

Permeation Data (ASTM F739) **DuPont Tychem® 10,000**  
Effective January 2003

**Symbols and abbreviations used in data table:**

SBT = Standardized Breakthrough Time      PR = Permeation Rate  
> = greater than      < = less than      S = solid      L = Liquid      G = Gas      M = Mixture

Chemical Name	CAS Number	Class	Sub Class	Phase	Tychem® 10,000	
					Average SBT (minutes)	Average PR (µg/cm <sup>2</sup> /min)
Acetaldehyde	75-07-0	120	121	L	>480	0.001
Acetic acid	64-19-7	100	102	L	>480	<0.001
Acetic anhydride	108-24-7	160	161	L	>480	<0.001
Acetone	67-64-1	390	391	L	>480	<0.001
Acetone cyanohydrin	75-86-5	310 / 430	313 / 431	L	>480	0.06
Acetonitrile	75-05-8	430	431	L	>480	<0.007
Acrolein	107-02-8	120	121	L	>480	0.016
Acrylamide, 50% in water	79-06-1	130	135	L	>480	<0.01
Acrylonitrile	107-13-1	430	431	L	>480	0.003
Allyl alcohol	107-18-6	310	311	L	>480	<0.001
Allyl chloride	107-05-1	260	265	L	>480	0.022
Ammonia gas	7664-41-7	350	350	G	>480	<0.07
Ammonia liquid (-70° C)	7664-41-7	350 / 380	350 / 380	L	>480	<0.001
Ammonium hydroxide, 50%	1336-21-6	380	380	L	>480	<0.1
Arsine	7784-42-1	350	350	G	>480	<0.01
Azinphos ethyl, 2.5% in water	2642-71-9	460	462	L	>480	<0.001
Benzene	71-43-2	290	292	L	>480	0.05
Benzene sulfonyl chloride	98-09-9	500	505	L	>480	<0.05
Benzidine, 75% in Methanol	92-87-5	140	145 / 149	M	>480	<0.1
Benzyl chloride	100-44-7	260	266	L	>480	<0.001
Boron trifluoride	7637-07-2	350 / 360	350 / 360	G	>480	<0.1
Boron trifluoride etherate	109-63-7	590	590	L	>480	<0.001
Bromine	7726-95-6	330	330	L	91	139
1,3-Butadiene	106-99-0	290	296	G	>480	<0.001
n-Butyl acrylate	141-32-2	220	223	L	>480	0.02
n-Butylamine	109-73-9	140	141	L	>480	0.004
tert-Butylamine	75-64-9	140	141	L	>480	<0.02
Carbon disulfide	75-15-0	500	502	L	>480	<0.001
Carbon monoxide	630-08-0	350	350	G	290	0.26
Carbon tetrachloride	56-23-5	260	261	L	>480	0.07
Chlordane	57-74-9	260	261	L	>480	<0.1
Chlorine gas	7782-50-5	330 / 350	330 / 350	G	>480	<0.01
Chlorine liquid (-70° C)	7782-50-5	330 / 350	330 / 350	L	>480	<0.001
Chlorine trifluoride	7790-91-2	350	350	G	15	11
Chlorobenzene	108-90-7	260	263	L	>480	0.003
Chloroform	67-66-3	260	261	L	>480	0.004
Chlorophenol, mixture of 2-,3-,4-	mixture	260 / 310	263 / 316	L	>480	<0.1
Chlorosulfonic acid	7790-94-5	370 / 500	370 / 504	L	>480	0.05
m-Cresol	108-39-4	310	316	L	>480	<0.001
Cumene	98-82-8	290	292	L	>480	0.02
Cyanazine, 10% in water	21725-46-2	270 / 430	274 / 431	L	>480	<0.001
Cyanuric Chloride 20%, Toluene 80%	Mixture*	260 / 270	263 / 274	L	>480	<0.10
1,3-Dichloroacetone (40° C)	534-07-6	260 / 390	261 / 391	L	>480	<0.001
Dichloroacetyl chloride	79-36-7	110	111	L	>480	<0.01
1,2-Dichloroethane	107-06-2	260	261	L	>480	0.026
Dichloroethyl ether	111-44-4	240 / 260	241 / 261	L	>480	<0.001
2,4 Dichloro-6-isopropyl-S-triazine 22%, Toluene 78%	Mixture*	270	274	L	>480	<0.1

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Chemical Name	CAS Number	Class	Sub Class	Phase	Tychem® 10,000	
					Average SBT (minutes)	Average PR (µg/cm <sup>2</sup> /min)
Dichloromethane	75-09-2	260	261	L	>480	<0.001
Dichlorosilane	4109-96-0	480	480	G	>480	<0.1
Diethylamine	109-89-7	140	142	L	>480	<0.001
Diethylenetriamine	111-40-0	140	148	L	>480	<0.003
Diethyl sulfate	64-67-5	500	507	L	>480	<0.1
N,N-Dimethylacetamide	127-19-5	130	132	L	>480	0.007
Dimethylamine	124-40-3	140	142	G	>480	<0.004
N,N-Dimethylaniline	121-69-7	140	146	L	>480	<0.001
Dimethyldichlorosilane	75-78-5	480	480	L	>480	<0.1
Dimethyl ether	115-10-6	240	241	G	>480	<0.001
N,N-Dimethylformamide	68-12-2	130	132	L	>480	<0.001
1,1-Dimethylhydrazine	57-14-7	280	280	L	>480	0.007
Dimethyl sulfate	77-78-1	500	507	L	>480	<0.001
Dimethyl sulfoxide	67-68-5	500	503	L	>480	<0.003
Dinitro-o-cresol, sat. sol. in methanol	534-52-1	310 / 440	316 / 442	L	>480	<0.1
1,4-Dioxane	123-91-1	270	278	L	>480	0.01
4,4'-Diphenyl methane diisocyanate	101-68-8	210	212	S	>480	<0.01
Disulfur dichloride	10025-67-9	500	502	L	>480	<0.01
Epichlorohydrin	106-89-8	270	275	L	>480	0.001
Ethanolamine	141-43-5	140 / 310	141 / 311	L	>480	<0.1
Ethyl acetate	141-78-6	220	222	L	>480	<0.001
Ethyl acrylate	140-88-5	220	223	L	>480	0.04
Ethylamine (15° C)	75-04-7	140	141	L	>480	<0.03
Ethyl benzene	100-41-4	290	292	L	>480	0.008
Ethyl chloride	75-00-3	260	261	L	>480	<0.1
Ethylene dibromide	106-93-4	260	261	L	>480	0.02
Ethyleneimine	151-56-4	270	274	L	>480	<0.001
Ethylene oxide, 10% in HCFC 124	mixture	260 / 270	261 \ 275	G	>480	<0.008
Ethylene oxide gas	75-21-8	270	275	G	>480	<0.02
Ethylene oxide liquid (0° C)	75-21-8	270	275	L	>480	<0.01
Ethyl parathion	56-38-2	460	462	L	>480	<0.1
Fluorine	7782-41-4	350	350	G	>480	<0.001
Fluorosilicic acid	16961-83-4	370	370	L	>480	<0.1
Fluorosulfonic acid	7789-21-1	370	370	L	>480	<0.1
Formalin (Formaldehyde 37%)	50-00-0	120	121	L	>480	<0.01
2-Furaldehyde	98-01-1	120 / 270	122 \ 277	L	>480	<0.01
Glycolic acid, sat. sol. in water	79-14-1	100	103	L	>480	<0.1
Hexachlorobutadiene	87-68-3	260	264	L	>480	<0.001
n-Hexane	110-54-3	290	291	L	>480	<0.001
Hydrazine hydrate, 50%	10217-52-4	280	280	L	>480	<0.01
Hydriodic acid, 57%	10034-85-2	370	370	L	>480	<0.1
Hydrochloric acid, 37%	7647-01-0	370	370	L	>480	<0.1
Hydrofluoric acid, 50%	7664-39-3	370	370	L	>480	0.03
Hydrofluoric acid, 70%	7664-39-3	370	370	L	40	0.33
Hydrogen bromide	10035-10-6	350 / 370	350 / 370	G	>480	<0.028
Hydrogen chloride gas	7647-01-0	350	350	G	>480	<0.1
Hydrogen cyanide liquid	74-90-8	345 / 370	345 / 370	L	360	0.18
Hydrogen fluoride gas	7664-39-3	350	350	G	>480	<0.1

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Hydrogen fluoride liquid (0°C)	7664-39-3	350 / 370	350 / 370	L	35	0.55
Hydrogen peroxide, 30%	7722-84-1	300	300	L	>480	<0.002
Hydrogen peroxide, 70%	7722-84-1	300	300	L	>480	<0.01
Hydrogen selenide	7783-07-5	350	350	G	>480	<0.001
Hydrogen sulfide	7783-06-4	350 / 500	350 / 502	G	>480	<0.001
Isopropylamine	75-31-0	140	141	L	>480	<0.001
JP-8 jet fuel	8008-20-6	290	291	L	>480	<0.01
Lindane, sat. sol. in methanol	58-89-9	260	261	L	>480	<0.02
Lithium chloride, sat. sol.	7447-41-8	340	340	L	>480	<0.1
Lithium hydroxide, sat. sol.	1310-65-2	380	380	L	>480	<0.1
Malathion, 50% in methanol	121-75-5	460	462	L	>480	<0.1
Mercury	7439-97-6	330	330	L	>480	<0.001
Methacrylic acid	79-41-4	100	102	L	>480	<0.001
Methanol	67-56-1	310	311	L	>480	<0.001
Methomyl, 29% (Lannate® LV)	16752-77-5	230	233	L	>480	<0.1
Methyl acrylate	96-33-3	220	223	L	>480	0.02
Methylamine	74-89-5	140	141	G	>480	<0.001
Methyl bromide	74-83-9	260	261	G	>480	0.03
Methyl Cellosolve®	109-86-4	240 / 310	245 / 311	L	>480	<0.001
Methyl Cellosolve® acetate	110-49-6	240	245	L	>480	0.007
Methyl chloride	74-87-3	260	261	G	>480	<0.03
Methylene dianiline, mixed isomers (100°C)	mixture	140	145 / 149	L	>480	<0.007
Methyl ethyl ketone	78-93-3	390	391	L	>480	<0.001
Methylhydrazine	60-34-4	280	280	L	>480	<0.001
Methyl iodide	74-88-4	260	261	L	>480	<0.001
Methyl isobutyl ketone	108-10-1	390	391	L	>480	0.05
Methyl isocyanate	624-83-9	210	211	L	>480	0.009
Methyl mercaptan	74-93-1	500	501	G	>480	0.029
Methyl methacrylate	80-62-6	220	223	L	181	0.14
Methyl trichlorosilane	75-79-6	480	480	L	>480	<0.001
Nickel carbonyl	13463-39-3	470	470	L	>480	<0.002
Nitric acid, 70%	7697-37-2	370	370	L	>480	<0.1
Nitric acid, red fuming	8007-58-7	370	370	L	>480	0.04
Nitric oxide	10102-43-9	350	350	G	>480	<0.1
Nitrobenzene	98-95-3	440	441	L	>480	<0.001
2-Nitrophenol (70° C)	88-75-5	310 / 440	316 / 442	L	>480	<0.004
2-Nitropropane	79-46-9	440	441	L	>480	<0.001
Nitrous oxide	10024-97-2	350	350	G	>480	<0.1
n-Octane	111-65-9	290	291	L	>480	0.003
Oleum, 103%	8014-95-7	370	370	L	270	48
Oleum, 65% free SO3	8014-95-7	370	370	L	310	43
Oxamyl, 10% in water	23135-22-0	130	137	L	>480	<0.001
Paraphenylene diisocyanate (PPDI) crude	104-49-4	210	212	L	>480	<0.1
Pentachlorophenol, sat. sol. in methanol	87-86-5	310	316	L	>480	<0.1
Perchloric acid, 70%	7601-90-3	370	370	L	>480	<0.1
Phenol (45° C)	108-95-2	310	316	L	>480	<0.01

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Phosgene	75-44-5	350	350	G	>480	0.002
Phosphine	7803-51-2	350	350	G	>480	<0.001
Phosphorus oxychloride	10025-87-3	360	360	L	>480	0.053
3-Picoline	108-99-6	270	271	L	>480	<0.09
Propylene dichloride	78-87-5	260	261	L	>480	<0.01
1,2-Propylene oxide	75-56-9	270	275	L	>480	0.008
Pyridine	110-86-1	270	271	L	>480	<0.001
Silane	7803-62-5	480	480	G	15	>0.99
Silicon tetrachloride	10026-04-7	360 / 480	360 / 480	L	>480	<0.1
Sodium hydroxide, 50%	1310-73-2	380	380	L	>480	<0.1
Styrene	100-42-5	290	292	L	56	0.38
Sulfur dichloride, 80%	10545-99-0	500	502	L	>480	<0.1
Sulfur dioxide	7446-09-5	350 / 365	350 / 365	G	280	>0.1
Sulfuric acid, 98%	7664-93-9	370	370	L	>480	<0.1
Sulfur trioxide	7446-11-9	365	365	L	70	>50
Sulfuryl chloride	7791-25-5	350 / 360	350 / 360	L	>480	<0.1
1,1,2,2-Tetrachloroethane	79-34-5	260	261 / 264	L	>480	<0.016
Tetraethyl lead	78-00-2	470	470	L	>480	<0.001
Tetrahydrofuran	109-99-9	240	241	L	>480	<0.001
Thionyl chloride	7719-09-7	360	360	L	>480	<0.1
Titanium tetrachloride	7550-45-0	360	360	L	293	0.3
Toluene	108-88-3	290	292	L	>480	<0.001
o-Toluidine	95-53-4	140	145	L	>480	<0.001
1,1,1-Trichloroethane	71-55-6	260	261	L	>480	0.03
1,1,2-Trichloroethane	79-00-5	260	261	L	>480	0.001
Trichloroethylene	79-01-6	260	264	L	>480	<0.001
Trichlorophenylsilane	98-13-5	480	480	L	>480	<0.1
Triethylamine	121-44-8	140	143	L	>480	0.03
Trimethylamine gas	75-50-3	140	143	G	>480	<0.001
Vinyl acetate	108-05-4	220	222	L	>480	0.03
Vinyl chloride	75-01-4	260	264	G	>480	0.01
Xylene, mixed isomers	1330-20-7	290	292	L	>480	<0.003