

Chemical Compatibility Guide for: Tychem[®] TK Suits

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353441

Last revised 09/26/2016



DuPont Permeation Guide



TABLE OF CONTENTS

- [How to use this Permeation Guide](#) 3
- [Independent Testing](#) 3
- [What is Permeation?](#) 3
- [How Permeation Tests are Conducted](#) 4
- [Definitions of Terms](#) 4
- [Chemical Class and Subclass Listings](#) 5
- [ASTM F1001 List of 21 Challenge Chemicals Data Table](#) 6
- [Tychem® Chemical Permeation Data Table](#) 7
- [Tyvek® Fabric Information](#) 24
- [Tyvek® Chemical Permeation Data Table](#) 25
- Appendix
 - [Alphabetical Index](#) 26
 - [CAS Number Index](#) 31

Caution:

This information is based upon technical data that DuPont believes to be reliable on the date issued. It is subject to revision as additional knowledge and experience are gained. The information set forth herein reflects laboratory performance of fabrics, not complete garments, under controlled conditions. It is intended for informational use by persons having technical skill for evaluation under their specific end-use conditions, at their own discretion and risk.

It is the user's responsibility to determine the level of toxicity and the proper personal protective equipment needed. Anyone intending to use this information should first verify that the garment selected is suitable for the intended use. In many cases, seams and closures have shorter breakthrough times and higher permeation rates than the fabric. If fabric becomes torn,

abraded or punctured, or if seams or closures fail, or if attached gloves, visors, etc. are damaged, end user should discontinue use of garment to avoid potential exposure to chemical.

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Warning:

- Tychem® and Tyvek® fabrics should not be used around heat, flames, sparks or in potentially flammable or explosive environments. Only Tychem® ThermoPro, Tychem® Reflector® and Tychem® TK styles 600T/601T (with aluminized outer suit) garments are designed and tested to help reduce burn injury during escape from a flash fire. Users of Tychem® ThermoPro, Tychem® Reflector® and Tychem® TK styles 600T/601T (with aluminized outer suit) garments should not knowingly enter an explosive environment.
- Tychem® garments with attached socks must be worn inside protective outer footwear and are not suitable as outer footwear. These attached socks do not have adequate durability or slip resistance to be worn as the outer foot covering.

How to Use this Permeation Guide

To Find Permeation Test Results

1. Locate the desired chemical in the Chemical Index (Appendix).

The Chemical Index is presented in two ways:

- Alphabetical Index
- Chemical Abstract System (CAS) Number Index

For each chemical, the following information is listed:

- Chemical name
- CAS number
- Chemical class and subclass number(s)
- Synonyms, if applicable

2. Using the chemical name or CAS number, locate the class and subclass(es) of the chemical in the permeation index table.
3. Using the class and subclass, go to the chemical permeation data tables to locate the chemical. The range of fabrics is listed across the top of the table. If testing was done, the permeation data is reported.

Independent Testing

All testing reported in this guide was performed by a third party laboratory.

Permeation data for industrial chemicals is obtained per ASTM F739. Normalized breakthrough times (the time at which the permeation rate exceeds 0.1 ?g/cm²/min) are reported in minutes. All chemicals have been tested between approximately 20°C and 27°C unless otherwise stated. All chemicals have been tested at a concentration of greater than 95% unless otherwise stated.

Chemical warfare agents (Lewisite, Sarin, Soman, Sulfur Mustard, Tabun and VX Nerve Agent) have been tested at 22°C and 50% relative humidity per military standard MIL-STD-282. "Breakthrough time" for chemical warfare agents is defined as the time when the cumulative mass which permeated through the fabric exceeds the limit in MIL-STD-282 [either 1.25 or 4.0 ?g/cm²].

What is Permeation?

Permeation is the absorption, diffusion and desorption of a chemical through a barrier material at the molecular level. Penetration, on the other hand, is the bulk passage of a chemical through a pore or opening in the barrier material.

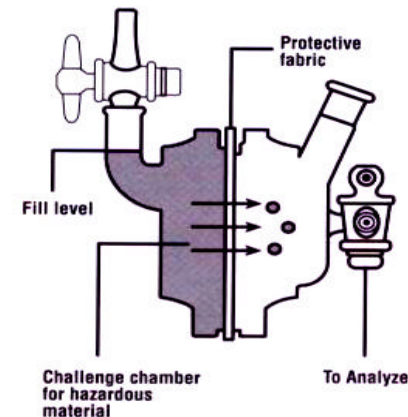
To help you understand the difference between these two mechanisms, consider this example. Have you ever opened a bottle of soda to find out that it was flat? There aren't any holes in the bottle. The liquid is still inside. Why is the soda flat? It's flat because the carbon dioxide that gives soda its fizz has permeated through the bottle over time. If you opened a fresh bottle of soda and did not replace the cap, the carbon dioxide would just escape out of the top of the bottle. That would be penetration.

Permeation tests are best suited for testing liquids and vapors.

How Permeation Tests Are Conducted

Other than for Chemical Warfare Agents, permeation tests are conducted following ASTM F739 "Test Method for Resistance of Protective Clothing Materials to Permeation by Liquids and Gases." A swatch of test fabric is inserted into a special test cell, with the outside surface of the fabric toward the

challenge chamber, thus exposing it to a challenge chemical. The inside surface of the fabric is toward the sampling chamber. If the chemical moves through the fabric and is detected on the inside surface of the fabric, it is said to have permeated through the fabric.



ASTM F739 Test Cell

Definitions of Key Terms for ASTM F739

Breakthrough time: In permeation testing, the actual breakthrough time is the length of time it takes for a challenge chemical to permeate the fabric being tested. It is measured from the point of initial contact of the challenge chemical with the outside surface of the fabric to the time that the challenge chemical is detected on the inside of the fabric. Sensitive analytical equipment is often used to measure the amount of chemical permeating the fabric.

Normalized, or sometimes called "standardized" breakthrough time, is a measure of the elapsed time from initial contact with the challenge chemical until the chemical permeates the fabric at a rate of 0.1 $\mu\text{g}/\text{cm}^2/\text{min}$. This is defined in ASTM F739 test method. Normalized breakthrough times eliminate biased results due to differences in the sensitivity of the detection equipment and are thus the industry

standard measure of breakthrough time. This DuPont Permeation Guide reports normalized breakthrough times using the 0.1 $\mu\text{g}/\text{cm}^2/\text{min}$ criteria.

A normalized breakthrough time of >480 minutes does not always mean that there was no chemical permeation; it means that the rate of permeation did not exceed 0.1 $\mu\text{g}/\text{cm}^2/\text{min}$ during the 8 hour test. If the permeation rate exceeds 0.1 $\mu\text{g}/\text{cm}^2/\text{min}$ in the first 10 minutes of testing, DuPont chooses to report the breakthrough time as "immediate" (imm.).

PLEASE NOTE: In Europe, normalized breakthrough times are based on a permeation rate of 1.0 $\mu\text{g}/\text{cm}^2/\text{min}$. This is 10 times less sensitive than the basis used in North America.

Physical phase: The phase of the challenge chemical during the test: solid-S, liquid-L, gas-G.

Chemical Class & Subclass Listing*

<p>100 Carboxylic acids 102 Aliphatic and Alicyclic, Unsubstituted 103 Aliphatic and Alicyclic, Substituted 104 Aliphatic and Alicyclic, Polybasic</p> <p>110 Acid Halides, Carboxylic 111 Aliphatic and Alicyclic 112 Aromatic 113 Chloroformates</p> <p>120 Aldehydes 121 Aliphatic and Alicyclic 122 Aromatic</p> <p>130 Amides 132 Aliphatic and Alicyclic 135 Acrylamides</p> <p>140 Amines 141 Aliphatic and Alicyclic, Primary 142 Aliphatic and Alicyclic, Secondary 143 Aliphatic and Alicyclic, Tertiary 145 Aromatic, Primary 146 Aromatic, Secondary and Tertiary 148 Aliphatic and Alicyclic Polyamines 149 Aromatic Polyamines</p> <p>150 Hydroxlamines and Ketoximes</p> <p>160 Anhydrides 161 Aliphatic and Alicyclic</p> <p>210 Isocyanates 211 Aliphatic and Alicyclic 212 Aromatic</p> <p>220 Carboxylic Esters 221 Formates 222 Acetates 223 Acrylates and Methacrylates 224 Aliphatic, Others</p>	<p>230 Non-Carboxylic Esters 233 Carbamates and Others</p> <p>240 Ethers 241 Aliphatic and Alicyclic 245 Glycol Ethers 246 Vinyllic</p> <p>260 Halogen Compounds 261 Aliphatic and Alicyclic 263 Aromatic 264 Vinyllic 265 Alylic 266 Benzylic</p> <p>270 Heterocyclic Compounds 271 Nitrogen, Pyridines 274 Nitrogen, Others 275 Oxygen, Epoxides 277 Oxygen, Furans 278 Oxygen, Others</p> <p>280 Hydrazines</p> <p>290 Hydrocarbons 291 Aliphatic and Alicyclic, Saturated 292 Aromatic 293 Aromatic Polynuclear 294 Aliphatic and Alicyclic, Unsaturated 296 Polyenes</p> <p>300 Peroxides</p> <p>310 Hydroxylic Compounds (includes alcohols) 311 Aliphatic and Alicyclic, Primary 312 Aliphatic and Alicyclic, Secondary 313 Aliphatic and Alicyclic, Tertiary 314 Aliphatic and Alicyclic, Polyols 315 Aliphatic and Alicyclic, Substituted 316 Aromatic, Phenols</p>	<p>330 Elements</p> <p>340 Inorganic Salts and Inorganic Salt Solutions 345 Inorganic Cyano Compounds</p> <p>350 Inorganic Gases and Vapors</p> <p>360 Inorganic Acid Halides 365 Inorganic Acid Oxides</p> <p>370 Inorganic Acids</p> <p>380 Inorganic Bases</p> <p>390 Ketones 391 Aliphatic and Alicyclic</p> <p>430 Nitriles 431 Aliphatic and Alicyclic 432 Aromatic</p> <p>440 Nitro Compounds 441 Unsubstituted 442 Substituted</p> <p>450 Nitroso Compounds</p> <p>460 Organo-Phosphorus Compounds 462 Derivatives of Phosphorus-based acids</p> <p>470 Organo-Metallic Compounds</p> <p>480 Organo-Silicon Compounds</p> <p>500 Sulfur Compounds 501 Thiols 502 Sulfides and Disulfides 503 Sulfones and Sulfoxides 504 Sulfonic Acids 505 Sulfonyl Chlorides 507 Sulfonates, Sulfates, and Sulfites 509 Other</p> <p>550 Organic Salts and Organic Salt Solutions</p> <p>590 Miscellaneous (Not classified)</p>
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*Partial list based on ASTM F1186. A complete copy of ASTM F1186 may be purchased from ASTM (www.astm.org).

ASTM F1001 List of Challenge Chemicals (Permeation Test Method ASTM F739)

Sub-class	Chemical Name	CAS Number	Phase	Normalized Breakthrough Time (Minutes)									
				Tyvek® 800J	Tychem® QC	Tychem® SL	Tychem® F	Tychem® ThermoPro	Tychem® CPF 3	Tychem® BR	Tychem® Responder® CSM	Tychem® TK	Tychem® Reflector®
380	Sodium hydroxide (50%)	1310-73-2	L	>480	>480	>480	>480	>480	>480	>480	>480	>480	>480
> = greater than imm. = immediate (<10 minutes) {empty} = not tested L = Liquid G = Gas S = Solid				* Actual breakthrough time; normalized breakthrough time is not available. ** Solid tested, vapor phase permeation measured.									

Chemical Permeation Data Tables

C	S	C	C	C	C	C	Breakthrough Time (Minutes)												
							Tyvek® 800J	Tychem® QC	Tychem® SL	Tychem® F	Tychem® ThermoPro	Tychem® CPF 3	Tychem® BR	Tychem® Responder® CSM	Tychem® TK	Tychem® Reflector®			
100 Carboxylic acids																			
102 Aliphatic and Alicyclic, Unsubstituted																			
					Chemical Name	CAS	Phase												
					Acetic acid	64-19-7	L		imm.	>480	>480	>480	84	339	>480	>480	>480		
					Acrylic acid	79-10-7	L		imm.	>480	>480	>480		270	>480	>480	>480		270
					Formic acid	64-18-6	L		imm.	>480	260	260	>480	>480	>480	>480	>480		>480
					Methacrylic acid	79-41-4	L				>480	>480		>480	>480	>480	>480		>480
103 Aliphatic and Alicyclic, Substituted																			
					Chloroacetic acid	79-11-8	L							>480	>480	>480	>480		>480
					Chloroacetic acid (70%-80%)	79-11-8	L		370	>480	>480	>480	>480	>480	>480	>480	>480		>480
					Glycolic acid (sat. sol. in water)	79-14-1	L							>480	>480	>480	>480		>480
					Thioglycolic acid	68-11-1	L			>480	>480	>480	>480	>480	>480	>480	>480		>480
					Trichloroacetic acid	76-03-9	L			>480	>480	>480							
					Trifluoroacetic acid	76-05-1	L			>480	>480	>480				>480			
104 Aliphatic and Alicyclic, Polybasic																			
					Citric acid (50% in water)	77-92-9	L						>480						
					Oxalic acid (10.5%)	144-62-7	L							>480	>480	>480	>480		>480
					Oxalic acid (sat. sol. in water)	144-62-7	L						>480						
110 Acid Halides, Carboxylic																			
111 Aliphatic and Alicyclic																			
					Acetyl chloride	75-36-5	L			63	>480	>480	>480	181	181	>480	>480		181
					Acryloyl Chloride	814-68-6	L			imm.	334	334	55						
					Chloroacetyl chloride	79-04-9	L			120			77	160	160	160	160		160
					Dichloroacetyl chloride	79-36-7	L				160	160		100	100	>480	>480		100
112 Aromatic																			
					Benzoyl chloride	98-88-4	L				>480	>480	>480	>480	>480	>480	>480		>480
113 Chloroformates																			
					Benzyl chloroformate	501-53-1	L						>480						
					Methyl chloroformate	79-22-1	L							>480	>480	>480	>480		>480
120 Aldehydes																			
121 Aliphatic and Alicyclic																			
					Acetaldehyde	75-07-0	L				imm.	>480		>480	>480	>480	>480		>480
					Acrolein	107-02-8	L			24	63	63	178	>480	>480	>480	>480		>480
					Acrolein (10 g/m ²)	107-02-8	L				>480	>480							
					Butyraldehyde, n-	123-72-8	L		imm.	41	>480			>480	>480	>480	>480		>480
					Formaldehyde (100 ppm)	50-00-0	G							>480	>480	>480	>480		>480
					Formalin (3.7% Formaldehyde, 1.0-1.5% Methanol)	mixture	L		>480										
					Formalin (37% Formaldehyde, 10-15% Methanol)	mixture	L		imm.	>480	>480	>480	>480	>480	>480	>480	>480		>480
					Gluteraldehyde (5% in water)	111-30-8	L			>480				>480	>480	>480	>480		>480
					Gluteraldehyde (50%)	111-30-8	L			>480	170	170		>480	>480	>480	>480		>480

Chemical Permeation Data Tables

C	S	C	I	A	S	S	Chemical Name	CAS	P	h	Breakthrough Time (Minutes)									
											Tyvek® 800J	Tychem® QC	Tychem® SL	Tychem® F	Tychem® ThermoPro	Tychem® CPF 3	Tychem® BR	Tychem® Responder® CSM	Tychem® TK	Tychem® Reflector®
							trans-Crotonaldehyde	123-73-9	L				34				>480	>480	>480	>480
122 Aromatic																				
							Furfural	98-01-1	L				227	>480	>480	>480	>480	>480	>480	>480
130 Amides																				
132 Aliphatic and Alicyclic																				
							Dimethylacetamide, N,N-	127-19-5	L				96	>480	>480	>480	>480	>480	>480	>480
							Dimethylacetamide, N,N- (8% in water)	127-19-5	L				>480							
							Dimethylformamide, N,N-	68-12-2	L				imm.	90	>480	>480	>480	>480	>480	>480
							Methyl-2-pyrrolidone, N-	872-50-4	L				>480	>480	>480	>480	>480	>480	>480	>480
							Methylformamide, N-	123-39-7	L					>480	>480	>480				
135 Acrylamides																				
							Acrylamide (50% in water)	79-06-1	L				>480	>480	>480		>480	>480	>480	>480
140 Amines																				
141 Aliphatic and Alicyclic, Primary																				
							Butylamine, n-	109-73-9	L					200	200	>480	>480	>480	>480	>480
							Butylamine, tert-	75-64-9	L							>480	>480	>480	>480	>480
							Ethanolamine	141-43-5	L					>480	>480	>480	>480	>480	>480	>480
							Ethylamine (15° C)	75-04-7	L							361	361	>480	>480	361
							Isopropylamine	75-31-0	L					>480	>480	15	>480	>480	>480	>480
							Methylamine	74-89-5	G					>480	>480		105	105	>480	105
							Methylamine (40% in water)	74-89-5	L							140	261	261	261	261
							Methylamine (50% in water)	74-89-5	L								232	232	232	232
							Propylamine, n-	107-10-8	L							100				
142 Aliphatic and Alicyclic, Secondary																				
							Diethanolamine	111-42-2	L							>480				
							Diethylamine	109-89-7	L				imm.	15	>480	>480	>480	>480	>480	>480
							Dimethylamine	124-40-3	G					>480	>480	>480			>480	
							Hexamethyldisilazane	999-97-3	L				>480				>480	>480	>480	>480
							Morpholine	110-91-8	L				158				>480	>480	>480	>480
143 Aliphatic and Alicyclic, Tertiary																				
							Triethylamine	121-44-8	L				22				>480	>480	>480	>480
							Trimethylamine (gas)	75-50-3	G										>480	
							Tripropylamine	102-69-2	L								>480	>480	>480	>480
145 Aromatic, Primary																				
							Aminodiphenyl, 4- (1 mg/ml in methanol)	92-67-1	L					>480	>480					
							Aniline	62-53-3	L				imm.	>480	>480	>480	320	>480	>480	>480
							Benzidine (25% in methanol)	92-87-5	L								>480	>480	>480	>480
							Benzidine (75% in methanol)	92-87-5	L										>480	>480
							Chloroaniline, p-	106-47-8	S								>480	>480**	>480	>480

Chemical Permeation Data Tables

C l a s s	S u b - C l a s s	Chemical Name	CAS	P h a s e	Breakthrough Time (Minutes)									
					Tyvek® 800J	Tychem® QC	Tychem® SL	Tychem® F	Tychem® ThermoPro	Tychem® CPF 3	Tychem® BR	Tychem® Responder® CSM	Tychem® TK	Tychem® Reflector®
		Chloroaniline, p- (70° C)	106-47-8	L			imm.	imm.	imm.		344	344	344	344
		Dichloroaniline, 3,4- (liquid, 70° C)	95-76-1	L			imm.				284	284	284	284
		Dichloroaniline, 3,4- (solid)	95-76-1	S							>480	>480**	>480	>480
		Diethyl-m-toluidine crude	91-67-8	L			>480					>480		
		Methylene dianiline, 4,4'- (15% in MEK)	101-77-9	L							>480	>480	>480	>480
		Methylene dianiline, 4,4'- (sat. sol. in methanol)	101-77-9	L									>480	
		Toluidine, m-	108-44-1	L			>480					>480		
		Toluidine, o-	95-53-4	L			imm.	>480	>480	>480	>480	>480	>480	>480
146 Aromatic, Secondary and Tertiary														
		Diethylaniline	91-66-7	L						>480	>480		>480	>480
		Diethylaniline crude	91-66-7	L			>480					>480		
		Dimethylaniline, N,N-	121-69-7	L				>480	>480	imm.	>480	>480	>480	>480
148 Aliphatic and Alicyclic Polyamines														
		Aminoethylethanolamine	111-41-1	L			imm.	>480	>480	>480	>480	>480	>480	>480
		Aminoethylethanolamine (60%)	111-41-1	L			>480	>480	>480	>480	>480	>480	>480	>480
		Aminoethylpiperazine	140-31-8	L			>480	>480	>480	>480	>480	>480	>480	>480
		Diethylenetriamine	111-40-0	L			321	>480	>480	>480	>480	>480	>480	>480
		Dytek® A	15520-10-2	L				>480	>480	>480				
		Ethylenediamine	107-15-3	L			>480	>480	>480	>480	>480	>480	>480	>480
		Hexamethylenediamine, 1,6- (45° C)	124-09-4	L				>480	>480		>480	>480	>480	>480
		Hexamethylenediamine, 1,6- (50° C)	124-09-4	L			80			45		80		
		Methylene bis-cyclohexane diamine, 4,4'-	1761-71-3	L			>480	>480	>480			>480		
		Tetraethylenepentamine	112-57-2	L			>480	>480	>480	>480	>480	>480	>480	>480
149 Aromatic Polyamines														
		Benzidine (25% in methanol)	92-87-5	L							>480	>480	>480	>480
		Benzidine (75% in methanol)	92-87-5	L									>480	
		Methylene bis (o-chloroaniline), 4,4'- (sat. sol. in methanol)	101-14-4	L			>480				>480	>480	>480	>480
		Methylene dianiline, 4,4'- (15% in MEK)	101-77-9	L							>480	>480	>480	>480
		Methylene dianiline, 4,4'- (sat. sol. in methanol)	101-77-9	L									>480	
150 Hydroxamines and Ketoximes														
150 Hydroxamines and Ketoximes - All														
		Methyl ethyl ketoxime	96-29-7	L			>480	>480	>480		>480	>480	>480	>480
160 Anhydrides														
161 Aliphatic and Alicyclic														
		Acetic anhydride	108-24-7	L			48	>480		>480	>480	>480	>480	>480
210 Isocyanates														
211 Aliphatic and Alicyclic														
		Cyclohexyl isocyanate	3173-53-3	L			54					54		
		Hexamethylene diisocyanate	822-06-0	L			>480	>480	>480	>480	>480	>480	>480	>480

Chemical Permeation Data Tables

C l a s s	S u b - C l a s s	Chemical Name	CAS	P h a s e	Breakthrough Time (Minutes)									
					Tyvek® 800J	Tychem® QC	Tychem® SL	Tychem® F	Tychem® ThermoPro	Tychem® CPF 3	Tychem® BR	Tychem® Responder® CSM	Tychem® TK	Tychem® Reflector®
		Chloromethyl methyl ether	107-30-2	L				46	46		>480	>480	>480	>480
		Dichloroethyl ether	111-44-4	L				>480	>480	>480	>480	>480	>480	>480
		Dimethyl ether	115-10-6	G									>480	
		Ethyl ether	60-29-7	L			imm.	>480	>480	>480	>480	>480	>480	>480
		Methyl tert-butyl ether	1634-04-4	L			>480	>480	>480	>480	>480	>480	>480	>480
		Tetrahydrofuran	109-99-9	L			imm.	imm.	>480	>480	>480	>480	>480	>480
245 Glycol Ethers														
		(2-Ethoxyethoxy)-ethanol, 2-	111-90-0	L			>480					>480		
		Butyl Cellosolve®	111-76-2	L			>480	>480				>480		
		Ethyl Cellosolve®	110-80-5	L			>480	>480	>480	>480	>480	>480	>480	>480
		Ethyl Cellosolve® acetate	111-15-9	L			238	>480	>480	>480	>480	>480	>480	>480
		Methyl Cellosolve®	109-86-4	L			>480	>480	>480	405	>480	>480	>480	>480
		Methyl Cellosolve® acetate	110-49-6	L			>480	>480	>480	>480	>480	>480	>480	>480
		Polyethylene glycol dimethyl ether	24991-55-7	L					>480					
260 Halogen Compounds														
261 Aliphatic and Alicyclic														
		Carbon tetrachloride	56-23-5	L				11	11	>480	>480	>480	>480	>480
		Chlordane	57-74-9	L							>480	>480	>480	>480
		Chlordane (44%)	57-74-9	L						>480				
		Chloroethanol, 2-	107-07-3	L			imm.	>480	>480	>480	>480	>480	>480	>480
		Chloroform	67-66-3	L			imm.	imm.	imm.	imm.	>480	>480	>480	>480
		Chloropicrin	76-06-2	L				>480	>480					
		Dibromo-3-chloropropane, 1,2-	96-12-8	L						>480				
		Dichloroacetone (40° C)	534-07-6	L				>480	>480		>480	>480	>480	>480
		Dichloroethyl ether	111-44-4	L				>480	>480	>480	>480	>480	>480	>480
		Dichloromethane	75-09-2	L			imm.	imm.	imm.	imm.	>480	>480	>480	>480
		Dichloropropene, 1,3-	542-75-6	L			imm.	25	25	imm.		imm.		
		Dichloropropene, 2,3-	78-88-6	L				25	25		>480	>480	>480	>480
		Diiodo-1,1,2,2-tetrafluorobutane, 1,4-	755-95-3	L							>480	>480	>480	>480
		Epichlorohydrin	106-89-8	L			15	372	372	67	>480	>480	>480	>480
		Ethyl chloride	75-00-3	L									>480	
		Ethylene dibromide	106-93-4	L				288	288	>480	>480	>480	>480	>480
		Ethylene dichloride	107-06-2	L			imm.	118	118	>480	>480	>480	>480	>480
		Hexafluoroethane	76-16-4	G							>480	>480	>480	>480
		Hexafluoroisobutylene	382-10-5	G							>480	>480	>480	>480
		Lindane (sat. sol. in acetone)	58-89-9	L							>480	>480	>480	>480
		Lindane (sat. sol. in methanol)	58-89-9	L									>480	
		Methyl bromide	74-83-9	G			>480				>480	>480	>480	>480
		Methyl chloride (gas)	74-87-3	G			imm.	>480	>480	>480	>480	>480	>480	>480

Chemical Permeation Data Tables

C	S	U	C	I	A	S	Chemical Name	CAS	P	h	Breakthrough Time (Minutes)													
											Tyvek® 800J	Tychem® QC	Tychem® SL	Tychem® F	Tychem® ThermoPro	Tychem® CPF 3	Tychem® BR	Tychem® Responder® CSM	Tychem® TK	Tychem® Reflector®				
							Tetrachloroethylene, 1,1,2,2-	127-18-4	L				imm.	imm.	>480	>480	>480	>480	>480	>480	>480	>480		
							Trichloroethylene	79-01-6	L				imm.	imm.	>480	>480	>480	>480	>480	>480	>480	>480		
							Vinyl chloride	75-01-4	G						>480	>480	>480	>480	>480	>480	>480	>480		
							Vinylidene chloride	75-35-4	L						>480	>480	170	>480	>480	>480	>480	>480		
							trans-1,2-Dichloroethylene	156-60-5	L				imm.	imm.					imm.					
							trans-1,4-Dichloro-2-butene	110-57-6	L				75*											
265 Allylic																								
							Allyl chloride	107-05-1	L				imm.	>480	>480	12	>480	>480	>480	>480	>480	>480		
266 Benzylic																								
							Benzyl chloride	100-44-7	L						>480	>480	>480	>480	>480	>480	>480	>480		
270 Heterocyclic Compounds																								
271 Nitrogen, Pyridines																								
							Aminopyridine, 2- (saturated solution)	504-29-0	L					>480						>480				
							Nicotine	54-11-5	L						>480	>480	>480	>480	>480	>480	>480	>480		
							Picoline, 2-	109-06-8	L						>480	>480	>480	>480	>480	>480	>480	>480		
							Picoline, 3-	108-99-6	L						>480	>480	>480	>480	>480	>480	>480	>480		
							Pyridine	110-86-1	L					31	>480	>480	>480	>480	>480	>480	>480	>480		
							Vinylpyridine, 4-	100-43-6	L					15						15				
274 Nitrogen, Others																								
							Aminoethylpiperazine	140-31-8	L						>480	>480	>480	>480	>480	>480	>480	>480		
							Dichloro-6-isopropyl-S-triazine, 2,4- (22% in toluene)	30894-74-7	L									>480	>480	>480	>480	>480		
							Ethyleneimine	151-56-4	L								59	59	>480	>480	59	59		
							Propylene imine	75-55-8	L								150	150	150	150	150	150		
							Pyrrolidine	123-75-1	L					100	100		413	413	413	413	413	413		
275 Oxygen, Epoxides																								
							Bisphenol-A diglycidyl ether	1675-54-3	L						>480	>480	>480		>480	>480	>480	>480		
							Epichlorohydrin	106-89-8	L					15	372	372	67	>480	>480	>480	>480	>480		
							Ethylene oxide (gas)	75-21-8	G				imm.	imm.	126	>480	>480	>480	>480	>480	>480	>480		
							Ethylene oxide (liquid, -70° C)	75-21-8	L											>180				
							Ethylene oxide (liquid, 0° C)	75-21-8	L									>480	>480	>480	>480	>480		
							Ethylene oxide (liquid, 11° C)	75-21-8	L							18								
							Ethylene oxide mixture (10% in HCFC 124)		G											>480				
							Phenyl glycidyl ether	122-60-1	L						>480					>480				
							Propylene oxide, 1,2-	75-56-9	L						14	14	30	>480	>480	>480	>480	>480		
							Tetramethylethylene oxide	5076-20-0	L											>480				
277 Oxygen, Furans																								
							Furfural	98-01-1	L					227	>480	>480	>480	>480	>480	>480	>480	>480		
278 Oxygen, Others																								
							Dioxane, 1,4-	123-91-1	L						>480	>480	>480	>480	>480	>480	>480	>480		

Chemical Permeation Data Tables

C	l	a	s	S	u	b	C	l	a	s	Chemical Name	CAS	P	h	a	s	Breakthrough Time (Minutes)								
																	Tyvek® 800J	Tychem® QC	Tychem® SL	Tychem® F	Tychem® ThermoPro	Tychem® CPF 3	Tychem® BR	Tychem® Responder® CSM	Tychem® TK
280 Hydrazines																									
280 Hydrazines - All																									
											Dimethylhydrazine, 1,1-	57-14-7	L			13					>480*	>480*	>480*	>480*	
											Hydrazine	302-01-2	L			>480	283	283				>480	>480	>480	>480
											Hydrazine hydrate	10217-52-4	L												>480
											Hydrazine hydrate (50%)	10217-52-4	L												>480
											Hydrazine hydrate (85%)	10217-52-4	L									440	440	440	440
											Methyl hydrazine	60-34-4	L									>480	>480	>480	>480
290 Hydrocarbons																									
290 Hydrocarbons - All																									
											Diethylbenzene	25340-17-4	L			31	>480	>480				>480	>480	>480	>480
291 Aliphatic and Alicyclic, Saturated																									
											Cyclohexane	110-82-7	L					>480	>480	>480		>480	>480	>480	>480
											Diesel automotive test fuel mixture		L		imm.										
											Diesel fuel	68334-30-5	L			48	>480	>480	199			>480	>480	>480	>480
											Fuel oil	68476-30-2	L		imm.	>480						>480			
											Gasoline	86290-81-5	L			imm.	30	30	>480			>480	>480	>480	>480
											Gasoline, E-10	308066-70-8	L			16							16		
											Heptane	142-82-5	L						>480						
											Hexane, n-	110-54-3	L		imm.	imm.	>480	>480	>480			>480	>480	>480	>480
											JP-4 jet fuel	50815-00-4	L			imm.						>480	>480	>480	>480
											JP-8 jet fuel	94114-58-6	L			58						>480	>480	>480	>480
											Kerosene	8008-20-6	L			58	>480	>480	>480			>480	>480	>480	>480
											Mineral oil	8012-95-1	L			>480						>480			
											Mineral spirits	64475-85-0	L		imm.	190						>480	>480	>480	>480
											Octane, n-	111-65-9	L									>480	>480	>480	>480
											Propane	74-98-6	G												>480
											Stoddard solvent	8052-41-3	L									>480	>480	>480	>480
											VM&P Naphtha	8030-30-6	L			imm						>480	>480	>480	>480
292 Aromatic																									
											Benzene	71-43-2	L			imm.	>480	>480	>480			>480	>480	>480	>480
											Cumene	98-82-8	L				>480	>480	364			>480	>480	>480	>480
											Ethyl benzene	100-41-4	L			imm.	>480	>480	>480			>480	>480	>480	>480
											Styrene	100-42-5	L			16	>480	>480	>480			>480	>480	>480	>480
											Toluene	108-88-3	L		imm.	imm.	>480	>480	>480			>480	>480	>480	>480
											Xylene, mixed isomers	1330-20-7	L				>480	>480	>480			>480	>480	>480	>480
											Xylene, o-	95-47-6	L									>480			
293 Aromatic Polynuclear																									
											Anthracene (sat. sol. in toluene)	120-12-7	L					>480	>480	>480					

Chemical Permeation Data Tables

C	S	C	I	A	S	S	Chemical Name	CAS	P	h	Breakthrough Time (Minutes)										
											Tyvek® 800J	Tychem® QC	Tychem® SL	Tychem® F	Tychem® ThermoPro	Tychem® CPF 3	Tychem® BR	Tychem® Responder® CSM	Tychem® TK	Tychem® Reflector®	
							Naphthalene	91-20-3	S					>480	>480	>480					
294 Aliphatic and Alicyclic, Unsaturated																					
							Crude oil	8002-05-9	L			imm.	>480				>480	>480	>480	>480	
296 Polyenes																					
							Butadiene, 1,3- (gas)	106-99-0	G			imm.	>480	>480	>480	>480	>480	>480	>480	>480	
							Butadiene, 1,3- (liquid, 0° C)	106-99-0	L										>180		
							Cyclooctadiene	1552-12-1	L							>480					
							d-Limonene	5989-27-5	L					>480	>480	>480	>480	>480	>480	>480	
300 Peroxides																					
300 Peroxides - All																					
							Hydrogen peroxide (30%)	7722-84-1	L			>480	>480						>480	>480	
							Hydrogen peroxide (50%)	7722-84-1	L			>480		>480	>480						
							Hydrogen peroxide (70%)	7722-84-1	L			>480				>480	>480	>480	>480	>480	
310 Hydroxylic Compounds (includes alcohols)																					
311 Aliphatic and Alicyclic, Primary																					
							Allyl alcohol	107-18-6	L				>480	>480	>480	>480	>480	>480	>480	>480	
							Aminoethylethanolamine	111-41-1	L				imm.	>480	>480	>480	>480	>480	>480	>480	
							Aminoethylethanolamine (60%)	111-41-1	L				>480	>480	>480	>480	>480	>480	>480	>480	
							Butanol, n-	71-36-3	L			imm.	>480	>480	>480	>480	>480	>480	>480	>480	
							Ethanolamine	141-43-5	L					>480	>480	>480	>480	>480	>480	>480	
							Ethyl alcohol	64-17-5	L					>480	>480	>480			>480		
							Mercaptoethanol	60-24-2	L					>480	>480				>480		
							Methanol	67-56-1	L			imm.	>480	117	>480	imm.	185	>480	>480	>480	
							Methyl Cellosolve®	109-86-4	L					>480	>480	405	>480	>480	>480	>480	
							Pentanol, n-	71-41-0	L					>480	>480	>480					
							Propargyl alcohol ((null))	107-19-7	L						123	123				>480	
312 Aliphatic and Alicyclic, Secondary																					
							Benzyl alcohol	100-51-6	L					>480	>480				>480		
							Isoamyl alcohol	123-51-3	L					>480					>480		
							Isopropyl alcohol	67-63-0	L			imm.	>480	>480	>480	>480	>480	>480	>480	>480	
							Isopropyl alcohol (70%)	67-63-0	L			imm.	>480		>480						
313 Aliphatic and Alicyclic, Tertiary																					
							Acetone cyanohydrin	75-86-5	L					>480	>480			>480	>480	>480	
314 Aliphatic and Alicyclic, Polyols																					
							Chloro-1,2-propanediol, 3-	96-24-2	L								>480	>480	>480	>480	
							Ethylene glycol	107-21-1	L				>480	>480	>480	>480	>480	>480	>480	>480	
315 Aliphatic and Alicyclic, Substituted																					
							Chloroethanol, 2-	107-07-3	L			imm.		>480	>480	>480	>480	>480	>480	>480	
							Trichloroethanol, 2,2,2-	115-20-8	L					>480	>480	>480	>480	>480	>480	>480	

Chemical Permeation Data Tables

C l a s s	S u b - C l a s s	Chemical Name	CAS	P h a s e	Breakthrough Time (Minutes)									
					Tyvek® 800J	Tychem® QC	Tychem® SL	Tychem® F	Tychem® ThermoPro	Tychem® CPF 3	Tychem® BR	Tychem® Responder® CSM	Tychem® TK	Tychem® Reflector®
		Potassium acetate (sat. sol. in water)	127-08-2	L			>480				>480*	>480*	>480*	>480*
		Potassium carbonate	584-08-7	L						>480				
		Potassium chromate (sat. sol. in water)	7789-00-6	L			>480	>480	>480		>480*	>480*	>480*	>480*
		Potassium permanganate	7722-64-7	L		>480								
		Sodium fluoride (sat. sol. in water)	7681-49-4	L			>480					>480		
		Sodium hypochlorite (15%)	7681-52-9	L	>480	>480	>480	>480	>480	>480	>480	>480	>480	>480
		Sodium hypochlorite (30%)	7681-52-9	L			>480	>480	>480	>480				
		Sodium hypochlorite (6%)	7681-52-9	L	>480	>480								
		Sodium metabisulfite (38% w/w in water)	7681-57-4	L		imm	>480			23	>480	>480	>480	>480
		Sodium silicate (40-42% in water)	6834-92-0	L		>480								
		Sodium sulfide (60% w/w in water slurry)	1313-82-2	L		>480	>480			>480	>480	>480	>480	>480
345 Inorganic Cyano Compounds														
		Cyanogen chloride	506-77-4	G					>480				>60	>60
		Hydrogen cyanide (gas)	74-90-8	G					>480	30	>480	>480	>480	>480
		Hydrogen cyanide (liquid, 21° C)	74-90-8	L						105	105	>480	105	
		Potassium cyanide (10%)	151-50-8	L		>480								
		Sodium cyanide (45%)	143-33-9	L			>480	>480						
		Sodium cyanide (sat. sol. in water)	143-33-9	L			>480					>480		
350 Inorganic Gases and Vapors														
350 Inorganic Gases and Vapors - All														
		Ammonia (gas)	7664-41-7	G		imm.	26	20	90	imm.	133	133	>480	>480
		Ammonia (liquid, < -35°C)	7664-41-7	L					>480	>480			>480	>480
		Arsine	7784-42-1	G							>480	>480	>480	>480
		Boron trichloride	10294-34-5	G							>480	>480	>480	>480
		Boron trifluoride	7637-07-2	G							>480	>480	>480	>480
		Carbon monoxide	630-08-0	G							330	330	330	330
		Chlorine (gas)	7782-50-5	G		imm.	>480	>480	>480	imm.	>480	>480	>480	>480
		Chlorine (gas, 20 ppm)	7782-50-5	G		>480*								
		Chlorine (liquid, -70° C)	7782-50-5	L						>480			>480	>480
		Chlorine dioxide (1000 ppm)	10049-04-4	G							>480	>480	>480	>480
		Chlorine dioxide (150 ppm)	10049-04-4	G							>480	>480	>480	>480
		Chlorine trifluoride	7790-91-2	G							45	45	45	45
		Diborane (10%)	19287-45-7	G							>480	>480	>480	>480
		Fluorine	7782-41-4	G									>480	
		Hydrogen bromide (gas)	10035-10-6	G				>480	>480		>480	>480	>480	>480
		Hydrogen chloride (gas)	7647-01-0	G		imm.	>480	>480	>480	>480	>480	>480	>480	>480
		Hydrogen chloride (liquid, -90° C)	7647-01-0	L									>180	
		Hydrogen cyanide (gas)	74-90-8	G					>480	30	>480	>480	>480	>480
		Hydrogen cyanide (liquid, 21° C)	74-90-8	L							105	105	>480	105

Chemical Permeation Data Tables

C l a s s	S u b - C l a s s	Chemical Name	CAS	P h a s e	Breakthrough Time (Minutes)									
					Tyvek® 800J	Tychem® QC	Tychem® SL	Tychem® F	Tychem® ThermoPro	Tychem® CPF 3	Tychem® BR	Tychem® Responder® CSM	Tychem® TK	Tychem® Reflector®
		Hydrogen fluoride (gas)	7664-39-3	G		imm.	35	imm.	imm.	170	135	135	>480	>480
		Hydrogen selenide	7783-07-5	G							>480	>480	>480	>480
		Hydrogen sulfide	7783-06-4	G				>480	>480	imm.	>480	>480	>480	>480
		Nitric oxide	10102-43-9	G									>480	
		Nitrogen dioxide	10102-44-0	G			>480	14	14			>480		
		Nitrogen tetroxide (gas)	10544-72-6	G							90	90	90	420
		Nitrogen tetroxide (liquid, 0° C)	10544-72-6	L							>480	>480	>480	>480
		Nitrogen tetroxide (liquid, 21° C)	10544-72-6	L									450	
		Nitrogen trifluoride	7783-54-2	G							>480	>480	>480	>480
		Nitrous oxide	10024-97-2	G							>480	>480	>480	>480
		Phosgene	75-44-5	G			>480	>480	>480	>480	>480	>480	>480	>480
		Phosphine	7803-51-2	G				imm.	imm.		>480	>480	>480	>480
		Sulfonyl chloride	7791-25-5	L				>480	>480	120	>480	>480	>480	>480
		Sulfur dioxide	7446-09-5	G		imm.	>480	38*	38*		>480	>480	>480	>480
		Sulfur hexafluoride	2551-62-4	G							>480	>480	>480	>480
		Tungsten hexafluoride	7783-82-6	L							>480	>480	>480	>480
360 Inorganic Acid Halides														
360 Inorganic Acid Halides - All														
		Antimony pentachloride	7647-18-9	L			>480	15	15			>480		
		Boron trichloride	10294-34-5	G							>480	>480	>480	>480
		Boron trifluoride	7637-07-2	G							>480	>480	>480	>480
		Phosphorus oxychloride	10025-87-3	L			>480	>480	>480	410	>480	>480	>480	>480
		Phosphorus trichloride	7719-12-2	L			imm.	>480	>480	>480	>480	>480	>480	>480
		Silicon tetrachloride	10026-04-7	L			35	>480	>480	>480	>480	>480	>480	>480
		Sulfonyl chloride	7791-25-5	L				>480	>480	120	>480	>480	>480	>480
		Thionyl chloride	7719-09-7	L				imm.	imm.	15	35	35	90	35
		Titanium tetrachloride	7550-45-0	L			imm.	>480	>480	120	>480	>480	>480	>480
		Vanadium tetrachloride	7632-51-1	L					>480					
365 Inorganic Acid Oxides														
		Sulfur dioxide	7446-09-5	G		imm.	>480	38*	38*		>480	>480	>480	>480
		Sulfur trioxide	7446-11-9	L						imm.	90	90	90	90
370 Inorganic Acids														
370 Inorganic Acids - All														
		Chlorosulfonic acid	7790-94-5	L			>480	>480	17	330	180	>480	>480	180
		Chromic acid (60-62%)	1333-82-0	L			>480	>480				>480		
		Fluoroboric acid (48-50%)	16872-11-0	L			>480			>480	>480	>480		
		Fluosilicic acid	16961-83-4	L				>480		>480	>480	>480	>480	>480
		Fluosulfonic acid	7789-21-1	L							>480	>480	>480	>480
		Hydriodic acid (47%)	10034-85-2	L			>480					>480		

Chemical Permeation Data Tables

C	S	C	C	C	C	Breakthrough Time (Minutes)											
						Tyvek® 800J	Tychem® QC	Tychem® SL	Tychem® F	Tychem® ThermoPro	Tychem® CPF 3	Tychem® BR	Tychem® Responder® CSM	Tychem® TK	Tychem® Reflector®		
					Hydriodic acid (55-57%)	10034-85-2	L				>480	>480	>480	>480	>480	>480	>480
					Hydrobromic acid (48-49%)	10035-10-6	L						>480				
					Hydrochloric acid (37%)	7647-01-0	L		140	>480	>480	>480	>480	>480	>480	>480	>480
					Hydrofluoric acid (48-51%)	7664-39-3	L		400	>480	>480	15	180	>480	>480	>480	>480
					Hydrofluoric acid (60%)	7664-39-3	L				52						
					Hydrofluoric acid (70%)	7664-39-3	L			143	35		126	>480	>480	>480	>480
					Hydrogen bromide (gas)	10035-10-6	G				>480	>480	>480	>480	>480	>480	>480
					Hydrogen cyanide (gas)	74-90-8	G					>480	30	>480	>480	>480	>480
					Hydrogen cyanide (liquid, 21° C)	74-90-8	L						105	105	>480	>480	105
					Hydrogen fluoride (gas)	7664-39-3	G		imm.	35	imm.	imm.	170	135	135	>480	>480
					Hypophosphorus acid (50%)	6303-21-5	L				>480	>480	>480				
					Nitric acid (50%)	7697-37-2	L					>480					
					Nitric acid (70%)	7697-37-2	L		>480	>480	>480	140		>480	>480	>480	>480
					Nitric acid (90%)	7697-37-2	L						>480	>480	>480	>480	>480
					Nitric acid, red fuming	52583-42-3	L				14	14	>480	>480	>480	>480	>480
					Oleum (103% (13% free SO3))	8014-95-7	L		230							>480	
					Oleum (20% free SO3)	8014-95-7	L				>480	>480	59			>480	
					Oleum (30% free SO3)	8014-95-7	L				450				450		
					Oleum (40% free SO3)	8014-95-7	L		398*			468		>480	>480	>480	>480
					Oleum (65% free SO3)	8014-95-7	L					248	15			>480	
					Perchloric acid (70%)	7601-90-3	L							>480	>480	>480	>480
					Phosphoric acid (75%)	7664-38-2	L						15				
					Phosphoric acid (85%)	7664-38-2	L				>480	>480	>480	>480	>480	>480	>480
					Sulfamic acid (15%)	5329-14-6	L		>480					>480	>480	>480	>480
					Sulfuric acid	7664-93-9	L		>480	>480	>480	50	>480	>480	>480	>480	>480
					Sulfuric acid (18%)	7664-93-9	L										
					Sulfuric acid (30%)	7664-93-9	L		>480				>480				
					Sulfuric acid (50%)	7664-93-9	L					>480					
380 Inorganic Bases																	
380 Inorganic Bases - All																	
					Ammonia (gas)	7664-41-7	G		imm.	26	20	90	imm.	133	133	>480	>480
					Ammonia (liquid, < -35°C)	7664-41-7	L						>480	>480		>480	>480
					Ammonium hydroxide (28%-30%)	1336-21-6	L		imm.	>480	>480	35	89	160	>480	>480	>480
					Ammonium hydroxide (in household cleaner, 2-3%)	1336-21-6	L			>480		>480			>480		
					Lithium hydroxide (14.9%)	1310-65-2	L		>480								
					Potassium hydroxide (45%)	1310-58-3	L		>480	>480	>480	>480	>480	>480	>480	>480	>480
					Sodium hydroxide (40%)	1310-73-2	L										
					Sodium hydroxide (50%)	1310-73-2	L		>480	>480	>480	>480	>480	>480	>480	>480	>480
390 Ketones																	

Chemical Permeation Data Tables

C	S	Sub	C	I	A	S	S	Chemical Name	CAS	P	h	Breakthrough Time (Minutes)										
												Tyvek® 800J	Tychem® QC	Tychem® SL	Tychem® F	Tychem® ThermoPro	Tychem® CPF 3	Tychem® BR	Tychem® Responder® CSM	Tychem® TK	Tychem® Reflector®	
391 Aliphatic and Alicyclic																						
								Acetone	67-64-1	L			imm.	imm.	>480	>480	>480	>480	>480	>480	>480	>480
								Chloroacetone	78-95-5	L				258	>480	>480	>480		258			
								Cyclohexanone	108-94-1	L				136	>480	>480		>480	>480	>480	>480	>480
								Dichloroacetone (40° C)	534-07-6	L					>480	>480		>480	>480	>480	>480	>480
								Hexone	108-10-1	L					>480	>480	>480	>480	>480	>480	>480	>480
								Mesityl oxide	141-79-7	L						>480						
								Methyl ethyl ketone	78-93-3	L				18	71	71	>480	>480	>480	>480	>480	>480
								Trichloroacetone, 1,1,3-	921-03-9	L					>480	>480						
430 Nitriles																						
431 Aliphatic and Alicyclic																						
								Acetone cyanohydrin	75-86-5	L					>480	>480		>480	>480	>480	>480	>480
								Acetonitrile	75-05-8	L			imm.	60	>480	>480	imm.	>480	>480	>480	>480	>480
								Acrylonitrile	107-13-1	L			imm.	48	12	12	13	>480	>480	>480	>480	>480
								Acrylonitrile (10 g/m ²)	107-13-1	L							>480	>480	>480	>480	>480	
								Adiponitrile	111-69-3	L					>480	>480	>480	>480	>480	>480	>480	
								Chloroacrylonitrile, 2-	920-37-6	L					>480	>480						
								Methyl-1,5-pentanedinitrile, 2-	4553-62-2	L					>480	>480						
								Methyl-1,5-pentanedinitrile, 2- (87%)	4553-62-2	L							>480	>480				
								Pentenenitrile, 2-	13284-42-9	L					>480	>480						
								Pentenenitrile, 3-	4635-87-4	L							>480	>480	>480	>480	>480	
								cis-2-Pentenenitrile (70%)	25899-50-7	L							>480	>480	>480	>480	>480	
432 Aromatic																						
								Benzonitrile	100-47-0	L					>480	>480	450	>480	>480	>480	>480	
								Benzyl cyanide	140-29-4	L					>390	>390	>390					
440 Nitro Compounds																						
441 Unsubstituted																						
								Nitrobenzene	98-95-3	L			imm.	57	>480	>480	>480	>480	>480	>480	>480	
								Nitromethane	75-52-5	L					229	229		>480	>480	>480	>480	
								Nitropropane, 2-	79-46-9	L					>480	>480	>480	>480	>480	>480	>480	
442 Substituted																						
								Dinitroresol (sat. sol. in methanol)	534-52-1	L							>480	>480	>480	>480		
								Nitrochlorobenzene, o-	88-73-3	S			15									
								Nitrochlorobenzene, p-	100-00-5	S			imm.									
								Nitrophenol, o- (70° C)	88-75-5	L			imm.				208	208	208	208		
								Nitrophenol, p- (60° C)	100-02-7	L			imm.					imm.				
								Nitrotoluene, o-	88-72-2	L				95					95			
								Nitrotoluene, p-	99-99-0	S			imm.									
450 Nitroso Compounds																						

Chemical Permeation Data Tables

C	S	C	C	S	Chemical Name	CAS	P	h	Breakthrough Time (Minutes)									
									Tyvek® 800J	Tychem® QC	Tychem® SL	Tychem® F	Tychem® ThermoPro	Tychem® CPF 3	Tychem® BR	Tychem® Responder® CSM	Tychem® TK	Tychem® Reflector®
450 Nitroso Compounds - All																		
					Dimethyl nitrosamine	62-75-9	L						>480	>480				
460 Organo-Phosphorus Compounds																		
462 Derivatives of Phosphorus-based acids																		
					Ethyl parathion	56-38-2	L							>480	>480	>480	>480	
					Malathion	121-75-5	L							>480	>480	>480	>480	
					Malathion (50% in methanol)	121-75-5	L							>480	>480	>480	>480	
					Malathion (50% in water)	121-75-5	L				>480			>480				
					Sarin (10 g/m ²)	107-44-8	L						120	>480	>480	>480	>480	
					Sarin (100 g/m ²)	107-44-8	L					>480	>480	>480	>480	>480	>480	
					Skydrol®	95660-51-8	L				>480							
					Soman (10 g/m ²)	96-64-0	L						>480	>480	>480	>480	>480	
					Soman (100 g/m ²)	96-64-0	L					>480	>480				>480	
					Tabun (10 g/m ²)	77-81-6	L							>480	>480	>480	>480	
					Tabun (100 g/m ²)	77-81-6	L							>480	>480	>480	>480	
					Trimethyl phosphite	512-56-1	L							>480	>480	>480	>480	
					Trimethyl phosphite	121-45-9	L				210			>480	>480	>480	>480	
					VX Nerve agent (10 g/m ²)	50782-69-9	L						>480	>480	>480	>480	>480	
					VX Nerve agent (100 g/m ²)	50782-69-9	L							>480	>480	>480	>480	
470 Organo-Metallic Compounds																		
470 Organo-Metallic Compounds - All																		
					Dimethyl mercury in decane (100 ppm)	593-74-8	L						>480					
					Lewisite (10 g/m ²)	541-25-3	L				>360			120	>480	>480	>480	>480
					Lewisite (100 g/m ²)	541-25-3	L					360	360		120	120	>480	120
					Nickel carbonyl	13463-39-3	L										>480	
					Tetraethyl lead	78-00-2	L							>480	>480	>480	>480	>480
					Triethylaluminum	97-93-8	L											>480
					Vinylmagnesium chloride (15% in tetrahydrofuran)	3536-96-7	L										imm.	
					Vinylmagnesium chloride (16.5%)	3536-96-7	L								>480	>480	>480	>480
480 Organo-Silicon Compounds																		
480 Organo-Silicon Compounds - All																		
					Dichlorosilane	4109-96-0	G							>480	>480	>480	>480	
					Dimethyldichlorosilane	75-78-5	L				46	>480	>480			46	>480	
					Hexamethyldisilazane	999-97-3	L					>480			>480	>480	>480	>480
					Methyl trichlorosilane	75-79-6	L							>480	>480	>480	>480	>480
					Silane	7803-62-5	G								>480	>480	>480	>480
					Silicon tetrachloride	10026-04-7	L				35	>480	>480	>480	>480	>480	>480	>480
					Tetraethoxysilane	78-10-4	L								>480	>480	>480	>480
					Trichlorophenylsilane	98-13-5	L					>480	>480	>480		>480	>480	

Chemical Permeation Data Tables

C	S	C	C	C	C	Breakthrough Time (Minutes)										
						Tyvek® 800J	Tychem® QC	Tychem® SL	Tychem® F	Tychem® ThermoPro	Tychem® CPF 3	Tychem® BR	Tychem® Responder® CSM	Tychem® TK	Tychem® Reflector®	
				Trichlorosilane	10025-78-2	L			60		>480		>480	>480	>480	>480
				Trichlorovinylsilane	75-94-5	L			100				100			
500 Sulfur Compounds																
501 Thiols																
				Ethyl Mercaptan	75-08-1	L			imm.	>480	>480	>480	>480	>480	>480	>480
				Mercaptoethanol	60-24-2	L				>480	>480				>480	>480
				Methyl mercaptan	74-93-1	G				>480	>480	>480	>480	>480	>480	>480
				Phenyl mercaptan	108-98-5	L									>480	>480
				Thioglycolic acid	68-11-1	L				>480	>480	>480	>480	>480	>480	>480
502 Sulfides and Disulfides																
				Carbon disulfide	75-15-0	L			imm.	imm.	>480	>480	16	>480	>480	>480
				Chlorine sulfide	10545-99-0	L									440	
				Chlorine sulfide (80%)	10545-99-0	L						imm.	70	70	>480	70
				Dimethyl sulfide	75-18-3	L				271	271					
				Hydrogen sulfide	7783-06-4	G				>480	>480	imm.	>480	>480	>480	>480
				Sulfur monochloride	10025-67-9	L						210	>480	>480	>480	>480
				Sulfur mustard (10 g/m ²)	505-60-2	L						120	>480	>480	>480	>480
				Sulfur mustard (100 g/m ²)	505-60-2	L				>480	>480		>480	>480	>480	>480
503 Sulfones and Sulfoxides																
				Dimethyl sulfoxide	67-68-5	L				36	36	>480	>480	>480	>480	>480
504 Sulfonic Acids																
				Chlorosulfonic acid	7790-94-5	L			>480	>480	17	330	180	>480	>480	180
				Methanesulfonic acid (70% in water)	75-75-2	L			>480					>480		
				Trifluoromethane sulfonic acid	1493-13-6	L			>480	>480	>480		>480	>480	>480	>480
505 Sulfonyl Chlorides																
				Benzene sulfonyl chloride	98-09-9	L				>480	>480	>480	>480	>480	>480	>480
				Methane sulfonyl chloride	124-63-0	L							>480	>480	>480	>480
507 Sulfonates, Sulfates, and Sulfites																
				Diethyl sulfate	64-67-5	L				>480	>480	>480			>480	
				Dimethyl sulfate	77-78-1	L			>480	>480	>480	>480	>480	>480	>480	>480
509 Other																
				Sulfamic acid (15%)	5329-14-6	L			>480				>480	>480	>480	>480
				Sulfur hexafluoride	2551-62-4	G							>480	>480	>480	>480
550 Organic Salts and Organic Salt Solutions																
550 Organic Salts and Organic Salt Solutions - All																
				Sodium methylate (50% in methanol)	124-41-4	L							>480	>480	>480	>480
				Tetraethyl Ammonium Hydroxide (35%)	77-98-5	L				>480				>480		
				Tetramethylammonium hydroxide (25%)	75-59-2	L			>480	>480	>480	>480			>480	
590 Miscellaneous (Not classified)																

Chemical Permeation Data Tables

C l a s s	S u b - C l a s s	Chemical Name	CAS	P h a s e	Breakthrough Time (Minutes)									
					Tyvek® 800J	Tychem® QC	Tychem® SL	Tychem® F	Tychem® ThermoPro	Tychem® CPF 3	Tychem® BR	Tychem® Responder® CSM	Tychem® TK	Tychem® Reflector®
590 Miscellaneous (Not classified) - All														
		Black liquor	308074-23-9	L		>480	>480				>480	>480	>480	>480
		Boron trifluoride dimethyletherate	353-42-4	L				>480	>480	>480				
		Boron trifluoride etherate	109-63-7	L				>480	>480				>480	
		Chemidize 727 ND	mixture	L			>480					>480		
		DuPont Activator 193S	mixture	L		>480								
		DuPont Activator 4505S	mixture	L		>480								
		DuPont Activator 4507S	mixture	L		>480								
		Green liquor	68131-30-6	L		>480	>480				>480	>480	>480	>480
		Tetramethyltin (0.5% in n-pentane)	mixture	L							>480	>480	>480	>480
		White liquor	68131-33-9	L		>480	>480				>480	>480	>480	>480
		t-Sodium-amylate / t-amyl alcohol	mixture	S							120	120**	120	120
<p>> = greater than imm. = immediate (<10 minutes) {empty} = not tested L = Liquid G = Gas S = Solid</p> <p>* Actual breakthrough time; normalized breakthrough time is not available.</p> <p>** Solid tested, vapor phase permeation measured.</p>														

Permeation data for Tyvek® Plus and Tyvek® Xpert

DuPont™ Tyvek® fabric provides an ideal balance of protection, durability and comfort. Tyvek® garments are composed of flash spun high density polyethylene fabric which creates a unique, nonwoven material available only from DuPont.

Tyvek® Plus and Tyvek® Xpert garments use a special type of Tyvek® fabric which has different physical properties and improved chemical resistance properties when compared to fabric used in standard Tyvek® garments.

Tyvek® Xpert garments have external sewn seams where the seam thread is visible on the outside of the garment. This seam design, when coupled with the enhanced fabric, offers improved overall garment protection levels. Tyvek® Xpert garments are CE certified to Types 5 & 6 (light liquid aerosols and airborne solid particles).

Tyvek® Plus garments have sewn seams which are over-taped. This seam design, when coupled with the enhanced fabric, offers further improved overall garment protection levels. Tyvek® Plus garments are CE certified to Types 4, 5 & 6 (light and heavy liquid aerosols and airborne solid particles).

NOTE

The permeation data provided in the following table only applies to Tyvek® Xpert and Tyvek® Plus garment fabrics.

Chemical Permeation Data Table

C l a s s	S u b - C l a s s	Chemical Name	CAS	Phase	Breakthrough Time (Minutes)	
					Tyvek® Xpert	Tyvek® Plus
380 Inorganic Bases						
380 Inorganic Bases - All						
		Sodium hydroxide (40%)	1310-73-2	L	>480	>480
370 Inorganic Acids						
370 Inorganic Acids - All						
		Sulfuric acid (18%)	7664-93-9	L	>480	>480
		Sulfuric acid (30%)	7664-93-9	L		>240
> = greater than imm. = immediate (<10 minutes) {empty} = not tested L = Liquid G = Gas S = Solid						

APPENDIX CHEMICAL INDEX - Alphabetical Listing - Chemical Names and Synonyms

Chemical Name	Synonym	CAS Number	Class	Sub-Class	Chemical Name	Synonym	CAS Number	Class	Sub-Class
(2-Ethoxyethoxy)-ethanol, 2-		111-90-0	240	245	Borane-pyridine complex		110-51-0	590	590
Acetaldehyde		75-07-0	120	121	Boron trichloride		10294-34-5	350 / 360	350 / 360
Acetic acid		64-19-7	100	102	Boron trifluoride		7637-07-2	350 / 360	350 / 360
Acetic anhydride		108-24-7	160	161	Boron trifluoride dimethyletherate		353-42-4	590	590
Acetone		67-64-1	390	391	Boron trifluoride etherate		109-63-7	590	590
Acetone cyanohydrin		75-86-5	310 / 430	313 / 431	Bromine		7726-95-6	330	330
Acetonitrile		75-05-8	430	431	Bromochloromethane		74-97-5	260	261
Acetyl chloride		75-36-5	110	111	Bromofluorobenzene, 4-		460-00-4	260	263
Acrolein		107-02-8	120	121	Butadiene, 1,3-	1,3-Butadiene	106-99-0	290	296
Acrylamide		79-06-1	130	135	Butanol, n-		71-36-3	310	311
Acrylic acid		79-10-7	100	102	Butyl acetate, n-		123-86-4	220	222
Acrylonitrile		107-13-1	430	431	Butyl acrylate, n-		141-32-2	220	223
Acryloyl Chloride	Acrylic Acid Chloride	814-68-6	110	111	Butyl Cellosolve®		111-76-2	240	245
Adiponitrile		111-69-3	430	431	Butyl ether, n-		142-96-1	240	241
AFFF		191681-14-8	590	590	Butylamine, n-	1-Aminobutane, Aminobutane, 1-, Butan-1-amine	109-73-9	140	141
Allyl alcohol		107-18-6	310	311	Butylamine, tert-	tert-Butylamine	75-64-9	140	141
Allyl chloride		107-05-1	260	265	Butylene oxide, 1,2-		106-88-7	270	275
Aluminum sulfate hydrate		17927-65-0	340	340	Butyraldehyde, n-	Butanal	123-72-8	120	121
Aminodiphenyl, 4-		92-67-1	140	145	Butyric acid		107-92-6	100	102
Aminoethylethanolamine	N-Aminoethyl ethanolamine	111-41-1	140 / 310	148 / 311	Calcium chloride		10043-52-4	340	340
Aminoethylpiperazine		140-31-8	140 / 270	148 / 274	Carbon disulfide		75-15-0	500	502
Aminopyridine, 2-		504-29-0	270	271	Carbon monoxide		630-08-0	350	350
Ammonia	Anhydrous ammonia	7664-41-7	350 / 380	350 / 380	Carbon tetrachloride		56-23-5	260	261
Ammonium chloride		12125-02-9	340	340	Chemidize 727 ND	mixture		590	590
Ammonium fluoride		12125-01-8	340	340	Chlordane		57-74-9	260	261
Ammonium hydroxide		1336-21-6	380	380	Chlorine		7782-50-5	330 / 350	330 / 350
Amyl acetate, n-		628-63-7	220	222	Chlorine dioxide		10049-04-4	350	350
Aniline		62-53-3	140	145	Chlorine sulfide	Sulfur dichloride	10545-99-0	500	502
Anthracene		120-12-7	290	293	Chlorine trifluoride		7790-91-2	350	350
Antimony pentachloride		7647-18-9	360	360	Chloro-1,2-propanediol, 3-		96-24-2	310	314
Arsenic trichloride		7784-34-1	340	340	Chloro-1,3-butadiene, 2-		126-99-8	260	264
Arsine		7784-42-1	350	350	Chloro-benzotrifluoride, 4-		98-56-6	260	263
Asbestos (all forms)		1332-21-4	sol	sol1	Chloroacetic acid		79-11-8	100	103
Astromat Orange		mixture		590	Chloroacetone		78-95-5	390	391
Benzene		71-43-2	290	292	Chloroacetophenone		532-27-4	260	261
Benzene sulfonyl chloride		98-09-9	500	505	Chloroacetyl chloride		79-04-9	110	111
Benzidine		92-87-5	140	145 / 149	Chloroacrylonitrile, 2-		920-37-6	260 / 430	264 / 431
Benzonitrile		100-47-0	430	432	Chloroaniline, p-	Chloroaniline, 4-	106-47-8	140	145
Benzotrifluoride		98-07-7	260	263	Chlorobenzene		108-90-7	260	263
Benzoyl chloride		98-88-4	110	112	Chlorobenzotrifluoride, 4-		5216-25-1	260	263
Benzyl alcohol		100-51-6	310	312	Chloroethanol, 2-		107-07-3	260 / 310	261 / 315
Benzyl chloride		100-44-7	260	266	Chloroform		67-66-3	260	261
Benzyl chloroformate		501-53-1	110	113	Chloromethyl methyl ether		107-30-2	240	241
Benzyl cyanide		140-29-4	430	432	Chlorophenol, 4-		106-48-9	260 / 310	263 / 316
Beryllium		7440-41-7	sol	sol1	Chloropicrin		76-06-2	260	261
Bisphenol-A diglycidyl ether		1675-54-3	270	275	Chlorosulfonic acid		7790-94-5	370 / 500	370 / 504
Black liquor		308074-23-9	590	590	Chlorotoluene, o-		95-49-8	260	263

APPENDIX
CHEMICAL INDEX - Alphabetical Listing - Chemical Names and Synonyms

Chemical Name	Synonym	CAS Number	Class	Sub-Class	Chemical Name	Synonym	CAS Number	Class	Sub-Class
Chromic acid		1333-82-0	370	370	Dimethyl sulfide		75-18-3	500	502
cis-2-Pentenenitrile		25899-50-7	430	431	Dimethyl sulfoxide		67-68-5	500	503
Citric acid		77-92-9	100	104	Dimethylacetamide, N,N-	DMAc, N,N-	127-19-5	130	132
Creosote		8001-58-9	310	316	Dimethylamine		124-40-3	140	142
Cresol, mixed isomers		1319-77-3	310	316	Dimethylaniline, N,N-		121-69-7	140	146
Cresol, o-		95-48-7	310	316	Dimethyldichlorosilane		75-78-5	480	480
Crude oil		8002-05-9	290	294	Dimethylformamide, N,N-	N,N-Dimethylformamide	68-12-2	130	132
Crude oil on wildlife		mixture	liq	liq4	Dimethylhydrazine, 1,1-		57-14-7	280	280
Cumene		98-82-8	290	292	Dimethylmaleate		624-48-6	220	224
Cyanogen chloride	CK (Cyanogen chloride)	506-77-4	340	345	Dinitrocresol		534-52-1	310 / 440	316 / 442
Cyanuric chloride		108-77-0	260	263	Dioxane, 1,4-		123-91-1	270	278
Cyclohexane		110-82-7	290	291	Dowtherm heat transfer fluid		8004-13-5	590	590
Cyclohexanone		108-94-1	390	391	DuPont Activator 193S		mixture	590	590
Cyclohexyl isocyanate		3173-53-3	210	211	DuPont Activator 4505S		mixture	590	590
Cyclohexylamine		108-91-8	140	141	DuPont Activator 4507S		mixture	590	590
Cyclooctadiene		1552-12-1	290	296	Dytek® A		15520-10-2	140	148
d-Limonene		5989-27-5	290	296	Epichlorohydrin		106-89-8	260 / 270	261 / 275
Decontaminating agent (DS-2)		mixture	590	590	Ethanolamine		141-43-5	140 / 310	141 / 311
Diborane		19287-45-7	350	350	Ethyl acetate		141-78-6	220	222
Dibromo-3-chloropropane, 1,2-		96-12-8	260	261	Ethyl acrylate		140-88-5	220	223
Dichloro-2-butene, 1,4-		764-41-0	260	264	Ethyl alcohol	Ethanol, Ethyl hydroxide	64-17-5	310	311
Dichloro-6-isopropyl-S-triazine, 2,4-		30894-74-7	270	274	Ethyl benzene		100-41-4	290	292
Dichloroacetone		534-07-6	260 / 390	261 / 391	Ethyl Cellosolve®		110-80-5	240	245
Dichloroacetyl chloride		79-36-7	110	111	Ethyl Cellosolve® acetate		111-15-9	240	245
Dichloroaniline, 3,4-		95-76-1	140 / 260	145 / 263	Ethyl chloride		75-00-3	260	261
Dichloroethyl ether		111-44-4	240 / 260	241 / 261	Ethyl ether		60-29-7	240	241
Dichloromethane	Methylene chloride	75-09-2	260	261	Ethyl Mercaptan	Ethanethiol	75-08-1	500	501
Dichloropropene, 1,3-		542-75-6	260	261	Ethyl methacrylate		97-63-2	220	223
Dichloropropene, 2,3-	Dichloropropene,2,3-	78-88-6	260	261	Ethyl parathion		56-38-2	460	462
Dichlorosilane		4109-96-0	480	480	Ethyl vinyl ether		109-92-2	240 / 260	246 / 261
Diesel automotive test fuel		mixture	290	291	Ethylamine		75-04-7	140	141
Diesel fuel		68334-30-5	290	291	Ethylene		74-85-1	290	294
Diethanolamine		111-42-2	140	142	Ethylene dibromide		106-93-4	260	261
Diethyl sulfate		64-67-5	500	507	Ethylene dichloride		107-06-2	260	261
Diethyl-m-toluidine crude		91-67-8	140	145	Ethylene glycol		107-21-1	310	314
Diethylamine		109-89-7	140	142	Ethylene glycol acrylate		818-61-1	220	223
Diethylaniline		91-66-7	140	146	Ethylene oxide	Dimethylene oxide, Epoxyethane	75-21-8	270	275
Diethylaniline crude		91-66-7	140	146	Ethylene oxide mixture		mixture	270	275
Diethylbenzene		25340-17-4	290	290	Ethylenediamine		107-15-3	140	148
Diethylenetriamine		111-40-0	140	148	Ethyleneimine		151-56-4	270	274
Diethylhexyl phthalate		117-81-7	220	226	Ferric chloride	Iron trichloride, Iron(III) chloride	7705-08-0	340	340
Diiodo-1,1,2,2-tetrafluorobutane, 1,4-		755-95-3	260	261	Ferrous chloride	Iron (II) chloride, Iron dichloride	7758-94-3	340	340
Dimethyl disulfide		624-92-0	500	502	Fluorine		7782-41-4	350	350
Dimethyl ether		115-10-6	240	241	Fluorobenzene		462-06-6	260	263
Dimethyl mercury in decane		593-74-8	470	470	Fluoroboric acid		16872-11-0	370	370
Dimethyl nitrosamine		62-75-9	450	450	Fluorosilicic acid		16961-83-4	370	370
Dimethyl sulfate		77-78-1	500	507	Fluorosulfonic acid		7789-21-1	370	370

APPENDIX
CHEMICAL INDEX - Alphabetical Listing - Chemical Names and Synonyms

Chemical Name	Synonym	CAS Number	Class	Sub-Class	Chemical Name	Synonym	CAS Number	Class	Sub-Class
Formaldehyde		50-00-0	120	121	Isobutylbenzene		538-93-2	290	292
Formalin	Formalin	mixture	120	121	Isophorone diisocyanate		4098-71-9	210	211
Formic acid		64-18-6	100	102	Isoprene		78-79-5	290	296
Fuel oil		68476-30-2	290	291	Isopropyl alcohol	IPA (Isopropyl alcohol), Isopropanol	67-63-0	310	312
Furfural		98-01-1	120 / 270	122 / 277	Isopropylamine		75-31-0	140	141
gamma Butyrolactone		96-48-0		225	JP-4 jet fuel		50815-00-4	290	291
Gasoline		86290-81-5	290	291	JP-8 jet fuel		94114-58-6	290	291
Gasoline, E-10		308066-70-8	290	291	Kerosene	Jet A fuel	8008-20-6	290	291
Gluteraldehyde	1,5-Pentanedial, Glutaric acid dialdehyde, Glutaric aldehyde, Pentanedial, 1,5-	111-30-8	120	121	Lead		7439-92-1	sol	sol1
Glycolic acid		79-14-1	100	103	Lewisite		541-25-3	470	470
Green liquor		68131-30-6	590	590	Lime	mixture		sol	sol1
Heptane		142-82-5	290	291	Lindane		58-89-9	260	261
Hexachlorobutadiene		87-68-3	260	264	Lithium chloride		7447-41-8	340	340
Hexachlorocyclopentadiene		77-47-4	260	264	Lithium hydroxide		1310-65-2	380	380
Hexafluoroethane		76-16-4	260	261	m-Cresol 55%, p-Cresol 30%, Phenol 15%		mixture	310	316
Hexafluoroisobutylene		382-10-5	260	261	Malathion		121-75-5	460	462
Hexamethyldisilazane	Hexamethyldisilazane	999-97-3	140 / 480	142 / 480	Maleic acid		110-16-7	100	104
Hexamethylene diisocyanate		822-06-0	210	211	Maleic anhydride		108-31-6	160	161
Hexamethylene diisocyanate in DuPont Activator 193S		mixture	210	211	Mercaptoethanol		60-24-2	310 / 500	311 / 501
Hexamethylene diisocyanate in DuPont Activator 4505S		mixture	210	211	Mercuric chloride		7487-94-7	340	340
Hexamethylene diisocyanate in DuPont Activator 4507S		mixture	210	211	Mercury		7439-97-6	330	330
Hexamethylenediamine, 1,6-		124-09-4	140	148	Mesityl oxide		141-79-7	390	391
Hexane, n-	n-Hexane	110-54-3	290	291	Methacrylic acid		79-41-4	100	102
Hexene, 1-		592-41-6	290	294	Methane		74-82-8	290	291
Hexone	MIBK (Methyl isobutyl ketone), Methyl isobutyl ketone	108-10-1	390	391	Methane sulfonyl chloride		124-63-0	500	505
Hydrazine		302-01-2	280	280	Methanesulfonic acid		75-75-2	500	504
Hydrazine hydrate		10217-52-4	280	280	Methanol		67-56-1	310	311
Hydriodic acid		10034-85-2	370	370	Methomyl		16752-77-5	230	233
Hydrobromic acid		10035-10-6	370	370	Methyl acrylate		96-33-3	220	223
Hydrochloric acid	Muriatic acid	7647-01-0	370	370	Methyl bromide		74-83-9	260	261
Hydrofluoric acid		7664-39-3	370	370	Methyl Cellosolve®		109-86-4	240 / 310	245 / 311
Hydrogen bromide		10035-10-6	350 / 370	350 / 370	Methyl Cellosolve® acetate		110-49-6	240	245
Hydrogen chloride		7647-01-0	350	350	Methyl chloride		74-87-3	260	261
Hydrogen cyanide	HCN (Hydrogen cyanide), Hydrocyanic acid	74-90-8	340 / 350 / 370	345 / 350 / 370	Methyl chloroformate		79-22-1	110	113
Hydrogen fluoride		7664-39-3	350 / 370	350 / 370	Methyl ethyl ketone	MEK (Methyl ethyl ketone)	78-93-3	390	391
Hydrogen peroxide		7722-84-1	300	300	Methyl ethyl ketoxime		96-29-7	150	150
Hydrogen selenide		7783-07-5	350	350	Methyl fluoride		593-53-3	260	261
Hydrogen sulfide		7783-06-4	350 / 500	350 / 502	Methyl formate		107-31-3	220	221
Hypophosphorus acid		6303-21-5	370	370	Methyl hydrazine		60-34-4	280	280
Iodine		7553-56-2	330	330	Methyl iodide		74-88-4	260	261
Isoamyl alcohol		123-51-3	310	312	Methyl isocyanate		624-83-9	210	211
Isobutane		75-28-5	290	291	Methyl mercaptan		74-93-1	500	501
Isobutanol		78-83-1	310	311	Methyl methacrylate		80-62-6	220	223
					Methyl parathion		298-00-0	460	462
					Methyl salicylate		119-36-8	220	226
					Methyl tert-butyl ether		1634-04-4	240	241
					Methyl trichlorosilane		75-79-6	480	480

APPENDIX CHEMICAL INDEX - Alphabetical Listing - Chemical Names and Synonyms

Chemical Name	Synonym	CAS Number	Class	Sub-Class	Chemical Name	Synonym	CAS Number	Class	Sub-Class
Methyl-1,5-pentanedinitrile, 2-	Methylglutaronitrile, 2-	4553-62-2	430	431	Pentenenitrile, 2-		13284-42-9	430	431
Methyl-2-pyrrolidone, N-		872-50-4	130	132	Pentenenitrile, 3-		4635-87-4	430	431
Methylamine		74-89-5	140	141	Perchloric acid		7601-90-3	370	370
Methylene bis (o-chloroaniline), 4,4'-		101-14-4	140	149	Phenethyl alcohol, 2-		60-12-8	310	318
Methylene bis-cyclohexane diamine, 4,4'-		1761-71-3	140	148	Phenol		108-95-2	310	316
Methylene bromide		74-95-3	260	261	Phenyl glycidyl ether		122-60-1	270	275
Methylene dianiline, 4,4'-		101-77-9	140	145 / 149	Phenyl mercaptan		108-98-5	500	501
Methylene diphenyl isocyanate	Diphenylmethane Diisocyanate 4,4-	101-68-8	210	212	Phenylethanol, 1-		98-85-1	310	318
Methylformamide, N-		123-39-7	130	132	Phosgene		75-44-5	350	350
Mineral oil		8012-95-1	290	291	Phosphine		7803-51-2	350	350
Mineral spirits		64475-85-0	290	291	Phosphoric acid		7664-38-2	370	370
Morpholine		110-91-8	140	142	Phosphorus oxychloride		10025-87-3	360	360
N-Methylmethacrylamide	Methylmethacrylamide, N-	3887-02-3	130	135	Phosphorus trichloride		7719-12-2	360	360
Naphthalene		91-20-3	290	293	Picoline, 2-		109-06-8	270	271
Nickel carbonyl		13463-39-3	470	470	Picoline, 3-		108-99-6	270	271
Nicotine		54-11-5	270	271	Polyethylene glycol dimethyl ether	Selexol®#0153;	24991-55-7	240	245
Nitric acid		7697-37-2	370	370	Polymethylene polyphenyl-polyisocyanate		9016-87-9	210	212
Nitric acid, red fuming		52583-42-3	370	370	Potassium acetate		127-08-2	340	340
Nitric oxide		10102-43-9	350	350	Potassium carbonate		584-08-7	340	340
Nitrobenzene		98-95-3	440	441	Potassium chromate		7789-00-6	340	340
Nitrochlorobenzene, o-		88-73-3	260 / 440	263 / 442	Potassium cyanide		151-50-8	340	345
Nitrochlorobenzene, p-		100-00-5	260 / 440	263 / 442	Potassium hydroxide	Caustic potash, KOH (Potassium hydroxide), Potash lye	1310-58-3	380	380
Nitrogen dioxide		10102-44-0	350	350	Potassium permanganate		7722-64-7	340	340
Nitrogen tetroxide		10544-72-6	350	350	Propane		74-98-6	290	291
Nitrogen trifluoride		7783-54-2	350	350	Propargyl alcohol	2-Propyn-1-ol, Propyn-1-ol, 2-	107-19-7	310	311
Nitromethane		75-52-5	440	441	Propionaldehyde		123-38-6	120	121
Nitrophenol, o-		88-75-5	310 / 440	316 / 442	Propionic acid		79-09-4	100	102
Nitrophenol, p-		100-02-7	310 / 440	316 / 442	Propylamine, n-		107-10-8	140	141
Nitropropane, 2-		79-46-9	440	441	Propylbromide, n-	1-Bromopropane, 1-Propyl bromide, Bromopropane, 1-, Propyl bromide, 1-, n-Propylbromide	106-94-5	260	261
Nitrotoluene, o-		88-72-2	440	442	Propylene dichloride		78-87-5	260	261
Nitrotoluene, p-		99-99-0	440	442	Propylene imine		75-55-8	270	274
Nitrous oxide		10024-97-2	350	350	Propylene oxide, 1,2-		75-56-9	270	275
Nonylamine		112-20-9	140	141	Pyridine		110-86-1	270	271
Norbornene-2-yl acetate, 5-		6143-29-9	220	222	Pyrrolidine		123-75-1	270	274
Octane, n-		111-65-9	290	291	Sarin		107-44-8	460	462
Oleum		8014-95-7	370	370	Silane		7803-62-5	480	480
Organo-Tin Paint	mixture		470	470	Silicon tetrachloride		10026-04-7	360 / 480	360 / 480
Otto fuel II		106602-80-6	590	590	Skydrol®		95660-51-8	460	462
Oxalic acid		144-62-7	100	104	Sodium cyanide		143-33-9	340	345
Paraphenylene diisocyanate (PPDI) crude		104-49-4	210	212	Sodium dichromate		10588-01-9	340	340
PCB	Polychlorinated biphenyl	mixture	260	263	Sodium fluoride		7681-49-4	340	340
PCB 1254	Polychlorinated biphenyl 1254	11097-69-1	260	263	Sodium hydrosulfide		16721-80-5	340	340
PCB 1254	Polychlorinated biphenyl 1254	mixture	260	263	Sodium hydroxide	Caustic soda, Lye, NaOH (Sodium hydroxide)	1310-73-2	380	380 / 591 / 592
PCB gas condensate	mixture		260	263	Sodium hypochlorite		7681-52-9	340	340
PCB in transformer oil	mixture		260	263	Sodium metabisulfite	Sodium disulfite, Sodium pyrosulfite	7681-57-4	340	340
Pentachlorophenol		87-86-5	310	316					
Pentanol, n-		71-41-0	310	311					

APPENDIX CHEMICAL INDEX - Alphabetical Listing - Chemical Names and Synonyms

Chemical Name	Synonym	CAS Number	Class	Sub-Class	Chemical Name	Synonym	CAS Number	Class	Sub-Class
Sodium methylate		124-41-4	550	550	Trichlorobenzene, 1,2,4-		120-82-1	260	263
Sodium silicate		6834-92-0	340	340	Trichloroethane, 1,1,1-		71-55-6	260	261
Sodium sulfide	Disodium sulfide	1313-82-2	340	340	Trichloroethane, 1,1,2-		79-00-5	260	261
Soman		96-64-0	460	462	Trichloroethanol, 2,2,2-		115-20-8	310	315
Stoddard solvent		8052-41-3	290	291	Trichloroethylene		79-01-6	260	264
Styrene		100-42-5	290	292	Trichlorophenylsilane		98-13-5	480	480
Sulfamic acid		5329-14-6	370 / 500	370 / 509	Trichlorosilane		10025-78-2	480	480
Sulfonyl chloride		7791-25-5	350 / 360	350 / 360	Trichlorovinylsilane		75-94-5	480	480
Sulfur dioxide		7446-09-5	350 / 360	350 / 365	Triethoxysilane		998-30-1	480	480
Sulfur hexafluoride		2551-62-4	350 / 500	350 / 509	Triethylaluminum		97-93-8	470	470
Sulfur monochloride	Disulfur dichloride, Sulfur chloride	10025-67-9	500	502	Triethylamine		121-44-8	140	143
Sulfur mustard		505-60-2	500	502	Triethylenetetramine		112-24-3		
Sulfur trioxide		7446-11-9	360	365	Trifluoroacetic acid		76-05-1	100 / 260	103 / 261
Sulfuric acid		7664-93-9	370	370	Trifluoroacetyl chloride		354-32-5	110	111
t-Sodium-amylate / t-amyl alcohol		mixture	590	590	Trifluoroethanol, 2,2,2-		75-89-8	310	315
Tabun		77-81-6	460	462	Trifluoromethane		75-46-7	260	261
tert-Butyl alcohol	Butyl alcohol, tert-	75-65-0	310	313	Trifluoromethane sulfonic acid		1493-13-6	500	504
Tetrabromoethane		79-27-6	260	261	Trimethyl phosphate		512-56-1	460	462
Tetrachloro-bisphenol -A, 2,2',6,6'	Tetrachloro-bisphenol -A, 2,2',6,6'	79-95-8	260 / 310	263 / 316	Trimethyl phosphite		121-45-9	460	462
Tetrachloroethane, 1,1,2,2-		79-34-5	260	261	Trimethylamine		75-50-3	140	143
Tetrachloroethylene, 1,1,2,2-	1,1,2,2-Tetrachloroethylene	127-18-4	260	264	Trimethylbenzene, 1,2,3-		526-73-8	290	292
Tetraethoxysilane		78-10-4	480	480	Triphenyl phosphite		101-02-0	460	462
Tetraethyl Ammonium Hydroxide	Tetraethylammonium hydroxide; N,N,N,	77-98-5	550	550	Tripropylamine		102-69-2	140	143
Tetraethyl lead		78-00-2	470	470	Tungsten hexafluoride		7783-82-6	350	350
Tetraethylenepentamine		112-57-2	140	148	Turpentine		8006-64-2	290	294
Tetrafluoroethane, 1,1,1,2-		811-97-2	260	261	Vanadium tetrachloride		7632-51-1	360	360
Tetrafluoromethane		75-73-0	260	261	Vinyl acetate		108-05-4	220	222
Tetrahydrofuran		109-99-9	240	241	Vinyl bromide		593-60-2	260	264
Tetralone		529-34-0	290	292	Vinyl chloride		75-01-4	260	264
Tetramethylammonium hydroxide		75-59-2	550	550	Vinylidene chloride		75-35-4	260	264
Tetramethylethylene oxide		5076-20-0	270	275	Vinylmagnesium chloride		3536-96-7	470	470
Tetramethyltin		mixture	590	590	Vinylpyridine, 4-		100-43-6	270	271
Thioglycolic acid		68-11-1	100 / 500	103 / 501	VM&P Naphtha		8030-30-6	290	291
Thionyl chloride		7719-09-7	360	360	VX Nerve agent		50782-69-9	460	462
Titanium tetrachloride		7550-45-0	360	360	White liquor		68131-33-9	590	590
Toluene		108-88-3	290	292	Xylene, mixed isomers		1330-20-7	290	292
Toluene-1,3-diisocyanate		26471-62-5	210	212	Xylene, o-		95-47-6	290	292
Toluene-2,4-diisocyanate		584-84-9	210	212					
Toluidine, m-		108-44-1	140	145					
Toluidine, o-		95-53-4	140	145					
trans-1,2-Dichloroethylene		156-60-5	260	264					
trans-1,4-Dichloro-2-butene		110-57-6	260	264					
trans-Crotonaldehyde		123-73-9	120	121					
Tribromophenol,2,4,6-	Tribromophenol, 2,4,6-	118-79-6	310	316					
Trichloro-1,2,2-trifluoroethane, 1,1,2-	1,1,2-Trichloro-1,2,2-trifluoroethane	76-13-1	260	261					
Trichloroacetic acid		76-03-9	100	103					
Trichloroacetone, 1,1,3-		921-03-9	260 / 390	261 / 391					

APPENDIX
CHEMICAL INDEX - Chemical Abstract System (CAS) Number - Chemical Names and Synonyms

CAS Number	Chemical Name	Synonym	Class	Sub-Class	CAS Number	Chemical Name	Synonym	Class	Sub-Class
50-00-0	Formaldehyde		120	121	75-18-3	Dimethyl sulfide		500	502
54-11-5	Nicotine		270	271	75-21-8	Ethylene oxide	Dimethylene oxide, Epoxyethane	270	275
56-23-5	Carbon tetrachloride		260	261	75-28-5	Isobutane		290	291
56-38-2	Ethyl parathion		460	462	75-31-0	Isopropylamine		140	141
57-14-7	Dimethylhydrazine, 1,1-		280	280	75-35-4	Vinylidene chloride		260	264
57-74-9	Chlordane		260	261	75-36-5	Acetyl chloride		110	111
58-89-9	Lindane		260	261	75-44-5	Phosgene		350	350
60-12-8	Phenethyl alcohol, 2-		310	318	75-46-7	Trifluoromethane		260	261
60-24-2	Mercaptoethanol		310 / 500	311 / 501	75-50-3	Trimethylamine		140	143
60-29-7	Ethyl ether		240	241	75-52-5	Nitromethane		440	441
60-34-4	Methyl hydrazine		280	280	75-55-8	Propylene imine		270	274
62-53-3	Aniline		140	145	75-56-9	Propylene oxide, 1,2-		270	275
62-75-9	Dimethyl nitrosamine		450	450	75-59-2	Tetramethylammonium hydroxide		550	550
64-17-5	Ethyl alcohol	Ethanol, Ethyl hydroxide	310	311	75-64-9	Butylamine, tert-	tert-Butylamine	140	141
64-18-6	Formic acid		100	102	75-65-0	tert-Butyl alcohol	Butyl alcohol, tert-	310	313
64-19-7	Acetic acid		100	102	75-73-0	Tetrafluoromethane		260	261
64-67-5	Diethyl sulfate		500	507	75-75-2	Methanesulfonic acid		500	504
67-56-1	Methanol		310	311	75-78-5	Dimethyldichlorosilane		480	480
67-63-0	Isopropyl alcohol	IPA (Isopropyl alcohol), Isopropanol	310	312	75-79-6	Methyl trichlorosilane		480	480
67-64-1	Acetone		390	391	75-86-5	Acetone cyanohydrin		310 / 430	313 / 431
67-66-3	Chloroform		260	261	75-89-8	Trifluoroethanol, 2,2,2-		310	315
67-68-5	Dimethyl sulfoxide		500	503	75-94-5	Trichlorovinylsilane		480	480
68-11-1	Thioglycolic acid		100 / 500	103 / 501	76-03-9	Trichloroacetic acid		100	103
68-12-2	Dimethylformamide, N,N-	N,N-Dimethylformamide	130	132	76-05-1	Trifluoroacetic acid		100 / 260	103 / 261
71-36-3	Butanol, n-		310	311	76-06-2	Chloropicrin		260	261
71-41-0	Pentanol, n-		310	311	76-13-1	Trichloro-1,2,2-trifluoroethane, 1,1,2-	1,1,2-Trichloro-1,2,2-trifluoroethane	260	261
71-43-2	Benzene		290	292	76-16-4	Hexafluoroethane		260	261
71-55-6	Trichloroethane, 1,1,1-		260	261	77-47-4	Hexachlorocyclopentadiene		260	264
74-82-8	Methane		290	291	77-78-1	Dimethyl sulfate		500	507
74-83-9	Methyl bromide		260	261	77-81-6	Tabun		460	462
74-85-1	Ethylene		290	294	77-92-9	Citric acid		100	104
74-87-3	Methyl chloride		260	261	77-98-5	Tetraethyl Ammonium Hydroxide	Tetraethylammonium hydroxide; N,N,N,	550	550
74-88-4	Methyl iodide		260	261	78-00-2	Tetraethyl lead		470	470
74-89-5	Methylamine		140	141	78-10-4	Tetraethoxysilane		480	480
74-90-8	Hydrogen cyanide	HCN (Hydrogen cyanide), Hydrocyanic acid	340 / 350 / 370	345 / 350 / 370	78-79-5	Isoprene		290	296
74-93-1	Methyl mercaptan		500	501	78-83-1	Isobutanol		310	311
74-95-3	Methylene bromide		260	261	78-87-5	Propylene dichloride		260	261
74-97-5	Bromochloromethane		260	261	78-88-6	Dichloropropene, 2,3-	Dichloropropene,2,3-	260	261
74-98-6	Propane		290	291	78-93-3	Methyl ethyl ketone	MEK (Methyl ethyl ketone)	390	391
75-00-3	Ethyl chloride		260	261	78-95-5	Chloroacetone		390	391
75-01-4	Vinyl chloride		260	264	79-00-5	Trichloroethane, 1,1,2-		260	261
75-04-7	Ethylamine		140	141	79-01-6	Trichloroethylene		260	264
75-05-8	Acetonitrile		430	431	79-04-9	Chloroacetyl chloride		110	111
75-07-0	Acetaldehyde		120	121	79-06-1	Acrylamide		130	135
75-08-1	Ethyl Mercaptan	Ethanethiol	500	501	79-09-4	Propionic acid		100	102
75-09-2	Dichloromethane	Methylene chloride	260	261	79-10-7	Acrylic acid		100	102
75-15-0	Carbon disulfide		500	502	79-11-8	Chloroacetic acid		100	103

APPENDIX CHEMICAL INDEX - Chemical Abstract System (CAS) Number - Chemical Names and Synonyms

CAS Number	Chemical Name	Synonym	Class	Sub-Class	CAS Number	Chemical Name	Synonym	Class	Sub-Class
79-14-1	Glycolic acid		100	103	100-43-6	Vinylpyridine, 4-		270	271
79-22-1	Methyl chloroformate		110	113	100-44-7	Benzyl chloride		260	266
79-27-6	Tetrabromoethane		260	261	100-47-0	Benzonitrile		430	432
79-34-5	Tetrachloroethane, 1,1,2,2-		260	261	100-51-6	Benzyl alcohol		310	312
79-36-7	Dichloroacetyl chloride		110	111	101-02-0	Triphenyl phosphite		460	462
79-41-4	Methacrylic acid		100	102	101-14-4	Methylene bis (o-chloroaniline), 4,4'-		140	149
79-46-9	Nitropropane, 2-		440	441	101-68-8	Methylene diphenyl isocyanate	Diphenylmethane Diisocyanate 4,4'-	210	212
79-95-8	Tetrachloro-bisphenol -A, 2,2',6,6'	Tetrachloro-bisphenol -A, 2,2',6,6'	260 / 310	263 / 316	101-77-9	Methylene dianiline, 4,4'-		140	145 / 149
80-62-6	Methyl methacrylate		220	223	102-69-2	Tripropylamine		140	143
87-68-3	Hexachlorobutadiene		260	264	104-49-4	Paraphenylene diisocyanate (PPDI) crude		210	212
87-86-5	Pentachlorophenol		310	316	106-47-8	Chloroaniline, p-	Chloroaniline, 4-	140	145
88-72-2	Nitrotoluene, o-		440	442	106-48-9	Chlorophenol, 4-		260 / 310	263 / 316
88-73-3	Nitrochlorobenzene, o-		260 / 440	263 / 442	106-88-7	Butylene oxide, 1,2-		270	275
88-75-5	Nitrophenol, o-		310 / 440	316 / 442	106-89-8	Epichlorohydrin		260 / 270	261 / 275
91-20-3	Naphthalene		290	293	106-93-4	Ethylene dibromide		260	261
91-66-7	Diethylaniline		140	146	106-94-5	Propylbromide, n-	1-Bromopropane, 1-Propyl bromide, Bromopropane, 1-, Propyl bromide, 1-, n-Propylbromide	260	261
91-66-7	Diethylaniline crude		140	146	106-99-0	Butadiene, 1,3-	1,3-Butadiene	290	296
91-67-8	Diethyl-m-toluidine crude		140	145	107-02-8	Acrolein		120	121
92-67-1	Aminodiphenyl, 4-		140	145	107-05-1	Allyl chloride		260	265
92-87-5	Benzidine		140	145 / 149	107-06-2	Ethylene dichloride		260	261
95-47-6	Xylene, o-		290	292	107-07-3	Chloroethanol, 2-		260 / 310	261 / 315
95-48-7	Cresol, o-		310	316	107-10-8	Propylamine, n-		140	141
95-49-8	Chlorotoluene, o-		260	263	107-13-1	Acrylonitrile		430	431
95-53-4	Toluidine, o-		140	145	107-15-3	Ethylenediamine		140	148
95-76-1	Dichloroaniline, 3,4-		140 / 260	145 / 263	107-18-6	Allyl alcohol		310	311
96-12-8	Dibromo-3-chloropropane, 1,2-		260	261	107-19-7	Propargyl alcohol	2-Propyn-1-ol, Propyn-1-ol, 2-	310	311
96-24-2	Chloro-1,2-propanediol, 3-		310	314	107-21-1	Ethylene glycol		310	314
96-29-7	Methyl ethyl ketoxime		150	150	107-30-2	Chloromethyl methyl ether		240	241
96-33-3	Methyl acrylate		220	223	107-31-3	Methyl formate		220	221
96-48-0	gamma Butyrolactone			225	107-44-8	Sarin		460	462
96-64-0	Soman		460	462	107-92-6	Butyric acid		100	102
97-63-2	Ethyl methacrylate		220	223	108-05-4	Vinyl acetate		220	222
97-93-8	Triethylaluminum		470	470	108-10-1	Hexone	MIBK (Methyl isobutyl ketone), Methyl isobutyl ketone	390	391
98-01-1	Furfural		120 / 270	122 / 277	108-24-7	Acetic anhydride		160	161
98-07-7	Benzotrichloride		260	263	108-31-6	Maleic anhydride		160	161
98-09-9	Benzene sulfonyl chloride		500	505	108-44-1	Toluidine, m-		140	145
98-13-5	Trichlorophenylsilane		480	480	108-77-0	Cyanuric chloride		260	263
98-56-6	Chloro-benzotrifluoride, 4-		260	263	108-88-3	Toluene		290	292
98-82-8	Cumene		290	292	108-90-7	Chlorobenzene		260	263
98-85-1	Phenylethanol, 1-		310	318	108-91-8	Cyclohexylamine		140	141
98-88-4	Benzoyl chloride		110	112	108-94-1	Cyclohexanone		390	391
98-95-3	Nitrobenzene		440	441	108-95-2	Phenol		310	316
99-99-0	Nitrotoluene, p-		440	442	108-98-5	Phenyl mercaptan		500	501
100-00-5	Nitrochlorobenzene, p-		260 / 440	263 / 442	108-99-6	Picoline, 3-		270	271
100-02-7	Nitrophenol, p-		310 / 440	316 / 442	109-06-8	Picoline, 2-		270	271
100-41-4	Ethyl benzene		290	292					
100-42-5	Styrene		290	292					

APPENDIX
CHEMICAL INDEX - Chemical Abstract System (CAS) Number - Chemical Names and Synonyms

CAS Number	Chemical Name	Synonym	Class	Sub-Class	CAS Number	Chemical Name	Synonym	Class	Sub-Class
109-63-7	Boron trifluoride etherate		590	590	123-75-1	Pyrrolidine		270	274
109-73-9	Butylamine, n-	1-Aminobutane, Aminobutane, 1-, Butan-1-amine	140	141	123-86-4	Butyl acetate, n-		220	222
109-86-4	Methyl Cellosolve®		240 / 310	245 / 311	123-91-1	Dioxane, 1,4-		270	278
109-89-7	Diethylamine		140	142	124-09-4	Hexamethylenediamine, 1,6-		140	148
109-92-2	Ethyl vinyl ether		240 / 260	246 / 261	124-40-3	Dimethylamine		140	142
109-99-9	Tetrahydrofuran		240	241	124-41-4	Sodium methylate		550	550
110-16-7	Maleic acid		100	104	124-63-0	Methane sulfonyl chloride		500	505
110-49-6	Methyl Cellosolve® acetate		240	245	126-99-8	Chloro-1,3-butadiene, 2-		260	264
110-51-0	Borane-pyridine complex		590	590	127-08-2	Potassium acetate		340	340
110-54-3	Hexane, n-	n-Hexane	290	291	127-18-4	Tetrachloroethylene, 1,1,2,2-	1,1,2,2-Tetrachloroethylene	260	264
110-57-6	trans-1,4-Dichloro-2-butene		260	264	127-19-5	Dimethylacetamide, N,N-	DMAc, N,N-	130	132
110-80-5	Ethyl Cellosolve®		240	245	140-29-4	Benzyl cyanide		430	432
110-82-7	Cyclohexane		290	291	140-31-8	Aminoethylpiperazine		140 / 270	148 / 274
110-86-1	Pyridine		270	271	140-88-5	Ethyl acrylate		220	223
110-91-8	Morpholine		140	142	141-32-2	Butyl acrylate, n-		220	223
111-15-9	Ethyl Cellosolve® acetate		240	245	141-43-5	Ethanolamine		140 / 310	141 / 311
111-30-8	Gluteraldehyde	1,5-Pentanedial, Glutaric acid dialdehyde, Glutaric aldehyde, Pentanedial, 1,5-	120	121	141-78-6	Ethyl acetate		220	222
111-40-0	Diethylenetriamine		140	148	141-79-7	Mesityl oxide		390	391
111-41-1	Aminoethylethanolamine	N-Aminoethyl ethanolamine	140 / 310	148 / 311	142-82-5	Heptane		290	291
111-42-2	Diethanolamine		140	142	142-96-1	Butyl ether, n-		240	241
111-44-4	Dichloroethyl ether		240 / 260	241 / 261	143-33-9	Sodium cyanide		340	345
111-65-9	Octane, n-		290	291	144-62-7	Oxalic acid		100	104
111-69-3	Adiponitrile		430	431	151-50-8	Potassium cyanide		340	345
111-76-2	Butyl Cellosolve®		240	245	151-56-4	Ethyleneimine		270	274
111-90-0	(2-Ethoxyethoxy)-ethanol, 2-		240	245	156-60-5	trans-1,2-Dichloroethylene		260	264
112-20-9	Nonylamine		140	141	298-00-0	Methyl parathion		460	462
112-24-3	Triethylenetetramine				302-01-2	Hydrazine		280	280
112-57-2	Tetraethylenepentamine		140	148	353-42-4	Boron trifluoride dimethyletherate		590	590
115-10-6	Dimethyl ether		240	241	354-32-5	Trifluoroacetyl chloride		110	111
115-20-8	Trichloroethanol, 2,2,2-		310	315	382-10-5	Hexafluoroisobutylene		260	261
117-81-7	Diethylhexyl phthalate		220	226	460-00-4	Bromofluorobenzene, 4-		260	263
118-79-6	Tribromophenol, 2,4,6-	Tribromophenol, 2,4,6-	310	316	462-06-6	Fluorobenzene		260	263
119-36-8	Methyl salicylate		220	226	501-53-1	Benzyl chloroformate		110	113
120-12-7	Anthracene		290	293	504-29-0	Aminopyridine, 2-		270	271
120-82-1	Trichlorobenzene, 1,2,4-		260	263	505-60-2	Sulfur mustard		500	502
121-44-8	Triethylamine		140	143	506-77-4	Cyanogen chloride	CK (Cyanogen chloride)	340	345
121-45-9	Trimethyl phosphite		460	462	512-56-1	Trimethyl phosphate		460	462
121-69-7	Dimethylaniline, N,N-		140	146	526-73-8	Trimethylbenzene, 1,2,3-		290	292
121-75-5	Malathion		460	462	529-34-0	Tetralone		290	292
122-60-1	Phenyl glycidyl ether		270	275	532-27-4	Chloroacetophenone		260	261
123-38-6	Propionaldehyde		120	121	534-07-6	Dichloroacetone		260 / 390	261 / 391
123-39-7	Methylformamide, N-		130	132	534-52-1	Dinitroresol		310 / 440	316 / 442
123-51-3	Isoamyl alcohol		310	312	538-93-2	Isobutylbenzene		290	292
123-72-8	Butyraldehyde, n-	Butanal	120	121	541-25-3	Lewisite		470	470
123-73-9	trans-Crotonaldehyde		120	121	542-75-6	Dichloropropene, 1,3-		260	261
					584-08-7	Potassium carbonate		340	340
					584-84-9	Toluene-2,4-diisocyanate		210	212

APPENDIX CHEMICAL INDEX - Chemical Abstract System (CAS) Number - Chemical Names and Synonyms

CAS Number	Chemical Name	Synonym	Class	Sub-Class	CAS Number	Chemical Name	Synonym	Class	Sub-Class
592-41-6	Hexene, 1-		290	294	5989-27-5	d-Limonene		290	296
593-53-3	Methyl fluoride		260	261	6143-29-9	Norbornene-2-yl acetate, 5-		220	222
593-60-2	Vinyl bromide		260	264	6303-21-5	Hypophosphorus acid		370	370
593-74-8	Dimethyl mercury in decane		470	470	6834-92-0	Sodium silicate		340	340
624-48-6	Dimethylmaleate		220	224	7439-92-1	Lead		sol	sol1
624-83-9	Methyl isocyanate		210	211	7439-97-6	Mercury		330	330
624-92-0	Dimethyl disulfide		500	502	7440-41-7	Beryllium		sol	sol1
628-63-7	Amyl acetate, n-		220	222	7446-09-5	Sulfur dioxide		350 / 360	350 / 365
630-08-0	Carbon monoxide		350	350	7446-11-9	Sulfur trioxide		360	365
755-95-3	Diiodo-1,1,2,2-tetrafluorobutane, 1,4-		260	261	7447-41-8	Lithium chloride		340	340
764-41-0	Dichloro-2-butene, 1,4-		260	264	7487-94-7	Mercuric chloride		340	340
811-97-2	Tetrafluoroethane, 1,1,1,2-		260	261	7550-45-0	Titanium tetrachloride		360	360
814-68-6	Acryloyl Chloride	Acrylic Acid Chloride	110	111	7553-56-2	Iodine		330	330
818-61-1	Ethylene glycol acrylate		220	223	7601-90-3	Perchloric acid		370	370
822-06-0	Hexamethylene diisocyanate		210	211	7632-51-1	Vanadium tetrachloride		360	360
872-50-4	Methyl-2-pyrrolidone, N-		130	132	7637-07-2	Boron trifluoride		350 / 360	350 / 360
920-37-6	Chloroacrylonitrile, 2-		260 / 430	264 / 431	7647-01-0	Hydrochloric acid	Muriatic acid	370	370
921-03-9	Trichloroacetone, 1,1,1,3-		260 / 390	261 / 391	7647-01-0	Hydrogen chloride		350	350
998-30-1	Triethoxysilane		480	480	7647-18-9	Antimony pentachloride		360	360
999-97-3	Hexamethyldisilazane	Hexamethyldisilazane	140 / 480	142 / 480	7664-38-2	Phosphoric acid		370	370
1310-58-3	Potassium hydroxide	Caustic potash, KOH (Potassium hydroxide), Potash lye	380	380	7664-39-3	Hydrofluoric acid		370	370
1310-65-2	Lithium hydroxide		380	380	7664-39-3	Hydrogen fluoride		350 / 370	350 / 370
1310-73-2	Sodium hydroxide	Caustic soda, Lye, NaOH (Sodium hydroxide)	380	380 / 591 / 592	7664-41-7	Ammonia	Anhydrous ammonia	350 / 380	350 / 380
1313-82-2	Sodium sulfide	Disodium sulfide	340	340	7664-93-9	Sulfuric acid		370	370
1319-77-3	Cresol, mixed isomers		310	316	7681-49-4	Sodium fluoride		340	340
1330-20-7	Xylene, mixed isomers		290	292	7681-52-9	Sodium hypochlorite		340	340
1332-21-4	Asbestos (all forms)		sol	sol1	7681-57-4	Sodium metabisulfite	Sodium disulfite, Sodium pyrosulfite	340	340
1333-82-0	Chromic acid		370	370	7697-37-2	Nitric acid		370	370
1336-21-6	Ammonium hydroxide		380	380	7705-08-0	Ferric chloride	Iron trichloride, Iron(III) chloride	340	340
1493-13-6	Trifluoromethane sulfonic acid		500	504	7719-09-7	Thionyl chloride		360	360
1552-12-1	Cyclooctadiene		290	296	7719-12-2	Phosphorus trichloride		360	360
1634-04-4	Methyl tert-butyl ether		240	241	7722-64-7	Potassium permanganate		340	340
1675-54-3	Bisphenol-A diglycidyl ether		270	275	7722-84-1	Hydrogen peroxide		300	300
1761-71-3	Methylene bis-cyclohexane diamine, 4,4'-		140	148	7726-95-6	Bromine		330	330
2551-62-4	Sulfur hexafluoride		350 / 500	350 / 509	7758-94-3	Ferrous chloride	Iron (II) chloride, Iron dichloride	340	340
3173-53-3	Cyclohexyl isocyanate		210	211	7782-41-4	Fluorine		350	350
3536-96-7	Vinylmagnesium chloride		470	470	7782-50-5	Chlorine		330 / 350	330 / 350
3887-02-3	N-Methylmethacrylamide	Methylmethacrylamide, N-	130	135	7783-06-4	Hydrogen sulfide		350 / 500	350 / 502
4098-71-9	Isophorone diisocyanate		210	211	7783-07-5	Hydrogen selenide		350	350
4109-96-0	Dichlorosilane		480	480	7783-54-2	Nitrogen trifluoride		350	350
4553-62-2	Methyl-1,5-pentanedinitrile, 2-	Methylglutaronitrile, 2-	430	431	7783-82-6	Tungsten hexafluoride		350	350
4635-87-4	Pentenenitrile, 3-		430	431	7784-34-1	Arsenic trichloride		340	340
5076-20-0	Tetramethylethylene oxide		270	275	7784-42-1	Arsine		350	350
5216-25-1	Chlorobenzotrichloride, 4-		260	263	7789-00-6	Potassium chromate		340	340
5329-14-6	Sulfamic acid		370 / 500	370 / 509	7789-21-1	Fluorosulfonic acid		370	370
					7790-91-2	Chlorine trifluoride		350	350
					7790-94-5	Chlorosulfonic acid		370 / 500	370 / 504

APPENDIX CHEMICAL INDEX - Chemical Abstract System (CAS) Number - Chemical Names and Synonyms

CAS Number	Chemical Name	Synonym	Class	Sub-Class	CAS Number	Chemical Name	Synonym	Class	Sub-Class
7791-25-5	Sulfonyl chloride		350 / 360	350 / 360	50782-69-9	VX Nerve agent		460	462
7803-51-2	Phosphine		350	350	50815-00-4	JP-4 jet fuel		290	291
7803-62-5	Silane		480	480	52583-42-3	Nitric acid, red fuming		370	370
8001-58-9	Creosote		310	316	64475-85-0	Mineral spirits		290	291
8002-05-9	Crude oil		290	294	68131-30-6	Green liquor		590	590
8004-13-5	Dowtherm heat transfer fluid		590	590	68131-33-9	White liquor		590	590
8006-64-2	Turpentine		290	294	68334-30-5	Diesel fuel		290	291
8008-20-6	Kerosene	Jet A fuel	290	291	68476-30-2	Fuel oil		290	291
8012-95-1	Mineral oil		290	291	86290-81-5	Gasoline		290	291
8014-95-7	Oleum		370	370	94114-58-6	JP-8 jet fuel		290	291
8030-30-6	VM&P Naphtha		290	291	95660-51-8	Skydrol®		460	462
8052-41-3	Stoddard solvent		290	291	106602-80-6	Otto fuel II		590	590
9016-87-9	Polymethylene polyphenyl-polyisocyanate		210	212	191681-14-8	AFFF		590	590
10024-97-2	Nitrous oxide		350	350	308066-70-8	Gasoline, E-10		290	291
10025-67-9	Sulfur monochloride	Disulfur dichloride, Sulfur chloride	500	502	308074-23-9	Black liquor		590	590
10025-78-2	Trichlorosilane		480	480	mixture	Astromat Orange			590
10025-87-3	Phosphorus oxychloride		360	360	mixture	Chemidize 727 ND		590	590
10026-04-7	Silicon tetrachloride		360 / 480	360 / 480	mixture	Crude oil on wildlife		liq	liq4
10034-85-2	Hydriodic acid		370	370	mixture	Decontaminating agent (DS-2)		590	590
10035-10-6	Hydrobromic acid		370	370	mixture	Diesel automotive test fuel		290	291
10035-10-6	Hydrogen bromide		350 / 370	350 / 370	mixture	DuPont Activator 193S		590	590
10043-52-4	Calcium chloride		340	340	mixture	DuPont Activator 4505S		590	590
10049-04-4	Chlorine dioxide		350	350	mixture	DuPont Activator 4507S		590	590
10102-43-9	Nitric oxide		350	350	mixture	Ethylene oxide mixture		270	275
10102-44-0	Nitrogen dioxide		350	350	mixture	Formalin	Formalin	120	121
10217-52-4	Hydrazine hydrate		280	280	mixture	Hexamethylene diisocyanate in DuPont Activator 193S		210	211
10294-34-5	Boron trichloride		350 / 360	350 / 360	mixture	Hexamethylene diisocyanate in DuPont Activator 4505S		210	211
10544-72-6	Nitrogen tetroxide		350	350	mixture	Hexamethylene diisocyanate in DuPont Activator 4507S		210	211
10545-99-0	Chlorine sulfide	Sulfur dichloride	500	502	mixture	Lime		sol	sol1
10588-01-9	Sodium dichromate		340	340	mixture	Organo-Tin Paint		470	470
11097-69-1	PCB 1254	Polychlorinated biphenyl 1254	260	263	mixture	PCB	Polychlorinated biphenyl	260	263
12125-01-8	Ammonium fluoride		340	340	mixture	PCB 1254	Polychlorinated biphenyl 1254	260	263
12125-02-9	Ammonium chloride		340	340	mixture	PCB gas condensate		260	263
13284-42-9	Pentenenitrile, 2-		430	431	mixture	PCB in transformer oil		260	263
13463-39-3	Nickel carbonyl		470	470	mixture	Tetramethyltin		590	590
15520-10-2	Dytek® A		140	148	mixture	m-Cresol 55%, p-Cresol 30%, Phenol 15%		310	316
16721-80-5	Sodium hydrosulfide		340	340	mixture	t-Sodium-amylate / t-amyl alcohol		590	590
16752-77-5	Methomyl		230	233					
16872-11-0	Fluoroboric acid		370	370					
16961-83-4	Fluorosilicic acid		370	370					
17927-65-0	Aluminum sulfate hydrate		340	340					
19287-45-7	Diborane		350	350					
24991-55-7	Polyethylene glycol dimethyl ether	Selexol®#0153;	240	245					
25340-17-4	Diethylbenzene		290	290					
25899-50-7	cis-2-Pentenenitrile		430	431					
26471-62-5	Toluene-1,3-diisocyanate		210	212					
30894-74-7	Dichloro-6-isopropyl-S-triazine, 2,4-		270	274					