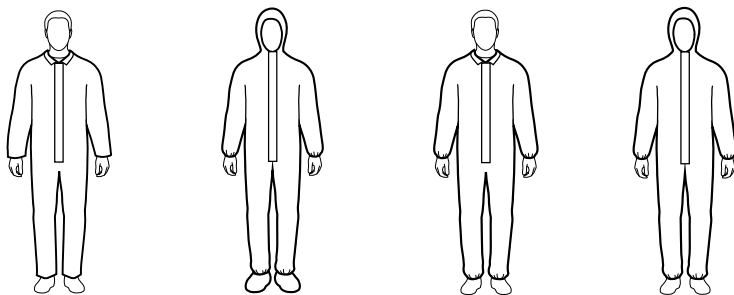
ChemMax® 2 is the second level of barrier protection in the new ChemMax® line of products from Lakeland Industries. ChemMax® 2 is a superior and economical chemical protective suit developed using the knowledge and expertise that you have come to expect from Lakeland. The unparalleled strength and softness of ChemMax® 2 features Dow Saranex® 23P film on two layers of a unique bi-component spunbond nonwoven substrate and provides protection for chemical mixing and handling, environmental clean up, hazardous materials remediation and response, pharmaceutical manufacturing, spray painting and general industry. ChemMax® 2 is useful in protecting against hazardous chemicals and contaminants found in the work place.

ChemMax® 2 Physical Properties

Property	Test Method	Units	ChemMax® 2
Basis Weight	ASTM D3776	oz/sy	4.3
Grab Tensile MD	ASTM D5034	pounds	47
Grab Tensile XD		pounds	33.9
Trapezoidal Tear MD	ASTM D5733	pounds	29.95
Trapezoidal Tear XD		pounds	12.47
Ball Burst	ASTM D751	pounds	48
Surface Resistance	EN1149-1:2006	Pass/Fail	Pass

Permeation Data for ASTM Recommended List of Chemicals for Evaluating Protective Clothing Materials (ASTM F1001)

Challenge Chemical	CAS Number	Physical State	ChemMax® 2
Acetone	67-64-1	Liquid	9
Acetonitrile	75-05-8	Liquid	<15
Ammonia Gas	7664-41-7	Gas	15
1,3-Butadiene Gas	106-99-0	Gas	>480
Carbon Disulfide	75-15-0	Liquid	imm.
Chlorine Gas	7782-50-5	Gas	>480
Dichloromethane	75-09-2	Liquid	imm.
Diethylamine	109-89-7	Liquid	imm.
Dimethyl Formamide	68-12-2	Gas	18
Ethyl Acetate	141-78-6	Liquid	21
Ethylene Oxide Gas	75-21-8	Gas	24
n-Hexane	110-54-3	Liquid	21
Hydrogen Chloride Gas	7647-01-0	Gas	>410
Methanol	67-56-1	Liquid	>480
Methyl Chloride Gas	74-87-3	Gas	>480.
Nitrobenzene	98-95-3	Liquid	45
Sodium Hydroxide, 50%	1310-73-2	Liquid	>480
Sulfuric Acid, 98%	7664-93-9	Liquid	>480
Tetrachloroethylene	127-18-4	Liquid	imm.
Tetrahydrofuran	109-99-9	Liquid	imm.
Toluene	108-88-3	Liquid	imm.



Coverall C44412 Bound Seam

- Zipper with storm flap
- Sizes:** S – 5XL
- Case Pack:** 12

Coverall C44414 Bound Seam

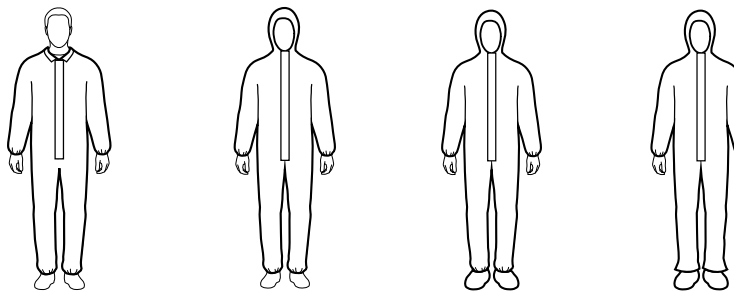
- Zipper with storm flap
- Attached hood
- Attached boots
- Elastic wrists
- Sizes:** S – 5XL
- Case Pack:** 12

Coverall C44417 Bound Seam

- Zipper with storm flap
- Elastic wrists
- Elastic ankles
- Sizes:** S – 5XL
- Case Pack:** 12

Coverall C44428 Bound Seam

- Zipper with storm flap
- Attached hood
- Elastic wrists
- Elastic ankles
- Sizes:** S – 5XL
- Case Pack:** 12



Coverall C72110 Sealed Seam

- Collar
- Storm flap over zipper.
- Elastic wrists
- Elastic ankles
- Sizes:** S – 5XL
- Case Pack:** 6

Coverall C72130 Sealed Seam

- Zipper with storm flap
- Elastic face
- Elastic wrists
- Elastic ankles
- Sizes:** S – 5XL
- Case Pack:** 6

Coverall C72150 Sealed Seam

- Zipper with storm flap
- Attached hood
- Elastic wrists
- Attached boots
- Sizes:** S – 5XL
- Case Pack:** 6

Coverall C72165 Sealed Seam

- Respirator fit hood
- Storm flap over zipper
- Attached boots with boot flaps
- Velcro® closure over zipper
- Sizes:** S – 5XL
- Case Pack:** 6

ND = None Detected

> = greater than

L = liquid

G = gas

Numbers reported are averages of samples tested by the ASTM F739 test method. Sample results do vary and therefore averages for these results are reported.

Warnings:

1. ChemMax® 2 is not flame resistant and should not be used around heat, flame sparks, or in potentially flammable or explosive environments.
2. Garments made of ChemMax® 2 should have slip resistant or anti-slip materials on the outer surface of boots, shoe covers or other garment surfaces in conditions where slipping could occur.

Note: Chemical Resistance Data is in accordance with ASTM F-739 test method. Testing is performed on fabric samples only, not finished garments. Sources for all test data are independent laboratory conditions and not actual use conditions.

Disposable and Chemical Clothing Sizing Charts

This following chart is a guide for garment selection. Proper fit varies with individual body shape and under clothing. Test garment for proper fit before use, as garment performance depends on selecting appropriate size. If you have any questions regarding your size call Lakeland Customer Service Toll Free at 800-645-9291.

ANSI/ISEA 101-2014 Recommended Sizing Chart for Limited Use Disposable Coveralls

