Tychem® SL

Lightweight protection of Tyvek® laminated with a chemical-resistant Saranex® film.

Tychem® SL delivers effective protection against a range of chemical environments. Tychem® SL, utilizing Saranex® 23-P film laminated to Tyvek® brand protective material, is a lightweight, comfortable garment specifically designed for easy wear. Tychem® SL is ideal for chemical mixing, remediation, emergency medical response, paint spraying, and radioactive environments.

Nuclear Environments

A study was conducted by Southwest Research Institute on the fabrics commonly used in potentially radioactive environments. The study of the fabrics' ability to prevent tritiated water vapor and tritium gas penetration showed Tychem® SL was 150 times better than PVC after three hours of exposure. The study states, "when it is desired to avoid all penetration of tritium, data suggest that the wearer may work three hours in Tychem® SL, as opposed to only half an hour in other fabrics".

Tychem® SL is used in a variety of industries, including environmental clean-up operations, waste management, industrial plants, cleanroom applications, hazardous material response teams and other emergency services. General garment construction/wear guidelines should be followed according to the specific application.[1]

Visibility

When workers wear high-visibility colors it improves how well they can be recognized and distinguished from the background. Obviously, safety is enhanced when workers can clearly see co-workers. The Tychem® SL standard white color provides the highest level of visibility in low and dim light; however, it may have low contrast. White garments provide high contrast visibility in wooded areas and low contrast against snow. In a laboratory study, Tychem® SL received high overall ratings for visibility for dim light and bright light. Contrast was low against bright, light colored backgrounds, but very high against dark and outdoor backgrounds.[2]

Durability

Tychem® SL is rugged and durable even in cold temperatures. Tychem® SL offers little change in stiffness when exposed to extreme cold temperatures (-65˚C to 20˚C or -85˚F to 68˚F) as measured per ASTM D747.

Permeation

Tychem® SL is the only fabric laminated with Saranex® for which DuPont provides permeation data and technical support. DuPont provides permeation data and detailed information on how our fabrics perform against chemical classes in a variety of forms. You can choose Fax-On-Demand, website, CD-Rom or our ever popular printed Permeation Guide[3] for DuPont Tychem® Protective Fabrics.

DUPONT®

Tychem® SL

CHEMICAL PROTECTIVE CLOTHING

Tychem® SL

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

CHEMICAL NAME	PHYSICAL PHASE	AVERAGE NORMALIZED BREAKTHROUGH TIME (minutes)	AVERAGE PERMEATION RATE (µg/cm²/minute)
Acetone	L	24	1.6
Acetonitrile	L	12	2.8
Ammonia	G	32	0.15
1,3-Butadiene	G	>480	<0.02
Carbon disulfide	L	immed.	>50
Chlorine	G	>480	<0.01
Dichloromethane	L	immed.	>50
Diethylamine	L	12	>50
N,N-Dimethylformamide	L	112	0.85
Ethyl acetate	L	14	0.54
Ethylene oxide	G	immed.	8.4
n-Hexane	L	146	0.48
Hydrogen chloride	G	>480	<0.1
Methanol	L	>480	<0.001
Methyl chloride	G	>480	<0.006
Nitrobenzene	L	102	2.3
Sodium hydroxide, 50%	L	>480	<0.1
Sulfuric acid (conc.)	L	>480	<0.1
1,1,2,2-Tetrachloroethylene	L	immed.	5.7
Tetrahydrofuran	L	immed.	>50
Toluene	L	immed.	25

INDEX OF CODES:

> = greater than, **<** = less than,
L = liquid, **G** = gas,
Immed. = immediate (<10 minutes)

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.

This information is based upon technical data that DuPont believes to be reliable. It is subject to revision as additional knowledge and experience are gained. DuPont makes no guarantee of results and assumes no obligation or liability in connection with this information.

It is the user's responsibility to determine the level of toxicity and the proper personal protective equipment needed. The information set forth herein reflects laboratory performance of fabrics, not complete garments, under controlled conditions. It is intended for information use by persons having technical skill for evaluation under their specific end-use conditions, at their own discretion and risk.

Anyone intending to use this information should first verify that the garment selected is suitable for the intended use. In many cases, seams and closures have shorter breakthrough times and higher permeation rates than the fabric. Please contact the garment manufacturer for specific data. If fabric becomes torn, abraded or punctured, end user should discontinue use of garment to avoid potential exposure to chemical. SINCE CONDITIONS OF USE ARE OUTSIDE OUR CONTROL, WE MAKE NO WARRANTIES, EXPRESSED OR IMPLIED, INCLUDING, WITHOUT LIMITATION, NO WARRANTIES OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR USE AND ASSUME NO LIABILITY WHATSOEVER IN CONNECTION WITH ANY USE OF THIS INFORMATION.

This information is not intended as a license to operate under or a recommendation to infringe any patent or technical information of DuPont or others covering any material or its use.

WARNINGS:

1) Tychem® SL is not flame-resistant and should not be used around heat, flame, sparks, or in potentially flammable or explosive environments.

2) Garments made of Tychem® SL should have slip-resistant or antislip materials on the outer surface of boots, shoe covers or other garment surfaces in conditions where slipping could occur.

For more information:

Visit our website at:
www.DuPontProtectiveApprl.com

For specific permeation data and breakthrough times for other chemicals:

DuPont Protective Apparel Fax-On-Demand Service
1-800-558-9329

The DuPont Tyvek® business manufactures a complete line of chemical protective fabrics made of Tychem® and fabric made of Tyvek® for dry particulate protection. Call for more information:

1-877-797-5907

DUPONT®
Tychem®
CHEMICAL PROTECTIVE CLOTHING

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H-91469 7/01 30M

Tychem® SL

Common Industrial Chemicals

CHEMICAL NAME	PHYSICAL STATE	CAS #	AVERAGE NORMALIZED BREAKTHROUGH TIME[1A]
Acetic acid	L	64-19-7	>480
Acetic anhydride	L	108-24-7	>480
Acrylic acid	L	79-10-7	>480
Acrylonitrile	L	107-13-1	>480
Ammonia	L	7664-41-7	>480
Ammonium hydroxide, 28%-30%	L	1336-21-6	>480
Benzene	L	71-43-2	74
Benzo[a]pyrene	S	50-32-8	>480
Black liquor	L	123465-36-1	>480
Chemidize 727 ND	L	mixture	>480
Chlorine, 20 ppm	G	7782-50-5	>480
Chloroacetone	L	78-95-5	>480
Chromic acid, 60%	L	1333-82-0	>480
o-Cresol	L	95-48-7	>480
Crude oil	L	8002-05-9	>480
1,1-Dichlorotetrafluoroethane	L	374-07-2	>480
Diethylaniline crude	L	91-66-7	>480
Diethyl-m-toluidine crude	L	91-67-8	>480
Ethylene glycol	L	107-21-1	>480
Formalin (Formaldehyde 37%)	L	50-00-0	>480
Formic acid	L	64-18-6	>480
Fuel oil	L	mixture	>480
Gluteraldehyde, 5% aqueous solution	L	111-30-8	>480
Green liquor	L	68131-30-6	>480
Hexamethyldisilizane	L	999-97-3	>480
Hydrazine	L	302-01-2	>480
Hydrochloric acid, 37%	L	7647-01-0	>480
Hydrofluoric acid, 48%	L	7664-39-3	>480
Iodine	S	7553-56-2	>480
Mercuric chloride, sat. sol. in water	L	7487-94-7	>480
Mercury	L	7439-97-6	>480
Methanesulfonic acid	L	75-75-2	>480
Methanol	L	67-56-1	>480
Methyl bromide	G	74-83-9	>480
Methyl chloride	G	74-87-3	>480
Methyl ethyl ketoxime	L	96-29-7	>480
Methyl t-butyl ether	L	1634-04-4	>480
n-Methyl-2-pyrrolidone	L	872-50-4	>480
4,4'-Methylene bis (o-chloroaniline), sat. sol. in methanol	L	101-14-4	>480
Mineral oil	L	8012-95-1	>480
Mineral spirits	L	64475-85-0	>480
Nicotine	L	54-11-5	450
Nitric acid, 70%	L	7697-37-2	>480
Nitrogen dioxide	G	10102-44-0	>480
Oleum, 40% free SO_3	L	8014-95-7	>480
PCB	L	11097-69-1	>480
PCB 1%, Mineral spirits 99%	L	11097-69-1	>480
PCB 50%, Mineral oil 50%	L	11097-69-1	>480
PCB 50%, Trichlorobenzene 50%	L	11097-69-1	>480
PCB gas condensate	L	11097-69-1	401
Phenol, 85%	L	108-95-2	>480
Phenyl ethyl alcohol	L	98-85-1	>480
Phosphoric acid, 85%	L	7664-38-2	>480
Potassium acetate, sat. sol. in water	L	127-08-2	>480
Sodium hydroxide, 50%	L	1310-73-2	>480
Sodium hypochlorite, 17%	L	7681-52-9	>480
Sodium hypochlorite, 5.25%	L	7681-52-9	>480
Sulfur dioxide	G	7446-09-5	>480
Sulfuric acid	L	7664-93-9	>480
1,1,1,2-Tetrafluoroethane	L	811-97-2	>480
Toluene-2,4-diisocyanate	L	584-84-9	>480
Triethylamine	L	121-44-8	>480
White liquor	L	68131-33-9	>480

> = greater than, **L** = liquid, **G** = gas, **S** = solid

[1A] Average Normalized Breakthrough Time shown in minutes

Chemical Warfare Agents

AGENT	TIME	CUMULATIVE PERMEATION	PROTOCOLS
HD, Sulfur Mustard	3 hours	<0.1 µg/cm²	DN3
L, Lewisite	6 hours	<0.1 µg/cm²	DN3
GB, Sarin	6 hours	<0.00012 µg/cm²	DN5
VX	12 hours	<0.00012 µg/cm²	DN5

Applied at 10g/m² in 1µL drops at 22°C, 50% RH

< = less than

Physical Properties of Tychem® SL

Total Basis Weight ASTM D3776-90	3.6 oz/yd²
Thickness ASTM D1777-75	13 mils
Mullen Burst ASTM D3786-87	73 psi
Breaking Strength Grab (md/cd) ASTM D5034-90	47/50 lbs
Tearing Strength Trapezoid (md/cd) ASTM D1117-80	9/8 lbs

Tychem® SL is available in many styles, from coveralls and aprons to fully encapsulated Level B suits.

Biohazards

Tychem® SL provides excellent resistance against blood, body fluid and viral contaminants, and passes ASTM F1670 for synthetic blood penetration and ASTM F1671 for viral penetration.

Pesticides

To determine the appropriate garment for a liquid application, read the EPA Product Registration Label. If the signal word is "CAUTION" or "WARNING" (only one will be listed), Tychem® QC may be the appropriate choice. If the signal word is "DANGER", Tychem® SL may be appropriate.

[1] General Garment Specification/Wear Guidelines:

Potential for light splash AND no pressure—Select serged seam construction for small volumes of fluids with minimal or no pressure.

Potential for light to moderate splash—Select bound seams that are tightly sewn and have a reinforced outer binding to enhance seam strength and barrier quality.

Potential for moderate to heavy splash—Select sewn and taped seams that offer higher strength and penetration resistance. All apparel used in liquid applications should have bound or sealed seams. A storm flap that covers zipper/closure area should also be considered. In the event of a splash or drench, the contaminated garment should be removed and clean apparel donned.

[2] ASTM D747—"Apparent Bending Modulus of Plastic by Means of a Cantilever Beam".

[3] Permeation Guide for DuPont Tychem® & DuPont StaSafe® Protective Fabrics.

Tychem® SL fabric is also available in gray.
Minimum order requirements may be applicable.