

# DuPont™ Tychem® TK , TKGEVJTYL00



## Product Description

DuPont™ Tychem® TK. Gas-tight suit with attached boots. Attached double gloves (removable). For use with SCBA. Wide panoramic visor. Lime Yellow.

## Certifications

- Chemical protective clothing, Category III, Type 1a-ET, limited use
- Certified according to EN 943-2 (protective clothing against liquid and gaseous chemicals)

## Packaging ( Quantity/Box )

1 per box

Size	Article Number	Chest Girth(cm)	Body Height(cm)	Chest Girth(in)	Body Height(ft/in)
SM	D15172596	88-96	163-175	35"-38"	5'4"-5'9"
MD	D13495380	96-104	169-182	38"-41"	5'6.5"-5'11.5"
LG	D13495378	104-112	176-188	41"-44"	5'9"-6'2"
XL	D13495396	112-124	182-194	44"-49"	5'11.5"-6'4"
2X	D13495360	124-136	188-200	49"-53.5"	6'2"-6'7"

Reference Number: TKGEVJTYL00

## Physical Properties

Property	Test Method	Result	EN Class
Colour	N/A	Lime yellow	N/A
Basis Weight	DIN EN ISO 536	400 g/m <sup>2</sup>	N/A
Thickness	DIN EN ISO 534	730 µm	N/A
Abrasion Resistance <sup>7</sup>	EN 530 Method 2	>2000 cycles	6 of 6 <sup>1</sup>
Flex Cracking Resistance <sup>7</sup>	EN ISO 7854 Method B	>1000 cycles	1 of 6 <sup>1</sup>
Flex Cracking Resistance at -30 °C	EN ISO 7854 Method B	>500 cycles	3 of 6 <sup>1</sup>
Trapezoidal Tear Resistance (MD)	EN ISO 9073-4	164 N	5 of 6 <sup>1</sup>
Trapezoidal Tear Resistance (XD)	EN ISO 9073-4	215 N	5 of 6 <sup>1</sup>
Tensile Strength (MD)	DIN EN ISO 13934-1	519.6 N	4 of 6 <sup>1</sup>
Tensile Strength (XD)	DIN EN ISO 13934-1	482.9 N	4 of 6 <sup>1</sup>
Puncture Resistance	EN 863	49 N	2 of 6 <sup>1</sup>
Resistance to Water Penetration	DIN EN 20811	>30 kPa	N/A
Surface Resistance at RH 25%, inside <sup>7</sup>	EN 1149-1	No antistatic treatment	N/A
Surface Resistance at RH 25%, outside <sup>7</sup>	EN 1149-1	No antistatic treatment	N/A
Resistance to Flame <sup>7</sup>	EN 13274-4 Method 3	No droplets, no burning, no hole formation	2 of 3 <sup>1</sup>

<sup>1</sup> According to EN 14325    <sup>2</sup> According to EN 14126    <sup>3</sup> According to EN 1073-2    <sup>4</sup> According to EN 14116    <sup>12</sup> According to EN 11612    <sup>5</sup> Front Tyvek ® / Back    <sup>6</sup> Based on test according to ASTM D-572    <sup>7</sup> See Instructions for Use for further information, limitations and warnings    > Larger than    < Smaller than    N/A Not Applicable    STD DEV Standard Deviation

## Garment Performance

Property	Test Method	Result	EN Class
Type 1: Performance Requirements for Gastight Suits (Type 1a)	EN 943-2	Pass	N/A
Seam Strength	ISO 5082	607 N	5 of 6 <sup>1</sup>
Shelf Life <sup>7</sup>	N/A	5 years <sup>6</sup>	N/A

<sup>1</sup> According to EN 14325    <sup>3</sup> According to EN 1073-2    <sup>12</sup> According to EN 11612    <sup>13</sup> According to EN 11611    <sup>5</sup> Front Tyvek ® / Back    <sup>6</sup> Based on test according to ASTM D-572    <sup>7</sup> See Instructions for Use for further information, limitations and warnings    <sup>11</sup> Based on the average of 10 suits, 3 activities, 3 probes    > Larger than    < Smaller than    N/A Not Applicable    \* Based on lowest single value

## Comfort

Property	Test Method	Result	EN Class
Air Permeability (Gurley method)	ISO 5636-5	No	N/A
Moisture Vapour Permeability	EN ISO 12752 Klima C	Impermeable	N/A

2 According to EN 14126 5 Front Tyvek © / Back > Larger than < Smaller than N/A Not Applicable

## Permeation Data for Tychem® 10000

Hazard Name	Physical State	CAS	BT Act	BT 0.1	BT 1.0	EN	SSPR	MDPR	Cum 480 Time 150	ISO	
Acetaldehyde	Liquid	75-07-0	>480	>480	>480	6	<0.01	0.01	<4.8	>480	6
Acetic acid (>95%)	Liquid	64-19-7	>480	>480	>480	6	<0.01	0.1	<48	>480	6
Acetic acid 2 ethoxy ethyl ester	Liquid	111-15-9	>480	>480	>480	6	<0.0023	0.0023	<1.1	>480	6
Acetic acid 2 methoxy ethyl ester	Liquid	110-49-6	>480	>480	>480	6	<0.01	0.01	<4.8	>480	6
Acetic acid ethenyl ester	Liquid	108-05-4	>480	>480	>480	6	<0.01	0.01	<4.8	>480	6
Acetic acid ethyl ester	Liquid	141-78-6	>480	>480	>480	6	<0.06	0.06	<28.8	>480	6
Acetic acid pentyl ester	Liquid	628-63-7	>480	>480	>480	6	<0.003	0.003	<1.4	>480	6
Acetic anhydride	Liquid	108-24-7	>480	>480	>480	6	<0.001	0.001	<0.48	>480	6
Acetic chloride	Liquid	75-36-5	>480	>480	>480	6	<0.05	0.05	<24	>480	6
Acetone	Liquid	67-64-1	>480	>480	>480	6	<0.01	0.01	<4.8	>480	6
Acetone cyanohydrin	Liquid	75-86-5	>480	>480	>480	6	<0.01	0.01	<4.8	>480	6
Acetonitrile	Liquid	75-05-8	>480	>480	>480	6	<0.1	0.1	<48	>480	6
Acetyl chloride	Liquid	75-36-5	>480	>480	>480	6	<0.05	0.05	<24	>480	6
Acroleic acid	Liquid	79-10-7	>480	>480	>480	6	<0.06	0.06	<28.8	>480	6
Acrolein	Liquid	107-02-8	>480	>480	>480	6	<0.02	0.02	<9.6	>480	6
Acryl amide (50%)	Liquid	79-06-1	>480	>480	>480	6	<0.1	0.1	<48	>480	6
Acrylic acid	Liquid	79-10-7	>480	>480	>480	6	<0.06	0.06	<28.8	>480	6
Acrylic acid ethyl ester	Liquid	140-88-5	>480	>480	>480	6	<0.02	0.02	<9.6	>480	6
Acrylic acid n-butyl ester	Liquid	141-32-2	>480	>480	>480	6	<0.02	0.02	<9.6	>480	6
Acrylic amide (50%)	Liquid	79-06-1	>480	>480	>480	6	<0.1	0.1	<48	>480	6
Adipic acid dinitrile	Liquid	111-69-3	>480	>480	>480	6	<0.1	0.1	<48	>480	6
Adipic acid nitrile	Liquid	111-69-3	>480	>480	>480	6	<0.1	0.1	<48	>480	6
Adiponitrile	Liquid	111-69-3	>480	>480	>480	6	<0.1	0.1	<48	>480	6
Adipyl dinitrile	Liquid	111-69-3	>480	>480	>480	6	<0.1	0.1	<48	>480	6
Allyl alcohol	Liquid	107-18-6	>480	>480	>480	6	<0.1	0.1	<48	>480	6
Allyl chloride	Liquid	107-05-1	>480	>480	>480	6	<0.06	0.06	<28.8	>480	6
Amido sulfonic acid (15%)	Liquid	5329-14-6	>480	>480	>480	6	<0.01	0.01	<4.8	>480	6
Amino 2-methylpropane, 2-	Liquid	75-64-9	>480	>480	>480	6	<0.03	0.03	<14.4	>480	6
Amino 3,4-dichlorobenzene, 1-	Solid	95-76-1	>480	>480	>480	6	<0.001	0.001	<0.48	>480	6
Amino 3,4-dichlorobenzene, 1- (70 °C, molten)	Liquid	95-76-1	128*	216*	nm		2.4	0.001			
Amino benzene	Liquid	62-53-3	>480	>480	>480	6	<0.1	0.1	<48	>480	6
Amino ethanol, 2-	Liquid	141-43-5	>480	>480	>480	6	<0.1	0.1	<48	>480	6
Amino ethylethanolamine	Liquid	111-41-1	>480	>480	>480	6	<0.005	0.005	<2.4	>480	6
Amino ethylethanolamine (60%)	Liquid	111-41-1	>480	>480	>480	6	<0.005	0.005	<2.4	>480	6
Amino ethylpiperazine	Liquid	140-31-8	>480	>480	>480	6	<0.005	0.005	<2.4	>480	6
Amino propane, 2-	Liquid	75-31-0	>480	>480	>480	6	<0.01	0.01	<4.8	>480	6
Ammonia (-70 °C, liquid)	Liquid	7664-41-7	>480	>480	>480	6	<0.1	0.1	<48	>480	6
Ammonia (gaseous)	Vapor	7664-41-7	>480	>480	>480	6	<0.05	0.05	<24	>480	6
Ammonium fluoride (40%)	Liquid	12125-01-8	nm	>480	>480	6	<0.1	0.01	<4.8	>480	6

BT Act (Actual) Breakthrough time at MDPR [mins] BT 0.1 Normalized breakthrough time at 0.1 µg/cm<sup>2</sup>/min [mins] BT 1.0 Normalized breakthrough time at 1.0 µg/cm<sup>2</sup>/min [mins] EN Classification according to EN 14325  
SSPR Steady state permeation rate [µg/cm<sup>2</sup>/min] MDPR Minimum detectable permeation rate [µg/cm<sup>2</sup>/min] CUM 480 Cumulative permeation mass after 480 mins [µg/cm<sup>2</sup>] Time 150 Time to reach cumulative permeation mass of 150 µg/cm<sup>2</sup> [mins] ISO Classification according to ISO 16602 CAS Chemical abstracts service registry number mins Minutes > Larger than < Smaller than imm Immediate (< 4 min) nm Not tested sat Saturated solution N/A Not Applicable \* Based on lowest single value na Not attained 8 Actual breakthrough time; normalized breakthrough time is not available

## Permeation Data for Tychem® 10000

Hazard Name	Physical State	CAS	BT Act	BT 0.1	BT 1.0	EN	SSPR	MDPR	Cum 480 Time 150	ISO	
Amyl ester acetic acid	Liquid	628-63-7	>480	>480	>480	6	<0.003	0.003	<1.4	>480	6
Aniline	Liquid	62-53-3	>480	>480	>480	6	<0.1	0.1	<48	>480	6
Aziridine	Liquid	151-56-4	>480	>480	>480	6	<0.01	0.01	<4.8	>480	6
Azolidine	Liquid	123-75-1	407	413	nm		9.2	0.012			
Benzenamine	Liquid	62-53-3	>480	>480	>480	6	<0.1	0.1	<48	>480	6
Benzene	Liquid	71-43-2	>480	>480	>480	6	<0.0008	0.0008	<0.48	>480	6
Benzene carbonyl chloride	Liquid	98-88-4	>480	>480	>480	6	<0.05	0.05	<24	>480	6
Benzene sulfone chloride	Liquid	98-09-9	>480	>480	>480	6	<0.1	0.1	<48	>480	6
Benzene sulfonyl chloride	Liquid	98-09-9	>480	>480	>480	6	<0.1	0.1	<48	>480	6
Benzene thiol	Liquid	108-98-5	>480	>480	>480	6	<0.02	0.02	<9.6	>480	6
Benzidine (75% in Methanol)	Liquid	92-87-5	>480	>480	>480	6	<0.1	0.1	<48	>480	6
Benzo nitrile	Liquid	100-47-0	>480	>480	>480	6	<0.004	0.004	<1.9	>480	6
Benzol	Liquid	71-43-2	>480	>480	>480	6	<0.0008	0.0008	<0.48	>480	6
Benzoyl chloride	Liquid	98-88-4	>480	>480	>480	6	<0.05	0.05	<24	>480	6
Benzyl chloride	Liquid	100-44-7	>480	>480	>480	6	<0.01	0.01	<4.8	>480	6
Biphenyl 4,4'-diamine, 1,1'- (75% in Methanol)	Liquid	92-87-5	>480	>480	>480	6	<0.1	0.1	<48	>480	6
Bis (4-(2,3-epoxypropoxy)phenyl)propane	Liquid	1675-54-3	>480	>480	>480	6	<0.01	0.01	<4.8	>480	6
Bis phenol A diglycidyl ether	Liquid	1675-54-3	>480	>480	>480	6	<0.01	0.01	<4.8	>480	6
Black liquor (mix)	Liquid	308074-23-9	>480	>480	>480	6	<0.1	0.1	<48	>480	6
Boron fluoride ethyl ether	Liquid	109-63-7	>480	>480	>480	6	<0.1	0.1	<48	>480	6
Boron trifluoride	Vapor	7637-07-2	>480	>480	>480	6	<0.1	0.1	<48	>480	6
Boron trifluoride diethyl etherate	Liquid	109-63-7	>480	>480	>480	6	<0.1	0.1	<48	>480	6
Boron trifluoride etherate	Liquid	109-63-7	>480	>480	>480	6	<0.1	0.1	<48	>480	6
Bromine	Liquid	7726-95-6	15	15	15	1	25	0.01			
Bromine (10 g/m <sup>2</sup> )	Liquid	7726-95-6	>480	>480	>480	6	<0.1	0.1	<48	>480	6
Bromine (sat vapour)	Vapor	7726-95-6	30*	30*	30*	1	0.59	0.1			
Bromo 4-fluorobenzene, 1-	Liquid	460-00-4	>480	>480	>480	6	<0.0013	0.0013	<0.6	>480	6
Bromo fluorobenzene, 4-	Liquid	460-00-4	>480	>480	>480	6	<0.0013	0.0013	<0.6	>480	6
Bromo methane	Vapor	74-83-9	>480	>480	>480	6	<0.01	0.01	<4.8	>480	6
Butadiene, 1,3- (0 °C, liquid)	Liquid	106-99-0	>180	>180	>180	4	<0.01	0.01	<4.8	>480	6
Butadiene, 1,3- (gaseous)	Vapor	106-99-0	>480	>480	>480	6	<0.07	0.07	<33.6	>480	6
Butanal, n-	Liquid	123-72-8	>480	>480	>480	6	<0.1	0.1	<48	>480	6
Butanol, 1-	Liquid	71-36-3	>480	>480	>480	6	<0.002	0.002	<1	>480	6
Butanol, n-	Liquid	71-36-3	>480	>480	>480	6	<0.002	0.002	<1	>480	6
Butanone	Liquid	78-93-3	>480	>480	>480	6	<0.0067	0.0067	<3.21	>480	6
Butanone oxime, 2-	Liquid	96-29-7	>480	>480	>480	6	<0.1	0.1	<48	>480	6
Butenal, 2-	Liquid	123-73-9	nm	>480	>480	6	<0.1	0.006	<2.88	>480	6
Butyl acetate, n-	Liquid	123-86-4	>480	>480	>480	6	<0.01	0.01	<4.8	>480	6
Butyl acrylate, n-	Liquid	141-32-2	>480	>480	>480	6	<0.02	0.02	<9.6	>480	6

BT Act (Actual) Breakthrough time at MDPR [mins] BT 0.1 Normalized breakthrough time at 0.1 µg/cm<sup>2</sup>/min [mins] BT 1.0 Normalized breakthrough time at 1.0 µg/cm<sup>2</sup>/min [mins] EN Classification according to EN 14325  
SSPR Steady state permeation rate [µg/cm<sup>2</sup>/min] MDPR Minimum detectable permeation rate [µg/cm<sup>2</sup>/min] CUM 480 Cumulative permeation mass after 480 mins [µg/cm<sup>2</sup>] Time 150 Time to reach cumulative permeation mass of 150 µg/cm<sup>2</sup> [mins] ISO Classification according to ISO 16602 CAS Chemical abstracts service registry number mins Minutes > Larger than < Smaller than imm Immediate (< 4 min) nm Not tested  
sat Saturated solution N/A Not Applicable \* Based on lowest single value na Not attained 8 Actual breakthrough time; normalized breakthrough time is not available

## Permeation Data for Tychem® 10000

Hazard Name	Physical State	CAS	BT Act	BT 0.1	BT 1.0	EN	SSPR	MDPR	Cum 480	Time 150	ISO
Butyl amine	Liquid	109-73-9	>480	>480	>480	6	<0.01	0.01	<4.8	>480	6
Butyl amine, tert-	Liquid	75-64-9	>480	>480	>480	6	<0.03	0.03	<14.4	>480	6
Butyl ether, n-	Liquid	142-96-1	228	>480	>480	6	0.001	0.001	<4.8	>480	6
Butyraldehyde, n-	Liquid	123-72-8	>480	>480	>480	6	<0.1	0.1	<48	>480	6
Carbon disulfide	Liquid	75-15-0	>480	>480	>480	6	<0.02	0.02	<9.6	>480	6
Carbon monoxide	Vapor	630-08-0	330	330	>480	6	0.1	0.1			
Carbon tetrachloride	Liquid	56-23-5	>480	>480	>480	6	<0.015	0.015	<7.2	>480	6
Carbon tetrafluoride	Vapor	75-73-0	nm	>480	>480	6	<0.0177	0.0177	<8.496	>480	6
Caustic soda (50%)	Liquid	1310-73-2	>480	>480	>480	6	<0.1	0.1	<48	>480	6
Chlor allylene	Liquid	107-05-1	>480	>480	>480	6	<0.06	0.06	<28.8	>480	6
Chlordane (60-75%)	Liquid	57-74-9	>480	>480	>480	6	<0.01	0.01	<4.8	>480	6
Chlorine (-70 °C, liquid)	Liquid	7782-50-5	>180	>180	>180	4	<0.02	0.02	<9.6	>480	6
Chlorine (gaseous)	Vapor	7782-50-5	>480	>480	>480	6	<0.01	0.01	<9.6	>480	6
Chlorine sulfide	Liquid	10545-99-0	440	440	>480	6	<0.3	0.1	<48	>480	6
Chlorine trifluoride	Vapor	7790-91-2	45	45	45	2	96	0.1			
Chloro 1,2-propanediol, 3-	Liquid	96-24-2	nm	>480	>480	6	<0.0142	0.0142			
Chloro 1-methylbenzene, 2-	Liquid	95-49-8	>480	>480	>480	6	<0.0001	0.0001	<0.04	>480	6
Chloro 2,3-epoxy propane, 1-	Liquid	106-89-8	>480	>480	>480	6	<0.014	0.014	<6.72	>480	6
Chloro acetic acid (80%)	Liquid	79-11-8	nm	>480	>480	6	<0.01	0.01	<4.8	>480	6
Chloro acetyl chloride	Liquid	79-04-9	160	160	170	4	23.2	0.1			
Chloro aniline, p-	Solid	106-47-8	>480	>480	>480	6	<0.02	0.02	<9.6	>480	6
Chloro aniline, p- (70 °C, molten)	Liquid	106-47-8	272	272*	355	5	9.4	0.001			
Chloro benzenamine, 4-	Solid	106-47-8	>480	>480	>480	6	<0.02	0.02	<9.6	>480	6
Chloro benzenamine, 4- (70 °C, molten)	Liquid	106-47-8	272	272*	355	5	9.4	0.001			
Chloro benzene	Liquid	108-90-7	>480	>480	>480	6	<0.001	0.001	<0.48	>480	6
Chloro ethanol, 2-	Liquid	107-07-3	>480	>480	>480	6	<0.0082	0.0082	<3.9	>480	6
Chloro ethene	Vapor	75-01-4	>480	>480	>480	6	<0.001	0.001	<0.4	>480	6
Chloro form	Liquid	67-66-3	>480	>480	>480	6	<0.0037	0.0037	<1.7	>480	6
Chloro methyl methyl ether	Liquid	107-30-2	305	>480	>480	6	0.03	0.001			
Chloro phenol, p- (sat in Methanol)	Liquid	106-48-9	>480	>480	>480	6	<0.013	0.013	<6.24	>480	6
Chloro prene, 3-	Liquid	107-05-1	>480	>480	>480	6	<0.06	0.06	<28.8	>480	6
Chloro toluene, alpha-	Liquid	100-44-7	>480	>480	>480	6	<0.01	0.01	<4.8	>480	6
Chloro toluene, o-	Liquid	95-49-8	>480	>480	>480	6	<0.0001	0.0001	<0.04	>480	6
Chlorsulfonic acid	Liquid	7790-94-5	>480	>480	>480	6	<0.1	0.1	<48	>480	6
Chromic acid (CrO3) (44.9%)	Liquid	1333-82-0	>480	>480	>480	6	<0.07	0.07	<33.6	>480	6
Cresols, mixed isomers	Liquid	1319-77-3	>480	>480	>480	6	<0.01	0.01	<4.8	>480	6
Cresylic acid	Liquid	1319-77-3	>480	>480	>480	6	<0.01	0.01	<4.8	>480	6
Croton aldehyde	Liquid	123-73-9	nm	>480	>480	6	<0.1	0.006	<2.88	>480	6
Crude oil, California	Liquid	8002-05-9	>480	>480	>480	6	<0.04	0.04	<19.2	>480	6

BT Act (Actual) Breakthrough time at MDPR [mins] BT 0.1 Normalized breakthrough time at 0.1 µg/cm<sup>2</sup>/min [mins] BT 1.0 Normalized breakthrough time at 1.0 µg/cm<sup>2</sup>/min [mins] EN Classification according to EN 14325  
SSPR Steady state permeation rate [µg/cm<sup>2</sup>/min] MDPR Minimum detectable permeation rate [µg/cm<sup>2</sup>/min] CUM 480 Cumulative permeation mass after 480 mins [µg/cm<sup>2</sup>] Time 150 Time to reach cumulative permeation mass of 150 µg/cm<sup>2</sup> [mins] ISO Classification according to ISO 16602 CAS Chemical abstracts service registry number mins Minutes > Larger than < Smaller than imm Immediate (< 4 min) nm Not tested  
sat Saturated solution N/A Not Applicable \* Based on lowest single value na Not attained 8 Actual breakthrough time, normalized breakthrough time is not available

## Permeation Data for Tychem® 10000

Hazard Name	Physical State	CAS	BT Act	BT 0.1	BT 1.0	EN	SSPR	MDPR	Cum 480 Time 150	ISO	ISO
Cyanide chloride (20% in Toluene)	Liquid	108-77-0	>480	>480	>480	6	<0.10	0.1	<48	>480	6
Cyanobenzene	Liquid	100-47-0	>480	>480	>480	6	<0.004	0.004	<1.9	>480	6
Cyanomethane	Liquid	75-05-8	>480	>480	>480	6	<0.1	0.1	<48	>480	6
Cyanopropan-2-ol, 2-	Liquid	75-86-5	>480	>480	>480	6	<0.01	0.01	<4.8	>480	6
Cyclo hexane	Liquid	110-82-7	>480	>480	>480	6	<0.0028	0.0028	<1.3	>480	6
Cyclo hexanone	Liquid	108-94-1	>480	>480	>480	6	<0.01	0.01	<4.8	>480	6
DEHP	Liquid	117-81-7	>480	>480	>480	6	<0.07	0.07	<33.6	>480	6
Diaminobiphenyl, 4,4'- (75% in Methanol)	Liquid	92-87-5	>480	>480	>480	6	<0.1	0.1	<48	>480	6
Diaminodiphenyl, p- (75% in Methanol)	Liquid	92-87-5	>480	>480	>480	6	<0.1	0.1	<48	>480	6
Diaminodiphenylmethane, 4,4'-	Liquid	101-77-9	>480	>480	>480	6	<0.1	0.1	<48	>480	6
Diaminodiphenylmethane, 4,4'- (15% in Methyl Ethyl Ketone)	Liquid	101-77-9	>480	>480	>480	6	<0.1	0.1	<48	>480	6
Diborane (10%)	Vapor	19287-45-7	nm	>480	>480	6	<0.1	0.0045	<2.1	>480	6
Dibromoethane, 1,2-	Liquid	106-93-4	>480	>480	>480	6	<0.1	0.1	<48	>480	6
Dichlorethane, 1,2.-	Liquid	107-06-2	>480	>480	>480	6	<0.01	0.01	<4.8	>480	6
Dichloro -2-propanone, 1,3- (95% at 40 °C, molten)	Liquid	534-07-6	>480	>480	>480	6	<0.1	0.1	<48	>480	6
Dichloro -4,4'-methylenedianiline, 2,2'-(sat in Methanol)	Liquid	101-14-4	>480	>480	>480	6	<0.1	0.1	<48	>480	6
Dichloro -6-isopropyl-S-triazine, 2,4- (22% in Toluene)	Liquid	30894-74-7	>480	>480	>480	6	<0.10	0.1	<48	>480	6
Dichloro acetone, 1,3- (95% at 40 °C, molten)	Liquid	534-07-6	>480	>480	>480	6	<0.1	0.1	<48	>480	6
Dichloro acetyl chloride	Liquid	79-36-7	>480	>480	>480	6	<0.01	0.01	<4.8	>480	6
Dichloro aniline, 3,4-	Solid	95-76-1	>480	>480	>480	6	<0.001	0.001	<0.48	>480	6
Dichloro aniline, 3,4- (70 °C, molten)	Liquid	95-76-1	128*	216*	nm		2.4	0.001			
Dichloro ethyl ether	Liquid	111-44-4	>480	>480	>480	6	<0.01	0.01	<4.8	>480	6
Dichloro ethylene, 1,1-	Liquid	75-35-4	>480	>480	>480	6	<0.01	0.01	<4.8	>480	6
Dichloro methane	Liquid	75-09-2	>480	>480	>480	6	<0.03	0.03	<14.4	>480	6
Dichloro propene, 2,3-	Liquid	78-88-6	>480	>480	>480	6	<0.0081	0.0081	<3.8	>480	6
Dichloro silane	Vapor	4109-96-0	>480	>480	>480	6	<0.1	0.1	<48	>480	6
Dicyanobutane, 1,4-	Liquid	111-69-3	>480	>480	>480	6	<0.1	0.1	<48	>480	6
Diesel Fuel Grade D-2	Liquid	mix	>480	>480	>480	6	<0.03	0.03	14.4	>480	6
Diethyl amine	Liquid	109-89-7	>480	>480	>480	6	<0.1	0.1	<48	>480	6
Diethyl aniline, N,N-	Liquid	91-66-7	>480	>480	>480	6	<0.024	0.024	<11.2	>480	6
Diethyl ethanamine, N,N-	Liquid	121-44-8	>480	>480	>480	6	<0.1	0.1	<48	>480	6
Diethyl ether	Liquid	60-29-7	>480	>480	>480	6	<0.001	0.001	<0.48	>480	6
Diethyl hexyl phthalate	Liquid	117-81-7	>480	>480	>480	6	<0.07	0.07	<33.6	>480	6
Diethyl sulfate	Liquid	64-67-5	>480	>480	>480	6	<0.1	0.1	<48	>480	6
Diethylene imide oxide	Liquid	110-91-8	>480	>480	>480	6	<0.1	0.1	<48	>480	6
Diethylene triamine	Liquid	111-40-0	>480	>480	>480	6	<0.005	0.005	<2.4	>480	6
Dimethyl acetamide, N,N-	Liquid	127-19-5	>480	>480	>480	6	<0.006	0.006	<2.88	>480	6
Dimethyl amine	Vapor	124-40-3	>480	>480	>480	6	<0.05	0.05	<24	>480	6
Dimethyl aniline, N,N-	Liquid	121-69-7	>480	>480	>480	6	<0.013	0.013	<6.24	>480	6

BT Act (Actual) Breakthrough time at MDPR [mins] BT 0.1 Normalized breakthrough time at 0.1 µg/cm<sup>2</sup>/min [mins] BT 1.0 Normalized breakthrough time at 1.0 µg/cm<sup>2</sup>/min [mins] EN Classification according to EN 14325  
SSPR Steady state permeation rate [µg/cm<sup>2</sup>/min] MDPR Minimum detectable permeation rate [µg/cm<sup>2</sup>/min] CUM 480 Cumulative permeation mass after 480 mins [µg/cm<sup>2</sup>] Time 150 Time to reach cumulative permeation mass of 150 µg/cm<sup>2</sup> [mins] ISO Classification according to ISO 16602 CAS Chemical abstracts service registry number mins Minutes > Larger than < Smaller than imm Immediate (< 4 min) nm Not tested  
sat Saturated solution N/A Not Applicable \* Based on lowest single value na Not attained 8 Actual breakthrough time; normalized breakthrough time is not available

## Permeation Data for Tychem® 10000

Hazard Name	Physical State	CAS	BT Act	BT 0.1	BT 1.0	EN	SSPR	MDPR	Cum 480 Time 150	ISO	
Dimethyl ether	Vapor	115-10-6	>480	>480	>480	6	<0.07	0.07	<33.6	>480	6
Dimethyl formamide, N,N-	Liquid	68-12-2	>480	>480	>480	6	<0.01	0.01	<4.8	>480	6
Dimethyl ketal	Liquid	67-64-1	>480	>480	>480	6	<0.01	0.01	<4.8	>480	6
Dimethyl ketone	Liquid	67-64-1	>480	>480	>480	6	<0.01	0.01	<4.8	>480	6
Dimethyl phenylamine, N,N-	Liquid	121-69-7	>480	>480	>480	6	<0.013	0.013	<6.24	>480	6
Dimethyl sulfate	Liquid	77-78-1	>480	>480	>480	6	<0.001	0.001	<0.48	>480	6
Dimethyl sulfoxide	Liquid	67-68-5	164	>480	>480	6	0.003	0.001	<14.4	>480	6
Dinitro-o-cresol, 4,6- (sat in Methanol)	Liquid	534-52-1	>480	>480	>480	6	<0.013	0.013	<6.24	>480	6
Dinitroresol (sat in Methanol)	Liquid	534-52-1	>480	>480	>480	6	<0.013	0.013	<6.24	>480	6
Dioxane, 1,4-	Liquid	123-91-1	>480	>480	>480	6	<0.05	0.05	<24	>480	6
Diphenyl methane diisocyanate, 4,4'-	Solid	101-68-8	>480	>480	>480	6	<0.07	0.07	<33.6	>480	6
Disulphur dichloride	Liquid	10025-67-9	>480	>480	>480	6	<0.01	0.01	<4.8	>480	6
Epichlorohydrin	Liquid	106-89-8	>480	>480	>480	6	<0.014	0.014	<6.72	>480	6
Epoxy ethane (-70 °C, liquid)	Liquid	75-21-8	>180	>180	>180	4	<0.02	0.02	<9.6	>480	6
Epoxy ethane (0 °C, liquid)	Liquid	75-21-8	>480	>480	>480	6	<0.01	0.01	<4.8	>480	6
Epoxy ethane (10% in HCFC)	Vapor	75-21-8	>480	>480	>480	6	<0.02	0.02	<9.6	>480	6
Epoxy ethane (gaseous)	Vapor	75-21-8	>480	>480	>480	6	<0.1	0.1	<48	>480	6
Epoxy propane, 1,2-	Liquid	75-56-9	>480	>480	>480	6	<0.0016	0.0016	<0.7	>480	6
Ethane 1,2-diol	Liquid	107-21-1	nm	>480	>480	6	<0.1	0.014	<6.72	>480	6
Ethane dioic acid (10.5%)	Liquid	144-62-7	>480	>480	>480	6	<0.1	0.1	<48	>480	6
Ethane diol dipropionate, 1,2-	Liquid	123-73-9	nm	>480	>480	6	<0.1	0.006	<2.88	>480	6
Ethane nitrile	Liquid	75-05-8	>480	>480	>480	6	<0.1	0.1	<48	>480	6
Ethane thiol	Liquid	75-08-1	>480	>480	>480	6	<0.01	0.01	<4.8	>480	6
Ethanol amine	Liquid	141-43-5	>480	>480	>480	6	<0.1	0.1	<48	>480	6
Ethanoyl chloride	Liquid	75-36-5	>480	>480	>480	6	<0.05	0.05	<24	>480	6
Ethoxy ethanol, 2-	Liquid	110-80-5	>480	>480	>480	6	<0.008	0.008	<3.84	>480	6
Ethoxy ethylacetat	Liquid	111-15-9	>480	>480	>480	6	<0.0023	0.0023	<1.1	>480	6
Ethyl Cellosolve®	Liquid	110-80-5	>480	>480	>480	6	<0.008	0.008	<3.84	>480	6
Ethyl acetate	Liquid	141-78-6	>480	>480	>480	6	<0.06	0.06	<28.8	>480	6
Ethyl acrylate	Liquid	140-88-5	>480	>480	>480	6	<0.02	0.02	<9.6	>480	6
Ethyl amine	Liquid	75-04-7	>480	>480	>480	6	<0.02	0.02	<9.6	>480	6
Ethyl benzene	Liquid	100-41-4	>480	>480	>480	6	<0.005	0.005	<2.4	>480	6
Ethyl chloride	Vapor	75-00-3	>480	>480	>480	6	<0.02	0.02	<9.6	>480	6
Ethyl ethanamine, N-	Liquid	109-89-7	>480	>480	>480	6	<0.1	0.1	<48	>480	6
Ethyl ether	Liquid	60-29-7	>480	>480	>480	6	<0.001	0.001	<0.48	>480	6
Ethyl glycol acetate	Liquid	111-15-9	>480	>480	>480	6	<0.0023	0.0023	<1.1	>480	6
Ethyl mercaptan	Liquid	75-08-1	>480	>480	>480	6	<0.01	0.01	<4.8	>480	6
Ethyl nitrile	Liquid	75-05-8	>480	>480	>480	6	<0.1	0.1	<48	>480	6
Ethyl parathion	Liquid	56-38-2	>480	>480	>480	6	<0.01	0.01	<4.8	>480	6

BT Act (Actual) Breakthrough time at MDPR [mins] BT 0.1 Normalized breakthrough time at 0.1 µg/cm<sup>2</sup>/min [mins] BT 1.0 Normalized breakthrough time at 1.0 µg/cm<sup>2</sup>/min [mins] EN Classification according to EN 14325  
SSPR Steady state permeation rate [µg/cm<sup>2</sup>/min] MDPR Minimum detectable permeation rate [µg/cm<sup>2</sup>/min] CUM 480 Cumulative permeation mass after 480 mins [µg/cm<sup>2</sup>] Time 150 Time to reach cumulative permeation mass of 150 µg/cm<sup>2</sup> [mins] ISO Classification according to ISO 16602 CAS Chemical abstracts service registry number mins Minutes > Larger than < Smaller than imm Immediate (< 4 min) nm Not tested  
sat Saturated solution N/A Not Applicable \* Based on lowest single value na Not attained 8 Actual breakthrough time, normalized breakthrough time is not available



Permeation Data for Tychem® 10000

Hazard Name	Physical State	CAS	BT Act	BT 0.1	BT 1.0	EN	SSPR	MDPR	Cum 480	Time 150	ISO
Ethylene chlorohydrin	Liquid	107-07-3	>480	>480	>480	6	<0.0082	0.0082	<3.9	>480	6
Ethylene dibromide	Liquid	106-93-4	>480	>480	>480	6	<0.1	0.1	<48	>480	6
Ethylene dichloride	Liquid	107-06-2	>480	>480	>480	6	<0.01	0.01	<4.8	>480	6
Ethylene glycol	Liquid	107-21-1	nm	>480	>480	6	<0.1	0.014	<6.72	>480	6
Ethylene glycol mono ethyl ether acetate	Liquid	111-15-9	>480	>480	>480	6	<0.0023	0.0023	<1.1	>480	6
Ethylene glycol monoethyl ether	Liquid	110-80-5	>480	>480	>480	6	<0.008	0.008	<3.84	>480	6
Ethylene glycol monomethyl ether	Liquid	109-86-4	>480	>480	>480	6	<0.01	0.01	<4.8	>480	6
Ethylene glycol monomethyl ether acetate	Liquid	110-49-6	>480	>480	>480	6	<0.01	0.01	<4.8	>480	6
Ethylene imine	Liquid	151-56-4	>480	>480	>480	6	<0.01	0.01	<4.8	>480	6
Ethylene oxide (-70 °C, liquid)	Liquid	75-21-8	>180	>180	>180	4	<0.02	0.02	<9.6	>480	6
Ethylene oxide (0 °C, liquid)	Liquid	75-21-8	>480	>480	>480	6	<0.01	0.01	<4.8	>480	6
Ethylene oxide (10% in HCFC)	Vapor	75-21-8	>480	>480	>480	6	<0.02	0.02	<9.6	>480	6
Ethylene oxide (gaseous)	Vapor	75-21-8	>480	>480	>480	6	<0.1	0.1	<48	>480	6
Ethylene tetrachloride	Liquid	127-18-4	>480	>480	>480	6	<0.01	0.01	<4.8	>480	6
Ethylene trichloride	Liquid	79-01-6	>480	>480	>480	6	<0.1	0.1	<48	>480	6
Fluorine	Vapor	7782-41-4	>480	>480	>480	6	<0.002	0.002	<0.96	>480	6
Fluorobenzene	Liquid	462-06-6	>480	>480	>480	6	<0.1	0.1	<48	>480	6
Fluorosulfonic acid	Liquid	7789-21-1	>480	>480	>480	6	<0.1	0.1	<48	>480	6
Formaldehyde (100 ppm)	Vapor	50-00-0	>480	>480	>480	6	<0.01	0.01	<4.8	>480	6
Formalin (100 ppm)	Vapor	50-00-0	>480	>480	>480	6	<0.01	0.01	<4.8	>480	6
Furaldehyde, 2-	Liquid	98-01-1	>480	>480	>480	6	<0.01	0.01	<4.8	>480	6
Furfural	Liquid	98-01-1	>480	>480	>480	6	<0.01	0.01	<4.8	>480	6
Gasoline, leaded	Liquid	mix	>480	>480	>480	6	<0.56 ppm	0.056 ppm			
Gasoline, unleaded	Liquid	86290-81-5	>480	>480	>480	6	<0.01	0.01	<4.8	>480	6
Glutaral (50%)	Liquid	111-30-8	>480	>480	>480	6	<0.1	0.1	<48	>480	6
Glutaraldehyde (50%)	Liquid	111-30-8	>480	>480	>480	6	<0.1	0.1	<48	>480	6
Glycol alcohol	Liquid	107-21-1	nm	>480	>480	6	<0.1	0.014	<6.72	>480	6
Glycol chlorohydrin	Liquid	107-07-3	>480	>480	>480	6	<0.0082	0.0082	<3.9	>480	6
Glycolic acid (sat)	Liquid	79-14-1	>480	>480	>480	6	<0.1	0.1	<48	>480	6
Green liquor (mix)	Liquid	68131-30-6	>480	>480	>480	6	<0.1	0.1	<48	>480	6
Hexachloro butadiene	Liquid	87-68-3	>480	>480	>480	6	<0.01	0.01	<4.8	>480	6
Hexachloro cyclohexane, 1,2,3,4,5,6- (sat in Acetone)	Liquid	58-89-9	>480	>480	>480	6	<0.06	0.06	<28.8	>480	6
Hexachloro cyclohexane, 1,2,3,4,5,6- (sat in Methanol)	Liquid	58-89-9	>480	>480	>480	6	<0.1	0.1	<48	>480	6
Hexafluoro ethane	Vapor	76-16-4	nm	>480	>480	6	<0.1	0.0139	<6.672	>480	6
Hexafluoro isobutylene	Vapor	382-10-5	>480	>480	>480	6	<0.01	0.01	<4.8	>480	6
Hexamethyl disilazane	Liquid	999-97-3	nm	>480	>480	6	<0.1	0.014	<6.72	>480	6
Hexamethyl disilazane, 1,1,1,3,3,3-	Liquid	999-97-3	nm	>480	>480	6	<0.1	0.014	<6.72	>480	6
Hexamethylene diamine (45 °C, molten)	Liquid	124-09-4	>480	>480	>480	6	<0.01	0.01	<4.8	>480	6
Hexamethylene diisocyanate	Liquid	822-06-0	>480	>480	>480	6	<0.0271	0.0271	<13.0	>480	6

BT Act (Actual) Breakthrough time at MDPR [mins] BT 0.1 Normalized breakthrough time at 0.1 µg/cm<sup>2</sup>/min [mins] BT 1.0 Normalized breakthrough time at 1.0 µg/cm<sup>2</sup>/min [mins] EN Classification according to EN 14325  
 SSPR Steady state permeation rate [µg/cm<sup>2</sup>/min] MDPR Minimum detectable permeation rate [µg/cm<sup>2</sup>/min] CUM 480 Cumulative permeation mass after 480 mins [µg/cm<sup>2</sup>] Time 150 Time to reach cumulative permeation mass of 150 µg/cm<sup>2</sup> [mins] ISO Classification according to ISO 16602 CAS Chemical abstracts service registry number mins Minutes > Larger than < Smaller than imm Immediate (< 4 min) nm Not tested  
 sat Saturated solution N/A Not Applicable \* Based on lowest single value na Not attained 8 Actual breakthrough time; normalized breakthrough time is not available

Permeation Data for Tychem® 10000

Hazard Name	Physical State	CAS	BT Act	BT 0.1	BT 1.0	EN	SSPR	MDPR	Cum 480 Time 150	ISO	
Hexanone	Liquid	108-94-1	>480	>480	>480	6	<0.01	0.01	<4.8	>480	6
Hexone	Liquid	108-10-1	32	>480	>480	6	0.001	0.001	<4.8	>480	6
Hydrazine hydrate (51%)	Liquid	10217-52-4	>480	>480	>480	6	<0.06	0.06	<28.8	>480	6
Hydrazine hydrate (85%)	Liquid	10217-52-4	240*	440	>480	6	0.06	0.004			
Hydrochloric acid (37%)	Liquid	7647-01-0	>480	>480	>480	6	<0.02	0.02	<9.6	>480	6
Hydrofluoric acid (48%)	Liquid	7664-39-3	>480	>480	>480	6	<0.1	0.1	<48	>480	6
Hydrofluoric acid (70%)	Liquid	7664-39-3	>480	>480	>480	6	<0.04	0.04	<19.2	>480	6
Hydrogen chloride (-90 °C, liquid)	Liquid	7647-01-0	>180	>180	>180	4	<0.1	0.1	<48	>480	6
Hydrogen chloride (gaseous)	Vapor	7647-01-0	>480	>480	>480	6	<0.1	0.1	<48	>480	6
Hydrogen cyanide (21 °C, liquid)	Liquid	74-90-8	>480	>480	>480	6	<0.01	0.01	<4.8	>480	6
Hydrogen cyanide (27 °C, gaseous)	Vapor	74-90-8	>480	>480	>480	6	<0.01	0.01	<4.8	>480	6
Hydrogen fluoride (27 °C, gaseous)	Vapor	7664-39-3	>480	>480	>480	6	<0.1	0.1	<48	>480	6
Hydrogen peroxide (30%)	Liquid	7722-84-1	>480	>480	>480	6	<0.04	0.04	<19.2	>480	6
Hydrogen peroxide (70%)	Liquid	7722-84-1	>480	>480	>480	6	<0.01	0.01	<4.8	>480	6
Hydrogen sulfide	Vapor	7783-06-4	>480	>480	>480	6	<0.01	0.01	<4.8	>480	6
Hydroxy 1-ethanethiol, 2-	Liquid	60-24-2	>480	>480	>480	6	<0.08	0.08	<38.4	>480	6
Hydroxy 2-methylpropionitrile, 2-	Liquid	75-86-5	>480	>480	>480	6	<0.01	0.01	<4.8	>480	6
Hydroxy 2-nitrobenzene, 1- (70 °C, molen)	Liquid	88-75-5	nm	208	>480	6	0.17	0.004			
Hydroxy acetic acid (sat)	Liquid	79-14-1	>480	>480	>480	6	<0.1	0.1	<48	>480	6
Hydroxy chlorobenzene (sat in Methanol)	Liquid	106-48-9	>480	>480	>480	6	<0.013	0.013	<6.24	>480	6
Hydroxy isobutyronitrile	Liquid	75-86-5	>480	>480	>480	6	<0.01	0.01	<4.8	>480	6
Hydroxy propene	Liquid	107-18-6	>480	>480	>480	6	<0.1	0.1	<48	>480	6
Iodomethane	Liquid	74-88-4	>480	>480	>480	6	<0.01	0.01	<4.8	>480	6
Isobutyl methyl ketone	Liquid	108-10-1	32	>480	>480	6	0.001	0.001	<4.8	>480	6
Isopropanol	Liquid	67-63-0	>480	>480	>480	6	<0.0097	0.0097	<4.7	>480	6
Isopropyl alcohol	Liquid	67-63-0	>480	>480	>480	6	<0.0097	0.0097	<4.7	>480	6
Isopropyl amine	Liquid	75-31-0	>480	>480	>480	6	<0.01	0.01	<4.8	>480	6
Isopropyl benzene	Liquid	98-82-8	>480	>480	>480	6	<0.01	0.01	<4.8	>480	6
Isopropylidenediphenol diglycidyl ether, 4,4'-	Liquid	1675-54-3	>480	>480	>480	6	<0.01	0.01	<4.8	>480	6
Ketone propane	Liquid	67-64-1	>480	>480	>480	6	<0.01	0.01	<4.8	>480	6
Lewisite (L), MIL-STD-282 (10 g/m <sup>2</sup> )	Liquid	541-25-3		>480 <sub>8</sub>							
Lewisite (L), MIL-STD-282 (100 g/m <sup>2</sup> )	Liquid	541-25-3		>480 <sub>8</sub>							
Limonene d-	Liquid	5989-27-5	>480	>480	>480	6	<0.001	0.001	<0.48	>480	6
Lindane (sat in Acetone)	Liquid	58-89-9	>480	>480	>480	6	<0.06	0.06	<28.8	>480	6
Lindane (sat in Methanol)	Liquid	58-89-9	>480	>480	>480	6	<0.1	0.1	<48	>480	6
Low boiling point naphtha - unspecified	Liquid	8052-41-3	>480	>480	>480	6	<0.001	0.001	<0.48	>480	6
MEK	Liquid	78-93-3	>480	>480	>480	6	<0.0067	0.0067	<3.21	>480	6
Malathion (50% in Methanol)	Liquid	121-75-5	>480	>480	>480	6	<0.1	0.1	<48	>480	6
Mercapto acetic acid	Liquid	68-11-1	>480	>480	>480	6	<0.1	0.1	<48	>480	6

BT Act (Actual) Breakthrough time at MDPR [mins] BT 0.1 Normalized breakthrough time at 0.1 µg/cm<sup>2</sup>/min [mins] BT 1.0 Normalized breakthrough time at 1.0 µg/cm<sup>2</sup>/min [mins] EN Classification according to EN 14325  
 SSPR Steady state permeation rate [µg/cm<sup>2</sup>/min] MDPR Minimum detectable permeation rate [µg/cm<sup>2</sup>/min] CUM 480 Cumulative permeation mass after 480 mins [µg/cm<sup>2</sup>] Time 150 Time to reach cumulative permeation mass of 150 µg/cm<sup>2</sup> [mins] ISO Classification according to ISO 16602 CAS Chemical abstracts service registry number mins Minutes > Larger than < Smaller than Imm Immediate (< 4 min) nm Not tested  
 sat Saturated solution N/A Not Applicable \* Based on lowest single value na Not attained 8 Actual breakthrough time; normalized breakthrough time is not available

## Permeation Data for Tychem® 10000

Hazard Name	Physical State	CAS	BT Act	BT 0.1	BT 1.0	EN	SSPR	MDPR	Cum 480	Time 150	ISO
Mercuric II chloride (sat)	Liquid	7487-94-7	>480	>480	>480	6	<0.28	0.28	<134.4	>480	6
Mercury	Liquid	7439-97-6	>480	>480	>480	6	<0.09	0.09	<43.2	>480	6
Methacrylic acid	Liquid	79-41-4	>480	>480	>480	6	<0.01	0.01	<4.8	>480	6
Methanesulfonyl chloride	Liquid	124-63-0	nm	>480	>480	6	<0.1	0.0006	<0.2	>480	6
Methanethiol	Vapor	74-93-1	>480	>480	>480	6	<0.001	0.001	<0.48	>480	6
Methanol	Liquid	67-56-1	>480	>480	>480	6	<0.1	0.1	<48	>480	6
Methomyl (29%)	Liquid	16752-77-5	>480	>480	>480	6	<0.1	0.1	<48	>480	6
Methoxy chloromethane	Liquid	107-30-2	305	>480	>480	6	0.03	0.001			
Methoxy ethanol, 2	Liquid	109-86-4	>480	>480	>480	6	<0.01	0.01	<4.8	>480	6
Methoxy ethylacetate, 2-	Liquid	110-49-6	>480	>480	>480	6	<0.01	0.01	<4.8	>480	6
Methyl 1,5-pentantedinitrile, 2-(87%)	Liquid	4553-62-2	>480	>480	>480	6	<0.1	0.1	<48	>480	6
Methyl 2-methyl-2-propenoate	Liquid	80-62-6	>480	>480	>480	6	<0.02	0.02	<9.6	>480	6
Methyl 2-pyrrolidon, N-	Liquid	872-50-4	>480	>480	>480	6	<0.01	0.01	<4.8	>480	6
Methyl 4-isopropenyl-1-cyclohexene, 1-	Liquid	5989-27-5	>480	>480	>480	6	<0.001	0.001	<0.48	>480	6
Methyl acetyl	Liquid	67-64-1	>480	>480	>480	6	<0.01	0.01	<4.8	>480	6
Methyl acrolein	Liquid	123-73-9	nm	>480	>480	6	<0.1	0.006	<2.88	>480	6
Methyl acrylate	Liquid	96-33-3	>480	>480	>480	6	<0.01	0.01	<4.8	>480	6
Methyl amine (gaseous)	Vapor	74-89-5	>480	>480	>480	6	<0.06	0.06	<28.8	>480	6
Methyl aniline, o-	Liquid	95-53-4	>480	>480	>480	6	<0.001	0.001	<0.48	>480	6
Methyl benzol	Liquid	108-88-3	>480	>480	>480	6	<0.02	0.02	<9.6	>480	6
Methyl bromide	Vapor	74-83-9	>480	>480	>480	6	<0.01	0.01	<4.8	>480	6
Methyl chloride (-70 °C, liquid)	Liquid	74-87-3	>180	>180	>180	4	<0.05	0.05	<24	>480	6
Methyl chloride (gaseous)	Vapor	74-87-3	>480	>480	>480	6	<0.02	0.02	<9.6	>480	6
Methyl chloroform	Liquid	71-55-6	>480	>480	>480	6	<0.004	0.004	<1.9	>480	6
Methyl chloroformate	Liquid	79-22-1	nm	>480	>480	6	<0.1	0.011	<5.2	>480	6
Methyl cyanide	Liquid	75-05-8	>480	>480	>480	6	<0.1	0.1	<48	>480	6
Methyl ethyl ketone	Liquid	78-93-3	>480	>480	>480	6	<0.0067	0.0067	<3.21	>480	6
Methyl ethyl ketoxime	Liquid	96-29-7	>480	>480	>480	6	<0.1	0.1	<48	>480	6
Methyl fluoride	Vapor	593-53-3	nm	>480	>480	6	<0.1	0.0205	<9.8	>480	6
Methyl hydrazine	Liquid	60-34-4	>480	>480	>480	6	<0.01	0.01	<4.8	>480	6
Methyl iodide	Liquid	74-88-4	>480	>480	>480	6	<0.01	0.01	<4.8	>480	6
Methyl isocyanate	Liquid	624-83-9	>480	>480	>480	6	<0.013	0.013	<6.24	>480	6
Methyl ketone	Liquid	67-64-1	>480	>480	>480	6	<0.01	0.01	<4.8	>480	6
Methyl mercaptan	Vapor	74-93-1	>480	>480	>480	6	<0.001	0.001	<0.48	>480	6
Methyl methacrylate	Liquid	80-62-6	>480	>480	>480	6	<0.02	0.02	<9.6	>480	6
Methyl pentan-2-one, 4-	Liquid	108-10-1	32	>480	>480	6	0.001	0.001	<4.8	>480	6
Methyl phenols	Liquid	1319-77-3	>480	>480	>480	6	<0.01	0.01	<4.8	>480	6
Methyl propenoic acid, 2-	Liquid	79-41-4	>480	>480	>480	6	<0.01	0.01	<4.8	>480	6
Methyl pyridine, 2-	Liquid	109-06-8	>480	>480	>480	6	<0.024	0.024	<11.5	>480	6

BT Act (Actual) Breakthrough time at MDPR [mins] BT 0.1 Normalized breakthrough time at 0.1 µg/cm<sup>2</sup>/min [mins] BT 1.0 Normalized breakthrough time at 1.0 µg/cm<sup>2</sup>/min [mins] EN Classification according to EN 14325  
SSPR Steady state permeation rate [µg/cm<sup>2</sup>/min] MDPR Minimum detectable permeation rate [µg/cm<sup>2</sup>/min] CUM 480 Cumulative permeation mass after 480 mins [µg/cm<sup>2</sup>] Time 150 Time to reach cumulative permeation mass of 150 µg/cm<sup>2</sup> [mins] ISO Classification according to ISO 16602 CAS Chemical abstracts service registry number mins Minutes > Larger than < Smaller than imm Immediate (< 4 min) nm Not tested  
sat Saturated solution N/A Not Applicable \* Based on lowest single value na Not attained 8 Actual breakthrough time, normalized breakthrough time is not available

## Permeation Data for Tychem® 10000

Hazard Name	Physical State	CAS	BT Act	BT 0.1	BT 1.0	EN	SSPR	MDPR	Cum 480	Time 150	ISO
Methyl trichloromethane	Liquid	71-55-6	>480	>480	>480	6	<0.004	0.004	<1.9	>480	6
Methyl trichlorosilane	Liquid	75-79-6	>480	>480	>480	6	<0.007	0.007	<3.36	>480	6
Methylene bis(2-Chloroaniline), 4,4- (sat in Methanol)	Liquid	101-14-4	>480	>480	>480	6	<0.1	0.1	<48	>480	6
Methylene chloride	Liquid	75-09-2	>480	>480	>480	6	<0.03	0.03	<14.4	>480	6
Methylene dianiline	Liquid	101-77-9	>480	>480	>480	6	<0.1	0.1	<48	>480	6
Methylene dianiline (15% in Methyl Ethyl Ketone)	Liquid	101-77-9	>480	>480	>480	6	<0.1	0.1	<48	>480	6
Methylene diphenyl diisocyanate, 4,4'-	Solid	101-68-8	>480	>480	>480	6	<0.07	0.07	<33.6	>480	6
Mineral oil	Liquid	8002-05-9	>480	>480	>480	6	<0.04	0.04	<19.2	>480	6
Mineral spirit	Liquid	64475-85-0	>480	>480	>480	6	<0.01	0.01	<4.8	>480	6
Morpholine	Liquid	110-91-8	>480	>480	>480	6	<0.1	0.1	<48	>480	6
Naphthalene (25% in Diethylene glycol dimethylether)	Liquid	91-20-3	>480	>480	>480	6	<0.007	0.007	<3.36	>480	6
Nickel carbonyl	Liquid	13463-39-3	>480	>480	>480	6	<0.04	0.04	<19.2	>480	6
Nicotine	Liquid	54-11-5	>480	>480	>480	6	<0.1	0.1	<48	>480	6
Nitric acid (70%)	Liquid	7697-37-2	>480	>480	>480	6	<0.1	0.1	<48	>480	6
Nitric acid (90%)	Liquid	7697-37-2	nm	>480	>480	6	<0.1	0.033	<15.8	>480	6
Nitric acid (>95%)	Liquid	7697-37-2	390	390	420	5	3.6	0.1			
Nitric oxide	Vapor	10102-43-9	>480	>480	>480	6	<0.04	0.04	<19.2	>480	6
Nitro benzene	Liquid	98-95-3	>480	>480	>480	6	<0.05	0.05	<24	>480	6
Nitro methane	Liquid	75-52-5	>480	>480	>480	6	<0.005	0.005	<2.4	>480	6
Nitro phenol, o- (70 °C, molen)	Liquid	88-75-5	nm	208	>480	6	0.17	0.004			
Nitro propane, 2-	Liquid	79-46-9	>480	>480	>480	6	<0.01	0.01	<4.8	>480	6
Nitrogen dioxide	Vapor	10102-44-0	420	>480	>480	6	<0.0001	0.0001	<0.04	>480	6
Nitrogen tetroxide (21 °C, liquid)	Liquid	10544-72-6	450	450	>480	6	0.2	0.1			
Nitrogen trifluoride	Vapor	7783-54-2	nm	>480	>480	6	<0.014	0.014	<6.72	>480	6
Nitrous oxide	Vapor	10024-97-2	nm	>480	>480	6	<0.018	0.018	<8.6	>480	6
Norflurane	Vapor	811-97-2	>480	>480	>480	6	<0.01	0.01	<4.8	>480	6
Octane n-	Liquid	111-65-9	>480	>480	>480	6	<0.01	0.01	<4.8	>480	6
Oleum (103%)	Liquid	8014-95-7	>480	>480	>480	6	<0.1	0.1	<48	>480	6
Oleum (40%)	Liquid	8014-95-7	>480	>480	>480	6	<0.04	0.04	<19.2	>480	6
Oleum (65%)	Liquid	8014-95-7	>480	>480	>480	6	<0.1	0.1	<48	>480	6
Oxalic acid (10.5%)	Liquid	144-62-7	>480	>480	>480	6	<0.1	0.1	<48	>480	6
PCB 1254 (mix)	Liquid	11097-69-1	>480	>480	>480	6	<0.001	0.001	<0.48	>480	6
Pentanedial, 1,5- (50%)	Liquid	111-30-8	>480	>480	>480	6	<0.1	0.1	<48	>480	6
Pentene nitrile, 3-	Liquid	4635-87-4	>480	>480	>480	6	<0.001	0.001	<0.48	>480	6
Pentene nitrile, cis-2- (70%)	Liquid	25899-50-7	>480	>480	>480	6	<0.001	0.001	<0.48	>480	6
Pentyl acetate	Liquid	628-63-7	>480	>480	>480	6	<0.003	0.003	<1.4	>480	6
Perchloric acid (70%)	Liquid	7601-90-3	>480	>480	>480	6	<0.1	0.1	<48	>480	6
Perfluoroethane	Vapor	76-16-4	nm	>480	>480	6	<0.1	0.0139	<6.672	>480	6
Phenethylene	Liquid	100-42-5	>480	>480	>480	6	<0.001	0.001	<0.48	>480	6

BT Act (Actual) Breakthrough time at MDPR [mins] BT 0.1 Normalized breakthrough time at 0.1 µg/cm²/min [mins] BT 1.0 Normalized breakthrough time at 1.0 µg/cm²/min [mins] EN Classification according to EN 14325  
SSPR Steady state permeation rate [µg/cm²/min] MDPR Minimum detectable permeation rate [µg/cm²/min] CUM 480 Cumulative permeation mass after 480 mins [µg/cm²] Time 150 Time to reach cumulative permeation mass of 150 µg/cm² [mins] ISO Classification according to ISO 16602 CAS Chemical abstracts service registry number mins Minutes > Larger than < Smaller than imm Immediate (< 4 min) nm Not tested sat Saturated solution N/A Not Applicable \* Based on lowest single value na Not attained 8 Actual breakthrough time; normalized breakthrough time is not available

## Permeation Data for Tychem® 10000

Hazard Name	Physical State	CAS	BT Act	BT 0.1	BT 1.0	EN	SSPR	MDPR	Cum 480 Time 150	ISO	
Phenol (60 °C, molten)	Liquid	108-95-2	113	125	165	4	<5	0.01	736	250	5
Phenol (88% at 45 °C)	Liquid	108-95-2	90	90	180	4	2.8	0.01			
Phenol (90%)	Liquid	108-95-2	>480	>480	>480	6	<0.07	0.07	<33.6	>480	6
Phenyl amine	Liquid	62-53-3	>480	>480	>480	6	<0.1	0.1	<48	>480	6
Phenyl chloride	Liquid	108-90-7	>480	>480	>480	6	<0.001	0.001	<0.48	>480	6
Phenyl cyanide	Liquid	100-47-0	>480	>480	>480	6	<0.004	0.004	<1.9	>480	6
Phenyl ethane	Liquid	100-41-4	>480	>480	>480	6	<0.005	0.005	<2.4	>480	6
Phenyl mercaptan	Liquid	108-98-5	>480	>480	>480	6	<0.02	0.02	<9.6	>480	6
Phenyl propane, 2-	Liquid	98-82-8	>480	>480	>480	6	<0.01	0.01	<4.8	>480	6
Phenyl trichlorosilane	Liquid	98-13-5	>480	>480	>480	6	<0.1	0.1	<48	>480	6
Phosgene	Vapor	75-44-5	>480	>480	>480	6	<0.1	0.1	<48	>480	6
Phosphine	Vapor	7803-51-2	>480	>480	>480	6	<0.01	0.01	<4.8	>480	6
Phosphoric acid (85%)	Liquid	7664-38-2	>480	>480	>480	6	<0.18	0.18	<86.4	>480	6
Phosphorus oxychloride	Liquid	10025-87-3	>480	>480	>480	6	<0.1	0.1	<48	>480	6
Phosphorus trichloride	Liquid	7719-12-2	>480	>480	>480	6	<0.1	0.1	<48	>480	6
Picoline, 2-	Liquid	109-06-8	>480	>480	>480	6	<0.024	0.024	<11.5	>480	6
Picoline, 3-	Liquid	108-99-6	>480	>480	>480	6	<0.024	0.024	<11.5	>480	6
Pimelic ketone	Liquid	108-94-1	>480	>480	>480	6	<0.01	0.01	<4.8	>480	6
Polymethylene polyphenyle isocyanate (p-MDI)	Liquid	9016-87-9	>480	>480	>480	6	<0.005	0.005	<2.4	>480	6
Potassium acetate (sat)	Liquid	127-08-2	>480	nm	>480	6	<0.49	0.49			
Potassium chromate (sat)	Liquid	7789-00-6	>480	nm	>480	6	<0.51	0.51			
Potassium hydroxide (45%)	Liquid	1310-58-3	>480	>480	>480	6	<0.008	0.008	<3.84	>480	6
Prop-2-en-1-al	Liquid	107-02-8	>480	>480	>480	6	<0.02	0.02	<9.6	>480	6
Prop-2-yn-1-ol	Liquid	107-19-7	>480	>480	>480	6	<0.07	0.07	<33.6	>480	6
Propan -2-ol	Liquid	67-63-0	>480	>480	>480	6	<0.0097	0.0097	<4.7	>480	6
Propan -2-one	Liquid	67-64-1	>480	>480	>480	6	<0.01	0.01	<4.8	>480	6
Propargyl alcohol	Liquid	107-19-7	>480	>480	>480	6	<0.07	0.07	<33.6	>480	6
Propen 1-ol, 2-	Liquid	107-18-6	>480	>480	>480	6	<0.1	0.1	<48	>480	6
Propenamide (50%)	Liquid	79-06-1	>480	>480	>480	6	<0.1	0.1	<48	>480	6
Propene acid	Liquid	79-10-7	>480	>480	>480	6	<0.06	0.06	<28.8	>480	6
Propenoic acid butyl ester, 2-	Liquid	141-32-2	>480	>480	>480	6	<0.02	0.02	<9.6	>480	6
Propylene aldehyde	Liquid	123-73-9	nm	>480	>480	6	<0.1	0.006	<2.88	>480	6
Propylene imine (90%)	Liquid	75-55-8	120	120	>480	6	0.34	0.01			
Propylene oxide, 1,2-	Liquid	75-56-9	>480	>480	>480	6	<0.0016	0.0016	<0.7	>480	6
Pyridine	Liquid	110-86-1	>480	>480	>480	6	<0.01	0.01	<4.8	>480	6
Pyroacetic ether	Liquid	67-64-1	>480	>480	>480	6	<0.01	0.01	<4.8	>480	6
Pyrrolidine	Liquid	123-75-1	407	413	nm		9.2	0.012			
Sarin (GB), MIL-STD-282 (10 g/m <sup>2</sup> )	Liquid	107-44-8		>480 <sub>8</sub>							
Sarin (GB), MIL-STD-282 (100 g/m <sup>2</sup> )	Liquid	107-44-8		>480 <sub>8</sub>							

BT Act (Actual) Breakthrough time at MDPR [mins] BT 0.1 Normalized breakthrough time at 0.1 µg/cm<sup>2</sup>/min [mins] BT 1.0 Normalized breakthrough time at 1.0 µg/cm<sup>2</sup>/min [mins] EN Classification according to EN 14325  
SSPR Steady state permeation rate [µg/cm<sup>2</sup>/min] MDPR Minimum detectable permeation rate [µg/cm<sup>2</sup>/min] CUM 480 Cumulative permeation mass after 480 mins [µg/cm<sup>2</sup>] Time 150 Time to reach cumulative permeation mass of 150 µg/cm<sup>2</sup> [mins] ISO Classification according to ISO 16602 CAS Chemical abstracts service registry number mins Minutes > Larger than < Smaller than imm Immediate (< 4 min) nm Not tested  
sat Saturated solution N/A Not Applicable \* Based on lowest single value na Not attained 8 Actual breakthrough time; normalized breakthrough time is not available

## Permeation Data for Tychem® 10000

Hazard Name	Physical State	CAS	BT Act	BT 0.1	BT 1.0	EN	SSPR	MDPR	Cum 480	Time 150	ISO
Silicon tetrachloride	Liquid	10026-04-7	>480	>480	>480	6	<0.1	0.1	<48	>480	6
Sodium hydroxide (50%)	Liquid	1310-73-2	>480	>480	>480	6	<0.1	0.1	<48	>480	6
Sodium hypochlorite (15%)	Liquid	7681-52-9	>480	>480	>480	6	<0.03	0.03	<14.4	>480	6
Sodium methylate (50% in Methanol)	Liquid	124-41-4	>480	>480	>480	6	<0.1	0.1	<48	>480	6
Soman (GD), MIL-STD-282 (10 g/m <sup>2</sup> )	Liquid	96-64-0		>480 <sub>8</sub>							
Soman (GD), MIL-STD-282 (100 g/m <sup>2</sup> )	Liquid	96-64-0		>480 <sub>8</sub>							
Stoddard solvent	Liquid	8052-41-3	>480	>480	>480	6	<0.001	0.001	<0.48	>480	6
Styrene	Liquid	100-42-5	>480	>480	>480	6	<0.001	0.001	<0.48	>480	6
Sulfamic acid (15%)	Liquid	5329-14-6	>480	>480	>480	6	<0.01	0.01	<4.8	>480	6
Sulfamidic acid (15%)	Liquid	5329-14-6	>480	>480	>480	6	<0.01	0.01	<4.8	>480	6
Sulfur Mustard (HD), MIL-STD-282 (10 g/m <sup>2</sup> )	Liquid	505-60-2		>480 <sub>8</sub>							
Sulfur Mustard (HD), MIL-STD-282 (100 g/m <sup>2</sup> )	Liquid	505-60-2		>480 <sub>8</sub>							
Sulfur dioxide	Vapor	7446-09-5	>480	>480	>480	6	<0.01	0.01	<4.8	>480	6
Sulfur hexafluoride	Vapor	2551-62-4	nm	>480	>480	6	<0.015	0.015	<7.2	>480	6
Sulfur monochloride	Liquid	10025-67-9	>480	>480	>480	6	<0.01	0.01	<4.8	>480	6
Sulfur trioxide	Liquid	7446-11-9	90	90	90	3	696	0.1			
Sulfuric acid (>95%)	Liquid	7664-93-9	>480	>480	>480	6	<0.1	0.1	<48	>480	6
Sulfuric acid diethyl ester	Liquid	64-67-5	>480	>480	>480	6	<0.1	0.1	<48	>480	6
Sulfuric acid dimethyl ester	Liquid	77-78-1	>480	>480	>480	6	<0.001	0.001	<0.48	>480	6
Sulfuric acid fuming (103%)	Liquid	8014-95-7	>480	>480	>480	6	<0.1	0.1	<48	>480	6
Sulfuric acid fuming (40%)	Liquid	8014-95-7	>480	>480	>480	6	<0.04	0.04	<19.2	>480	6
Sulfuric acid fuming (65%)	Liquid	8014-95-7	>480	>480	>480	6	<0.1	0.1	<48	>480	6
Sulfuryl chloride	Liquid	7791-25-5	>480	>480	>480	6	<0.1	0.1	<48	>480	6
Sulphur dichloride	Liquid	10545-99-0	440	440	>480	6	<0.3	0.1	<48	>480	6
Tabun (GA), MIL-STD-282 (10 g/m <sup>2</sup> )	Liquid	77-81-6		>480 <sub>8</sub>							
Tabun (GA), MIL-STD-282 (100 g/m <sup>2</sup> )	Liquid	77-81-6		>480 <sub>8</sub>							
Tetracarbonylnickel	Liquid	13463-39-3	>480	>480	>480	6	<0.04	0.04	<19.2	>480	6
Tetrachloro ethane, 1,1,2,2,-	Liquid	79-34-5	>480	>480	>480	6	<0.008	0.008	<3.84	>480	6
Tetrachloro ethylene, 1,1,2,2-	Liquid	127-18-4	>480	>480	>480	6	<0.01	0.01	<4.8	>480	6
Tetrachloro methane	Liquid	56-23-5	>480	>480	>480	6	<0.015	0.015	<7.2	>480	6
Tetraethoxysilane	Liquid	78-10-4	nm	>480	>480	6	<0.014	0.014	<6.72	>480	6
Tetraethyl lead	Liquid	78-00-2	>480	>480	>480	6	<0.07	0.07	<33.6	>480	6
Tetraethylene pentamine	Liquid	112-57-2	306*	>480	>480	6	<0.01	0.005			
Tetrafluoroethane, 1,1,1,2-	Vapor	811-97-2	>480	>480	>480	6	<0.01	0.01	<4.8	>480	6
Tetrafluoromethane	Vapor	75-73-0	nm	>480	>480	6	<0.0177	0.0177	<8.496	>480	6
Tetrahydrofuran	Liquid	109-99-9	>480	>480	>480	6	<0.04	0.04	<19.2	>480	6
Tetramethyl ammonium hydroxide (25%)	Liquid	75-59-2	>480	>480	>480	6	<0.01	0.01	<4.8	>480	6
Tetramethyl tin (0.5% in Pentane)	Liquid	594-27-4	nm	>480	>480	6	<0.006	0.006	<2.88	>480	6
Thioglycolic acid	Liquid	68-11-1	>480	>480	>480	6	<0.1	0.1	<48	>480	6

BT Act (Actual) Breakthrough time at MDPR [mins] BT 0.1 Normalized breakthrough time at 0.1 µg/cm<sup>2</sup>/min [mins] BT 1.0 Normalized breakthrough time at 1.0 µg/cm<sup>2</sup>/min [mins] EN Classification according to EN 14325  
SSPR Steady state permeation rate [µg/cm<sup>2</sup>/min] MDPR Minimum detectable permeation rate [µg/cm<sup>2</sup>/min] CUM 480 Cumulative permeation mass after 480 mins [µg/cm<sup>2</sup>] Time 150 Time to reach cumulative permeation mass of 150 µg/cm<sup>2</sup> [mins] ISO Classification according to ISO 16602 CAS Chemical abstracts service registry number mins Minutes > Larger than < Smaller than imm Immediate (< 4 min) nm Not tested  
sat Saturated solution N/A Not Applicable \* Based on lowest single value na Not attained 8 Actual breakthrough time; normalized breakthrough time is not available

## Permeation Data for Tychem® 10000

Hazard Name	Physical State	CAS	BT Act	BT 0.1	BT 1.0	EN	SSPR	MDPR	Cum 480 Time 150	ISO	
Titan(IV) chloride	Liquid	7550-45-0	>480	>480	>480	6	<0.1	0.1	<48	>480	6
Titanium tetrachloride	Liquid	7550-45-0	>480	>480	>480	6	<0.1	0.1	<48	>480	6
Toluene	Liquid	108-88-3	>480	>480	>480	6	<0.02	0.02	<9.6	>480	6
Toluene diisocyanate, 1,3-	Liquid	26471-62-5	>480	>480	>480	6	<0.01	0.01	<4.8	>480	6
Toluidine, o-	Liquid	95-53-4	>480	>480	>480	6	<0.001	0.001	<0.48	>480	6
Trichloro 1,2,2-trifluoroethane, 1,1,2-	Liquid	76-13-1	>480	>480	>480	6	<0.01	0.01	<4.8	>480	6
Trichloro 1,3,5-triazine, 2,4,6- (20% in Toluene)	Liquid	108-77-0	>480	>480	>480	6	<0.10	0.1	<48	>480	6
Trichloro benzene, 1,2,4-	Liquid	120-82-1	>480	>480	>480	6	<0.01	0.01	<4.8	>480	6
Trichloro ethane, 1,1,1-	Liquid	71-55-6	>480	>480	>480	6	<0.004	0.004	<1.9	>480	6
Trichloro ethanol, 2,2,2-	Liquid	115-20-8	>480	>480	>480	6	<0.008	0.008	<3.84	>480	6
Trichloro ethylene	Liquid	79-01-6	>480	>480	>480	6	<0.1	0.1	<48	>480	6
Trichloro methane	Liquid	67-66-3	>480	>480	>480	6	<0.0037	0.0037	<1.7	>480	6
Trichloro phenylsilane	Liquid	98-13-5	>480	>480	>480	6	<0.1	0.1	<48	>480	6
Trichloro silane	Liquid	10025-78-2	nm	>480	>480	6	<0.0218	0.0218	<9.6	>480	6
Triethyl amine	Liquid	121-44-8	>480	>480	>480	6	<0.1	0.1	<48	>480	6
Triethylentetramine (60%)	Liquid	112-24-3	>480	>480	>480	6	<0.005	0.005	<2.4	>480	6
Trifluoro 2-(trifluoromethyl)propene, 3,3,3-	Vapor	382-10-5	>480	>480	>480	6	<0.01	0.01	<4.8	>480	6
Trifluoro ethanol, 2,2,2-	Liquid	75-89-8	>480	>480	>480	6	<0.0013	0.0013	<0.6	>480	6
Trifluoro methane	Vapor	75-46-7	nm	>480	>480	6	<0.0141	0.0141	<6.72	>480	6
Trifluoro methansulfonic acid	Liquid	1493-13-6	>480	>480	>480	6	<0.01	0.01	<4.8	>480	6
Trimethyl amine	Vapor	75-50-3	>480	>480	>480	6	<0.1	0.1	<48	>480	6
Trimethyl aminomethane	Liquid	75-64-9	>480	>480	>480	6	<0.03	0.03	<14.4	>480	6
Trimethyl phosphate	Liquid	512-56-1	>480	>480	>480	6	<0.01	0.01	<4.8	>480	6
Trimethyl phosphite	Liquid	121-45-9	>480	>480	>480	6	<0.02	0.02	<9.6	>480	6
Tripropyl amine	Liquid	102-69-2	>480	>480	>480	6	<0.07	0.07	<33.6	>480	6
Tungsten hexafluoride	Vapor	7783-82-6	nm	>480	>480	6	<0.0259	0.0259	<12.4	>480	6
VM & P Naphtha	Liquid	8030-30-6	nm	>480	>480	6	<0.006	0.006	<2.88	>480	6
VX Nerve Agent, MIL-STD-282 (10 g/m <sup>2</sup> )	Liquid	50782-69-9		>480 <sub>8</sub>							
VX Nerve Agent, MIL-STD-282 (100 g/m <sup>2</sup> )	Liquid	50782-69-9		>480 <sub>8</sub>							
Vinyl acetate	Liquid	108-05-4	>480	>480	>480	6	<0.01	0.01	<4.8	>480	6
Vinyl benzol	Liquid	100-42-5	>480	>480	>480	6	<0.001	0.001	<0.48	>480	6
Vinyl carbinol	Liquid	107-18-6	>480	>480	>480	6	<0.1	0.1	<48	>480	6
Vinyl chloride	Vapor	75-01-4	>480	>480	>480	6	<0.001	0.001	<0.4	>480	6
Vinyl ethylene (0 °C, liquid)	Liquid	106-99-0	>180	>180	>180	4	<0.01	0.01	<4.8	>480	6
Vinyl ethylene (gaseous)	Vapor	106-99-0	>480	>480	>480	6	<0.07	0.07	<33.6	>480	6
Vinylidene chloride	Liquid	75-35-4	>480	>480	>480	6	<0.01	0.01	<4.8	>480	6
White liquor	Liquid	68131-33-9	>480	>480	>480	6	<0.1	0.1	<48	>480	6

**BT Act** (Actual) Breakthrough time at MDPR [mins] **BT 0.1** Normalized breakthrough time at 0.1 µg/cm<sup>2</sup>/min [mins] **BT 1.0** Normalized breakthrough time at 1.0 µg/cm<sup>2</sup>/min [mins] **EN** Classification according to EN 14325  
**SSPR** Steady state permeation rate [µg/cm<sup>2</sup>/min] **MDPR** Minimum detectable permeation rate [µg/cm<sup>2</sup>/min] **CUM 480** Cumulative permeation mass after 480 mins [µg/cm<sup>2</sup>] **Time 150** Time to reach cumulative permeation mass of 150 µg/cm<sup>2</sup> [mins] **ISO** Classification according to ISO 16602 **CAS** Chemical abstracts service registry number **mins** Minutes **>** Larger than **<** Smaller than **imm** Immediate (< 4 min) **nm** Not tested  
**sat** Saturated solution **N/A** Not Applicable **\*** Based on lowest single value **na** Not attained **8** Actual breakthrough time; normalized breakthrough time is not available

## Important Note

The permeation data published have been generated for DuPont by independent accredited testing laboratories according to the test method applicable at that time (EN369, ASTM F739, EN 374-3, EN ISO 6529 (method A and B) or ASTM D6978)

The data is typically the average of three fabrics samples tested.

All chemicals have been tested at an assay of greater than 95 (w/w) % unless otherwise stated.

The tests were performed at room temperature and environmental pressure unless otherwise stated.

A different temperature may have significant influence on the breakthrough time.

Permeation typically increases with temperature.

Cumulative permeation data have been measured or have been calculated based on steady state permeation rate.

Cytostatic drugs testing has been performed at a test temperature of 27°C according to ASTM D6978 or ISO 6529 with the additional requirement of reporting a normalized breakthrough time at 0.01 µg/cm<sup>2</sup>/min.

Chemical warfare agents (Lewisite, Sarin, Soman, Mustard, Tabun and VX Nerve Agent) have been tested according to MIL-STD-282 at 22°C or according to FINABEL 0.7 at 37°C.

Permeation data for Tyvek® is applicable to white Tyvek® 500/ Tyvek® 600 only and is not applicable for other Tyvek® styles or colours.

Permeation data are usually measured for single chemicals. The permeation characteristics of mixtures can often deviate considerably from the behaviour of the individual chemicals.

Please use the permeation data provided as a part of the risk assessment to assist with the selection of a protective fabric, garment or accessory suitable for your application. Breakthrough time is not the same as safe wear time. Breakthrough times are indicative of the barrier performance, but results can vary between the test methods and laboratories. Breakthrough time alone is insufficient to determine how long a garment may be worn once the garment has been contaminated. Safe user wear time may be longer or shorter than the breakthrough time depending on the permeation behaviour of the substance, the toxicity of the substance, working conditions and the exposure conditions (e.g. temperature, pressure, concentration, physical state).

Latest Update Permeation Data: 30/05/2018

- MTO: Made to order terms & conditions apply.
- Ambient Working temperature for Tychem® TK. garments: Tychem® TK. Garments can be worn in an ambient temperature range of -25° C to 49° C. In colder environments, Tychem® garments can become stiff. If cold enough the fabric may become even brittle. Please be aware that the heat stress of the wearer becomes a greater concern in higher ambient temperatures. At higher temperature, chemical hazards become more aggressive. Breakthrough times and permeation rate may change at higher temperatures. Tychem® fabrics offer little or no thermal insulation to protect the wearer's from prolonged exposure to hot and cold.
- Working in Ex-Zones: Please take this into account for your risk-assessment that the attached socks may isolate the wearer. There is the possibility that the garment and wearer cannot be grounded via the shoes and other measures for grounding the garment and the wearer are required.

The information provided herein corresponds to our knowledge on the subject at the date of its publication. This information may be subject to revision as new knowledge and experience becomes available. The data provided fall within the normal range of product properties and relate only to the specific material designated; these data may not be valid for such material used in combination with any other materials or additives or in any process, unless expressly indicated otherwise. The data provided should not be used to establish specification limits or used alone as the basis of design; they are not intended to substitute for any testing you may need to conduct to determine for yourself the suitability of a specific material for your particular purposes. Since DuPont cannot anticipate all variations in actual end-use conditions DuPont makes no warranties and assumes no liability in connection with any use of this information. Nothing in this publication is to be considered as a license to operate under or a recommendation to infringe any patent rights.