

## DuPont™ Tychem® 10000 , TK128T LY



### Technical Data Sheet

DuPont™ Tychem® 10000 Coverall. Respirator Fit Hood. Elastic Wrists. Attached Socks with Outer Boot Flaps. Double Storm Flap with Adhesive Closure. Taped Seams. Lime Yellow.

### Packaging(Quantity/Box)

2 per case

Full Part Number: TK128TLYxx000200

## PHYSICAL PROPERTIES

| Property                         | Test Method | Typical Result        | EN |
|----------------------------------|-------------|-----------------------|----|
| Basis Weight                     | ASTM D3776  | 12 oz/yd <sup>2</sup> |    |
| Breaking Strength - Grab (CD)    | ASTM D5034  | 170 lb <sub>f</sub>   |    |
| Breaking Strength - Grab (MD)    | ASTM D5034  | 151 lb <sub>f</sub>   |    |
| Burst Strength - Ball            | ASTM D3787  | 185 lb <sub>f</sub>   |    |
| Tear Resistance - Trap Tear (CD) | ASTM D5733  | 56 lb <sub>f</sub>    |    |
| Tear Resistance - Trap Tear (MD) | ASTM D5733  | 75 lb <sub>f</sub>    |    |
| Thickness                        | ASTM D1777  | 28 mils               |    |
| Wearing Apparel Flammability     | 16 CFR 1610 | Class 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



# Permeation Data for Tychem® 10000

| Hazard / Chemical 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  | <0.1    | 0.1    | <48     | >480     | 6   |
| Acetic acid 2 ethoxy ethyl ester  | Liquid         | 111-15-9  | >480   | >480   | >480   | 6  | <0.05   | 0.05   | <24     | >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  | <0.05   | 0.05   | <24     | >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   | 6  | <0.0126 | 0.0126 |         |          |     |
| Acetone                           | Liquid         | 67-64-1   | >480   | >480   | >480   | 6  | <0.04   | 0.04   | <19.2   | >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  | <0.05   | 0.05   | <24     | >480     | 6   |
| Acetyl chloride                   | Liquid         | 75-36-5   |        | >480   | >480   | 6  | <0.0126 | 0.0126 |         |          |     |
| 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   |
| Acrylamide (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   |
| Acrylicamide (50%)                | Liquid         | 79-06-1   | >480   | >480   | >480   | 6  | <0.1    | 0.1    | <48     | >480     | 6   |
| Acrylonitrile                     | Liquid         | 107-13-1  | >480   | >480   | >480   | 6  | <0.0003 | 0.0003 |         |          |     |
| 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   |

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® 10000

| Hazard / Chemical Name                        | Physical State | CAS        | BT Act   | BT 0.1   | BT 1.0 | EN | SSPR    | MDPR   | Cum 480 | Time 150 | ISO |
|-----------------------------------------------|----------------|------------|----------|----------|--------|----|---------|--------|---------|----------|-----|
| Amino 3,4-dichlorobenzene, 1- (70 °C, molten) | Liquid         | 95-76-1    | 128*/216 | 216*/284 |        |    | 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 |          | >480     | >480   | 6  | <0.1    | 0.01   |         |          |     |
| Ammonium hydroxide (28% - 30%)                | Liquid         | 1336-21-6  | >480     | >480     | >480   | 6  | <0.1    | 0.1    | <48     | >480     | 6   |
| Amyl acetate, n-                              | Liquid         | 628-63-7   | >480     | >480     | >480   | 6  | <0.003  | 0.003  | <1.4    | >480     | 6   |
| 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   |
| Arsine                                        | Vapor          | 7784-42-1  | >480     | >480     | >480   | 6  | <0.01   | 0.01   | <4.8    | >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      |        |    | 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 (25% in Methanol)                   | Liquid         | 92-87-5    | >480     | >480     | >480   | 6  | <0.01   | 0.01   | <4.8    | >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   |
| 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'-(25% in Methanol) | Liquid         | 92-87-5    | >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   |

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DOT5 Degradation after 5 min    DOT20 Degradation after 20 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® 10000

| Hazard / Chemical Name                   | Physical State | CAS        | BT Act   | BT 0.1 | BT 1.0 | EN | SSPR    | MDPR    | Cum 480 Time 150 | ISO  |   |
|------------------------------------------|----------------|------------|----------|--------|--------|----|---------|---------|------------------|------|---|
| 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     | >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 trichloride                        | Vapor          | 10294-34-5 |          | >480   | >480   | 6  | <0.1    | 0.00118 |                  |      |   |
| 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*/40   | 30*/40 | 30*/40 | 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  | <0.05   | 0.05    | <24              | >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  | <3.2             | >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   |          | >480   | >480   | 6  | <0.1    | 0.006   |                  |      |   |
| 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 |
| Butyl alcohol, n-                        | Liquid         | 71-36-3    | >480     | >480   | >480   | 6  | <0.002  | 0.002   | <1               | >480 | 6 |
| 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*/396 | >480   | >480   | 6  | 0.001   | 0.001   |                  |      |   |
| 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  | <0.05   | 0.05    | <24              | >480 | 6 |

BTAct (Actual) Breakthrough time at MDPR [mins]    BT0.1 Normalized breakthrough time at 0.1 µg/cm<sup>2</sup>/min [mins]    BT1.0 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]    CUM480 Cumulative permeation mass after 480 mins [µg/cm<sup>2</sup>]    Time150 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    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/cm<sup>2</sup>/min [mins] acc. ASTM F1383

# Permeation Data for Tychem® 10000

| Hazard / Chemical Name                 | Physical State | CAS        | BT Act | BT 0.1   | BT 1.0 | EN | SSPR    | MDPR   | Cum 480 Time 150 | ISO    |
|----------------------------------------|----------------|------------|--------|----------|--------|----|---------|--------|------------------|--------|
| 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    | >480   | >480     | >480   | 6  | <0.0177 | 0.0177 | <8.5             | >480 6 |
| Caustic ammonia (28% - 30%)            | Liquid         | 1336-21-6  | >480   | >480     | >480   | 6  | <0.1    | 0.1    | <48              | >480 6 |
| Caustic soda (50%)                     | Liquid         | 1310-73-2  | >480   | >480     | >480   | 6  | <0.03   | 0.03   | <14.4            | >480 6 |
| Cellosolve acetate                     | Liquid         | 110-80-5   | >480   | >480     | >480   | 6  | <0.008  | 0.008  | <3.8             | >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  | >480   | >480     | >480   | 6  | <0.01   | 0.01   | <4.8             | >480 6 |
| Chlorine (gaseous)                     | Vapor          | 7782-50-5  | >480   | >480     | >480   | 6  | <0.05   | 0.05   | <24              | >480 6 |
| Chlorine sulfide                       | Liquid         | 10545-99-0 | 440    | 440      | >480   | 6  | <0.3    | 0.1    | <48              | >480 6 |
| Chlorine sulfide (80%)                 | Liquid         | 10545-99-0 | >480   | >480     | >480   | 6  | <0.1    | 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    |        | >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  | <6.7             | >480 6 |
| Chloro acetic acid (80%)               | Liquid         | 79-11-8    |        | >480     | >480   | 6  | <0.01   | 0.01   |                  |        |
| 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*/323 | 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*/323 | 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  | <0.48            | >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  | <6.2             | >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 |

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® 10000

| Hazard / Chemical Name                                     | Physical State | CAS        | BT Act | BT 0.1 | BT 1.0 | EN | SSPR    | MDPR   | Cum 480 | Time 150 | ISO |
|------------------------------------------------------------|----------------|------------|--------|--------|--------|----|---------|--------|---------|----------|-----|
| 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   |        | >480   | >480   | 6  | <0.1    | 0.006  |         |          |     |
| Crude oil, California                                      | Liquid         | 8002-05-9  | >480   | >480   | >480   | 6  | <0.04   | 0.04   | <19.2   | >480     | 6   |
| Cumene                                                     | Liquid         | 98-82-8    | >480   | >480   | >480   | 6  | <0.01   | 0.01   | <4.8    | >480     | 6   |
| 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   |
| Cyanoethylene                                              | Liquid         | 107-13-1   | >480   | >480   | >480   | 6  | <0.0003 | 0.0003 |         |          |     |
| Cyanomethane                                               | Liquid         | 75-05-8    | >480   | >480   | >480   | 6  | <0.05   | 0.05   | <24     | >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'- (25% in Methanol)                   | Liquid         | 92-87-5    | >480   | >480   | >480   | 6  | <0.01   | 0.01   | <4.8    | >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- (25% in Methanol)                      | Liquid         | 92-87-5    | >480   | >480   | >480   | 6  | <0.01   | 0.01   | <4.8    | >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    | <4.8    | >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   |
| Diaminoethane, 1,2-                                        | Liquid         | 107-15-3   | >480   | >480   | >480   | 6  | <0.0097 | 0.0097 | <4.7    | >480     | 6   |
| Diborane (10%)                                             | Vapor          | 19287-45-7 |        | >480   | >480   | 6  | <0.1    | 0.0045 |         |          |     |
| Dibromoethane, 1,2-                                        | Liquid         | 106-93-4   | >480   | >480   | >480   | 6  | <0.1    | 0.1    | <48     | >480     | 6   |
| 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   | 251    | >480   | >480   | 6  | <0.02   | 0.005  | <0.9    | >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   |

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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® 10000

| Hazard / Chemical Name                                    | Physical State | CAS        | BT Act   | BT 0.1   | BT 1.0 | EN | SSPR    | MDPR   | Cum 480 | Time 150 | ISO |
|-----------------------------------------------------------|----------------|------------|----------|----------|--------|----|---------|--------|---------|----------|-----|
| 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 | 216*/284 |        |    | 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  | <0.05   | 0.05   | <24     | >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   |
| Diesel fuel                                               | Liquid         | 68334-30-5 | >480     | >480     | >480   | 6  | <0.03   | 0.03   | <14.4   | >480     | 6   |
| Diethyl amine                                             | Liquid         | 109-89-7   | >480     | >480     | >480   | 6  | <0.05   | 0.05   | <24     | >480     | 6   |
| Diethyl aniline, N,N-                                     | Liquid         | 91-66-7    | >480     | >480     | >480   | 6  | <0.024  | 0.024  | <11.5   | >480     | 6   |
| Diethyl benzene (95%)                                     | Liquid         | 25340-17-4 | >480     | >480     | >480   | 6  | <0.022  | 0.022  | <10.6   | >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  | <0.0166 | 0.0166 | <8      | >480     | 6   |
| Diiodo-1,1,2,2-tetrafluorobutane, 1,4-                    | Liquid         | 755-95-3   |          | >480     |        |    |         |        |         |          |     |
| Dimethyl acetamide, N,N-                                  | Liquid         | 127-19-5   | >480     | >480     | >480   | 6  | <0.006  | 0.006  | <2.9    | >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  | <6.2    | >480     | 6   |
| Dimethyl dichlorosilane                                   | Liquid         | 75-78-5    | >480     | >480     | >480   | 6  | <0.1    | 0.1    | <48     | >480     | 6   |
| 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   |

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 10602    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® 10000

| Hazard / Chemical Name                               | Physical State | CAS        | BT Act   | BT 0.1            | BT 1.0 | EN | SSPR    | MDPR   | Cum 480 Time | ISO 150 | ISO |
|------------------------------------------------------|----------------|------------|----------|-------------------|--------|----|---------|--------|--------------|---------|-----|
| Dimethyl hydrazine, N,N-                             | Liquid         | 57-14-7    |          | >480 <sup>8</sup> |        |    |         |        |              |         |     |
| Dimethyl ketal                                       | Liquid         | 67-64-1    | >480     | >480              | >480   | 6  | <0.04   | 0.04   | <19.2        | >480    | 6   |
| Dimethyl ketone                                      | Liquid         | 67-64-1    | >480     | >480              | >480   | 6  | <0.04   | 0.04   | <19.2        | >480    | 6   |
| Dimethyl phenylamine, N,N-                           | Liquid         | 121-69-7   | >480     | >480              | >480   | 6  | <0.013  | 0.013  | <6.2         | >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*/372 | >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  | <6.2         | >480    | 6   |
| Dinitroresol (sat in Methanol)                       | Liquid         | 534-52-1   | >480     | >480              | >480   | 6  | <0.013  | 0.013  | <6.2         | >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   |
| Diphenyl methane diisocyanate, 4,4'- (50 °C, molten) | Liquid         | 101-68-8   | >480     | >480              | >480   | 6  | <0.0403 | 0.0403 | <19.3        | >480    | 6   |
| Disodium sulfide (60% (slurry))                      | Liquid         | 1313-82-2  |          | >480              | >480   | 6  | <0.1    | 0.052  |              |         |     |
| 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  | <6.7         | >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  | <0.05   | 0.05   | <24          | >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   |          | >480              | >480   | 6  | <0.1    | 0.014  |              |         |     |
| 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   |          | >480              | >480   | 6  | <0.1    | 0.006  |              |         |     |
| Ethane nitrile                                       | Liquid         | 75-05-8    | >480     | >480              | >480   | 6  | <0.05   | 0.05   | <24          | >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    | >480     | >480              | >480   | 6  | <0.001  | 0.001  | <0.48        | >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   | 6  | <0.0126 | 0.0126 |              |         |     |
| Ethoxy ethanol, 2-                                   | Liquid         | 110-80-5   | >480     | >480              | >480   | 6  | <0.008  | 0.008  | <3.8         | >480    | 6   |
| Ethoxy ethylacetat                                   | Liquid         | 111-15-9   | >480     | >480              | >480   | 6  | <0.05   | 0.05   | <24          | >480    | 6   |
| Ethyl Cellosolve®                                    | Liquid         | 110-80-5   | >480     | >480              | >480   | 6  | <0.008  | 0.008  | <3.8         | >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 10002    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® 10000

| Hazard / Chemical Name                   | Physical State | CAS       | BT Act | BT 0.1 | BT 1.0 | EN | SSPR    | MDPR   | Cum 480 | Time 150 | ISO |
|------------------------------------------|----------------|-----------|--------|--------|--------|----|---------|--------|---------|----------|-----|
| Ethyl acetate                            | Liquid         | 141-78-6  | >480   | >480   | >480   | 6  | <0.05   | 0.05   | <24     | >480     | 6   |
| Ethyl acrylate                           | Liquid         | 140-88-5  | >480   | >480   | >480   | 6  | <0.02   | 0.02   | <9.6    | >480     | 6   |
| Ethyl amine (15 °C, liquid)              | 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  | <0.05   | 0.05   | <24     | >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  | <0.05   | 0.05   | <24     | >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  | <0.05   | 0.05   | <24     | >480     | 6   |
| Ethyl parathion                          | Liquid         | 56-38-2   | >480   | >480   | >480   | 6  | <0.01   | 0.01   | <4.8    | >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  | <0.0082 | 0.0082 | <3.9    | >480     | 6   |
| Ethylene diamine                         | Liquid         | 107-15-3  | >480   | >480   | >480   | 6  | <0.0097 | 0.0097 | <4.7    | >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  |        | >480   | >480   | 6  | <0.1    | 0.014  |         |          |     |
| Ethylene glycol mono ethyl ether acetate | Liquid         | 111-15-9  | >480   | >480   | >480   | 6  | <0.05   | 0.05   | <24     | >480     | 6   |
| Ethylene glycol monoethyl ether          | Liquid         | 110-80-5  | >480   | >480   | >480   | 6  | <0.008  | 0.008  | <3.8    | >480     | 6   |
| Ethylene glycol monomethyl ether         | Liquid         | 109-86-4  | >480   | >480   | >480   | 6  | <0.005  | 0.005  | <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  | <0.05   | 0.05   | <24     | >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  | <0.1    | 0.1    | <48     | >480     | 6   |
| Fluorine                                 | Vapor          | 7782-41-4 | >480   | >480   | >480   | 6  | <0.002  | 0.002  | <1      | >480     | 6   |
| Fluorobenzene                            | Liquid         | 462-06-6  | >480   | >480   | >480   | 6  | <0.1    | 0.1    | <48     | >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® 10000

| Hazard / Chemical Name                                 | Physical State | CAS        | BT Act  | BT 0.1 | BT 1.0 | EN | SSPR      | MDPR      | Cum 480 Time | ISO  | 150 |
|--------------------------------------------------------|----------------|------------|---------|--------|--------|----|-----------|-----------|--------------|------|-----|
| 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   |
| Formalin (37% (10-15% Methanol))                       | Liquid         | 50-00-0    | >480    | >480   | >480   | 6  | <0.0048   | 0.0048    | <2.3         | >480 | 6   |
| Formic acid (>95%)                                     | Liquid         | 64-18-6    | >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 (5%)                                          | Liquid         | 111-30-8   | >480    | >480   | >480   | 6  | <0.1      | 0.1       | <48          | >480 | 6   |
| Glutaral (50%)                                         | Liquid         | 111-30-8   | >480    | >480   | >480   | 6  | <0.1      | 0.1       | <48          | >480 | 6   |
| Glutaraldehyde (5%)                                    | 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   |         | >480   | >480   | 6  | <0.1      | 0.014     |              |      |     |
| 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         | mix        | >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    |         | >480   | >480   | 6  | <0.1      | 0.0139    |              |      |     |
| Hexafluoro isobutylene                                 | Vapor          | 382-10-5   | >480    | >480   | >480   | 6  | <0.01     | 0.01      | <4.8         | >480 | 6   |
| Hexamethyl disilazane                                  | Liquid         | 999-97-3   |         | >480   | >480   | 6  | <0.1      | 0.014     |              |      |     |
| Hexamethyl disilazane, 1,1,1,3,3,3-                    | Liquid         | 999-97-3   |         | >480   | >480   | 6  | <0.1      | 0.014     |              |      |     |
| 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          | >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  | <0.01     | 0.01      | <4.8         | >480 | 6   |
| Hexone                                                 | Liquid         | 108-10-1   | 32*/120 | >480   | >480   | 6  | <0.1      | 0.001     |              |      |     |
| Hydrazine                                              | Liquid         | 302-01-2   | >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  
Technical Description: Tychem 10000 is a low density polyethylene film with a thickness of 0.006 inches (0.152 mm). It is designed for use as a barrier material in protective suits and other applications requiring high resistance to chemical and biological agents. The film is made of high purity polyethylene and is free of additives and fillers. It is available in rolls and sheets. \* 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® 10000              |                |            |          |        |        |    |         |        |                  |      |   |
|------------------------------------------------|----------------|------------|----------|--------|--------|----|---------|--------|------------------|------|---|
| Hazard / Chemical Name                         | Physical State | CAS        | BT Act   | BT 0.1 | BT 1.0 | EN | SSPR    | MDPR   | Cum 480 Time 150 | ISO  |   |
| 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*/360 | 440    | >480   | 6  | 0.06    | 0.004  |                  |      |   |
| Hydriodic acid (55-57%)                        | Liquid         | 10034-85-2 | >480     | >480   | >480   | 6  | <0.1    | 0.1    | <48              | >480 | 6 |
| Hydrochloric acid (37%)                        | Liquid         | 7647-01-0  | >480     | >480   | >480   | 6  | <0.02   | 0.02   | <9.6             | >480 | 6 |
| Hydrofluoric acid (48-51%)                     | 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 bromide (gaseous)                     | Vapor          | 10035-10-6 | >480     | >480   | >480   | 6  | <0.1    | 0.1    | <48              | >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  | <0.05   | 0.05   | <24              | >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 (20-27 °C, gaseous)          | Vapor          | 7664-39-3  | >480     | >480   | >480   | 6  | <0.025  | 0.025  | <12              | >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 selenide                              | Vapor          | 7783-07-5  |          | >480   |        |    |         |        |                  |      |   |
| 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, molten)     | Liquid         | 88-75-5    |          | 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  | <6.2             | >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*/120  | >480   | >480   | 6  | <0.1    | 0.001  |                  |      |   |
| 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 |

BT Act Actual breakthrough time in minutes at 0.1 µg/cm²/min [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]     
 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® 10000

| Hazard / Chemical Name                               | Physical State | CAS        | BT Act | BT 0.1            | BT 1.0 | EN | SSPR    | MDPR   | Cum 480 | Time 150 | ISO |
|------------------------------------------------------|----------------|------------|--------|-------------------|--------|----|---------|--------|---------|----------|-----|
| JP-4 Jet Fuel                                        | Liquid         | 50815-00-4 | >480   | >480              | >480   | 6  | <0.0017 | 0.0017 |         |          |     |
| JP-8 Jet Fuel                                        | Liquid         | 94114-58-6 | >480   | >480              | >480   | 6  | <0.01   | 0.01   | <4.8    | >480     | 6   |
| Ketone propane                                       | Liquid         | 67-64-1    | >480   | >480              | >480   | 6  | <0.04   | 0.04   | <19.2   | >480     | 6   |
| Lewisite (L), MIL-STD-282<br>(10 g/m <sup>2</sup> )  | Liquid         | 541-25-3   |        | >480 <sup>8</sup> |        |    |         |        |         |          |     |
| Lewisite (L), MIL-STD-282<br>(100 g/m <sup>2</sup> ) | Liquid         | 541-25-3   |        | >480 <sup>8</sup> |        |    |         |        |         |          |     |
| 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 -<br>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 | <3.2    | >480     | 6   |
| Malathion                                            | Liquid         | 121-75-5   | >480   | >480              | >480   | 6  | <0.013  | 0.013  | <6.2    | >480     | 6   |
| Mercapto acetic acid                                 | Liquid         | 68-11-1    | >480   | >480              | >480   | 6  | <0.1    | 0.1    | <48     | >480     | 6   |
| Mercapto ethanol                                     | Liquid         | 60-24-2    | >480   | >480              | >480   | 6  | <0.08   | 0.08   | <38.4   | >480     | 6   |
| Mercuric II chloride (sat)                           | Liquid         | 7487-94-7  |        | >480 <sup>8</sup> |        |    |         |        |         |          |     |
| 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   |        | >480              | >480   | 6  | <0.1    | 0.0006 |         |          |     |
| 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  | <0.05   | 0.05   | <24     | >480     | 6   |
| Methomyl (29%)                                       | Liquid         | 16752-77-5 | >480   | >480              | >480   | 6  | <0.1    | 0.1    | <48     | >480     | 6   |
| Methoxy 2-methylpropane, 2-                          | Liquid         | 1634-04-4  | >480   | >480              | >480   | 6  | <0.007  | 0.007  |         |          |     |
| 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  | <0.005  | 0.005  | <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,<br>2- (87%)            | Liquid         | 4553-62-2  | >480   | >480              | >480   | 6  | <0.1    | 0.1    | <48     | >480     | 6   |
| Methyl<br>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<br>4-isopropenyl-1-cyclohexene,<br>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  | <0.04   | 0.04   | <19.2   | >480     | 6   |
| Methyl acrolein                                      | Liquid         | 123-73-9   |        | >480              | >480   | 6  | <0.1    | 0.006  |         |          |     |

BTAct (Actual) Breakthrough time at MDPR [mins]    BT0.1 Normalized breakthrough time at 0.1 µg/cm<sup>2</sup>/min [mins]    BT1.0 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]    CUM480 Cumulative permeation mass after 480 mins [µg/cm<sup>2</sup>]    Time150 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    min Minute    > Larger than    < Smaller than    imm Immediate (< 10 min)    nm Not tested  
Technical Description    tychem-10000-1k128-1v.pdf printed on page 14 of 23  
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/cm<sup>2</sup>/min [mins] acc. ASTM F1383

# Permeation Data for Tychem® 10000

| Hazard / Chemical Name                                 | Physical State | CAS       | BT Act  | BT 0.1 | BT 1.0 | EN | SSPR    | MDPR   | Cum 480 | Time 150 | ISO |
|--------------------------------------------------------|----------------|-----------|---------|--------|--------|----|---------|--------|---------|----------|-----|
| Methyl acrylate                                        | Liquid         | 96-33-3   | >480    | >480   | >480   | 6  | <0.01   | 0.01   | <4.8    | >480     | 6   |
| Methyl amine (40%)                                     | Liquid         | 74-89-5   | 72      | 261    |        |    | 3.9     | 0.017  |         |          |     |
| Methyl amine (50%)                                     | Liquid         | 74-89-5   | 204     | 232    |        |    |         |        |         |          |     |
| 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  | <0.05   | 0.05   | <24     | >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 chloro formate                                  | Liquid         | 79-22-1   |         | >480   | >480   | 6  | <0.1    | 0.011  |         |          |     |
| Methyl chloroform                                      | Liquid         | 71-55-6   | >480    | >480   | >480   | 6  | <0.004  | 0.004  | <1.9    | >480     | 6   |
| Methyl cyanide                                         | Liquid         | 75-05-8   | >480    | >480   | >480   | 6  | <0.05   | 0.05   | <24     | >480     | 6   |
| Methyl ethyl ketone                                    | Liquid         | 78-93-3   | >480    | >480   | >480   | 6  | <0.0067 | 0.0067 | <3.2    | >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  |         | >480   | >480   | 6  | <0.1    | 0.0205 |         |          |     |
| 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  | <6.2    | >480     | 6   |
| Methyl ketone                                          | Liquid         | 67-64-1   | >480    | >480   | >480   | 6  | <0.04   | 0.04   | <19.2   | >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*/120 | >480   | >480   | 6  | <0.1    | 0.001  |         |          |     |
| 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   |
| 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  | <0.007  | 0.007  |         |          |     |
| 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  | <3.4    | >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   |

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® 10000

| Hazard / Chemical Name                                 | Physical State | CAS        | BT Act | BT 0.1 | BT 1.0 | EN | SSPR    | MDPR   | Cum 480 | Time 150 | ISO |
|--------------------------------------------------------|----------------|------------|--------|--------|--------|----|---------|--------|---------|----------|-----|
| Methylene chloride                                     | Liquid         | 75-09-2    | >480   | >480   | >480   | 6  | <0.05   | 0.05   | <24     | >480     | 6   |
| Methylene dianiline                                    | Liquid         | 101-77-9   | >480   | >480   | >480   | 6  | <0.1    | 0.1    | <4.8    | >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   |
| Methylene diphenyl diisocyanate, 4,4'- (50 °C, molten) | Liquid         | 101-68-8   | >480   | >480   | >480   | 6  | <0.0403 | 0.0403 | <19.3   | >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  | <3.4    | >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  |        | >480   | >480   | 6  | <0.1    | 0.033  |         |          |     |
| Nitric acid (>95%)                                     | Liquid         | 7697-37-2  | 390    | 390    | 420    | 5  | 3.6     | 0.1    |         |          |     |
| Nitric acid, red fuming (90%)                          | Liquid         | 52583-42-3 |        | >480   | >480   | 6  | <0.1    | 0.033  |         |          |     |
| 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, molten)                       | Liquid         | 88-75-5    |        | 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 tetroxide                                     | Liquid         | 10544-72-6 | 60     | >480   | >480   | 6  |         |        |         |          |     |
| Nitrogen tetroxide (21 °C, liquid)                     | Liquid         | 10544-72-6 | 450    | 450    | >480   | 6  | 0.2     | 0.1    |         |          |     |
| Nitrogen tetroxide (gaseous)                           | Vapor          | 10544-72-6 | 90     | 90     |        |    | >1.1    | 0.003  |         |          |     |
| Nitrogen trifluoride                                   | Vapor          | 7783-54-2  |        | >480   | >480   | 6  | <0.014  | 0.014  |         |          |     |
| Nitrous oxide                                          | Vapor          | 10024-97-2 |        | >480   | >480   | 6  | <0.018  | 0.018  |         |          |     |
| 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% (13% free SO3))                            | Liquid         | 8014-95-7  | >480   | >480   | >480   | 6  | <0.1    | 0.1    | <48     | >480     | 6   |
| Oleum (40% free SO3)                                   | Liquid         | 8014-95-7  | >480   | >480   | >480   | 6  | <0.1    | 0.1    | <48     | >480     | 6   |
| Oleum (65% free SO3)                                   | Liquid         | 8014-95-7  | >480   | >480   | >480   | 6  | <0.1    | 0.1    | <48     | >480     | 6   |

BT Act (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  
 Technical Description Tychem-10000-TK128-IV.pdf printed on page 16 of 23  
 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® 10000

| Hazard / Chemical Name                  | Physical State | CAS        | BT Act | BT 0.1 | BT 1.0 | EN | SSPR   | MDPR   | Cum 480 | Time 150 | ISO |
|-----------------------------------------|----------------|------------|--------|--------|--------|----|--------|--------|---------|----------|-----|
| Oxalic acid (10.5%)                     | Liquid         | 144-62-7   | >480   | >480   | >480   | 6  | <0.1   | 0.1    | <48     | >480     | 6   |
| PCB (50% in Trichlorobenzene)           | Liquid         | mix        | >480   | >480   | >480   | 6  | 6      | 6      |         |          |     |
| Paraphenylene diisocyanate (PPDI) crude | Liquid         | 104-49-4   | >480   | >480   | >480   | 6  | <0.1   | 0.1    | <48     | >480     | 6   |
| Pentachlorophenol (sat in Methanol)     | Liquid         | 87-86-5    | >480   | >480   | >480   | 6  | <0.013 | 0.013  | <6.2    | >480     | 6   |
| Pentanedial, 1,5- (5%)                  | Liquid         | 111-30-8   | >480   | >480   | >480   | 6  | <0.1   | 0.1    | <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   |
| Perfluoro 2-propoxy propionyl fluoride  | Liquid         | 2062-98-8  | imm    | >480   | >480   | 6  | <0.04  | 0.008  | <19.2   | >480     | 6   |
| Perfluoroethane                         | Vapor          | 76-16-4    |        | >480   | >480   | 6  | <0.1   | 0.0139 |         |          |     |
| Phenethylene                            | Liquid         | 100-42-5   | >480   | >480   | >480   | 6  | <0.001 | 0.001  | <0.48   | >480     | 6   |
| Phenol (45 °C, molten)                  | Liquid         | 108-95-2   | >480   | >480   | >480   | 6  | <0.01  | 0.01   | <4.8    | >480     | 6   |
| Phenol (60 °C, molten)                  | Liquid         | 108-95-2   | 113    | 125    | 165    | 4  | <5     | 0.01   | 736     | 250      | 5   |
| Phenol (85% at 45 °C)                   | Liquid         | 108-95-2   | >480   | >480   | >480   | 6  | <0.01  | 0.01   | <4.8    | >480     | 6   |
| Phenol (85%)                            | Liquid         | 108-95-2   | >480   | >480   | >480   | 6  | <0.06  | 0.006  | <2.9    | >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 ethanol, 1-                      | Liquid         | 98-85-1    | >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   |

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® 10000

| Hazard / Chemical Name                          | Physical State | CAS        | BT Act | BT 0.1            | BT 1.0 | EN | SSPR    | MDPR   | Cum 480 | Time 150 | ISO |
|-------------------------------------------------|----------------|------------|--------|-------------------|--------|----|---------|--------|---------|----------|-----|
| 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   | >480 <sup>8</sup> | >480   | 6  | <0.49   | 0.49   |         |          |     |
| Potassium chromate (sat)                        | Liquid         | 7789-00-6  | >480   | >480 <sup>8</sup> | >480   | 6  | <0.51   | 0.51   |         |          |     |
| Potassium hydroxide (45%)                       | Liquid         | 1310-58-3  |        | >480              | >480   | 6  | <0.1    | 0.008  |         |          |     |
| 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  | <0.04   | 0.04   | <19.2   | >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   |
| Propenenitrile, 2-                              | Liquid         | 107-13-1   | >480   | >480              | >480   | 6  | <0.0003 | 0.0003 |         |          |     |
| Propenoic acid butyl ester, 2-                  | Liquid         | 141-32-2   | >480   | >480              | >480   | 6  | <0.02   | 0.02   | <9.6    | >480     | 6   |
| Propenoic acid nitrile                          | Liquid         | 107-13-1   | >480   | >480              | >480   | 6  | <0.0003 | 0.0003 |         |          |     |
| Propylene aldehyde                              | Liquid         | 123-73-9   |        | >480              | >480   | 6  | <0.1    | 0.006  |         |          |     |
| Propylene dichloride                            | Liquid         | 78-87-5    | >480   | >480              | >480   | 6  |         |        |         |          |     |
| Propylene imine (90%)                           | Liquid         | 75-55-8    | 120    | 150               | >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  | <0.04   | 0.04   | <19.2   | >480     | 6   |
| Pyrrolidine                                     | Liquid         | 123-75-1   | 407    | 413               |        |    | 9.2     | 0.012  |         |          |     |
| Sarin (GB), MIL-STD-282 (10 g/m <sup>2</sup> )  | Liquid         | 107-44-8   |        | >480 <sup>8</sup> |        |    |         |        |         |          |     |
| Sarin (GB), MIL-STD-282 (100 g/m <sup>2</sup> ) | Liquid         | 107-44-8   |        | >480 <sup>8</sup> |        |    |         |        |         |          |     |
| 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  | <0.1    | 0.1    | <48     | >480     | 6   |
| Sodium hydroxide (50%)                          | Liquid         | 1310-73-2  | >480   | >480              | >480   | 6  | <0.03   | 0.03   | <14.4   | >480     | 6   |

BTAct (Actual) Breakthrough time at MDPR [mins]    BT0.1 Normalized breakthrough time at 0.1 µg/cm<sup>2</sup>/min [mins]    BT1.0 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]    CUM480 Cumulative permeation mass after 480 mins [µg/cm<sup>2</sup>]    Time150 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    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    <sup>8</sup> 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/cm<sup>2</sup>/min [mins] acc. ASTM F1383

# Permeation Data for Tychem® 10000

| Hazard / Chemical Name                                   | Physical State | CAS        | BT Act | BT 0.1            | BT 1.0 | EN | SSPR   | MDPR  | Cum 480 | Time 150 | ISO |
|----------------------------------------------------------|----------------|------------|--------|-------------------|--------|----|--------|-------|---------|----------|-----|
| Sodium hypochlorite (15%)                                | Liquid         | 7681-52-9  | >480   | >480              | >480   | 6  | <0.03  | 0.03  | <14.4   | >480     | 6   |
| Sodium metabisulphite (38%)                              | Liquid         | 7681-57-4  |        | >480              | >480   | 6  | <0.052 | 0.052 |         |          |     |
| 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 <sup>8</sup> |        |    |        |       |         |          |     |
| Soman (GD), MIL-STD-282 (100 g/m <sup>2</sup> )          | Liquid         | 96-64-0    |        | >480 <sup>8</sup> |        |    |        |       |         |          |     |
| 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 <sup>8</sup> |        |    |        |       |         |          |     |
| Sulfur Mustard (HD), MIL-STD-282 (100 g/m <sup>2</sup> ) | Liquid         | 505-60-2   |        | >480 <sup>8</sup> |        |    |        |       |         |          |     |
| Sulfur dioxide                                           | Vapor          | 7446-09-5  | >480   | >480              | >480   | 6  | <0.01  | 0.01  | <4.8    | >480     | 6   |
| Sulfur hexafluoride                                      | Vapor          | 2551-62-4  |        | >480              | >480   | 6  | <0.015 | 0.015 |         |          |     |
| 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  | <0.005 | 0.05  | <24     | >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% (13% free SO <sub>3</sub> ))  | Liquid         | 8014-95-7  | >480   | >480              | >480   | 6  | <0.1   | 0.1   | <48     | >480     | 6   |
| Sulfuric acid fuming (40% free SO <sub>3</sub> )         | Liquid         | 8014-95-7  | >480   | >480              | >480   | 6  | <0.1   | 0.1   | <48     | >480     | 6   |
| Sulfuric acid fuming (65% free SO <sub>3</sub> )         | Liquid         | 8014-95-7  | >480   | >480              | >480   | 6  | <0.1   | 0.1   | <48     | >480     | 6   |
| Sulfonyl 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   |
| Sulphur dichloride (80%)                                 | Liquid         | 10545-99-0 | >480   | >480              | >480   | 6  | <0.1   | 0.1   | <48     | >480     | 6   |
| Tabun (GA), MIL-STD-282 (10 g/m <sup>2</sup> )           | Liquid         | 77-81-6    |        | >480 <sup>8</sup> |        |    |        |       |         |          |     |
| Tabun (GA), MIL-STD-282 (100 g/m <sup>2</sup> )          | Liquid         | 77-81-6    |        | >480 <sup>8</sup> |        |    |        |       |         |          |     |
| 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 | <3.8    | >480     | 6   |
| 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    | >480   | >480              | >480   | 6  | <0.015 | 0.015 | <7.2    | >480     | 6   |

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BTAct (Actual) Breakthrough time at MDPR [mins]    BT0.1 Normalized breakthrough time at 0.1 µg/cm<sup>2</sup>/min [mins]    BT1.0 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]    CUM480 Cumulative permeation mass after 480 mins [µg/cm<sup>2</sup>]    Time150 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    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/cm<sup>2</sup>/min [mins] acc. ASTM F1383

Permeation Data for Tychem® 10000

| Hazard / Chemical Name                           | Physical State | CAS        | BT Act   | BT 0.1 | BT 1.0 | EN | SSPR    | MDPR   | Cum 480 Time | ISO    |
|--------------------------------------------------|----------------|------------|----------|--------|--------|----|---------|--------|--------------|--------|
|                                                  |                |            |          |        |        |    |         |        | 150          |        |
| Tetraethoxysilane                                | Liquid         | 78-10-4    |          | >480   | >480   | 6  | <0.014  | 0.014  |              |        |
| 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*/421 | >480   | >480   | 6  | <0.01   | 0.005  | <4.8         | >480 6 |
| 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    | >480     | >480   | >480   | 6  | <0.0177 | 0.0177 | <8.5         | >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   |          | >480   | >480   | 6  | <0.006  | 0.006  |              |        |
| Thioglycolic acid                                | Liquid         | 68-11-1    | >480     | >480   | >480   | 6  | <0.1    | 0.1    | <48          | >480 6 |
| Thionyl chloride                                 | Liquid         | 7719-09-7  | 90       | 90     | 90     | 3  | 63.6    | 0.1    |              |        |
| 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  | <0.05   | 0.05   | <24          | >480 6 |
| Toluene diisocyanate, 1,3-                       | Liquid         | 26471-62-5 | >480     | >480   | >480   | 6  | <0.01   | 0.01   | <4.8         | >480 6 |
| Toluene diisocyanate, 2,4-                       | Liquid         | 584-84-9   | >480     | >480   | >480   | 6  | <0.0216 | 0.0216 | <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  | <0.001  | 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 ethane, 1,1,2-                         | Liquid         | 79-00-5    | >480     | >480   | >480   | 6  | <0.001  | 0.001  | <0.48        | >480 6 |
| 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  | <0.1    | 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 |          | >480   | >480   | 6  | <0.0218 | 0.0218 |              |        |
| Triethyl amine                                   | Liquid         | 121-44-8   | >480     | >480   | >480   | 6  | <0.1    | 0.1    | <48          | >480 6 |
| Triethylenetetramine (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 |

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 10002    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

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# Permeation Data for Tychem® 10000

| Hazard / Chemical Name                                 | Physical State | CAS        | BT Act | BT 0.1            | BT 1.0 | EN | SSPR    | MDPR   | Cum 480 | Time 150 | ISO |
|--------------------------------------------------------|----------------|------------|--------|-------------------|--------|----|---------|--------|---------|----------|-----|
| 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    |        | >480              | >480   | 6  | <0.0141 | 0.0141 |         |          |     |
| 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  |        | >480              | >480   | 6  | <0.0259 | 0.0259 |         |          |     |
| VM & P Naphtha                                         | Liquid         | 8030-30-6  | >480   | >480              | >480   | 6  | <0.0201 | 0.0201 | <9.6    | >480     | 6   |
| VX Nerve Agent,<br>MIL-STD-282 (10 g/m <sup>2</sup> )  | Liquid         | 50782-69-9 |        | >480 <sup>8</sup> |        |    |         |        |         |          |     |
| VX Nerve Agent,<br>MIL-STD-282 (100 g/m <sup>2</sup> ) | Liquid         | 50782-69-9 |        | >480 <sup>8</sup> |        |    |         |        |         |          |     |
| 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  | <0.48   | >480     | 6   |
| Vinyl cyanide                                          | Liquid         | 107-13-1   | >480   | >480              | >480   | 6  | <0.0003 | 0.0003 |         |          |     |
| 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  | <0.05   | 0.05   | <24     | >480     | 6   |
| Vinyl magnesium chloride<br>(16.5% in Tetrahydrofuran) | Liquid         | 3536-96-7  | >480   | >480              | >480   | 6  | <0.01   | 0.01   | <4.8    | >480     | 6   |
| Vinylidene chloride                                    | Liquid         | 75-35-4    | >480   | >480              | >480   | 6  | <0.01   | 0.01   | <4.8    | >480     | 6   |
| White Liquor                                           | Liquid         | mix        | >480   | >480              | >480   | 6  | <0.1    | 0.1    | <48     | >480     | 6   |
| Xylene, mixed isomers                                  | Liquid         | 1330-20-7  | >480   | >480              | >480   | 6  | <0.01   | 0.01   | <4.8    | >480     | 6   |
| m-Cresol 55%, p-Cresol 30%,<br>Phenol 15% (mix)        | Liquid         | mix        | >480   | >480              | >480   | 6  | <0.09   | 0.09   | <43.2   | >480     | 6   |
| t-Sodium-amylate / t-amyl<br>alcohol (mix)             | Liquid         | mix        | 120    | 120               | 240    | 5  | 4.9     | 0.01   |         |          |     |

BTAct (Actual) Breakthrough time at MDPR [mins]    BT0.1 Normalized breakthrough time at 0.1 µg/cm<sup>2</sup>/min [mins]    BT1.0 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]    CUM480 Cumulative permeation mass after 480 mins [µg/cm<sup>2</sup>]    Time150 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    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    <sup>8</sup> 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/cm<sup>2</sup>/min [mins] acc. ASTM F1383

## 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/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 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: 5/5/2020

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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For further product information, literature and as well as assistance in locating a local supplier, please visit:

[www.safespec.dupont.co.uk](http://www.safespec.dupont.co.uk)

The footnotes can be found on the SafeSPEC® website.

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