Technical Data Sheet

DuPont™ Tychem® 6000 F , *TFCHA5TGY00*

CAT III T3 T4 T5 T6 EN 1073-2

EN 1149-5 EN 14126

Technical Data Sheet

DuPont Tychem® 6000 F Grey. Hooded coverall. Stitched and over-taped seams. Thumb loops. Elastication at wrists, ankles, face and waist. Self-adhesive double zipper flap and chin flap. Grey.

Certifications

- Certified according to Regulation (EU) 2016/425
- Chemical protective clothing, Category III, Type 3-B, 4-B, 5-B and 6-B
- EN 14126 (barrier to infective agents), EN 1073-2 (protection against radioactive contamination)
- Antistatic treatment (EN 1149-5) - on inside

Packaging(Quantity/Box)

25 per box, individually packed.

Product Size	Article Number	Body Height(cm)	Chest Girth(cm)	Chest Girth(in)	Body Height(ft/in)
SM	D13495186	162-170	84-92	33-36	5'4"-5'7"
MD	D13495156	168-176	92-100	36-39	5'6"-5'9"
LG	D13395221	174-182	100-108	39-43	5'8"-6'0"
XL	D13395545	180-188	108-116	43-46	5'11"-5'2"
2X	D13395268	186-194	116-124	46-49	6'1"-6'4"
3X	D13495118	192-200	124-132	49-52	6'3"-6'7"

Reference Number: TFCHA5TGY00

PHYSICAL PROPERTIES

Property	Test Method	Result	EN
Abrasion Resistance [7]	EN 530 Method 2	>2000 cycles	6 of 6 [1]
Basis Weight	DIN EN ISO 536	120 g/m^2	N/A
Bursting Strength (Mullenburst)	ISO 2758	610 kPa	N/A
Colour	N/A	Grey	N/A
Exposure to high Temperature	N/A	Garments seams opens at ~98 °C	N/A
Exposure to low Temperature	N/A	Flexibility retained down to -73 °C	N/A
Flex Cracking Resistance [7]	EN ISO 7854 Method B	>1000 cycles	1 of 6 [1]
Flex Cracking Resistance at -30°C	EN ISO 7854 Method B	>1000 cycles	N/A
Puncture Resistance	EN 863	26 N	2 of 6 [1]
Resistance to Ignition [7]	EN 13274-4 Method 3	No after flame, no drop formation, hole formation	N/A
Resistance to Water Penetration	DIN EN 20811	>30 kPa	N/A
Surface Resistance at RH 25%, inside [7]	EN 1149-1	< 2,5 • 10^9 Ohm	N/A
Surface Resistance at RH 25%, outside [7]	EN 1149-1	No antistatic treatment	N/A
Tensile Strength (MD)	DIN EN ISO 13934-1	240 N	3 of 6 [1]
Tensile Strength (XD)	DIN EN ISO 13934-1	245 N	3 of 6 [1]
Thickness	DIN EN ISO 534	210 µm	N/A
Trapezoidal Tear Resistance (MD)	EN ISO 9073-4	40 N	2 of 6 [1]
Trapezoidal Tear Resistance (XD)	EN ISO 9073-4	35 N	2 of 6 [1]

1 According to EN 14325 **2** According to EN 14126 **3** According to EN 1073-2 **4** According to EN 14116 **12** According to EN 11612 **5** Front Tyvek ® / Back **6** Based on test according to ASTM D-572 **7** 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
Nominal protection factor [7]	EN 1073-2	>5	1 of 3 [3]
Seam Strength	EN ISO 13935-2	>125 N	4 of 6 [1]
Shelf Life [7]	N/A	10 years [6]	N/A
Type 3: Resistance to Penetration by Liquids (Jet Test)	EN 17491-3	Pass	N/A
Type 4: Resistance to Penetration by Liquids (High Level Spray Test)	EN ISO 17491-4, Method B	Pass	N/A
Type 5: Inward Leakage of Airborne Solid Particulates	EN ISO 13982-2	Pass	N/A
Type 6: Resistance to Penetration by Liquids (Low Level Spray Test)	EN ISO 17491-4, Method A	Pass	N/A

1 According to EN 14325 **3** According to EN 1073-2 **12** According to EN 11612 **13** According to EN 11611 **5** Front Tyvek ® / Back **6** Based on test according to ASTM D-572 **7** See Instructions for Use for further information, limitations and warnings **11** 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
Air Permeability (Gurley method)	ISO 5636-5	No	N/A

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

PENETRATION AND REPELLENCY

Property	Test Method	Result	EN
Repellency to Liquids, o-Xylene	EN ISO 6530	>95 %	3 of 3 [1]
Repellency to Liquids, Butan-1-ol	EN ISO 6530	>95 %	3 of 3 [1]
Repellency to Liquids, Sodium Hydroxide (10%)	EN ISO 6530	>95 %	3 of 3 [1]
Repellency to Liquids, Sulphuric Acid (30%)	EN ISO 6530	>95 %	3 of 3 [1]
Resistance to Penetration by Liquids, Butan-1-ol	EN ISO 6530	<1 %	3 of 3 [1]
Resistance to Penetration by Liquids, Sodium Hydroxide (10%)	EN ISO 6530	<1 %	3 of 3 [1]
Resistance to Penetration by Liquids, Sulphuric Acid (30%)	EN ISO 6530	<1 %	3 of 3 [1]
Resistance to Penetration by Liquids, o-Xylene	EN ISO 6530	<1 %	3 of 3 [1]

1 According to EN 14325 **>** Larger than **<** Smaller than

BIOLOGICAL BARRIER

Property	Test Method	Result	EN
Resistance to Penetration by Biologically Contaminated Aerosols	ISO/DIS 22611	log ratio >5	3 of 3 [2]
Resistance to Penetration by Blood-borne Pathogens using Bacteriophage Phi-X174	ISO 16604 Procedure C	20 kPa	6 of 6 [2]
Resistance to Penetration by Contaminated Liquids	EN ISO 22610	>75 min	6 of 6 [2]
Resistance to Penetration by Contaminated Solid Particles	ISO 22612	log cfu <1	3 of 3 [2]

2 According to EN 14126 **>** Larger than **<** Smaller than

Permeation Data for Tychem® 6000 F

Hazard / Chemical Name	Physical State	CAS	BT Act	BT 0.1	BT 1.0	EN	SSPR	MDPR	Cum 480	Time 150	ISO
2-(2-Butoxyethoxy) ethanol	Liquid	112-34-5	>480	>480	>480	6	<0.05	0.05	<24	>480	6
2-Methyl-2-Butanol	Liquid	75-85-4	>480	>480	>480	6	<0.05	0.05	<24	>480	6
Acetaldehyde	Liquid	75-07-0	imm	imm	13*/23	1	2	0.06			
Acetic acid (>95%)	Liquid	64-19-7	>480	>480	>480	6	<0.08	0.08	<38.4	>480	6
Acetic acid 2 ethoxy ethyl ester	Liquid	111-15-9	>480	>480	>480	6	<0.005	0.005	<2.4	>480	6
Acetic acid 2 methoxy ethyl ester	Liquid	110-49-6	>480	>480	>480	6	<0.005	0.005	<2.4	>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	<0.01	0.01	<4.8	>480	6
Acetic acid pentyl ester	Liquid	628-63-7	>480	>480	>480	6	0.007	0.001	<10.2	>480	6
Acetic anhydride	Liquid	108-24-7	>480	>480	>480	6	<0.01	0.01	<4.8	>480	6
Acetic chloride	Liquid	75-36-5	155	>480	>480	6	0.0014	0.0001			
Acetone	Liquid	67-64-1	>480	>480	>480	6	<0.02	0.02	<9.6	>480	6
Acetone cyanohydrin	Liquid	75-86-5	>480	>480	>480	6	<0.05	0.05	<24	>480	6
Acetonitrile	Liquid	75-05-8	65*/83	131	>480	6	<0.4	0.03	<82	>480	6
Acetyl chloride	Liquid	75-36-5	155	>480	>480	6	0.0014	0.0001			
Acroleic acid	Liquid	79-10-7	>480	>480	>480	6	<0.06	0.06	<28.8	>480	6
Acrolein	Liquid	107-02-8	51*/65	75*/101	>480	6	<0.5	0.02	105	>480	6
Acrolein (10 g/m^2)	Liquid	107-02-8	>480	>480	>480	6	<0.04	0.04	<19.2	>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	imm*/161	imm*/162	imm*/163		<5	0.04			
Acrylic acid n-butyl ester	Liquid	141-32-2	>480	>480	>480	6	<0.05	0.05	<24	>480	6
Acrylic amide (50%)	Liquid	79-06-1	>480	>480	>480	6	<0.1	0.1	<48	>480	6
Acrylonitrile	Liquid	107-13-1	72*/91	73*/92	103	3	8.9	0.0085			
Acryloyl Chloride	Liquid	814-68-6	166*/224	334	>480	6	<0.3	0.04	29.6	>480	6
Adipic acid dinitrile	Liquid	111-69-3	>480	>480	>480	6	<0.05	0.05	<24	>480	6
Adipic acid nitrile	Liquid	111-69-3	>480	>480	>480	6	<0.05	0.05	<24	>480	6
Adiponitrile	Liquid	111-69-3	>480	>480	>480	6	<0.05	0.05	<24	>480	6
Adipyl dinitrile	Liquid	111-69-3	>480	>480	>480	6	<0.05	0.05	<24	>480	6
Allyl alcohol	Liquid	107-18-6	>480	>480	>480	6	<0.02	0.02	<9.6	>480	6
Allyl chloride	Liquid	107-05-1	291*/400	381*/447	>480	6	<0.2	0.02	<18.5	>480	6
Amido sulfonic acid (15%)	Liquid	5329-14-6	>480	>480	>480	6	<0.04	0.04	<19.2	>480	6
Amino benzene	Liquid	62-53-3	>480	>480	>480	6	<0.03	0.03	<14.4	>480	6
Amino diphenyl, 4- (1 mg/ml in Methanol)	Liquid	92-67-1	>480	>480	>480	6	<0.01	0.01	<4.8	>480	6
Amino ethanol, 2-	Liquid	141-43-5	>480	>480	>480	6	<0.05	0.05	<24	>480	6

BTAct (Actual) Breakthrough time at MDPR [mins] BT0.1 Normalized breakthrough time at 0.1 µg/cm²/min [mins] BT1.0 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] CUM480 Cumulative permeation mass after 480 mins [µg/cm²] Time150 Time to reach cumulative permeation mass of 150 µg/cm² [mins] ISO Classification according to ISO 16602 CAS Chemical abstracts service registry number min Minute > Larger than < Smaller than imm Immediate (< 10 min) nm Not tested sat Saturated solution N/A Not Applicable na Not attained GPR grade General purpose reagent grade * Based on lowest single value 8 Actual breakthrough time; normalized breakthrough time is not available DOT5 Degradation after 5 min DOT30 Degradation after 30 min DOT60 Degradation after 60 min DOT240 Degradation after 240 min BT1383 Normalized breakthrough time at 0.1 µg/cm²/min [mins] acc. ASTM F1383

Permeation Data for Tychem® 6000 F

Hazard / Chemical Name	Physical State	CAS	BT Act	BT 0.1	BT 1.0	EN	SSPR	MDPR	Cum 480	Time 150	ISO
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	<0.05	0.05	<24	>480	6
Ammonia (gaseous)	Vapor	7664-41-7	20	20	21	1	1.5	0.0024			
Ammonium bifluoride (sat)	Liquid	1341-49-7	>480	>480	>480	6	<0.005	0.005	<2.4	>480	6
Ammonium hydrogendifluoride (sat)	Liquid	1341-49-7	>480	>480	>480	6	<0.005	0.005	<2.4	>480	6
Ammonium hydroxide (32%)	Liquid	1336-21-6	>480	>480	>480	6	<0.005	0.005	<2.4	>480	6
Amyl acetate, n-	Liquid	628-63-7	>480	>480	>480	6	0.007	0.001	<10.2	>480	6
Amyl alcohol	Liquid	71-41-0	>480	>480	>480	6	<0.1	0.1	<48	>480	6
Amyl alcohol, tert-	Liquid	75-85-4	>480	>480	>480	6	<0.05	0.05	<24	>480	6
Amyl ester acetic acid	Liquid	628-63-7	>480	>480	>480	6	0.007	0.001	<10.2	>480	6
Anilin, 4-Trifluoromethoxy-	Liquid	461-82-5	>480	>480	>480	6	<0.05	0.05	<24	>480	6
Aniline	Liquid	62-53-3	>480	>480	>480	6	<0.03	0.03	<14.4	>480	6
Anthracene (sat in Toluene)	Liquid	120-12-7	>480	>480	>480	6	<0.02	0.02	<9.6	>480	6
Anthracin (sat in Toluene)	Liquid	120-12-7	>480	>480	>480	6	<0.02	0.02	<9.6	>480	6
Antimony pentachloride	Liquid	7647-18-9	<15	<15	<15	1	>10	0.1			
Arsenic (III) chloride	Liquid	7784-34-1	22*/29	32*/38	59	2	334	0.01			
Arsenic trichloride	Liquid	7784-34-1	22*/29	32*/38	59	2	334	0.01			
Azolidine	Liquid	123-75-1	40*/80	45*/100	145*/185	4	4.7	0.05			
Benzenamine	Liquid	62-53-3	>480	>480	>480	6	<0.03	0.03	<14.4	>480	6
Benzene	Liquid	71-43-2	>480	>480	>480	6	<0.02	0.02	<9.6	>480	6
Benzene carbonyl chloride	Liquid	98-88-4	>480	>480	>480	6	<0.08	0.08	<38.4	>480	6
Benzene sulfone chloride	Liquid	98-09-9	>480	>480	>480	6	<0.02	0.02	<9.6	>480	6
Benzene sulfonyl chloride	Liquid	98-09-9	>480	>480	>480	6	<0.02	0.02	<9.6	>480	6
Benzo nitrile	Liquid	100-47-0	>480	>480	>480	6	<0.02	0.02	<9.6	>480	6
Benzol	Liquid	71-43-2	>480	>480	>480	6	<0.02	0.02	<9.6	>480	6
Benzoyl chloride	Liquid	98-88-4	>480	>480	>480	6	<0.08	0.08	<38.4	>480	6
Benzyl alcohol	Liquid	100-51-6	>480	>480	>480	6	<0.1	0.1	<48	>480	6
Benzyl chloride	Liquid	100-44-7	>480	>480	>480	6	<0.05	0.05	<24	>480	6
Benzyl cyanide	Liquid	140-29-4	>390	>390	>390	5	<0.01	0.01	<4.8	>480	6
Benzyl methylamine, N-	Liquid	103-67-3	>480	>480	>480	6	<0.02	0.02	<9.6	>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	mix		>480							

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Permeation Data for Tychem® 6000 F

Hazard / Chemical Name	Physical State	CAS	BT Act	BT 0.1	BT 1.0	EN	SSPR	MDPR	Cum 480	Time 150	ISO
Boron fluoride ethyl ether	Liquid	109-63-7	>480	>480	>480	6	<0.05	0.05	<24	>480	6
Boron trifluoride diethyl etherate	Liquid	109-63-7	>480	>480	>480	6	<0.05	0.05	<24	>480	6
Boron trifluoride dimethyl etherate	Liquid	353-42-4	>480	>480	>480	6	<0.01	0.01	<4.8	>480	6
Boron trifluoride etherate	Liquid	109-63-7	>480	>480	>480	6	<0.05	0.05	<24	>480	6
Brom thiophene, 2-	Liquid	1003-09-4	>480	>480	>480	6	<0.03	0.03	<14.4	>480	6
Bromine	Liquid	7726-95-6	imm	imm	imm		105	0.001			
Bromo 4-fluorobenzene, 1-	Liquid	460-00-4	>480	>480	>480	6	<0.02	0.02	<9.6	>480	6
Bromo fluorobenzene, 4-	Liquid	460-00-4	>480	>480	>480	6	<0.02	0.02	<9.6	>480	6
But-3-en-2-one	Liquid	78-94-4	287*/379	>480	>480	6	<0.1	0.02	<9.6	>480	6
Butadiene, 1,3- (gaseous)	Vapor	106-99-0	>480	>480	>480	6	<0.01	0.01	<4.8	>480	6
Butanal, n-	Liquid	123-72-8	>480	>480	>480	6	<0.05	0.05	<24	>480	6
Butanol, 1-	Liquid	71-36-3	>480	>480	>480	6	<0.05	0.05	<24	>480	6
Butanol, n-	Liquid	71-36-3	>480	>480	>480	6	<0.05	0.05	<24	>480	6
Butanol, tert-	Liquid	75-65-0	10*/147	37*/205	>480	6	0.26	0.02			
Butanone	Liquid	78-93-3	imm	40*/64	>480	6	0.36	0.001			
Butanone oxime, 2-	Liquid	96-29-7	>480	>480	>480	6	<0.02	0.02	<9.6	>480	6
Butenal, 2-	Liquid	123-73-9	121	147	>480	6	<1	0.02	210	405	5
Butoxy ethanol, 2-	Liquid	111-76-2	>480	>480	>480	6	<0.05	0.05	<24	>480	6
Butyl acetate, n-	Liquid	123-86-4	>480	>480	>480	6	<0.02	0.02	<9.6	>480	6
Butyl acrylate, n-	Liquid	141-32-2	>480	>480	>480	6	<0.05	0.05	<24	>480	6
Butyl alcohol, n-	Liquid	71-36-3	>480	>480	>480	6	<0.05	0.05	<24	>480	6
Butyl amine	Liquid	109-73-9	170	200	>480	6	0.84	0.01	137.5	>480	6
Butyl ether, n-	Liquid	142-96-1	223*/285	223*/285	224*/287	4	14.6	0.021			
Butyl stannium trichloride	Liquid	1118-46-3	>480	>480	>480	6	<0.0001	0.0001	<0.04	>480	6
Butyraldehyde, n-	Liquid	123-72-8	>480	>480	>480	6	<0.05	0.05	<24	>480	6
Butyric Acid	Liquid	107-92-6	>480	>480	>480	6	<0.07	0.07	<33.6	>480	6
Calomel (sat)	Liquid	10112-91-1	>480	>480	>480	6	<0.1	0.1	<48	>480	6
Carbon disulfide	Liquid	75-15-0	>480	>480	>480	6	<0.05	0.05	<24	>480	6
Carbon tetrachloride	Liquid	56-23-5	imm	imm*/11	>480	6	0.57	0.001			
Carmustine (3.3 mg/ml, 10 % Ethanol)	Liquid	154-93-8	>240	>240	>240	5	<0.001	0.001			
Caustic ammonia (32%)	Liquid	1336-21-6	>480	>480	>480	6	<0.005	0.005	<2.4	>480	6
Caustic soda (50% at 50 °C)	Liquid	1310-73-2	>480	>480	>480	6	<0.02	0.02	<9.6	>480	6
Caustic soda (50%)	Liquid	1310-73-2	>480	>480	>480	6	<0.025	0.025	<12	>480	6
Chlor allylene	Liquid	107-05-1	291*/400	381*/447	>480	6	<0.2	0.02	<18.5	>480	6
Chlor trinitromethan	Liquid	76-06-2	>480	>480	>480	6	<0.05	0.05	<24	>480	6

BTAct (Actual) Breakthrough time at MDPR [mins] BT0.1 Normalized breakthrough time at 0.1 µg/cm²/min [mins] BT1.0 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] CUM480 Cumulative permeation mass after 480 mins [µg/cm²] Time150 Time to reach cumulative permeation mass of 150 µg/cm² [mins] ISO Classification according to ISO 16602 CAS Chemical abstracts service registry number min Minute > Larger than < Smaller than imm Immediate (< 10 min) nm Not tested sat Saturated solution N/A Not Applicable na Not attained GPR grade General purpose reagent grade * Based on lowest single value 8 Actual breakthrough time; normalized breakthrough time is not available DOT5 Degradation after 5 min DOT30 Degradation after 30 min DOT60 Degradation after 60 min DOT240 Degradation after 240 min BT1383 Normalized breakthrough time at 0.1 µg/cm²/min [mins] acc. ASTM F1383

Permeation Data for Tychem® 6000 F

Hazard / Chemical Name	Physical State	CAS	BT Act	BT 0.1	BT 1.0	EN	SSPR	MDPR	Cum 480	Time 150	ISO
Chlorine (gaseous)	Vapor	7782-50-5	>480	>480	>480	6	<0.005	0.005	<2.4	>480	6
Chloro 1,3-butadiene, 2- (50% in Butanol)	Liquid	126-99-8	>480	>480	>480	6	<0.02	0.02	<9.6	>480	6
Chloro 1-methylbenzene, 2-	Liquid	95-49-8	>480	>480	>480	6	<0.02	0.02	<9.6	>480	6
Chloro 2,3-epoxy propane, 1-	Liquid	106-89-8	355	395	>480	6	<0.4	0.02	18.4	>480	6
Chloro 2-nitrobenzene, 1- (35-40 °C, molten)	Liquid	88-73-3	>480	>480	>480	6	<0.1	0.1	<48	>480	6
Chloro acetic acid (80%)	Liquid	79-11-8	>480	>480	>480	6	<0.005	0.005	<2.4	>480	6
Chloro acetone (95%)	Liquid	78-95-5	>480	>480	>480	6	<0.01	0.01	<4.8	>480	6
Chloro acrylonitrile, 2-	Liquid	920-37-6	>480	>480	>480	6	<0.01	0.01	<4.8	>480	6
Chloro aniline, p- (70 °C, molten)	Liquid	106-47-8		imm	11	1	256	0.0206			
Chloro benzenamine, 4- (70 °C, molten)	Liquid	106-47-8		imm	11	1	256	0.0206			
Chloro benzene	Liquid	108-90-7	>480	>480	>480	6	<0.05	0.05	<24	>480	6
Chloro buta-1,3-diene, 2- (50% in Butanol)	Liquid	126-99-8	>480	>480	>480	6	<0.02	0.02	<9.6	>480	6
Chloro ethanol, 2-	Liquid	107-07-3	>480	>480	>480	6	<0.06	0.06	<28.8	>480	6
Chloro ethene	Vapor	75-01-4	imm	>480	>480	6	0.02	0.001	<9.6	>480	6
Chloro form	Liquid	67-66-3	imm	imm	imm		10.6	0.001			
Chloro methyl methyl ether	Liquid	107-30-2	imm*/11	imm*/37	>480	6	0.75	0.001			
Chloro picrin	Liquid	76-06-2	>480	>480	>480	6	<0.05	0.05	<24	>480	6
Chloro prene (50% in Butanol)	Liquid	126-99-8	>480	>480	>480	6	<0.02	0.02	<9.6	>480	6
Chloro prene, 3-	Liquid	107-05-1	291*/400	381*/447	>480	6	<0.2	0.02	<18.5	>480	6
Chloro propan-2-one, 1- (95%)	Liquid	78-95-5	>480	>480	>480	6	<0.01	0.01	<4.8	>480	6
Chloro toluene, alpha-	Liquid	100-44-7	>480	>480	>480	6	<0.05	0.05	<24	>480	6
Chloro toluene, o-	Liquid	95-49-8	>480	>480	>480	6	<0.02	0.02	<9.6	>480	6
Chloroacetic ethylester	Liquid	105-39-5	>480	>480	>480	6	<0.06	0.06	<28.8	>480	6
Chloroacetic ethylester (75% in Ethanol)	Liquid	105-39-5	>480								
Chlorsulfonic acid	Liquid	7790-94-5	423	>480	>480	6	0.0003	0.0001			
Chromic acid (CrO3) (44.9%)	Liquid	1333-82-0	>480	>480	>480	6	<0.07	0.07	<33.6	>480	6
Citric acid (sat)	Liquid	77-92-9	>480	>480	>480	6	<0.005	0.005	<2.4	>480	6
Creosote	Liquid	8001-58-9	>480	>480	>480	6	<0.02	0.02	<9.6	>480	6
Cresol o-	Liquid	95-48-7	173	179	211	4	<4	0.02	674	295	5
Cresols, mixed isomers	Liquid	1319-77-3	>480	>480	>480	6	<0.03	0.03	<14.4	>480	6
Cresylic acid	Liquid	1319-77-3	>480	>480	>480	6	<0.03	0.03	<14.4	>480	6
Croton aldehyde	Liquid	123-73-9	121	147	>480	6	<1	0.02	210	405	5
Cumene	Liquid	98-82-8	>480	>480	>480	6	<0.05	0.05	<24	>480	6
Cyanamide (50%)	Liquid	420-04-2	62*/208	nm	>480	6	na	0.17	<81.6	>480	6
Cyanobenzene	Liquid	100-47-0	>480	>480	>480	6	<0.02	0.02	<9.6	>480	6

BTAct (Actual) Breakthrough time at MDPR [mins] BT0.1 Normalized breakthrough time at 0.1 µg/cm²/min [mins] BT1.0 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] CUM480 Cumulative permeation mass after 480 mins [µg/cm²] Time150 Time to reach cumulative permeation mass of 150 µg/cm² [mins] ISO Classification according to ISO 16602 CAS Chemical abstracts service registry number min Minute > Larger than < Smaller than imm Immediate (< 10 min) nm Not tested sat Saturated solution N/A Not Applicable na Not attained GPR grade General purpose reagent grade * Based on lowest single value 8 Actual breakthrough time; normalized breakthrough time is not available DOT5 Degradation after 5 min DOT30 Degradation after 30 min DOT60 Degradation after 60 min DOT240 Degradation after 240 min BT1383 Normalized breakthrough time at 0.1 µg/cm²/min [mins] acc. ASTM F1383

Permeation Data for Tychem® 6000 F

Hazard / Chemical Name	Physical State	CAS	BT Act	BT 0.1	BT 1.0	EN	SSPR	MDPR	Cum 480	Time 150	ISO
Cyanoethylene	Liquid	107-13-1	72*/91	73*/92	103	3	8.9	0.0085			
Cyanomethane	Liquid	75-05-8	65*/83	131	>480	6	<0.4	0.03	<82	>480	6
Cyanopropan-2-ol, 2-	Liquid	75-86-5	>480	>480	>480	6	<0.05	0.05	<24	>480	6
Cyclo hexane	Liquid	110-82-7	>480	>480	>480	6	<0.02	0.02	<9.6	>480	6
Cyclo hexanone	Liquid	108-94-1	>480	>480	>480	6	<0.05	0.05	<24	>480	6
Diamine	Liquid	302-01-2	269	283	352	5	2.3	0.001			
Diamino sulfo chloride	Liquid	13360-57-1	>480	>480	>480	6	<0.04	0.04	<19.2	>480	6
Diaminoethane, 1,2-	Liquid	107-15-3	>480	>480	>480	6	<0.005	0.005	<2.4	>480	6
Dibromoethane, 1,2-	Liquid	106-93-4	84*/153	144*/288	>480	6	0.52	0.001			
Dibutyl 1,2-benzenedicarboxylate	Liquid	84-74-2		nm	>480	6		0.05			
Dibutyl phthalate	Liquid	84-74-2		nm	>480	6		0.05			
Dibutyl sebacate	Liquid	109-43-3		nm	>480	6	<1	1			
Dichlorbenzen, 1,2-	Liquid	95-50-1	>480	>480	>480	6	<0.005	0.005	<2.4	>480	6
Dichlorbenzen, 1,3-	Liquid	541-73-1	>480	>480	>480	6	<0.005	0.005	<2.4	>480	6
Dichlorbenzen, 1,4- (50% in Ethanol)	Liquid	106-46-7	>480	>480	>480	6	<0.005	0.005	<2.4	>480	6
Dichlorethane, 1.2.-	Liquid	107-06-2	65*/83	93	109	3	<3	0.04	898	182	4
Dichloro -2-propanone, 1,3- (45 °C, molten)	Liquid	534-07-6	>480	>480	>480	6	<0.02	0.02	<9.6	>480	6
Dichloro acetone, 1,3- (45 °C, molten)	Liquid	534-07-6	>480	>480	>480	6	<0.02	0.02	<9.6	>480	6
Dichloro acetyl chloride	Liquid	79-36-7	160	160	180	4	78.41	0.01			
Dichloro ethyl ether	Liquid	111-44-4	>480	>480	>480	6	<0.02	0.02	<9.6	>480	6
Dichloro ethylene, 1,1-	Liquid	75-35-4	>480	>480	>480	6	<0.02	0.02	<9.6	>480	6
Dichloro methane	Liquid	75-09-2	imm	imm	imm		23.7	0.03			
Dichloro propene, 2,3-	Liquid	78-88-6	imm	imm*/25	54*/143	2	2.4	0.001			
Dicyanobutane, 1,4-	Liquid	111-69-3	>480	>480	>480	6	<0.05	0.05	<24	>480	6
Diesel Fuel Grade D-2	Liquid	mix	>480	>480	>480	6	<0.03	0.03	<14.4	>480	6
Diesel fuel	Liquid	68334-30-5	8*/323	>480	>480	6	0.02	0.001			
Diethyl amine	Liquid	109-89-7	>480	>480	>480	6	<0.05	0.05	<24	>480	6
Diethyl benzene (95%)	Liquid	25340-17-4	>480	>480	>480	6	<0.0216	0.0216	<10.4	>480	6
Diethyl ethanamine, N,N-	Liquid	121-44-8	>480	>480	>480	6	0.05	0.05	<24	>480	6
Diethyl ether	Liquid	60-29-7	>480	>480	>480	6	<0.01	0.01	<4.8	>480	6
Diethyl sulfate	Liquid	64-67-5	>480	>480	>480	6	<0.01	0.01	<4.8	>480	6
Diethylene glycol monobutyl ether	Liquid	112-34-5	>480	>480	>480	6	<0.05	0.05	<24	>480	6
Diethylene triamine	Liquid	111-40-0	imm	>480	>480	6	<0.01	0.005	<4.8	>480	6
Diketene Acetone (95%)	Liquid	5394-63-8	>480	>480	>480	6	<0.0229	0.0229	<11	>480	6
Dimethyl acetamide, N,N-	Liquid	127-19-5	>480	>480	>480	6	<0.014	0.014	<6.7	>480	6

BTAct (Actual) Breakthrough time at MDPR [mins] BT0.1 Normalized breakthrough time at 0.1 µg/cm²/min [mins] BT1.0 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] CUM480 Cumulative permeation mass after 480 mins [µg/cm²] Time150 Time to reach cumulative permeation mass of 150 µg/cm² [mins] ISO Classification according to ISO 16602 CAS Chemical abstracts service registry number min Minute > Larger than < Smaller than imm Immediate (< 10 min) nm Not tested sat Saturated solution N/A Not Applicable na Not attained GPR grade General purpose reagent grade * Based on lowest single value 8 Actual breakthrough time; normalized breakthrough time is not available DOT5 Degradation after 5 min DOT30 Degradation after 30 min DOT60 Degradation after 60 min DOT240 Degradation after 240 min BT1383 Normalized breakthrough time at 0.1 µg/cm²/min [mins] acc. ASTM F1383

Permeation Data for Tychem® 6000 F

Hazard / Chemical Name	Physical State	CAS	BT Act	BT 0.1	BT 1.0	EN	SSPR	MDPR	Cum 480	Time 150	ISO
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	<0.1	0.1	<48	>480	6
Dimethyl dichlorosilane	Liquid	75-78-5	>480	>480	>480	6	<0.0001	0.0001	<0.04	>480	6
Dimethyl formamide, N,N-	Liquid	68-12-2	>480	>480	>480	6	<0.05	0.05	<24	>480	6
Dimethyl fumarate (27 °C, solid)	Solid	624-49-7	>480	nm	>480	6	<0.39	0.39			
Dimethyl fumarate (37 °C, solid)	Solid	624-49-7	>480	nm	>480	6	<0.39	0.39			
Dimethyl ketal	Liquid	67-64-1	>480	>480	>480	6	<0.02	0.02	<9.6	>480	6
Dimethyl ketone	Liquid	67-64-1	>480	>480	>480	6	<0.02	0.02	<9.6	>480	6
Dimethyl nitrosamine	Liquid	62-75-9	>480	>480	>480	6	<0.001	0.001	<0.48	>480	6
Dimethyl phenylamine, N,N-	Liquid	121-69-7	>480	>480	>480	6	<0.1	0.1	<48	>480	6
Dimethyl sulfate	Liquid	77-78-1	>480	>480	>480	6	<0.09	0.09	<43.2	>480	6
Dimethyl sulfide	Liquid	75-18-3	83*/139	271	452	5	1.21	0.02			
Dimethyl sulfoxide	Liquid	67-68-5	>480	>480	>480	6	<0.05	0.05	<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'- (50 °C, molten)	Liquid	101-68-8	>480	>480	>480	6	<0.0403	0.0403	<19.3	>480	6
Dytek® A	Liquid	15520-10-2	>480	>480	>480	6	<0.01	0.01	<4.8	>480	6
Epichlorohydrin	Liquid	106-89-8	355	395	>480	6	<0.4	0.02	18.4	>480	6
Epoxy ethane (gaseous)	Vapor	75-21-8	106	126	>480	6	<0.35	0.05	76	>480	6
Epoxy propane, 1,2-	Liquid	75-56-9	41	43	51	2	<5	0.03	1860	114	3
Ethane 1,2-diol	Liquid	107-21-1	>480	>480	>480	6	<0.001	0.001	<0.48	>480	6
Ethane dioic acid (sat)	Liquid	144-62-7	>480	>480	>480	6	<0.005	0.005	<2.4	>480	6
Ethane diol dipropanoate, 1,2-	Liquid	123-73-9	121	147	>480	6	<1	0.02	210	405	5
Ethane nitrile	Liquid	75-05-8	65*/83	131	>480	6	<0.4	0.03	<82	>480	6
Ethane thiol	Liquid	75-08-1	>480	>480	>480	6	<0.01	0.01	<4.8	>480	6
Ethane trichloride	Liquid	79-00-5	120*/173	164*/232	202*/302	4	9.1	0.01			
Ethanol	Liquid	64-17-5	>480	>480	>480	6	<0.02	0.02	<9.6	>480	6
Ethanol amine	Liquid	141-43-5	>480	>480	>480	6	<0.05	0.05	<24	>480	6
Ethanoyl chloride	Liquid	75-36-5	155	>480	>480	6	0.0014	0.0001			
Ethansulphonic acid (70%)	Liquid	594-45-6	>480	>480	>480	6	<0.08	0.08	<38.4	>480	6
Ethoxy ethanol, 2-	Liquid	110-80-5	>480	>480	>480	6	<0.005	0.005	<2.4	>480	6
Ethoxy ethylacetat	Liquid	111-15-9	>480	>480	>480	6	<0.005	0.005	<2.4	>480	6
Ethyl Cellosolve®	Liquid	110-80-5	>480	>480	>480	6	<0.005	0.005	<2.4	>480	6
Ethyl acetate	Liquid	141-78-6	>480	>480	>480	6	<0.01	0.01	<4.8	>480	6
Ethyl acrylate	Liquid	140-88-5	imm*/161	imm*/162	imm*/163		<5	0.04			
Ethyl alcohol	Liquid	64-17-5	>480	>480	>480	6	<0.02	0.02	<9.6	>480	6

BTAct (Actual) Breakthrough time at MDPR [mins] BT0.1 Normalized breakthrough time at 0.1 µg/cm²/min [mins] BT1.0 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] CUM480 Cumulative permeation mass after 480 mins [µg/cm²] Time150 Time to reach cumulative permeation mass of 150 µg/cm² [mins] ISO Classification according to ISO 16602 CAS Chemical abstracts service registry number min Minute > Larger than < Smaller than imm Immediate (< 10 min) nm Not tested sat Saturated solution N/A Not Applicable na Not attained GPR grade General purpose reagent grade * Based on lowest single value 8 Actual breakthrough time; normalized breakthrough time is not available DOT5 Degradation after 5 min DOT30 Degradation after 30 min DOT60 Degradation after 60 min DOT240 Degradation after 240 min BT1383 Normalized breakthrough time at 0.1 µg/cm²/min [mins] acc. ASTM F1383

Permeation Data for Tychem® 6000 F

Hazard / Chemical Name	Physical State	CAS	BT Act	BT 0.1	BT 1.0	EN	SSPR	MDPR	Cum 480	Time 150	ISO
Ethyl benzene	Liquid	100-41-4	>480	>480	>480	6	<0.005	0.005	<2.4	>480	6
Ethyl ethanamine, N-	Liquid	109-89-7	>480	>480	>480	6	<0.05	0.05	<24	>480	6
Ethyl ether	Liquid	60-29-7	>480	>480	>480	6	<0.01	0.01	<4.8	>480	6
Ethyl glycol acetate	Liquid	111-15-9	>480	>480	>480	6	<0.005	0.005	<2.4	>480	6
Ethyl hexanoic acid	Liquid	149-57-5	>480	>480	>480	6	<0.04	0.04	<19.2	>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	65*/83	131	>480	6	<0.4	0.03	<82	>480	6
Ethylene carboxylic acid	Liquid	79-10-7	>480	>480	>480	6	<0.06	0.06	<28.8	>480	6
Ethylene chlorohydrin	Liquid	107-07-3	>480	>480	>480	6	<0.06	0.06	<28.8	>480	6
Ethylene diamine	Liquid	107-15-3	>480	>480	>480	6	<0.005	0.005	<2.4	>480	6
Ethylene dibromide	Liquid	106-93-4	84*/153	144*/288	>480	6	0.52	0.001			
Ethylene dichloride	Liquid	107-06-2	65*/83	93	109	3	<3	0.04	898	182	4
Ethylene glycol	Liquid	107-21-1	>480	>480	>480	6	<0.001	0.001	<0.48	>480	6
Ethylene glycol mono ethyl ether acetate	Liquid	111-15-9	>480	>480	>480	6	<0.005	0.005	<2.4	>480	6
Ethylene glycol monobutyl ether	Liquid	111-76-2	>480	>480	>480	6	<0.05	0.05	<24	>480	6
Ethylene glycol monoethyl ether	Liquid	110-80-5	>480	>480	>480	6	<0.005	0.005	<2.4	>480	6
Ethylene glycol monomethyl ether	Liquid	109-86-4	>480	>480	>480	6	<0.005	0.005	<2.4	>480	6
Ethylene glycol monomethyl ether acetate	Liquid	110-49-6	>480	>480	>480	6	<0.005	0.005	<2.4	>480	6
Ethylene oxide (gaseous)	Vapor	75-21-8	106	126	>480	6	<0.35	0.05	76	>480	6
Ethylene tetrachloride	Liquid	127-18-4	>480	>480	>480	6	<0.05	0.05	<24	>480	6
Ethylene trichloride	Liquid	79-01-6	>480	>480	>480	6	<0.01	0.01	<4.8	>480	6
Ferric (II) chloride (sat)	Liquid	7758-94-3	>480	>480	>480	6	<0.07	0.07	<33.6	>480	6
Ferric (III) chloride (40%)	Liquid	7705-08-0	>480	>480	>480	6	<0.03	0.03	<14.4	>480	6
Ferric (III) chloride (50%)	Liquid	7705-08-0	>480	>480	>480	6	<0.07	0.07	<33.6	>480	6
Fluorobenzene	Liquid	462-06-6	>480	>480	>480	6	<0.02	0.02	<9.6	>480	6
Fluorosilicic acid (33-35%)	Liquid	16961-83-4	>480	>480	>480	6	<0.04	0.04	<19.2	>480	6
Fluorosulfonic acid	Liquid	7789-21-1	87	194	>480	6	na	0.02	29	>480	6
Formaldehyde (37%)	Liquid	50-00-0	>480	>480	>480	6	<0.02	0.02	<9.6	>480	6
Formalin (37% (10-15% Methanol))	Liquid	50-00-0	>480	>480	>480	6	<0.0048	0.0048	<2.3	>480	6
Formalin (37%)	Liquid	50-00-0	>480	>480	>480	6	<0.02	0.02	<9.6	>480	6
Formic acid (50%)	Liquid	64-18-6	>480	>480	>480	6	<0.005	0.005	<2.4	>480	6
Formic acid (>95%)	Liquid	64-18-6	172	260	>480	6	0.24	0.001			
Furaldehyde, 2-	Liquid	98-01-1	459	>480	>480	6	na	0.03	<14.4	>480	6
Furan	Liquid	110-00-9	75	97	>480	6	<1	0.02	206	411	5
Furfural	Liquid	98-01-1	459	>480	>480	6	na	0.03	<14.4	>480	6

BTAct (Actual) Breakthrough time at MDPR [mins] BT0.1 Normalized breakthrough time at 0.1 µg/cm²/min [mins] BT1.0 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] CUM480 Cumulative permeation mass after 480 mins [µg/cm²] Time150 Time to reach cumulative permeation mass of 150 µg/cm² [mins] ISO Classification according to ISO 16602 CAS Chemical abstracts service registry number min Minute > Larger than < Smaller than imm Immediate (< 10 min) nm Not tested sat Saturated solution N/A Not Applicable na Not attained GPR grade General purpose reagent grade * Based on lowest single value 8 Actual breakthrough time; normalized breakthrough time is not available DOT5 Degradation after 5 min DOT30 Degradation after 30 min DOT60 Degradation after 60 min DOT240 Degradation after 240 min BT1383 Normalized breakthrough time at 0.1 µg/cm²/min [mins] acc. ASTM F1383

Permeation Data for Tychem® 6000 F

Hazard / Chemical Name	Physical State	CAS	BT Act	BT 0.1	BT 1.0	EN	SSPR	MDPR	Cum 480	Time 150	ISO
Gasoline, leaded	Liquid	mix	imm	imm*/21			0.32	0.001			
Gasoline, unleaded	Liquid	86290-81-5	>480	>480	>480	6	<0.001	0.001	<0.48	>480	6
Glutaral (50%)	Liquid	111-30-8	150	170	200	4	1.861	0.01			
Glutaraldehyde (50%)	Liquid	111-30-8	150	170	200	4	1.861	0.01			
Glycol alcohol	Liquid	107-21-1	>480	>480	>480	6	<0.001	0.001	<0.48	>480	6
Glycol chlorohydrin	Liquid	107-07-3	>480	>480	>480	6	<0.06	0.06	<28.8	>480	6
Green Liquor (mix)	Liquid	mix		>480							
Hexamethylene diamine (45 °C, molten)	Liquid	124-09-4	423	>480	>480	6	0.003	0.0001	<1.4	>480	6
Hexamethylene diisocyanate	Liquid	822-06-0	>480	>480	>480	6	<0.0271	0.0271	<13	>480	6
Hexane n-	Liquid	110-54-3	>480	>480	>480	6	<0.05	0.05	<24	>480	6
Hexanone	Liquid	108-94-1	>480	>480	>480	6	<0.05	0.05	<24	>480	6
Hexone	Liquid	108-10-1	>480	>480	>480	6	<0.05	0.05	<24	>480	6
Hexyl chloro formate, 2-	Liquid	6092-54-2	>480	>480	>480	6	<0.08	0.08	<38.4	>480	6
Hydrazine	Liquid	302-01-2	269	283	352	5	2.3	0.001			
Hydriodic acid (55-57%)	Liquid	10034-85-2	>480	>480	>480	6	<0.01	0.01	<4.8	>480	6
Hydrobromic acid (48%)	Liquid	10035-10-6	>480	>480	>480	6	<0.04	0.04	<19.2	>480	6
Hydrochloric acid (37%)	Liquid	7647-01-0	>480	>480	>480	6	<0.005	0.005	<2.4	>480	6
Hydrofluoric acid (48-51%)	Liquid	7664-39-3	>480	>480	>480	6	<0.025	0.025	<12	>480	6
Hydrofluoric acid (60%)	Liquid	7664-39-3	18	52	373	5	na	0.005			
Hydrofluoric acid (70%)	Liquid	7664-39-3	22	35	293	5	na	0.005	414	227	4
Hydrogen bromide (gaseous)	Vapor	10035-10-6	>480	>480	>480	6	<0.0001	0.0001	<0.04	>480	6
Hydrogen chloride (gaseous)	Vapor	7647-01-0	>480	>480	>480	6	<0.005	0.005	<2.4	>480	6
Hydrogen fluoride (20-27 °C, gaseous)	Vapor	7664-39-3	imm	imm	23	1	na	0.05			
Hydrogen peroxide (50%)	Liquid	7722-84-1	>480	>480	>480	6	<0.01	0.01	<4.8	>480	6
Hydrogen peroxide (70%)	Liquid	7722-84-1	>480	>480	>480	6	<0.02	0.02	<9.6	>480	6
Hydroxy 1,2,3-propanetricarboxylic acid, 2- (sat)	Liquid	77-92-9	>480	>480	>480	6	<0.005	0.005	<2.4	>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	<0.05	0.05	<24	>480	6
Hydroxy isobutyronitrile	Liquid	75-86-5	>480	>480	>480	6	<0.05	0.05	<24	>480	6
Hydroxy propene	Liquid	107-18-6	>480	>480	>480	6	<0.02	0.02	<9.6	>480	6
Hydroxy toluene	Liquid	100-51-6	>480	>480	>480	6	<0.1	0.1	<48	>480	6
Hydroxy toluene, o-	Liquid	95-48-7	173	179	211	4	<4	0.02	674	295	5
Hypophosphorus acid (50%)	Liquid	6303-21-5	>480	>480	>480	6	<0.09	0.09	<43.2	>480	6
Iodomethane	Liquid	74-88-4	254	296	>480	6	na	0.07	53.6	>480	6
Isobutyl methyl ketone	Liquid	108-10-1	>480	>480	>480	6	<0.05	0.05	<24	>480	6

BTAct (Actual) Breakthrough time at MDPR [mins] BT0.1 Normalized breakthrough time at 0.1 µg/cm²/min [mins] BT1.0 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] CUM480 Cumulative permeation mass after 480 mins [µg/cm²] Time150 Time to reach cumulative permeation mass of 150 µg/cm² [mins] ISO Classification according to ISO 16602 CAS Chemical abstracts service registry number min Minute > Larger than < Smaller than imm Immediate (< 10 min) nm Not tested sat Saturated solution N/A Not Applicable na Not attained GPR grade General purpose reagent grade * Based on lowest single value 8 Actual breakthrough time; normalized breakthrough time is not available DOT5 Degradation after 5 min DOT30 Degradation after 30 min DOT60 Degradation after 60 min DOT240 Degradation after 240 min BT1383 Normalized breakthrough time at 0.1 µg/cm²/min [mins] acc. ASTM F1383

Permeation Data for Tychem® 6000 F

Hazard / Chemical Name	Physical State	CAS	BT Act	BT 0.1	BT 1.0	EN	SSPR	MDPR	Cum 480	Time 150	ISO
Isophthaloyldichloride (45 °C, molten)	Liquid	99-63-8	>480	>480	>480	6	<0.0001	0.0001	<0.04	>480	6
Isopropanol	Liquid	67-63-0	>480	>480	>480	6	<0.05	0.05	<24	>480	6
Isopropyl alcohol	Liquid	67-63-0	>480	>480	>480	6	<0.05	0.05	<24	>480	6
Isopropyl amine	Liquid	75-31-0	>480	>480	>480	6	<0.05	0.05	<24	>480	6
Isopropyl benzene	Liquid	98-82-8	>480	>480	>480	6	<0.05	0.05	<24	>480	6
Isopropylidenediphenol diglycidyl ether, 4,4'-	Liquid	1675-54-3	>480	>480	>480	6	<0.01	0.01	<4.8	>480	6
Kerosene	Liquid	8008-20-6	>480	>480	>480	6	<0.001	0.001	<0.48	>480	6
Ketone propane	Liquid	67-64-1	>480	>480	>480	6	<0.02	0.02	<9.6	>480	6
Lewisite (L), FINABEL 0.7.C	Liquid	541-25-3		>260*/693 [8]							
Lewisite (L), MIL-STD-282 (100 g/m^2)	Liquid	541-25-3		360[8]							
Limonene d-	Liquid	5989-27-5	>480	>480	>480	6	<0.02	0.02	<9.6	>480	6
MEK	Liquid	78-93-3	imm	40*/64	>480	6	0.36	0.001			
Maleic anhydride (66 °C, molten)	Liquid	108-31-6	21	22	24	1	24.6	0.016			
Mercapto acetic acid	Liquid	68-11-1	>480	>480	>480	6	<0.0001	0.0001	<0.04	>480	6
Mercapto ethanol	Liquid	60-24-2	>480	>480	>480	6	<0.08	0.08	<38.4	>480	6
Mercuric I chloride (sat)	Liquid	10112-91-1	>480	>480	>480	6	<0.1	0.1	<48	>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	<0.0001	0.0001	<0.04	>480	6
Methanesulfonyl chloride	Liquid	124-63-0	>480	>480	>480	6	<0.02	0.02	<9.6	>480	6
Methanesulphonic acid	Liquid	75-75-2	>480	>480	>480	6	<0.05	0.05	<24	>480	6
Methanethiol	Vapor	74-93-1	>480	>480	>480	6	<0.05	0.05	<24	>480	6
Methanol	Liquid	67-56-1	56	117	>480	6	0.14	0.02			
Methoxy 2-methylpropane, 2-	Liquid	1634-04-4	>480	>480	>480	6	<0.01	0.01	<4.8	>480	6
Methoxy chloromethane	Liquid	107-30-2	imm*/11	imm*/37	>480	6	0.75	0.001			
Methoxy ethanol, 2	Liquid	109-86-4	>480	>480	>480	6	<0.005	0.005	<2.4	>480	6
Methoxy ethylacetate, 2-	Liquid	110-49-6	>480	>480	>480	6	<0.005	0.005	<2.4	>480	6
Methyl -2-pyridyl acetate	Liquid	1658-42-0	>480	>480	>480	6	<0.05	0.05	<24	>480	6
Methyl 1,5-pentantedinitrile, 2-	Liquid	4553-62-2	>480	>480	>480	6	<0.1	0.1	<48	>480	6
Methyl 2-methyl-2-propenoate	Liquid	80-62-6	imm*/26	imm*/53			1.4	0.001			
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	<0.02	0.02	<9.6	>480	6
Methyl N-nitrosomethanamine, N-	Liquid	62-75-9	>480	>480	>480	6	<0.001	0.001	<0.48	>480	6
Methyl acetyl	Liquid	67-64-1	>480	>480	>480	6	<0.02	0.02	<9.6	>480	6
Methyl acrolein	Liquid	123-73-9	121	147	>480	6	<1	0.02	210	405	5
Methyl acrylate	Liquid	96-33-3	>480	>480	>480	6	<0.02	0.02	<9.6	>480	6

BTAct (Actual) Breakthrough time at MDPR [mins] BT0.1 Normalized breakthrough time at 0.1 µg/cm²/min [mins] BT1.0 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] CUM480 Cumulative permeation mass after 480 mins [µg/cm²] Time150 Time to reach cumulative permeation mass of 150 µg/cm² [mins] ISO Classification according to ISO 16602 CAS Chemical abstracts service registry number min Minute > Larger than < Smaller than imm Immediate (< 10 min) nm Not tested sat Saturated solution N/A Not Applicable na Not attained GPR grade General purpose reagent grade * Based on lowest single value 8 Actual breakthrough time; normalized breakthrough time is not available DOT5 Degradation after 5 min DOT30 Degradation after 30 min DOT60 Degradation after 60 min DOT240 Degradation after 240 min BT1383 Normalized breakthrough time at 0.1 µg/cm²/min [mins] acc. ASTM F1383

Permeation Data for Tychem® 6000 F

Hazard / Chemical Name	Physical State	CAS	BT Act	BT 0.1	BT 1.0	EN	SSPR	MDPR	Cum 480	Time 150	ISO
Methyl amine (gaseous)	Vapor	74-89-5	>480	>480	>480	6	<0.05	0.05	<24	>480	6
Methyl aniline, o-	Liquid	95-53-4	>480	>480	>480	6	<0.03	0.03	<14.4	>480	6
Methyl benzol	Liquid	108-88-3	>480	>480	>480	6	<0.05	0.05	<24	>480	6
Methyl benzylamine, N-	Liquid	103-67-3	>480	>480	>480	6	<0.02	0.02	<9.6	>480	6
Methyl chloride (gaseous)	Vapor	74-87-3	>480	>480	>480	6	<0.01	0.01	<4.8	>480	6
Methyl chloro formate	Liquid	79-22-1	99*/175	204*/308	>480	6	0.17	0.05	<24	>480	6
Methyl cyanide	Liquid	75-05-8	65*/83	131	>480	6	<0.4	0.03	<82	>480	6
Methyl ethyl ketone	Liquid	78-93-3	imm	40*/64	>480	6	0.36	0.001			
Methyl ethyl ketoxime	Liquid	96-29-7	>480	>480	>480	6	<0.02	0.02	<9.6	>480	6
Methyl formamide, N-	Liquid	123-39-7	>480	>480	>480	6	<0.05	0.05	<24	>480	6
Methyl hydrazine	Liquid	60-34-4	83*/206	183*/283	280*/413	5	0.98	0.01			
Methyl imidazole, 1-	Liquid	616-47-7	>480	>480	>480	6	<0.06	0.06	<28.8	>480	6
Methyl iodide	Liquid	74-88-4	254	296	>480	6	na	0.07	53.6	>480	6
Methyl isocyanate	Liquid	624-83-9	imm	imm			0.42	0.001			
Methyl ketone	Liquid	67-64-1	>480	>480	>480	6	<0.02	0.02	<9.6	>480	6
Methyl mercaptan	Vapor	74-93-1	>480	>480	>480	6	<0.05	0.05	<24	>480	6
Methyl methacrylate	Liquid	80-62-6	imm*/26	imm*/53			1.4	0.001			
Methyl pentan-2-one, 4-	Liquid	108-10-1	>480	>480	>480	6	<0.05	0.05	<24	>480	6
Methyl phenols	Liquid	1319-77-3	>480	>480	>480	6	<0.03	0.03	<14.4	>480	6
Methyl propan-2-ol, 2-	Liquid	75-65-0	10*/147	37*/205	>480	6	0.26	0.02			
Methyl propenoic acid, 2-	Liquid	79-41-4	>480	>480	>480	6	<0.0001	0.0001	<0.04	>480	6
Methyl pyridine, 2-	Liquid	109-06-8	>480	>480	>480	6	<0.024	0.024	<11.5	>480	6
Methyl pyridine, 3-	Liquid	108-99-6	>480	>480	>480	6	<0.024	0.024	<11.5	>480	6
Methyl tert-butyl ether	Liquid	1634-04-4	>480	>480	>480	6	<0.01	0.01	<4.8	>480	6
Methyl trichlorosilane	Liquid	75-79-6	>480	>480	>480	6	<0.0001	0.0001	<0.04	>480	6
Methyl vinyl ketone	Liquid	78-94-4	287*/379	>480	>480	6	<0.1	0.02	<9.6	>480	6
Methylen Isocyclohexylamine, 4,4- (40 °C)	Liquid	1761-71-3	>480	>480	>480	6	<0.01	0.01	<4.8	>480	6
Methylene bromide	Liquid	74-95-3	imm	imm	20	1	111	0.05			
Methylene chloride	Liquid	75-09-2	imm	imm	imm		23.7	0.03			
Methylene diphenyl diisocyanate, 4,4'- (50 °C, molten)	Liquid	101-68-8	>480	>480	>480	6	<0.0403	0.0403	<19.3	>480	6
Naphthalene	Solid	91-20-3	>480	>480	>480	6	<0.001	0.001	<0.48	>480	6
Naphthalene (25% in Diethylene glycol dimethylether)	Liquid	91-20-3	>480	>480	>480	6	<0.007	0.007	<3.4	>480	6
Neoprene (50% in Butanol)	Liquid	126-99-8	>480	>480	>480	6	<0.02	0.02	<9.6	>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	<0.005	0.005	<2.4	>480	6

BTAct (Actual) Breakthrough time at MDPR [mins] BT0.1 Normalized breakthrough time at 0.1 µg/cm²/min [mins] BT1.0 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] CUM480 Cumulative permeation mass after 480 mins [µg/cm²] Time150 Time to reach cumulative permeation mass of 150 µg/cm² [mins] ISO Classification according to ISO 16602 CAS Chemical abstracts service registry number min Minute > Larger than < Smaller than imm Immediate (< 10 min) nm Not tested sat Saturated solution N/A Not Applicable na Not attained GPR grade General purpose reagent grade * Based on lowest single value 8 Actual breakthrough time; normalized breakthrough time is not available DOT5 Degradation after 5 min DOT30 Degradation after 30 min DOT60 Degradation after 60 min DOT240 Degradation after 240 min BT1383 Normalized breakthrough time at 0.1 µg/cm²/min [mins] acc. ASTM F1383

Permeation Data for Tychem® 6000 F

Hazard / Chemical Name	Physical State	CAS	BT Act	BT 0.1	BT 1.0	EN	SSPR	MDPR	Cum 480	Time 150	ISO
Nitric acid, red fuming (90%)	Liquid	52583-42-3	imm	imm*/10	32	2	na	0.08	342/80 min	59	2
Nitro benzene	Liquid	98-95-3	>480	>480	>480	6	<0.02	0.02	<9.6	>480	6
Nitro chlormethan	Liquid	76-06-2	>480	>480	>480	6	<0.05	0.05	<24	>480	6
Nitro methane	Liquid	75-52-5	157	233			0.97	0.001			
Nitro propane, 2-	Liquid	79-46-9	>480	>480	>480	6	<0.05	0.05	<24	>480	6
Nitro toluene, 2-	Liquid	88-72-2	>480	>480	>480	6	<0.03	0.03	<14.4	>480	6
Nitrogen dioxide	Vapor	10102-44-0	<15	<15			>0.2	0.01			
Norflurane	Vapor	811-97-2	>480	>480	>480	6	<0.04	0.04	<19.2	>480	6
Octyl chlor formiate	Liquid	7452-59-7	>480	>480	>480	6	<0.06	0.06	<28.8	>480	6
Oleum (20% free SO3)	Liquid	8014-95-7	>480	>480	>480	6	<0.06	0.06	<28.8	>480	6
Oleum (40% free SO3)	Liquid	8014-95-7	130*/220	455*/468	>480	6	0.32	0.0001			
Oleum (65% free SO3)	Liquid	8014-95-7	180	248	370	5	na	0.04	398	428	5
Oxalic acid (sat)	Liquid	144-62-7	>480	>480	>480	6	<0.005	0.005	<2.4	>480	6
PCB in transformer oil (mix)	Liquid	mix	324*/428	>480	>480	6	0.032	0.01			
Pentachloroantimony	Liquid	7647-18-9	<15	<15	<15	1	>10	0.1			
Pentanedial, 1,5- (50%)	Liquid	111-30-8	150	170	200	4	1.861	0.01			
Pentanoic acid	Liquid	109-52-4	>480	>480	>480	6	<0.03	0.03	<14.4	>480	6
Pentanol, 1-	Liquid	71-41-0	>480	>480	>480	6	<0.1	0.1	<48	>480	6
Pentanol, tert-	Liquid	75-85-4	>480	>480	>480	6	<0.05	0.05	<24	>480	6
Pentene nitrile, 2-	Liquid	13284-42-9	>480	>480	>480	6	<0.02	0.02	<9.6	>480	6
Pentyl acetate	Liquid	628-63-7	>480	>480	>480	6	0.007	0.001	<10.2	>480	6
Perchloric acid (70%)	Liquid	7601-90-3	>480	>480	>480	6	<0.005	0.005	<2.4	>480	6
Phenethylene	Liquid	100-42-5	>480	>480	>480	6	<0.05	0.05	<24	>480	6
Phenol (45 °C, molten)	Liquid	108-95-2	22	25	29	1	na	0.05	>355, 120 min	56	2
Phenol (60 °C, molten)	Liquid	108-95-2	imm	imm	imm		na	0.01	426/24 min	14	1
Phenol (85%)	Liquid	108-95-2	>480	>480	>480	6	<0.05	0.05	<24	>480	6
Phenyl acetonitrile	Liquid	140-29-4	>390	>390	>390	5	<0.01	0.01	<4.8	>480	6
Phenyl amine	Liquid	62-53-3	>480	>480	>480	6	<0.03	0.03	<14.4	>480	6
Phenyl chlor formiate	Liquid	1885-14-9	>480	>480	>480	6	<0.06	0.06	<28.8	>480	6
Phenyl chloride	Liquid	108-90-7	>480	>480	>480	6	<0.05	0.05	<24	>480	6
Phenyl cyanide	Liquid	100-47-0	>480	>480	>480	6	<0.02	0.02	<9.6	>480	6
Phenyl ethane	Liquid	100-41-4	>480	>480	>480	6	<0.005	0.005	<2.4	>480	6
Phenyl ethanol, 1-	Liquid	98-85-1	>480	>480	>480	6	<0.005	0.005	<2.4	>480	6
Phenyl propane, 2-	Liquid	98-82-8	>480	>480	>480	6	<0.05	0.05	<24	>480	6
Phenyl trichlorosilane	Liquid	98-13-5	>480	>480	>480	6	<0.0001	0.0001	<0.04	>480	6

BTAct (Actual) Breakthrough time at MDPR [mins] BT0.1 Normalized breakthrough time at 0.1 µg/cm²/min [mins] BT1.0 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] CUM480 Cumulative permeation mass after 480 mins [µg/cm²] Time150 Time to reach cumulative permeation mass of 150 µg/cm² [mins] ISO Classification according to ISO 16602 CAS Chemical abstracts service registry number min Minute > Larger than < Smaller than imm Immediate (< 10 min) nm Not tested sat Saturated solution N/A Not Applicable na Not attained GPR grade General purpose reagent grade * Based on lowest single value 8 Actual breakthrough time; normalized breakthrough time is not available DOT5 Degradation after 5 min DOT30 Degradation after 30 min DOT60 Degradation after 60 min DOT240 Degradation after 240 min BT1383 Normalized breakthrough time at 0.1 µg/cm²/min [mins] acc. ASTM F1383

Permeation Data for Tychem® 6000 F

Hazard / Chemical Name	Physical State	CAS	BT Act	BT 0.1	BT 1.0	EN	SSPR	MDPR	Cum 480	Time 150	ISO
Phosgene	Vapor	75-44-5	>480	>480	>480	6	<0.02	0.02	<9.6	>480	6
Phosphine	Vapor	7803-51-2	imm	imm			>0.11	0.003			
Phosphinic acid (50%)	Liquid	6303-21-5	>480	>480	>480	6	<0.09	0.09	<43.2	>480	6
Phosphoric acid (85%)	Liquid	7664-38-2	>480	>480	>480	6	<0.005	0.005	<2.4	>480	6
Phosphorus oxychloride	Liquid	10025-87-3		>480	>480	6	<0.01	0.01	<4.8	>480	6
Phosphorus trichloride	Liquid	7719-12-2	>480	>480	>480	6	<0.05	0.05	<24	>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	<0.05	0.05	<24	>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	>480	>480	6	<0.07	0.07	<33.6	>480	6
Potassium chromate (sat)	Liquid	7789-00-6	>480	>480	>480	6	<0.08	0.08	<38.4	>480	6
Potassium hydroxide (45%)	Liquid	1310-58-3	>480	>480	>480	6	<0.023	0.023	<11	>480	0
Potassium hydroxide (50%)	Liquid	1310-58-3	>480	>480	>480	6	<0.005	0.005	<2.4	>480	6
Prop-2-en-1-al	Liquid	107-02-8	51*/65	75*/101	>480	6	<0.5	0.02	105	>480	6
Prop-2-en-1-al (10 g/m^2)	Liquid	107-02-8	>480	>480	>480	6	<0.04	0.04	<19.2	>480	6
Prop-2-yn-1-ol	Liquid	107-19-7	123	123	127	4	37.9	0.07			
Propan -1-ol	Liquid	71-23-8	>480	>480	>480	6	<0.02	0.02	<9.6	>480	6
Propan -2-ol	Liquid	67-63-0	>480	>480	>480	6	<0.05	0.05	<24	>480	6
Propan -2-one	Liquid	67-64-1	>480	>480	>480	6	<0.02	0.02	<9.6	>480	6
Propanoic acid	Liquid	79-09-4	>480	>480	>480	6	<0.03	0.03	<14.4	>480	6
Propanol, 1-	Liquid	71-23-8	>480	>480	>480	6	<0.02	0.02	<9.6	>480	6
Propanol, n-	Liquid	71-23-8	>480	>480	>480	6	<0.02	0.02	<9.6	>480	6
Propargyl alcohol	Liquid	107-19-7	123	123	127	4	37.9	0.07			
Propen 1-ol, 2-	Liquid	107-18-6	>480	>480	>480	6	<0.02	0.02	<9.6	>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
Propenenitrile, 2-	Liquid	107-13-1	72*/91	73*/92	103	3	8.9	0.0085			
Propenoic acid butyl ester, 2-	Liquid	141-32-2	>480	>480	>480	6	<0.05	0.05	<24	>480	6
Propenoic acid nitrile	Liquid	107-13-1	72*/91	73*/92	103	3	8.9	0.0085			
Propyl alcohol	Liquid	71-23-8	>480	>480	>480	6	<0.02	0.02	<9.6	>480	6
Propyl amine, n-	Liquid	107-10-8	imm	16*/21	>480	6	0.52	0.05			
Propyl bromide, n-	Liquid	106-94-5	>480	>480	>480	6	<0.03	0.03	<14.4	>480	6
Propylene aldehyde	Liquid	123-73-9	121	147	>480	6	<1	0.02	210	405	5
Propylene oxide, 1,2-	Liquid	75-56-9	41	43	51	2	<5	0.03	1860	114	3

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Permeation Data for Tychem® 6000 F

Hazard / Chemical Name	Physical State	CAS	BT Act	BT 0.1	BT 1.0	EN	SSPR	MDPR	Cum 480	Time 150	ISO
Pyridene, 2-fluoro-6-(trifluoromethyl)	Liquid	94239-04-0	>480	>480	>480	6	<0.02	0.02	<9.6	>480	6
Pyridine	Liquid	110-86-1	>480	>480	>480	6	<0.05	0.05	<24	>480	6
Pyroacetic ether	Liquid	67-64-1	>480	>480	>480	6	<0.02	0.02	<9.6	>480	6
Pyrrolidine	Liquid	123-75-1	40*/80	45*/100	145*/185	4	4.7	0.05			
Sarin (GB), FINABEL 0.7.C	Liquid	107-44-8		>1400[8]							
Sarin (GB), MIL-STD-282 (100 g/m^2)	Liquid	107-44-8		>480[8]							
Silane	Vapor	7803-62-5	>480	>480	>480	6	<0.1	0.1	<48	>480	6
Silicon tetrachloride	Liquid	10026-04-7	>480	>480	>480	6	<0.0001	0.0001	<0.04	>480	6
Sodium bisulphite (38-40%)	Liquid	7631-90-5	>480	>480	>480	6	<0.07	0.07	<33.6	>480	6
Sodium cyanide (45%)	Liquid	143-33-9	>480	>480	>480	6	<0.1	0.1	<48	>480	6
Sodium cyanide (sat)	Liquid	143-33-9	>480	>480	>480	6	<0.07	0.07	<33.6	>480	6
Sodium hydroxide (50% at 50 °C)	Liquid	1310-73-2	>480	>480	>480	6	<0.02	0.02	<9.6	>480	6
Sodium hydroxide (50%)	Liquid	1310-73-2	>480	>480	>480	6	<0.025	0.025	<12	>480	6
Sodium hypochlorite (15%)	Liquid	7681-52-9	>480	>480	>480	6	<0.03	0.03	<14.4	>480	6
Soman (GD), FINABEL 0.7.C	Liquid	96-64-0		>1400[8]							
Soman (GD), MIL-STD-282 (100 g/m^2)	Liquid	96-64-0		>480[8]							
Spiritus	Liquid	64-17-5	>480	>480	>480	6	<0.02	0.02	<9.6	>480	6
Styrene	Liquid	100-42-5	>480	>480	>480	6	<0.05	0.05	<24	>480	6
Sulfamic acid (15%)	Liquid	5329-14-6	>480	>480	>480	6	<0.04	0.04	<19.2	>480	6
Sulfamidic acid (15%)	Liquid	5329-14-6	>480	>480	>480	6	<0.04	0.04	<19.2	>480	6
Sulfur Mustard (HD), FINABEL 0.7.C	Liquid	505-60-2		>1400[8]							
Sulfur Mustard (HD), MIL-STD-282 (100 g/m^2)	Liquid	505-60-2		>480[8]							
Sulfur dioxide	Vapor	7446-09-5	28*/46	28*/46	>480	6	<0.5	0.1	<94	>480	6
Sulfuric acid (98% at 50 °C)	Liquid	7664-93-9	>480	>480	>480	6	<0.02	0.02	<9.6	>480	6
Sulfuric acid (>95%)	Liquid	7664-93-9	>480	>480	>480	6	<0.02	0.02	<9.6	>480	6
Sulfuric acid diethyl ester	Liquid	64-67-5	>480	>480	>480	6	<0.01	0.01	<4.8	>480	6
Sulfuric acid dimethyl ester	Liquid	77-78-1	>480	>480	>480	6	<0.09	0.09	<43.2	>480	6
Sulfuric acid fuming (20% free SO3)	Liquid	8014-95-7	>480	>480	>480	6	<0.06	0.06	<28.8	>480	6
Sulfuric acid fuming (40% free SO3)	Liquid	8014-95-7	130*/220	455*/468	>480	6	0.32	0.0001			
Sulfuric acid fuming (65% free SO3)	Liquid	8014-95-7	180	248	370	5	na	0.04	398	428	5
Sulfuryl chloride	Liquid	7791-25-5	>480	>480	>480	6	<0.01	0.01	<4.8	>480	6
Tabun (GA), FINABEL 0.7.C	Liquid	77-81-6		>1400[8]							
Tabun (GA), MIL-STD-282 (100 g/m^2)	Liquid	77-81-6		>480[8]							
Tetrachloro bisphenol-A, 2,2',6,6'-	Solid	79-95-8	>480	>480	>480	6	<0.1	0.1	<48	>480	6
Tetrachloro ethane, 1,1,2,2,-	Liquid	79-34-5	>480	>480	>480	6	<0.008	0.008	<3.8	>480	6

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Permeation Data for Tychem® 6000 F

Hazard / Chemical Name	Physical State	CAS	BT Act	BT 0.1	BT 1.0	EN	SSPR	MDPR	Cum 480	Time 150	ISO
Tetrachloro ethylene, 1,1,2,2-	Liquid	127-18-4	>480	>480	>480	6	<0.05	0.05	<24	>480	6
Tetrachloro methane	Liquid	56-23-5	imm	imm*/11	>480	6	0.57	0.001			
Tetraethylene pentamine	Liquid	112-57-2	>480	>480	>480	6	<0.005	0.005	<2.4	>480	6
Tetrafluoroethane, 1,1,1,2-	Vapor	811-97-2	>480	>480	>480	6	<0.04	0.04	<19.2	>480	6
Tetrahydrofuran	Liquid	109-99-9	>480	>480	>480	6	<0.05	0.05	<24	>480	6
Tetramethyl ammonium hydroxide (25%)	Liquid	75-59-2	>480	>480	>480	6	<0.01	0.01	<4.8	>480	6
Thiazol, 1,3-	Liquid	228-47-1	>480	>480	>480	6	<0.04	0.04	<19.2	>480	6
Thioglycolic acid	Liquid	68-11-1	>480	>480	>480	6	<0.0001	0.0001	<0.04	>480	6
Thionyl chloride	Liquid	7719-09-7	21	21	33	2	nm	0.1	nm	47	2
Thiophene	Liquid	110-02-1	>480	>480	>480	6	<0.01	0.01	<4.8	>480	6
Thiotepa (10 mg/ml)	Liquid	52-24-4	imm	>240	>240	5	<0.1	0.001			
Tin chloride, mono-n-butyl	Liquid	1118-46-3	>480	>480	>480	6	<0.0001	0.0001	<0.04	>480	6
Tin chloride, tri-n-butyl	Liquid	1461-22-9		nm	>480	6	nm	0.2			
Titan(IV) chloride	Liquid	7550-45-0	>480	>480	>480	6	<0.0001	0.0001	<0.04	>480	6
Titanium tetrachloride	Liquid	7550-45-0	>480	>480	>480	6	<0.0001	0.0001	<0.04	>480	6
Toluene	Liquid	108-88-3	>480	>480	>480	6	<0.05	0.05	<24	>480	6
Toluene diisocyanate, 2,4-	Liquid	584-84-9	>480	>480	>480	6	<0.0281	0.0281	<13.5	>480	6
Toluene diisocyanate, 2,4- (80%)	Liquid	584-84-9	>480	>480	>480	6	<0.0281	0.0281	<13.5	>480	6
Toluidine, o-	Liquid	95-53-4	>480	>480	>480	6	<0.03	0.03	<14.4	>480	6
Tributyl amine (95%)	Liquid	102-82-9	>480	>480	>480	6	<0.04	0.04	<19.2	>480	6
Trichloro acetic acid (sat)	Liquid	76-03-9	>480	>480	>480	6	<0.03	0.03	<14.4	>480	6
Trichloro acetone, 1,1,3- (87.7%)	Liquid	921-03-9	431*/458	467*/476	>480	6	<0.2	0.05	<24	>480	6
Trichloro benzene, 1,2,4-	Liquid	120-82-1	>480	>480	>480	6	<0.001	0.001	<0.48	>480	6
Trichloro ethane, 1,1,2-	Liquid	79-00-5	120*/173	164*/232	202*/302	4	9.1	0.01			
Trichloro ethanol, 2,2,2-	Liquid	115-20-8	>480	>480	>480	6	<0.008	0.008	<3.8	>480	6
Trichloro ethylene	Liquid	79-01-6	>480	>480	>480	6	<0.01	0.01	<4.8	>480	6
Trichloro methane	Liquid	67-66-3	imm	imm	imm		10.6	0.001			
Trichloro phenylsilane	Liquid	98-13-5	>480	>480	>480	6	<0.0001	0.0001	<0.04	>480	6
Triethyl amine	Liquid	121-44-8	>480	>480	>480	6	0.05	0.05	<24	>480	6
Triethylentetramine (60%)	Liquid	112-24-3	>480	>480	>480	6	<0.005	0.005	<2.4	>480	6
Trifluoro acetic acid	Liquid	76-05-1	>480	>480	>480	6	<0.01	0.01	<4.8	>480	6
Trifluoro methansulfonic acid	Liquid	1493-13-6	>480	>480	>480	6	<0.01	0.01	<4.8	>480	6
Trimethyl chinon (30 °C, molten)	Liquid	935-92-2		nm	>480	6	nm	0.05			
VX Nerve Agent, FINABEL 0.7.C	Liquid	50782-69-9		>1400[8]							
VX Nerve Agent, MIL-STD-282 (100 g/m^2)	Liquid	50782-69-9		>480[8]							

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Permeation Data for Tychem® 6000 F

Hazard / Chemical Name	Physical State	CAS	BT Act	BT 0.1	BT 1.0	EN	SSPR	MDPR	Cum 480	Time 150	ISO
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	<0.05	0.05	<24	>480	6
Vinyl carbinol	Liquid	107-18-6	>480	>480	>480	6	<0.02	0.02	<9.6	>480	6
Vinyl chloride	Vapor	75-01-4	imm	>480	>480	6	0.02	0.001	<9.6	>480	6
Vinyl cyanide	Liquid	107-13-1	72*/91	73*/92	103	3	8.9	0.0085			
Vinyl ethylene (gaseous)	Vapor	106-99-0	>480	>480	>480	6	<0.01	0.01	<4.8	>480	6
Vinylidene chloride	Liquid	75-35-4	>480	>480	>480	6	<0.02	0.02	<9.6	>480	6
White Liquor	Liquid	mix		>480							
White spirit	Liquid	mix	>480	>480	>480	6	<0.02	0.02	<9.6	>480	6
Xylene, mixed isomers	Liquid	1330-20-7	>480	>480	>480	6	<0.001	0.001	<0.48	>480	6
Xylidine, 2,4-	Liquid	95-68-1	>480	>480	>480	6	<0.0195	0.0195	<9.4	>480	6

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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 (EN ISO 6529 (method A and B), ASTM F739, ASTM F1383, ASTM D6978, EN369, EN 374-3)
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 between 20 °C and 27°C and at 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 minimum detectable 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/cm²/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 and 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.

The permeation data for gloves published have been generated according to ASTM F739 and to ASTM F1383.
The degradation data for gloves published have been generated based on a gravimetric method.
This degradation testing exposes one side of the glove material to the test chemical for four hours. The percent weight change after exposure is measured at four time intervals: 5, 30, 60 and 240 minutes.

Degradation Ratings:
• E: EXCELLENT (0-10% Weight Change)
• G: GOOD (11-20% Weight Change)
• F: FAIR (21-30% Weight Change)
• P: POOR (31-50% Weight Change)
• NR: NOT RECOMMENDED (Above 50% Weight Change)
• NT: NOT TESTED

Degradation is the physical change in a material after chemical exposure. Typical observable effects may be swelling, wrinkling, deterioration, or delamination. Strength loss may also occur.

Please use the permeation data provided as a part of the risk assessment to assist with the selection of a protective fabric, garment, glove 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: 15/03/2019
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.

- The garment does not protect against ionizing radiation.
- This garment and/or fabric are not flame resistant and should not be used around heat, open flame, sparks or in potentially flammable environments.
- 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.

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The footnotes can be found on the SafeSPEC™ website.