

DUPONT

Tychem.

EVERYDAY
HEROES
DESERVE

TO COME
HOME SAFE

TYCHEM[®]
2000 SFR

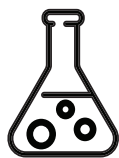
FOR
GREATER
GOOD[™]

DON'T COMPROMISE ON PROTECTION.

Why choose between flame resistance and chemical protection when you can have both?

Tychem® 2000 SFR coveralls represent a breakthrough in personal protective equipment (PPE) garment technology. They don't just help protect workers against a range of chemicals—they provide secondary flame resistance when worn over primary flame-resistant (FR) garments like those made with DuPont™ Nomex®.

Tychem® 2000 SFR coveralls add a layer of flame resistance, making them a dependable choice for keeping workers safe from both chemical and flash-fire threats.



Tychem® 2000 SFR coveralls provide protection against a multitude of inorganic acids and bases as well as a range of industrial cleaning formulations. Every garment seam is over-taped to ensure overall garment barrier performance equal to that of the fabric itself. Tychem® 2000 SFR coveralls also provide an effective barrier against hazardous dry particles larger than 0.3 micron.

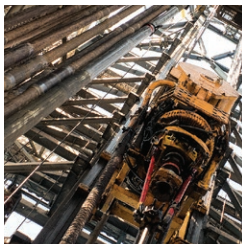


Tychem® 2000 SFR coveralls provide secondary flame resistance when worn over primary FR garments. In the event of a flash fire, they won't ignite and continue to burn after the flame source is removed and won't contribute additional burn injury if appropriate FR apparel is worn beneath. Must be worn over a primary flame-resistant garment, with additional PPE that protects a worker's face, hands and feet.

Industries



Refineries



Oil & gas



Petrochemical plants



Laboratories



Hazardous maintenance operations

Effective yet surprisingly lightweight, every pair of Tychem® 2000 SFR coveralls contains a number of protective design features.

Respirator-fit hood lined with ProShield™ 6 SFR

Covered, braided elastic at the hood

Chin flap with double-sided adhesive tape

Nylon zipper with a large metal pull

Zipper flap closure with double-sided adhesive tape

Elastic at waist (along garment back)

Over-taped seams

Covered, braided elastic at the sleeve and leg openings



A NEW GENERATION OF SECONDARY FLAME-RESISTANT CHEMICAL GARMENTS

Tychem® 2000 SFR represents a new generation of secondary flame-resistant chemical garment technology. Unlike traditional secondary flame-resistant chemical garments, Tychem® 2000 SFR garments are specially designed to meet dual-hazard needs. When worn over primary FR garments like Nomex®, Tychem® 2000 SFR offers protection against chemical splashes as well as secondary flame resistance.

The fabric used in Tychem® 2000 SFR garments is a unique technology. It doesn't char like conventional secondary FR technologies. Instead, it was designed to shrink away from flame—without burning. The results from ASTM D6413 vertical flammability testing confirm this unique Tychem® 2000 SFR fabric response.

Tychem® 2000 SFR Results, ASTM D6413 Testing

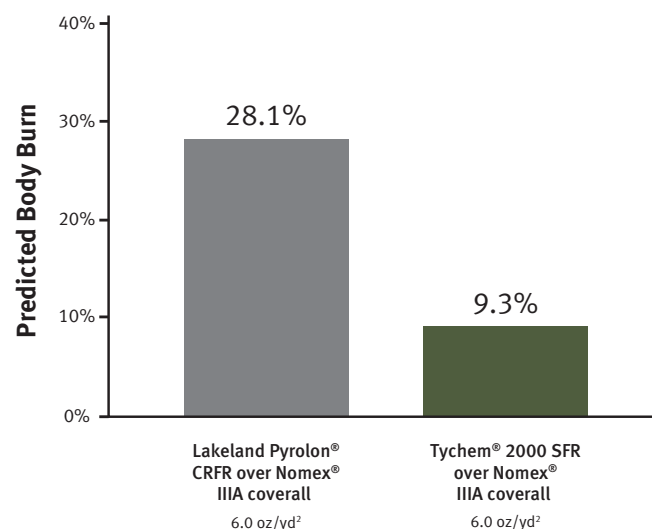
Property	Typical Results
Char Length (MD)	6.8 inch
Char Length (CD)	7.1 inch
After-flame (MD)	< 1.0 second
After-flame (CD)	< 1.0 second
Melting and Dripping	NO

MD = machine direction; CD = cross direction

We engineered Tychem® 2000 SFR to perform well in flame engulfment scenarios, which should be the main factor in the selection of any secondary FR garment. The garment's design and component selection were enhanced by extensive ASTM F1930 (instrumented thermal manikin) testing during product development.

The commercial Tychem® 2000 SFR garment demonstrates excellent performance. In fact, when tested side-by-side with competing garments (including Lakeland Pyrotron® CRFR), Tychem® 2000 SFR garments yield a much lower predicted body burn level and much less afterflame.

Test Results per ASTM F1930 Method with 4-Second Exposure (Average of 3 Replicates)



We have not yet validated the effectiveness of Tychem® 2000 SFR in electrical arc flash hazards.



PROVIDES CHEMICAL
AND SECONDARY FR
PROTECTION

PERMEATION TESTED
AGAINST A RANGE
OF CHEMICALS



MEANT TO BE
WORN OVER
PRIMARY FR GARMENTS

SELF-EXTINGUISHING
DESIGNED FOR FLAME
ENGULFMENT SCENARIOS



SHRINKS AWAY
FROM FLAME AND
DOES NOT CHAR



BETTER BODY
BURN RESULTS
THAN COMPETING GARMENTS



TYCHEM[®] 2000 SFR FABRIC PERFORMANCE

Comparison of Permeation Test (ASTM F739) Results

SOURCE FABRIC			Tychem [®] 2000 SFR	Pyrolon [®] CRFR
Chemical Name (Concentration)	CAS #	Chemical Phase	Normalized Breakthrough Time (minutes) at 0.1 µg/cm ² /min	
Black Liquor (mixture)	Mixture	Liquid	>480	Not reported
Chromic Acid (60-62%)	1333-82-0	Liquid	>480	Not reported
Dimethylacetamide, N, N- (8%)	127-19-5	Liquid	>480	Not reported
Green Liquor (mixture)	Mixture	Liquid	>480	Not reported
Hydrochloric Acid (37%)	7647-01-0	Liquid	54	Not reported
Hydrofluoric Acid (48-51%)	7664-39-3	Liquid	400	Not reported
Hydrogen Peroxide (70%)	7722-84-1	Liquid	>480	Not reported
Lithium Hydroxide (20%)	1310-65-2	Liquid	>480	Not reported
Nitric Acid (70%)	7697-37-2	Liquid	203	Not reported
Potassium Hydroxide (45%)	1310-58-3	Liquid	>480	Not reported
Sodium Hydroxide (50%)	1310-73-2	Liquid	>480	Not reported
Sodium Hypochlorite (15%)	7681-52-9	Liquid	>480	Not reported
Sulfuric Acid (>95%)	7664-93-9	Liquid	>480	Not reported
White Liquor (mixture)	Mixture	Liquid	>480	Not reported

Comparison of Penetration Test (ASTM F903, Procedure C) Results

SOURCE FABRIC	Tychem [®] 2000 SFR	Pyrolon [®] CRFR
Chemical Name (Concentration)	Time to Penetrate (minutes)	
Acetone (>95%)	>60	>60
Acetonitrile (>95%)	>60	>60
Benzene (>95%)	>60	>60
Carbon Disulfide (>95%)	>60	>60
Crude Oil (>95%)	>60	>60
Dichloromethane (>95%)	>60	Not reported
Diesel Fuel (>95%)	>60	>60
Ethyl Acetate (>95%)	>60	>60
n-Hexane (>95%)	>60	>60
1, 1, 2, 2-Tetrachloroethylene (>95%)	>60	>60
Toluene (>95%)	>60	>60

Note: ASTM F903 Procedure C=0 psi for 5 min., 2 psi for 1 min. and 0 psi for 54 min. Information on Pyrolon[®] CRFR is from Lakeland's U.S. website.

IF CHEMICAL PROTECTION IS YOUR GOAL, PERMEATION IS YOUR TEST.

When selecting PPE for chemical hazard protection, there are a range of garment fabric technologies available.

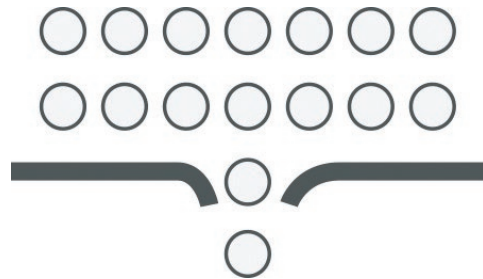
The two most-cited test methods for protective garment fabrics are ASTM Method F903, *Standard Test Method for Resistance of Materials Used in Protective Clothing to Penetration by Liquids* and ASTM Method F739, *Standard Test Method for Permeation of Liquids and Gases through Protective Clothing Materials under Conditions of Continuous Contact*.

While both are official ASTM test methodologies, permeation is the more rigorous test and represents the actual evaluation of a fabric's chemical resistance.

The bottom line is that permeation tests are best suited for testing the chemical resistance of protective garment fabrics from hazardous liquids and vapors. DuPont publishes permeation data for its chemical protective garments.

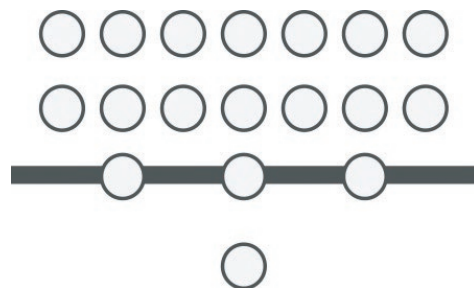
Penetration

The bulk passage of a chemical through a pore, seam, defect or other opening in the barrier material.



Permeation

The absorption, diffusion and desorption of a chemical through a barrier material at the molecular level.





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