



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](#) 26
- [Tyvek® Chemical Permeation Data Table](#) 27
- Appendix
 - [Alphabetical Index](#) 36
 - [CAS Number Index](#) 43

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.

Since conditions of use are outside our control, ***DuPont makes no warranties, express or implied, including, without limitation, no warranties of merchantability or fitness for a particular use and assume no liability in connection with any use of this information.***

This information is not intended as a license to operate under or a recommendation to infringe any patent, trademark or technical information of DuPont or others covering any material or its use.

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 $\mu\text{g}/\text{cm}^2/\text{min}$) 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 $\mu\text{g}/\text{cm}^2$].

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.

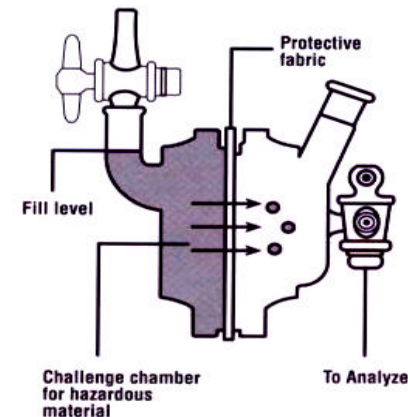
To help you understand the difference between these two mechanisms, consider this example. Have you ever opened a bottle of soda to find out that it was flat? There aren't any holes in the bottle. The liquid is still inside. Why is the soda flat? It's flat because the carbon dioxide that gives soda its 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 $\dot{g}/cm^2/min$. 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 $\dot{g}/cm^2/min$ 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 $\dot{g}/cm^2/min$ during the 8 hour test. If the permeation rate exceeds 0.1 $\dot{g}/cm^2/min$ 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 $\dot{g}/cm^2/min$. 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*

100 Carboxylic acids

- 102 Aliphatic and Alicyclic, Unsubstituted
- 103 Aliphatic and Alicyclic, Substituted
- 104 Aliphatic and Alicyclic, Polybasic

110 Acid Halides, Carboxylic

- 111 Aliphatic and Alicyclic
- 112 Aromatic
- 113 Chloroformates

120 Aldehydes

- 121 Aliphatic and Alicyclic
- 122 Aromatic

130 Amides

- 132 Aliphatic and Alicyclic
- 135 Acrylamides

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

150 Hydroxylamines and Ketoximes

160 Anhydrides

- 161 Aliphatic and Alicyclic

210 Isocyanates

- 211 Aliphatic and Alicyclic
- 212 Aromatic

220 Carboxylic Esters

- 221 Formates
- 222 Acetates
- 223 Acrylates and Methacrylates
- 224 Aliphatic, Others
- 226 Benzoates and Phthalates

230 Non-Carboxylic Esters

- 233 Carbamates and Others

240 Ethers

- 241 Aliphatic and Alicyclic
- 242 Aromatic
- 244 Ketals and Acetals
- 245 Glycol Ethers
- 246 Vinylic

260 Halogen Compounds

- 261 Aliphatic and Alicyclic
- 263 Aromatic
- 264 Vinylic
- 265 Alylic
- 266 Benzylic

270 Heterocyclic Compounds

- 271 Nitrogen, Pyridines
- 274 Nitrogen, Others
- 275 Oxygen, Epoxides
- 277 Oxygen, Furans
- 278 Oxygen, Others

280 Hydrazines

290 Hydrocarbons

- 291 Aliphatic and Alicyclic, Saturated
- 292 Aromatic
- 293 Aromatic Polynuclear
- 294 Aliphatic and Alicyclic, Unsaturated
- 296 Polyenes

300 Peroxides

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

- 318 Aromatic, Others

330 Elements

340 Inorganic Salts and Inorganic Salt Solutions

- 345 Inorganic Cyano Compounds

350 Inorganic Gases and Vapors

360 Inorganic Acid Halides

- 365 Inorganic Acid Oxides

370 Inorganic Acids

380 Inorganic Bases

390 Ketones

- 391 Aliphatic and Alicyclic

430 Nitriles

- 431 Aliphatic and Alicyclic
- 432 Aromatic

440 Nitro Compounds

- 441 Unsubstituted
- 442 Substituted

450 Nitroso Compounds

460 Organo-Phosphorus Compounds

- 462 Derivatives of Phosphorus-based acids

470 Organo-Metallic Compounds

480 Organo-Silicon Compounds

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

550 Organic Salts and Organic Salt Solutions

590 Miscellaneous (Not classified)

990 Cytostatic drugs (Active Pharmaceutical Potent Compound)

*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® 2000 SFR	Tychem® 2000	Tychem® 4000	Tychem® 5000	Tychem® 6000	Tychem® 6000 FR	Tychem® 9000	Tychem® RESPONDER® CSM	Tychem® 10000	Tychem® 10000 FR	
390	Acetone (>95%)	67-64-1	L			imm.	imm.	>480	>480	>480	>480	>480	>480	>480	>480
430	Acetonitrile (>95%)	75-05-8	L			imm.	60	imm.	>480	>480	>480	>480	>480	>480	>480
350 / 380	Ammonia (>95%, gas)	7664-41-7	G			imm.	26	imm.	20	90	133	133	>480	>480	
290	Butadiene, 1,3- (>95%, gas)	106-99-0	G			imm.	>480	>480	>480	>480	>480	>480	>480	>480	
500	Carbon disulfide (>95%)	75-15-0	L			imm.	imm.	16	>480	>480	>480	>480	>480	>480	
330 / 350	Chlorine (>95%, gas)	7782-50-5	G			imm.	>480	imm.	>480	>480	>480	>480	>480	>480	
260	Dichloromethane (>95%)	75-09-2	L			imm.	imm.	imm.	imm.	imm.	>480	>480	>480	>480	
140	Diethylamine (>95%)	109-89-7	L			imm.	15	>480	>480	>480	>480	>480	>480	>480	
130	Dimethylformamide, N,N- (>95%)	68-12-2	L			imm.	90	>480	>480	>480	>480	>480	>480	>480	
220	Ethyl acetate (>95%)	141-78-6	L			imm.	imm.	>480	>480	>480	>480	>480	>480	>480	
270	Ethylene oxide (>95%, gas)	75-21-8	G			imm.	imm.	>480	126	>480	>480	>480	>480	>480	
290	Hexane, n- (>95%)	110-54-3	L			imm.	imm.	>480	>480	>480	>480	>480	>480	>480	
350	Hydrogen chloride (>95%, gas)	7647-01-0	G			imm.	>480	>480	>480	>480	>480	>480	>480	>480	
310	Methanol (>95%)	67-56-1	L			imm.	>480	imm.	117	>480	185	>480	>480	>480	
260	Methyl chloride (>95%, gas)	74-87-3	G			imm.	>480	>480	>480	>480	>480	>480	>480	>480	
440	Nitrobenzene (>95%)	98-95-3	L			imm.	57	>480	>480	>480	>480	>480	>480	>480	
380	Sodium hydroxide (50%)	1310-73-2	L	48	>480	>480	>480	>480	>480	>480	>480	>480	>480	>480	
370	Sulfuric acid (>95%)	7664-93-9	L		>480	>480	>480	>480	>480	50	>480	>480	>480	>480	
260	Tetrachloroethylene, 1,1,2,2- (>95%)	127-18-4	L			imm.	imm.	>480	>480	>480	>480	>480	>480	>480	
240	Tetrahydrofuran (>95%)	109-99-9	L			imm.	imm.	>480	>480	>480	>480	>480	>480	>480	
290	Toluene (>95%)	108-88-3	L			imm.	imm.	>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 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® 2000 SFR	Tychem® 2000	Tychem® 4000	Tychem® 5000	Tychem® 6000	Tychem® 6000 FR	Tychem® 9000	Tychem® RESPONDER® CSM	Tychem® 10000	Tychem® 10000 FR
100 Carboxylic acids															
102 Aliphatic and Alicyclic, Unsubstituted															
		Acetic acid (30%)	64-19-7	Liquid	imm										
		Acetic acid (2%)	64-19-7	Liquid	imm										
		Acetic acid (10%)	64-19-7	Liquid	imm										
		Acetic acid (5%)	64-19-7	Liquid	imm										
		Acetic acid (84%)	64-19-7	Liquid											
		Acetic acid (>95%)	64-19-7	Liquid			imm.	>480	84	>480	>480	339	>480	>480	>480
		Acrylic acid (>95%)	79-10-7	Liquid			imm.	>480		>480	>480	270	>480	>480	270
		Formic acid (90%)	64-18-6	Liquid											
		Formic acid (30%)	64-18-6	Liquid											
		Formic acid (>95%)	64-18-6	Liquid			imm.	>480	>480	260	260	>480	>480	>480	>480
		Methacrylic acid (>95%)	79-41-4	Liquid						>480	>480	>480	>480	>480	>480
103 Aliphatic and Alicyclic, Substituted															
		Chloroacetic acid (70%-80%)	79-11-8	Liquid				370	>480	>480	>480	>480	>480	>480	>480
		Chloroacetic acid (>95%)	79-11-8	Liquid								>480	>480	>480	>480
		Glycolic acid (sat. sol. in water)	79-14-1	Liquid								>480	>480	>480	>480
		Thioglycolic acid (>95%)	68-11-1	Liquid					>480	>480	>480	>480	>480	>480	>480
		Trichloroacetic acid (>95%)	76-03-9	Liquid						>480	>480				
		Trifluoroacetic acid (>95%)	76-05-1	Liquid				>480		>480	>480		>480		
104 Aliphatic and Alicyclic, Polybasic															
		Citric acid (30%)	77-92-9	Liquid											
		Citric acid (50% in water)	77-92-9	Liquid					>480						
		Oxalic acid (10.5%)	144-62-7	Liquid								>480	>480	>480	>480
		Oxalic acid (sat.sol. in water)	144-62-7	Liquid					>480						
110 Acid Halides, Carboxylic															
110 Acid Halides, Carboxylic - All															
		Perfluoro-2-propoxy propionyl fluoride (>95%)	2062-98-8	Liquid								>480	>480	>480	>480
111 Aliphatic and Alicyclic															
		Acetyl chloride (>95%)	75-36-5	Liquid				63	>480	>480	>480	181	181	>480	181
		Acryloyl Chloride (>95%)	814-68-6	Liquid			imm.	55	334	334					
		Chloroacetyl chloride (>95%)	79-04-9	Liquid				120	77			160	160	160	160
		Dichloroacetyl chloride (>95%)	79-36-7	Liquid						160	160	100	100	>480	100
112 Aromatic															
		Benzoyl chloride (>95%)	98-88-4	Liquid					>480	>480	>480	>480	>480	>480	>480
113 Chloroformates															
		Benzyl chloroformate (>95%)	501-53-1	Liquid					>480						
		Methyl chloroformate (>95%)	79-22-1	Liquid								>480	>480	>480	>480
120 Aldehydes															

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® 2000 SFR	Tychem® 2000	Tychem® 4000	Tychem® 5000	Tychem® 6000	Tychem® 6000 FR	Tychem® 9000	Tychem® RESPONDER® CSM	Tychem® 10000	Tychem® 10000 FR
		Methylbenzylamine (>95%)	103-67-3	Liquid						>480					
		Morpholine (>95%)	110-91-8	Liquid				158				>480	>480	>480	
		N-Methylmorpholine (NMM)	109-02-4	Liquid						>480	>480				
143 Aliphatic and Alicyclic, Tertiary															
		Tributylamine	102-82-9	Liquid						>480		>480			
		Triethylamine (>95%)	121-44-8	Liquid				22				>480	>480	>480	
		Trimethylamine (>95%, gas)	75-50-3	Vapor									>480		
		Tripopylamine (>95%)	102-69-2	Liquid								>480	>480	>480	
145 Aromatic, Primary															
		Aminodiphenyl, 4- (1 mg/ml in methanol)	92-67-1	Liquid							>480	>480			
		Aniline (>95%)	62-53-3	Liquid			imm.	>480	320	>480	>480	>480	>480	>480	
		Aniline, 4-trifluoromethoxy (>95%)	461-82-5	Liquid						>480	>480	>480	>480	>480	
		Benzidine (25% in methanol)	92-87-5	Liquid								>480	>480	>480	
		Benzidine (75% in methanol)	92-87-5	Liquid									>480		
		Chloroaniline, p-	106-47-8	Solid								>480	>480**	>480	
		Chloroaniline, p- (>95% at 70° C)	106-47-8	Liquid			imm.			imm.	imm.	344	344	344	
		Dichloroaniline, 3,4- (>95%, liquid, 70° C)	95-76-1	Liquid			imm.					284	284	284	
		Dichloroaniline, 3,4- (solid)	95-76-1	Solid								>480	>480**	>480	
		Diethyl-m-toluidine crude (>95%)	91-67-8	Liquid				>480					>480		
		Methylene dianiline, 4,4'- (sat. sol. in methanol)	101-77-9	Liquid										>480	
		Methylene dianiline, 4,4'- (>95% at 190° C)	101-77-9	Liquid											
		Methylene dianiline, 4,4'- (15% in MEK)	101-77-9	Liquid								>480	>480	>480	
		Toluidine, m- (>95%)	108-44-1	Liquid				>480					>480		
		Toluidine, o- (>95%)	95-53-4	Liquid			imm.	>480		>480	>480	>480	>480	>480	
		Xylidin, 2,4- (>95%)	95-68-1	Liquid						>480	>480				
146 Aromatic, Secondary and Tertiary															
		Diethylaniline (>95%)	91-66-7	Liquid						>480			>480	>480	
		Diethylaniline crude (>95%)	91-66-7	Liquid				>480					>480		
		Dimethylaniline, N,N- (>95%)	121-69-7	Liquid					imm.	>480	>480	>480	>480	>480	
148 Aliphatic and Alicyclic Polyamines															
		Aminoethylethanolamine (60%)	111-41-1	Liquid				>480	>480	>480	>480	>480	>480	>480	
		Aminoethylethanolamine (>95%)	111-41-1	Liquid				imm.	>480	>480	>480	>480	>480	>480	
		Aminoethylpiperazine (>95%)	140-31-8	Liquid				>480	>480	>480	>480	>480	>480	>480	
		Diethylenetriamine (>95%)	111-40-0	Liquid				321	>480	>480	>480	>480	>480	>480	
		Dytek® A (>95%)	15520-10-2	Liquid						>480	>480	>480			
		Ethylenediamine (>95%)	107-15-3	Liquid			>480	>480	>480	>480	>480	>480	>480	>480	
		Hexamethylenediamine, 1,6- (>95% at 50° C)	124-09-4	Liquid				80	45			80			
		Hexamethylenediamine, 1,6- (>95% at 45° C)	124-09-4	Liquid						>480	>480	>480	>480	>480	
		Methylene bis-cyclohexane diamine, 4,4'- (>95%)	1761-71-3	Liquid				>480		>480	>480		>480		

Chemical Permeation Data Tables

C	S	C	C	C	P	Breakthrough Time (Minutes)											
						Tyvek® 800J	Tychem® 2000 SFR	Tychem® 2000	Tychem® 4000	Tychem® 5000	Tychem® 6000	Tychem® 6000 FR	Tychem® 9000	Tychem® RESPONDER® CSM	Tychem® 10000	Tychem® 10000 FR	
Classes		Chemical Name	CAS	Phase													
		Ethyl Cellosolve® acetate (>95%)	111-15-9	Liquid				238	>480	>480	>480	>480	>480	>480	>480	>480	>480
		Methyl Cellosolve® (>95%)	109-86-4	Liquid				>480	405	>480	>480	>480	>480	>480	>480	>480	>480
		Methyl Cellosolve® acetate (>95%)	110-49-6	Liquid				>480	>480	>480	>480	>480	>480	>480	>480	>480	>480
		Polyethylene glycol dimethyl ether (>95%)	24991-55-7	Liquid								>480					
260 Halogen Compounds																	
260 Halogen Compounds - All																	
		Perfluoro-2-propoxy propionyl fluoride (>95%)	2062-98-8	Liquid										>480	>480	>480	>480
261 Aliphatic and Alicyclic																	
		Carbon tetrachloride (>95%)	56-23-5	Liquid					>480	11	11	>480	>480	>480	>480	>480	>480
		Chlordane (>95%)	57-74-9	Liquid								>480	>480	>480	>480	>480	>480
		Chlordane (44%)	57-74-9	Liquid					>480								
		Chloroethanol, 2- (>95%)	107-07-3	Liquid					>480	>480	>480	>480	>480	>480	>480	>480	>480
		Chloroform (>95%)	67-66-3	Liquid										>480	>480	>480	>480
		Chloropicrin (>95%)	76-06-2	Liquid								>480	>480				
		Dibromo-3-chloropropane, 1,2- (>95%)	96-12-8	Liquid					>480								
		Dichloroacetone (>95% at 40° C)	534-07-6	Liquid											>480		
		Dichloroacetone (>95% at 45° C)	534-07-6	Liquid						>480	>480						
		Dichloroethyl ether (>95%)	111-44-4	Liquid					>480	>480	>480	>480	>480	>480	>480	>480	>480
		Dichloromethane (>95%)	75-09-2	Liquid										>480	>480	>480	>480
		Dichloropropene, 1,3- (>95%)	542-75-6	Liquid													
		Dichloropropene, 2,3- (>95%)	78-88-6	Liquid													
		Diiodo-1,1,2,2-tetrafluorobutane, 1,4- (>95%)	755-95-3	Liquid										>480	>480	>480	>480
		Epichlorohydrin (>95%)	106-89-8	Liquid					15	67	372	372	>480	>480	>480	>480	>480
		Ethyl chloride (>95%)	75-00-3	Liquid												>480	
		Ethylene dibromide (>95%)	106-93-4	Liquid					>480	288	288	>480	>480	>480	>480	>480	>480
		Ethylene dichloride (>95%)	107-06-2	Liquid										>480	>480	>480	>480
		Hexafluoroethane (>95%)	76-16-4	Vapor										>480	>480	>480	>480
		Hexafluoroisobutylene (>95%)	382-10-5	Vapor										>480	>480	>480	>480
		Lindane (sat. sol. in methanol)	58-89-9	Liquid											>480		
		Lindane (sat. sol. in acetone)	58-89-9	Liquid										>480	>480	>480	>480
		Methyl bromide (>95%)	74-83-9	Vapor					>480					>480	>480	>480	>480
		Methyl chloride (>95%, liquid, -70° C)	74-87-3	Liquid												>180	
		Methyl chloride (>95%, gas)	74-87-3	Vapor												>480	>480
		Methyl fluoride (>95%)	593-53-3	Vapor										>480	>480	>480	>480
		Methyl iodide (>95%)	74-88-4	Liquid										>480	>480	>480	>480
		Methylene bromide (>95%)	74-95-3	Liquid													
		Propylbromide, n- (>95%)	106-94-5	Liquid					12	>480					12		
		Propylene dichloride (>95%)	78-87-5	Liquid										>480	>480	>480	>480
		Tetrachloroethane, 1,1,2,2- (>95%)	79-34-5	Liquid					98	>480	>480	>480	>480	>480	>480	>480	>480

Chemical Permeation Data Tables

C	S	Sub - Classes	Chemical Name	CAS	Phase	Breakthrough Time (Minutes)										
						Tyvek® 800J	Tychem® 2000 SFR	Tychem® 2000	Tychem® 4000	Tychem® 5000	Tychem® 6000	Tychem® 6000 FR	Tychem® 9000	Tychem® RESPONDER® CSM	Tychem® 10000	Tychem® 10000 FR
			Tetrafluoroethane, 1,1,1,2- (>95%)	811-97-2	Liquid				>480					>480		
			Tetrafluoromethane (>95%)	75-73-0	Vapor								>480	>480	>480	>480
			Trichloro-1,2,2-trifluoroethane, 1,1,2- (>95%)	76-13-1	Vapor				>480			>480	>480	>480	>480	>480
			Trichloroacetone, 1,1,3- (>95%)	921-03-9	Liquid					>480	>480					
			Trichloroethane, 1,1,1- (>95%)	71-55-6	Liquid				>480		>480	>480	>480	>480	>480	>480
			Trichloroethane, 1,1,2- (>95%)	79-00-5	Liquid						232	>480	>480	>480	>480	>480
			Trifluoroacetic acid (>95%)	76-05-1	Liquid			>480		>480	>480		>480	>480	>480	>480
			Trifluoromethane (>95%)	75-46-7	Vapor								>480	>480	>480	>480
263 Aromatic																
			Benzotrichloride (>95%)	98-07-7	Liquid					>480						
			Bromofluorobenzene, 4- (>95%)	460-00-4	Liquid					>480	>480	>480	>480	>480	>480	>480
			Chloro-benzotrifluoride, 4- (>95%)	98-56-6	Liquid				460							
			Chlorobenzene (>95%)	108-90-7	Liquid			imm.	63	>480	>480	>480	>480	>480	>480	>480
			Chlorobenzotrichloride, 4- (>95%)	5216-25-1	Liquid					>480						
			Chlorophenol, 4- (sat. sol. in methanol)	106-48-9	Liquid							>480	>480	>480	>480	>480
			Chlorotoluene, o- (>95%)	95-49-8	Liquid			13		>480	>480	>480	>480	>480	>480	>480
			Cyanuric chloride (20%, Toluene 80%)	108-77-0	Liquid							>480	>480	>480	>480	>480
			Dichloroaniline, 3,4- (>95%, liquid, 70° C)	95-76-1	Liquid			imm.				284	284	284	284	284
			Dichloroaniline, 3,4- (solid)	95-76-1	Solid							>480	>480**	>480	>480	>480
			Dichlorobenzene, 1,2- (>95%)	95-50-1	Liquid			76	>480	>480		>480	>480	>480	>480	>480
			Dichlorobenzene, 1,3- (>95%)	541-73-1	Liquid			45	>480	>480		>480	>480	>480	>480	>480
			Dichlorobenzene, 1,4 (50% solution in Ethanol)	106-46-7	Liquid			>480	131	>480		>480	>480	>480	>480	>480
			Fluorobenzene (>95%)	462-06-6	Liquid			imm.	>480	>480	>480	>480	>480	>480	>480	>480
			Nitrochlorobenzene, o-	88-73-3	Solid			15								
			Nitrochlorobenzene, p-	100-00-5	Solid			imm.								
			PCB (50% in trichlorobenzene)	mixture	Liquid					>480		>480	>480	>480	>480	>480
			PCB 1254 (50% in mineral oil)	mixture	Liquid				>480				>480			
			PCB 1254 (>95%)	11097-69-1	Liquid											
			PCB 1254 (90%)	11097-69-1	Liquid			55	>480				>480			
			PCB gas condensate (>95%)	mixture	Liquid					>480	>480					
			PCB in transformer oil (>95%)	mixture	Liquid					>480	>480					
			Tetrachloro-bisphenol -A, 2,2',6,6'	79-95-8	Solid					>480	>480					
			Trichlorobenzene, 1,2,4- (>95%)	120-82-1	Liquid			imm.	87	>480	>480	>480	>480	>480	>480	>480
264 Vinylic																
			Chloroacrylonitrile, 2- (>95%)	920-37-6	Liquid					>480	>480					
			Hexachlorobutadiene (>95%)	87-68-3	Liquid							>480	>480	>480	>480	>480
			Tetrachloroethylene, 1,1,1,2,2- (>95%)	127-18-4	Liquid			imm.	imm.	>480	>480	>480	>480	>480	>480	>480
			Trichloroethylene (>95%)	79-01-6	Liquid			imm.	imm.	>480	>480	>480	>480	imm.	>480	>480
			Vinyl chloride (>95%, gas)	75-01-4	Vapor				>480	>480	>480	>480	>480	>480	>480	>480

Chemical Permeation Data Tables

C	S	u	b	-	C	l	a	s	Chemical Name	CAS	P	h	a	s	Breakthrough Time (Minutes)								
															Tyvek® 800J	Tychem® 2000 SFR	Tychem® 2000	Tychem® 4000	Tychem® 5000	Tychem® 6000	Tychem® 6000 FR	Tychem® 9000	Tychem® RESPONDER® CSM
									Vinylidene chloride (>95%)	75-35-4	Liquid				170	>480	>480	>480	>480	>480	>480	>480	
									trans-1,4-Dichloro-2-butene (>95%)	110-57-6	Liquid			75*									
265 Alylic																							
									Allyl chloride (>95%)	107-05-1	Liquid				imm.	12	447	447	>480	>480	>480	>480	
266 Benzylic																							
									Benzyl chloride (>95%)	100-44-7	Liquid				>480	>480	>480	>480	>480	>480	>480	>480	
270 Heterocyclic Compounds																							
271 Nitrogen, Pyridines																							
									Aminopyridine, 2- (saturated solution)	504-29-0	Liquid				>480					>480			
									Nicotine (>95%)	54-11-5	Liquid				>480	>480	>480	>480	>480	>480	>480	>480	
									Picoline, 2- (>95%)	109-06-8	Liquid				>480	>480	>480	>480	>480	>480	>480	>480	
									Picoline, 3- (>95%)	108-99-6	Liquid				>480	>480	>480	>480	>480	>480	>480	>480	
									Pyridine (>95%)	110-86-1	Liquid			31	>480	>480	>480	>480	>480	>480	>480	>480	
									Vinylpyridine, 4- (>95%)	100-43-6	Liquid			15						15			
274 Nitrogen, Others																							
									Aminoethylpiperazine (>95%)	140-31-8	Liquid				>480	>480	>480	>480	>480	>480	>480	>480	
									Dichloro-6-isopropyl-S-triazine, 2,4- (22% in toluene)	30894-74-7	Liquid								>480	>480	>480	>480	
									Ethyleneimine (>95%)	151-56-4	Liquid							59	59	>480	59		
									Propylene imine (>95%)	75-55-8	Liquid							150	150	150	150		
									Pyrrolidine (>95%)	123-75-1	Liquid					100	100	413	413	413	413		
275 Oxygen, Epoxides																							
									Bisphenol-A diglycidyl ether (>95%)	1675-54-3	Liquid				>480	>480	>480	>480	>480	>480	>480	>480	
									Epichlorohydrin (>95%)	106-89-8	Liquid			15	67	372	372	>480	>480	>480	>480	>480	
									Ethylene oxide (>95%, liquid, 0° C)	75-21-8	Liquid							>480	>480	>480	>480		
									Ethylene oxide (>95%, gas)	75-21-8	Vapor		imm.	imm.	>480	126	>480	>480	>480	>480	>480		
									Ethylene oxide (>95%, liquid, 11° C)	75-21-8	Liquid			18									
									Ethylene oxide (>95%, liquid, -70° C)	75-21-8	Liquid									>180			
									Ethylene oxide mixture (10% in HCFC 124)	mixture	Vapor									>480			
									Phenyl glycidyl ether (>95%)	122-60-1	Liquid			>480					>480				
									Propylene oxide, 1,2- (>95%)	75-56-9	Liquid			30	14	20	>480	>480	>480	>480	>480		
									Tetramethylethylene oxide (>95%)	5076-20-0	Liquid									>480			
277 Oxygen, Furans																							
									Furfural (>95%)	98-01-1	Liquid			227	>480	>480	>480	>480	>480	>480	>480	>480	
278 Oxygen, Others																							
									Diketene Acetone (>95%)	5394-63-8	Liquid				>480								
									Dioxane, 1,4- (>95%)	123-91-1	Liquid				>480	>480	>480	>480	>480	>480	>480		
280 Hydrazines																							
280 Hydrazines - All																							
									Dimethylhydrazine, 1,1- (>95%)	57-14-7	Liquid			13					>480*	>480*	>480*	>480*	

Chemical Permeation Data Tables

C	S	C	C	C	C	C	Breakthrough Time (Minutes)														
							Tyvek® 800J	Tychem® 2000 SFR	Tychem® 2000	Tychem® 4000	Tychem® 5000	Tychem® 6000	Tychem® 6000 FR	Tychem® 9000	Tychem® RESPONDER® CSM	Tychem® 10000	Tychem® 10000 FR				
l	a	a	a	a	a	a	Chemical Name	CAS	P	h	a	s	e								
							Hydrazine (>95%)	302-01-2	Liquid				>480		283	283	>480	>480	>480	>480	>480
							Hydrazine (85%)	302-01-2	Liquid												
							Hydrazine hydrate (>95%)	10217-52-4	Liquid												>480
							Hydrazine hydrate (85%)	10217-52-4	Liquid							440	440	440	440	440	440
							Hydrazine hydrate (50%)	10217-52-4	Liquid											>480	>480
							Methyl hydrazine (>95%)	60-34-4	Liquid						283	283	>480	>480	>480	>480	>480
290 Hydrocarbons																					
290 Hydrocarbons - All																					
							Diethylbenzene (>95%)	25340-17-4	Liquid				31		>480	>480	>480	>480	>480	>480	>480
291 Aliphatic and Alicyclic, Saturated																					
							Cyclohexane (>95%)	110-82-7	Liquid					>480	>480	>480	>480	>480	>480	>480	>480
							Diesel automotive test fuel (>95%)	mixture	Liquid			imm.									
							Diesel fuel (>95%)	68334-30-5	Liquid				48	199	>480	>480	>480	>480	>480	>480	>480
							Fuel oil (>95%)	68476-30-2	Liquid			imm.	>480						>480		
							Gasoline (>95%)	86290-81-5	Liquid				imm.	>480	30	30	>480	>480	>480	>480	>480
							Gasoline, E-10 (>95%)	308066-70-8	Liquid				16						16		
							Heptane (>95%)	142-82-5	Liquid					>480							
							Hexane, n- (>95%)	110-54-3	Liquid			imm.	imm.	>480	>480	>480	>480	>480	>480	>480	>480
							JP-4 jet fuel (>95%)	50815-00-4	Liquid				imm.				>480	>480	>480	>480	>480
							JP-8 jet fuel (>95%)	94114-58-6	Liquid				58				>480	>480	>480	>480	>480
							Kerosene (>95%)	8008-20-6	Liquid				58	>480	>480	>480	>480	>480	>480	>480	>480
							Mineral oil (>95%)	8012-95-1	Liquid				>480						>480		
							Mineral spirits (>95%)	64475-85-0	Liquid			imm.	190				>480	>480	>480	>480	>480
							Octane, n- (>95%)	111-65-9	Liquid								>480	>480	>480	>480	>480
							Propane (>95%)	74-98-6	Vapor												>480
							Stoddard solvent (>95%)	8052-41-3	Liquid								>480	>480	>480	>480	>480
							VM&P Naphtha (>95%)	8030-30-6	Liquid				imm.				>480	>480	>480	>480	>480
292 Aromatic																					
							Benzene (>95%)	71-43-2	Liquid				imm.	>480	>480	>480	>480	>480	>480	>480	>480
							Cumene (>95%)	98-82-8	Liquid					364	>480	>480	>480	>480	>480	>480	>480
							Ethyl benzene (>95%)	100-41-4	Liquid				imm.	>480	>480	>480	>480	>480	>480	>480	>480
							Styrene (>95%)	100-42-5	Liquid				16	>480	>480	>480	>480	>480	>480	>480	>480
							Toluene (>95%)	108-88-3	Liquid			imm.	imm.	>480	>480	>480	>480	>480	>480	>480	>480
							Xylene, mixed isomers (>95%)	1330-20-7	Liquid					>480	>480	>480	>480	>480	>480	>480	>480
							Xylene, o- (>95%)	95-47-6	Liquid					>480							
293 Aromatic Polynuclear																					
							Anthracene (sat. sol. in toluene)	120-12-7	Liquid					>480	>480	>480					
							Naphthalene (25% solution in Diethylene glycol dimethyl ether)	91-20-3	Liquid				79	>480	>480		>480	>480	>480	>480	>480
							Naphthalene	91-20-3	Solid					>480	>480	>480					

Chemical Permeation Data Tables

C	S	C	C	C	P	Breakthrough Time (Minutes)										
						Tyvek® 800J	Tychem® 2000 SFR	Tychem® 2000	Tychem® 4000	Tychem® 5000	Tychem® 6000	Tychem® 6000 FR	Tychem® 9000	Tychem® RESPONDER® CSM	Tychem® 10000	Tychem® 10000 FR
Classes		Chemical Name	CAS	Phase												
			Sulfuric acid (30%)	7664-93-9	Liquid	>480						>480				
380 Inorganic Bases																
380 Inorganic Bases - All																
			Ammonia (>95%, gas)	7664-41-7	Vapor			imm.	26	imm.	20	90	133	133	>480	>480
			Ammonia (>95%, liquid, < -35°C)	7664-41-7	Liquid					>480		>480			>480	>480
			Ammonium hydroxide (2-3% in household cleaner)	1336-21-6	Liquid				>480			>480			>480	>480
			Ammonium hydroxide (28%-30%)	1336-21-6	Liquid			imm.	>480	89	>480	35	160	>480	>480	>480
			Ammonium hydroxide (16%)	1336-21-6	Liquid	imm										
			Lithium hydroxide (14.9%)	1310-65-2	Liquid		>480	>480								
			Potassium hydroxide (45%)	1310-58-3	Liquid		>480	>480	>480	>480	>480	>480	>480	>480	>480	>480
			Sodium hydroxide (10%)	1310-73-2	Liquid	>480										
			Sodium hydroxide (50%)	1310-73-2	Liquid	48	>480	>480	>480	>480	>480	>480	>480	>480	>480	>480
			Sodium hydroxide (40%)	1310-73-2	Liquid											
390 Ketones																
390 Ketones - All																
			Diketene Acetone (>95%)	5394-63-8	Liquid							>480				
391 Aliphatic and Alicyclic																
			Acetone (>95%)	67-64-1	Liquid			imm.	imm.	>480	>480	>480	>480	>480	>480	>480
			Chloroacetone (>95%)	78-95-5	Liquid				258	>480	>480	>480		258		
			Cyclohexanone (>95%)	108-94-1	Liquid				136		>480	>480	>480	>480	>480	>480
			Dichloroacetone (>95% at 45° C)	534-07-6	Liquid						>480	>480				
			Dichloroacetone (>95% at 40° C)	534-07-6	Liquid										>480	
			Hexone (>95%)	108-10-1	Liquid					>480	>480	>480	>480	>480	>480	>480
			Mesityl oxide (>95%)	141-79-7	Liquid					>480						
			Methyl ethyl ketone (>95%)	78-93-3	Liquid				18	>480	71	71	>480	>480	>480	>480
			Trichloroacetone, 1,1,3- (>95%)	921-03-9	Liquid						>480	>480				
430 Nitriles																
431 Aliphatic and Alicyclic																
			Acetone cyanohydrin (>95%)	75-86-5	Liquid						>480	>480	>480	>480	>480	>480
			Acetonitrile (>95%)	75-05-8	Liquid			imm.	60	imm.	>480	>480	>480	>480	>480	>480
			Acrylonitrile (>95%)	107-13-1	Liquid			imm.	48	13	12	12	>480	>480	>480	>480
			Acrylonitrile (>95%, 10 g/m² coverage)	107-13-1	Liquid								>480	>480	>480	>480
			Adiponitrile (>95%)	111-69-3	Liquid					>480	>480	>480	>480	>480	>480	>480
			Chloroacrylonitrile, 2- (>95%)	920-37-6	Liquid						>480	>480				
			Methyl-1,5-pentanedinitrile, 2- (>95%)	4553-62-2	Liquid						>480	>480				
			Methyl-1,5-pentanedinitrile, 2- (87%)	4553-62-2	Liquid								>480	>480		
			Pentenenitrile, 2- (>95%)	13284-42-9	Liquid						>480	>480				
			Pentenenitrile, 3- (>95%)	4635-87-4	Liquid								>480	>480	>480	>480
			cis-2-Pentenenitrile (70%)	25899-50-7	Liquid								>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® 2000 SFR	Tychem® 2000	Tychem® 4000	Tychem® 5000	Tychem® 6000	Tychem® 6000 FR	Tychem® 9000	Tychem® RESPONDER® CSM	Tychem® 10000	Tychem® 10000 FR	
		Gemcitabine (38 mg/ml)	95058-81-4	Liquid												
		Ifosfamide (50 mg/ml)	3778-73-2	Liquid												
		Irinotecan (20 mg/ml)	100286-90-6	Liquid												
		Methotrexate (25 mg/ml, 0.1 N NaOH)	59-05-2	Liquid	>240											
		Mitomycin (0.5 mg/ml)	50-07-7	Liquid	>240											
		Oxaliplatin (5 mg/ml)	63121-00-6	Liquid												
		Paclitaxel (6 mg/ml, 49.7 % (v/v) Ethanol)	33069-62-4	Liquid			>240									
		Sodium chloride (9 g/l)	7647-14-5	Liquid												
		Thiotepa (10 mg/ml)	52-24-4	Liquid	>240***		>240***			>240***						
		Vincristine sulfate (1 mg/ml)	2068-78-2	Liquid												
		Vinorelbine (0.1 mg/ml)	71486-22-1	Liquid												
> = 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.																

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	P h a s e	Breakthrough Time (Minutes)		
					Tyvek® 500	Tyvek® 600	Tyvek® 800J
100 Carboxylic acids							
102 Aliphatic and Alicyclic, Unsubstituted							
		Acetic acid (30%)	64-19-7	Liquid	imm	imm	imm
380 Inorganic Bases							
380 Inorganic Bases - All							
		Ammonium hydroxide (16%)	1336-21-6	Liquid	imm	imm	imm
		Ammonium hydroxide (28%-30%)	1336-21-6	Liquid	imm	imm	
990 Cytostatic drugs (Active Pharmaceutical Potent Compound)							
990 Cytostatic drugs (Active Pharmaceutical Potent Compound) - All							
		Carboplatin (10 mg/ml)	441575-94-4	Liquid		>240	
		Carmustine (3.3 mg/ml, 10 % Ethanol)	154-93-8	Liquid		imm	>240***
		Cisplatin (1 mg/ml)	15663-27-1	Liquid		>240	>240
		Cyclophosphamide (20mg/ml)	50-18-0	Liquid		>240	>240
500 Sulfur Compounds							
507 Sulfonates, Sulfates, and Sulfites							
		Dimethyl sulfate (>95%)	77-78-1	Liquid	imm	imm	
990 Cytostatic drugs (Active Pharmaceutical Potent Compound)							
990 Cytostatic drugs (Active Pharmaceutical Potent Compound) - All							
		Doxorubicin HCl (2 mg/ml)	25136-40-9	Liquid		>240	>240
310 Hydroxylic Compounds (includes alcohols)							
314 Aliphatic and Alicyclic, Polyols							
		Ethylene glycol (>95%)	107-21-1	Liquid	imm	imm	imm
990 Cytostatic drugs (Active Pharmaceutical Potent Compound)							
990 Cytostatic drugs (Active Pharmaceutical Potent Compound) - All							
		Etoposide (20 mg/ml, 33.2 % (v/v) Ethanol)	33419-42-0	Liquid		>240	
		Fluorouracil, 5- (50 mg/ml, 1 N NH3OH)	51-21-8	Liquid		imm	>240
100 Carboxylic acids							
102 Aliphatic and Alicyclic, Unsubstituted							
		Formic acid (30%)	64-18-6	Liquid	imm	imm	

Chemical Permeation Data Table

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® 500	Tyvek® 600	Tyvek® 800J
990 Cytostatic drugs (Active Pharmaceutical Potent Compound)							
990 Cytostatic drugs (Active Pharmaceutical Potent Compound) - All							
		Ganciclovir (3 mg/ml)	82410-32-0	Liquid		>240	
		Gemcitabine (38 mg/ml)	95058-81-4	Liquid		<60***	
370 Inorganic Acids							
370 Inorganic Acids - All							
		Hydrochloric acid (32%)	7647-01-0	Liquid	imm	imm	imm
		Hydrochloric acid (16%)	7647-01-0	Liquid	imm	imm	imm
300 Peroxides							
300 Peroxides - All							
		Hydrogen peroxide (30%)	7722-84-1	Liquid	imm	imm	
990 Cytostatic drugs (Active Pharmaceutical Potent Compound)							
990 Cytostatic drugs (Active Pharmaceutical Potent Compound) - All							
		Ifosfamide (50 mg/ml)	3778-73-2	Liquid		>240	
		Irinotecan (20 mg/ml)	100286-90-6	Liquid		>240***	
		Methotrexate (25 mg/ml, 0.1 N NaOH)	59-05-2	Liquid		>240	>240
		Mitomycin (0.5 mg/ml)	50-07-7	Liquid		>240	>240
		Oxaliplatin (5 mg/ml)	63121-00-6	Liquid		imm	
		Paclitaxel (6 mg/ml, 49.7 % (v/v) Ethanol)	33069-62-4	Liquid		>240	
370 Inorganic Acids							
370 Inorganic Acids - All							
		Phosphoric acid (50%)	7664-38-2	Liquid	>480	>480	
990 Cytostatic drugs (Active Pharmaceutical Potent Compound)							
990 Cytostatic drugs (Active Pharmaceutical Potent Compound) - All							
		Sodium chloride (9 g/l)	7647-14-5	Liquid		>240	
380 Inorganic Bases							
380 Inorganic Bases - All							
		Sodium hydroxide (40%)	1310-73-2	Liquid	>480	>480	
370 Inorganic Acids							

Chemical Permeation Data Table

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® 500	Tyvek® 600	Tyvek® 800J
370 Inorganic Acids - All							
		Sulfuric acid (18%)	7664-93-9	Liquid	>480	>480	
		Sulfuric acid (30%)	7664-93-9	Liquid		>240	>480
990 Cytostatic drugs (Active Pharmaceutical Potent Compound)							
990 Cytostatic drugs (Active Pharmaceutical Potent Compound) - All							
		Thiotepa (10 mg/ml)	52-24-4	Liquid		imm	>240***
		Vincristine sulfate (1 mg/ml)	2068-78-2	Liquid		>240	
		Vinorelbine (0.1 mg/ml)	71486-22-1	Liquid		>240	
<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>							

APPENDIX CHEMICAL INDEX - Alphabetical Listing - Chemical Names and Synonyms

CAS Number	Chemical Name	Synonym	Class	Sub-Class	CAS Number	Chemical Name	Synonym	Class	Sub-Class
111-90-0	(2-Ethoxyethoxy)-ethanol, 2-		240	245	501-53-1	Benzyl chloroformate		110	113
112-34-5	2-(2-Butoxyethoxy)-ethanol	Butyl Carbitol, DEG Monobutyl Ether, Diethylene Glycol Monobutyl Ether	240 / 310	245 / 311	140-29-4	Benzyl cyanide		430	432
75-07-0	Acetaldehyde		120	121	7440-41-7	Beryllium		sol	sol1
64-19-7	Acetic acid		100	102	1675-54-3	Bisphenol-A diglycidyl ether		270	275
108-24-7	Acetic anhydride		160	161	308074-23-9	Black liquor		590	590
67-64-1	Acetone		390	391	110-51-0	Borane-pyridine complex		590	590
75-86-5	Acetone cyanohydrin		310 / 430	313 / 431	10294-34-5	Boron trichloride		350 / 360	350 / 360
75-05-8	Acetonitrile		430	431	7637-07-2	Boron trifluoride		350 / 360	350 / 360
75-36-5	Acetyl chloride		110	111	353-42-4	Boron trifluoride dimethyletherate		590	590
107-02-8	Acrolein		120	121	109-63-7	Boron trifluoride etherate		590	590
79-06-1	Acrylamide		130	135	7726-95-6	Bromine		330	330
79-10-7	Acrylic acid		100	102	74-97-5	Bromochloromethane		260	261
107-13-1	Acrylonitrile		430	431	460-00-4	Bromofluorobenzene, 4-		260	263
814-68-6	Acryloyl Chloride	Acrylic Acid Chloride	110	111	106-99-0	Butadiene, 1,3-	1,3-Butadiene	290	296
111-69-3	Adiponitrile		430	431	75-65-0	Butanol tert.	2-methyl 2-propanol	310	313
191681-14-8	AFFF		590	590	71-36-3	Butanol, n-		310	311
107-18-6	Allyl alcohol		310	311	123-86-4	Butyl acetate, n-		220	222
107-05-1	Allyl chloride		260	265	141-32-2	Butyl acrylate, n-		220	223
17927-65-0	Aluminum sulfate hydrate		340	340	111-76-2	Butyl Cellosolve®		240	245
92-67-1	Aminodiphenyl, 4-		140	145	142-96-1	Butyl ether, n-		240	241
111-41-1	Aminoethylethanolamine	N-Aminoethyl ethanolamine	140 / 310	148 / 311	109-73-9	Butylamine, n-	1-Aminobutane, Aminobutane, 1-, Butan-1-amine	140	141
140-31-8	Aminoethylpiperazine		140 / 270	148 / 274	75-64-9	Butylamine, tert-	tert-Butylamine	140	141
504-29-0	Aminopyridine, 2-		270	271	106-88-7	Butylene oxide, 1,2-		270	275
7664-41-7	Ammonia	Anhydrous ammonia	350 / 380	350 / 380	123-72-8	Butyraldehyde, n-	Butanal	120	121
1341-49-7	Ammonium Bifluoride	Ammonium Hydrofluoride, Ammonium Hydrogen Difluoride	340	340	107-92-6	Butyric acid		100	102
12125-02-9	Ammonium chloride		340	340	10043-52-4	Calcium chloride		340	340
12125-01-8	Ammonium fluoride		340	340	75-15-0	Carbon disulfide		500	502
1336-21-6	Ammonium hydroxide		380	380	630-08-0	Carbon monoxide		350	350
628-63-7	Amyl acetate, n-		220	222	56-23-5	Carbon tetrachloride		260	261
62-53-3	Aniline		140	145	441575-94-4	Carboplatin		990	990
461-82-5	Aniline, 4-trifluoromethoxy		140 / 240	145 / 242	154-93-8	Carmustine		990	990
120-12-7	Anthracene		290	293	mixture	Chemidize 727 ND		590	590
7647-18-9	Antimony pentachloride		360	360	57-74-9	Chlordane		260	261
7784-34-1	Arsenic trichloride		340	340	7782-50-5	Chlorine		330 / 350	330 / 350
7784-42-1	Arsine		350	350	10049-04-4	Chlorine dioxide		350	350
1332-21-4	Asbestos (all forms)		sol	sol1	10545-99-0	Chlorine sulfide	Sulfur dichloride	500	502
mixture	Astromat Orange			590	7790-91-2	Chlorine trifluoride		350	350
71-43-2	Benzene		290	292	96-24-2	Chloro-1,2-propanediol, 3-		310	314
98-09-9	Benzene sulfonyl chloride		500	505	126-99-8	Chloro-1,3-butadiene, 2-		260	264
92-87-5	Benzidine		140	145 / 149	98-56-6	Chloro-benzotrifluoride, 4-		260	263
100-47-0	Benzonitrile		430	432	79-11-8	Chloroacetic acid		100	103
98-07-7	Benzotrichloride		260	263	78-95-5	Chloroacetone		390	391
98-88-4	Benzoyl chloride		110	112	532-27-4	Chloroacetophenone		260	261
100-51-6	Benzyl alcohol		310	312	79-04-9	Chloroacetyl chloride		110	111
100-44-7	Benzyl chloride		260	266	920-37-6	Chloroacrylonitrile, 2-		260 / 430	264 / 431

APPENDIX
CHEMICAL INDEX - Alphabetical Listing - Chemical Names and Synonyms

CAS Number	Chemical Name	Synonym	Class	Sub-Class
75-00-3	Ethyl chloride		260	261
60-29-7	Ethyl ether		240	241
75-08-1	Ethyl Mercaptan	Ethanethiol	500	501
97-63-2	Ethyl methacrylate		220	223
56-38-2	Ethyl parathion		460	462
109-92-2	Ethyl vinyl ether		240 / 260	246 / 261
75-04-7	Ethylamine		140	141
74-85-1	Ethylene		290	294
106-93-4	Ethylene dibromide		260	261
107-06-2	Ethylene dichloride	1,2-Dichloroethane	260	261
107-21-1	Ethylene glycol		310	314
818-61-1	Ethylene glycol acrylate		220	223
75-21-8	Ethylene oxide	Dimethylene oxide, Epoxyethane	270	275
mixture	Ethylene oxide mixture		270	275
107-15-3	Ethylenediamine		140	148
151-56-4	Ethyleneimine		270	274
33419-42-0	Etoposide	Toposar®	990	990
7705-08-0	Ferric chloride	Iron trichloride, Iron(III) chloride	340	340
7758-94-3	Ferrous chloride	Iron (II) chloride, Iron dichloride	340	340
7782-41-4	Fluorine		350	350
462-06-6	Fluorobenzene		260	263
16872-11-0	Fluoroboric acid		370	370
16961-83-4	Fluorosilicic acid		370	370
7789-21-1	Fluorosulfonic acid		370	370
51-21-8	Fluorouracil, 5-		990	990
50-00-0	Formaldehyde		120	121
mixture	Formalin	Formalin	120	121
64-18-6	Formic acid		100	102
68476-30-2	Fuel oil		290	291
98-01-1	Furfural		120 / 270	122 / 277
96-48-0	gamma Butyrolactone			225
82410-32-0	Ganciclovir		990	990
86290-81-5	Gasoline		290	291
308066-70-8	Gasoline, E-10		290	291
95058-81-4	Gemcitabine		990	990
111-30-8	Glutaraldehyde	1,5-Pentanedial, Glutaric acid dialdehyde, Glutaric aldehyde, Gluteraldehyde, Pentanedial, 1,5-	120	121
79-14-1	Glycolic acid		100	103
68131-30-6	Green liquor		590	590
142-82-5	Heptane		290	291
87-68-3	Hexachlorobutadiene		260	264
77-47-4	Hexachlorocyclopentadiene		260	264
76-16-4	Hexafluoroethane		260	261
382-10-5	Hexafluoroisobutylene		260	261
999-97-3	Hexamethyldisilazane	Hexamethyldisilazane	140 / 480	142 / 480
822-06-0	Hexamethylene diisocyanate		210	211

CAS Number	Chemical Name	Synonym	Class	Sub-Class
mixture	Hexamethylene diisocyanate in DuPont Activator 193S		210	211
mixture	Hexamethylene diisocyanate in DuPont Activator 4505S		210	211
mixture	Hexamethylene diisocyanate in DuPont Activator 4507S		210	211
124-09-4	Hexamethylenediamine, 1,6-		140	148
110-54-3	Hexane, n-	n-Hexane	290	291
592-41-6	Hexene, 1-		290	294
108-10-1	Hexone	MIBK (Methyl isobutyl ketone), Methyl isobutyl ketone	390	391
302-01-2	Hydrazine		280	280
10217-52-4	Hydrazine hydrate		280	280
10034-85-2	Hydriodic acid		370	370
10035-10-6	Hydrobromic acid		370	370
7647-01-0	Hydrochloric acid	Muriatic acid	370	370
7664-39-3	Hydrofluoric acid		370	370
10035-10-6	Hydrogen bromide		350 / 370	350 / 370
7647-01-0	Hydrogen chloride		350	350
74-90-8	Hydrogen cyanide	HCN (Hydrogen cyanide), Hydrocyanic acid	340 / 350 / 370	345 / 350 / 370
7664-39-3	Hydrogen fluoride		350 / 370	350 / 370
7722-84-1	Hydrogen peroxide		300	300
7783-07-5	Hydrogen selenide		350	350
7783-06-4	Hydrogen sulfide		350 / 500	350 / 502
6303-21-5	Hypophosphorus acid		370	370
3778-73-2	Ilofosamide		990	990
7553-56-2	Iodine		330	330
100286-90-6	Irinotecan		990	990
123-51-3	Isoamyl alcohol		310	312
75-28-5	Isobutane		290	291
78-83-1	Isobutanol		310	311
538-93-2	Isobutylbenzene		290	292
4098-71-9	Isophorone diisocyanate		210	211
78-79-5	Isoprene		290	296
67-63-0	Isopropyl alcohol	IPA (Isopropyl alcohol), Isopropanol	310	312
75-31-0	Isopropylamine		140	141
50815-00-4	JP-4 jet fuel		290	291
94114-58-6	JP-8 jet fuel		290	291
8008-20-6	Kerosene	Jet A fuel	290	291
7439-92-1	Lead		sol	sol1
541-25-3	Lewisite		470	470
mixture	Lime		sol	sol1
58-89-9	Lindane		260	261
7447-41-8	Lithium chloride		340	340
1310-65-2	Lithium hydroxide		380	380
mixture	m-Cresol 55%, p-Cresol 30%, Phenol 15%		310	316
121-75-5	Malathion		460	462
110-16-7	Maleic acid		100	104
108-31-6	Maleic anhydride		160	161

APPENDIX CHEMICAL INDEX - Alphabetical Listing - Chemical Names and Synonyms

CAS Number	Chemical Name	Synonym	Class	Sub-Class	CAS Number	Chemical Name	Synonym	Class	Sub-Class
60-24-2	Mercaptoethanol		310 / 500	311 / 501	91-20-3	Naphthalene		290	293
7487-94-7	Mercuric chloride		340	340	91-20-3	Naphthalene		290	293
7439-97-6	Mercury		330	330	13463-39-3	Nickel carbonyl		470	470
141-79-7	Mesityl oxide		390	391	54-11-5	Nicotine		270	271
79-41-4	Methacrylic acid		100	102	7697-37-2	Nitric acid		370	370
74-82-8	Methane		290	291	52583-42-3	Nitric acid, red fuming		370	370
124-63-0	Methane sulfonyl chloride		500	505	10102-43-9	Nitric oxide		350	350
75-75-2	Methanesulfonic acid		500	504	98-95-3	Nitrobenzene		440	441
67-56-1	Methanol		310	311	88-73-3	Nitrochlorobenzene, o-		260 / 440	263 / 442
16752-77-5	Methomyl		230	233	100-00-5	Nitrochlorobenzene, p-		260 / 440	263 / 442
59-05-2	Methotrexate		990	990	10102-44-0	Nitrogen dioxide		350	350
96-33-3	Methyl acrylate		220	223	10544-72-6	Nitrogen tetroxide		350	350
74-83-9	Methyl bromide		260	261	7783-54-2	Nitrogen trifluoride		350	350
109-86-4	Methyl Cellosolve®		240 / 310	245 / 311	75-52-5	Nitromethane		440	441
110-49-6	Methyl Cellosolve® acetate		240	245	88-75-5	Nitrophenol, o-		310 / 440	316 / 442
74-87-3	Methyl chloride		260	261	100-02-7	Nitrophenol, p-		310 / 440	316 / 442
79-22-1	Methyl chloroformate		110	113	79-46-9	Nitropropane, 2-		440	441
78-93-3	Methyl ethyl ketone	MEK (Methyl ethyl ketone)	390	391	88-72-2	Nitrotoluene, o-		440	442
96-29-7	Methyl ethyl ketoxime		150	150	99-99-0	Nitrotoluene, p-		440	442
593-53-3	Methyl fluoride		260	261	10024-97-2	Nitrous oxide		350	350
107-31-3	Methyl formate		220	221	112-20-9	Nonylamine		140	141
60-34-4	Methyl hydrazine		280	280	6143-29-9	Norbornene-2-yl acetate, 5-		220	222
74-88-4	Methyl iodide		260	261	111-65-9	Octane, n-		290	291
624-83-9	Methyl isocyanate		210	211	8014-95-7	Oleum		370	370
74-93-1	Methyl mercaptan		500	501	mixture	Organo-Tin Paint		470	470
80-62-6	Methyl methacrylate		220	223	106602-80-6	Otto fuel II		590	590
298-00-0	Methyl parathion		460	462	144-62-7	Oxalic acid		100	104
119-36-8	Methyl salicylate		220	226	63121-00-6	Oxaliplatin		990	990
1634-04-4	Methyl tert-butyl ether		240	241	33069-62-4	Paclitaxel	Taxol	990	990
75-79-6	Methyl trichlorosilane		480	480	104-49-4	Paraphenylene diisocyanate (PPDI) crude		210	212
4553-62-2	Methyl-1,5-pentanedinitrile, 2-	Methylglutaronitrile, 2-	430	431	mixture	PCB	Polychlorinated biphenyl	260	263
872-50-4	Methyl-2-pyrrolidone, N-		130	132	mixture	PCB 1254	Polychlorinated biphenyl 1254	260	263
74-89-5	Methylamine		140	141	11097-69-1	PCB 1254	Polychlorinated biphenyl 1254	260	263
103-67-3	Methylbenzylamine	Benzyl (Methyl) amine	140	142	mixture	PCB gas condensate		260	263
101-14-4	Methylene bis (o-chloroaniline), 4,4'-		140	149	mixture	PCB in transformer oil		260	263
1761-71-3	Methylene bis-cyclohexane diamine, 4,4'-		140	148	87-86-5	Pentachlorophenol		310	316
74-95-3	Methylene bromide		260	261	71-41-0	Pentanol, n-		310	311
101-77-9	Methylene dianiline, 4,4'-		140	145 / 149	13284-42-9	Pentenenitrile, 2-		430	431
123-39-7	Methylformamide, N-		130	132	4635-87-4	Pentenenitrile, 3-		430	431
8012-95-1	Mineral oil		290	291	7601-90-3	Perchloric acid		370	370
64475-85-0	Mineral spirits		290	291	2062-98-8	Perfluoro-2-propoxy propionyl fluoride	2-(Hepta Fluoro Propoxy) Tetra Fluoro Propionyl Fluoride, HFPO Dimer	110 / 240 / 260	110 / 240 / 260
50-07-7	Mitomycin		990	990	60-12-8	Phenethyl alcohol, 2-		310	318
110-91-8	Morpholine		140	142	108-95-2	Phenol		310	316
3887-02-3	N-Methylmethacrylamide	Methylmethacrylamide, N-	130	135	122-60-1	Phenyl glycidyl ether		270	275
109-02-4	N-Methylmorpholine (NMM)	NMM (N-Methylmorpholine)	140	142	108-98-5	Phenyl mercaptan		500	501

APPENDIX
CHEMICAL INDEX - Alphabetical Listing - Chemical Names and Synonyms

CAS Number	Chemical Name	Synonym	Class	Sub-Class	CAS Number	Chemical Name	Synonym	Class	Sub-Class
98-85-1	Phenylethanol, 1-		310	318	5329-14-6	Sulfamic acid		370 / 500	370 / 509
75-44-5	Phosgene		350	350	7791-25-5	Sulfonyl chloride		350 / 360	350 / 360
7803-51-2	Phosphine		350	350	7446-09-5	Sulfur dioxide		350 / 360	350 / 365
7664-38-2	Phosphoric acid		370	370	2551-62-4	Sulfur hexafluoride		350 / 500	350 / 509
10025-87-3	Phosphorus oxychloride		360	360	10025-67-9	Sulfur monochloride	Disulfur dichloride, Sulfur chloride	500	502
7719-12-2	Phosphorus trichloride		360	360	505-60-2	Sulfur mustard		500	502
109-06-8	Picoline, 2-		270	271	7446-11-9	Sulfur trioxide		360	365
108-99-6	Picoline, 3-		270	271	7664-93-9	Sulfuric acid		370	370
24991-55-7	Polyethylene glycol dimethyl ether	Selexol	240	245	mixture	t-Sodium-amylate / t-amyl alcohol		590	590
9016-87-9	Polymethylene polyphenyl-polyisocyanate		210	212	77-81-6	Tabun		460	462
127-08-2	Potassium acetate		340	340	75-65-0	tert-Butyl alcohol	Butyl alcohol, tert-	310	313
584-08-7	Potassium carbonate		340	340	79-27-6	Tetrabromoethane		260	261
7789-00-6	Potassium chromate		340	340	79-95-8	Tetrachloro-bisphenol -A, 2,2',6,6'	Tetrachloro-bisphenol -A, 2,2',6,6'	260 / 310	263 / 316
151-50-8	Potassium cyanide		340	345	79-34-5	Tetrachloroethane, 1,1,2,2-		260	261
1310-58-3	Potassium hydroxide	Caustic potash, KOH (Potassium hydroxide), Potash lye	380	380	127-18-4	Tetrachloroethylene, 1,1,2,2-	1,1,2,2-Tetrachloroethylene	260	264
7722-64-7	Potassium permanganate		340	340	78-10-4	Tetraethoxysilane		480	480
74-98-6	Propane		290	291	77-98-5	Tetraethyl Ammonium Hydroxide	Tetraethylammonium hydroxide; N,N,N,	550	550
107-19-7	Propargyl alcohol	2-Propyn-1-ol, Propyn-1-ol, 2-	310	311	78-00-2	Tetraethyl lead		470	470
123-38-6	Propionaldehyde		120	121	112-57-2	Tetraethylenepentamine		140	148
79-09-4	Propionic acid		100	102	811-97-2	Tetrafluoroethane, 1,1,1,2-		260	261
107-10-8	Propylamine, n-		140	141	75-73-0	Tetrafluoromethane		260	261
106-94-5	Propylbromide, n-	1-Bromopropane, 1-Propyl bromide, Bromopropane, 1-, Propyl bromide, 1-, n-Propylbromide	260	261	109-99-9	Tetrahydrofuran		240	241
78-87-5	Propylene dichloride		260	261	529-34-0	Tetralone		290	292
75-55-8	Propylene imine		270	274	75-59-2	Tetramethylammonium hydroxide		550	550
75-56-9	Propylene oxide, 1,2-		270	275	5076-20-0	Tetramethylethylene oxide		270	275
110-86-1	Pyridine		270	271	110-18-9	Tetramethylethylenediamine (TMEDA)	TMEDA (Tetramethylethylenediamine)	140	148
123-75-1	Pyrrolidine		270	274	mixture	Tetramethyltin		590	590
107-44-8	Sarin		460	462	68-11-1	Thioglycolic acid		100 / 500	103 / 501
7803-62-5	Silane		480	480	7719-09-7	Thionyl chloride		360	360
10026-04-7	Silicon tetrachloride		360 / 480	360 / 480	52-24-4	Thiotepa		990	990
95660-51-8	Skydrol®		460	462	7550-45-0	Titanium tetrachloride		360	360
7647-14-5	Sodium chloride		990	990	108-88-3	Toluene		290	292
143-33-9	Sodium cyanide		340	345	26471-62-5	Toluene-1,3-diisocyanate		210	212
10588-01-9	Sodium dichromate		340	340	584-84-9	Toluene-2,4-diisocyanate		210	212
7681-49-4	Sodium fluoride		340	340	108-44-1	Toluidine, m-		140	145
16721-80-5	Sodium hydrosulfide		340	340	95-53-4	Toluidine, o-		140	145
1310-73-2	Sodium hydroxide	Caustic soda, Lye, NaOH (Sodium hydroxide)	380	380 / 591 / 592	156-60-5	trans-1,2-Dichloroethylene		260	264
7681-52-9	Sodium hypochlorite		340	340	110-57-6	trans-1,4-Dichloro-2-butene		260	264
7681-57-4	Sodium metabisulfite	Sodium disulfite, Sodium pyrosulfite	340	340	123-73-9	trans-Crotonaldehyde		120	121
124-41-4	Sodium methylate		550	550	118-79-6	Tribromophenol,2,4,6-	Tribromophenol, 2,4,6-	310	316
6834-92-0	Sodium silicate		340	340	102-82-9	Tributylamine		140	143
1313-82-2	Sodium sulfide	Disodium sulfide	340	340	76-13-1	Trichloro-1,2,2-trifluoroethane, 1,1,2-	1,1,2-Trichloro-1,2,2-trifluoroethane	260	261
96-64-0	Soman		460	462	76-03-9	Trichloroacetic acid		100	103
8052-41-3	Stoddard solvent		290	291	921-03-9	Trichloroacetone, 1,1,3-		260 / 390	261 / 391
100-42-5	Styrene		290	292	120-82-1	Trichlorobenzene, 1,2,4-		260	263

APPENDIX
CHEMICAL INDEX - Alphabetical Listing - Chemical Names and Synonyms

CAS Number	Chemical Name	Synonym	Class	Sub-Class
71-55-6	Trichloroethane, 1,1,1-		260	261
79-00-5	Trichloroethane, 1,1,2-		260	261
115-20-8	Trichloroethanol, 2,2,2-		310	315
79-01-6	Trichloroethylene		260	264
98-13-5	Trichlorophenylsilane		480	480
10025-78-2	Trichlorosilane		480	480
75-94-5	Trichlorovinylsilane		480	480
998-30-1	Triethoxysilane		480	480
97-93-8	Triethylaluminum		470	470
121-44-8	Triethylamine		140	143
112-24-3	Triethylenetetramine			
76-05-1	Trifluoroacetic acid		100 / 260	103 / 261
354-32-5	Trifluoroacetyl chloride		110	111
75-89-8	Trifluoroethanol, 2,2,2-		310	315
75-46-7	Trifluoromethane		260	261
1493-13-6	Trifluoromethane sulfonic acid		500	504
512-56-1	Trimethyl phosphate		460	462
121-45-9	Trimethyl phosphite		460	462
75-50-3	Trimethylamine		140	143
526-73-8	Trimethylbenzene, 1,2,3-		290	292
101-02-0	Triphenyl phosphite		460	462
102-69-2	Tripropylamine		140	143
7783-82-6	Tungsten hexafluoride		350	350
8006-64-2	Turpentine		290	294
7632-51-1	Vanadium tetrachloride		360	360
2068-78-2	Vincristine sulfate		990	990
71486-22-1	Vinorelbine		990	990
108-05-4	Vinyl acetate		220	222
593-60-2	Vinyl bromide		260	264
75-01-4	Vinyl chloride		260	264
75-35-4	Vinylidene chloride	Dichloroethylene, 1,1-	260	264
3536-96-7	Vinylmagnesium chloride		470	470
100-43-6	Vinylpyridine, 4-		270	271
8030-30-6	VM&P Naphtha		290	291
50782-69-9	VX Nerve agent		460	462
68131-33-9	White liquor		590	590
1330-20-7	Xylene, mixed isomers		290	292
95-47-6	Xylene, o-		290	292
95-68-1	Xylidin, 2,4-		140	145

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	75-01-4	Vinyl chloride		260	264
50-07-7	Mitomycin		990	990	75-04-7	Ethylamine		140	141
50-18-0	Cyclophosphamide		990	990	75-05-8	Acetonitrile		430	431
51-21-8	Fluorouracil, 5-		990	990	75-07-0	Acetaldehyde		120	121
52-24-4	Thiotepa		990	990	75-08-1	Ethyl Mercaptan	Ethanethiol	500	501
54-11-5	Nicotine		270	271	75-09-2	Dichloromethane	Methylene chloride	260	261
56-23-5	Carbon tetrachloride		260	261	75-15-0	Carbon disulfide		500	502
56-38-2	Ethyl parathion		460	462	75-18-3	Dimethyl sulfide		500	502
57-14-7	Dimethylhydrazine, 1,1-		280	280	75-21-8	Ethylene oxide	Dimethylene oxide, Epoxyethane	270	275
57-74-9	Chlordane		260	261	75-28-5	Isobutane		290	291
58-89-9	Lindane		260	261	75-31-0	Isopropylamine		140	141
59-05-2	Methotrexate		990	990	75-35-4	Vinylidene chloride	Dichloroethylene, 1,1-	260	264
60-12-8	Phenethyl alcohol, 2-		310	318	75-36-5	Acetyl chloride		110	111
60-24-2	Mercaptoethanol		310 / 500	311 / 501	75-44-5	Phosgene		350	350
60-29-7	Ethyl ether		240	241	75-46-7	Trifluoromethane		260	261
60-34-4	Methyl hydrazine		280	280	75-50-3	Trimethylamine		140	143
62-53-3	Aniline		140	145	75-52-5	Nitromethane		440	441
62-75-9	Dimethyl nitrosamine		450	450	75-55-8	Propylene imine		270	274
64-17-5	Ethyl alcohol	Ethanol, Ethyl hydroxide	310	311	75-56-9	Propylene oxide, 1,2-		270	275
64-18-6	Formic acid		100	102	75-59-2	Tetramethylammonium hydroxide		550	550
64-19-7	Acetic acid		100	102	75-64-9	Butylamine, tert-	tert-Butylamine	140	141
64-67-5	Diethyl sulfate		500	507	75-65-0	Butanol tert.	2-methyl 2-propanol	310	313
67-56-1	Methanol		310	311	75-65-0	tert-Butyl alcohol	Butyl alcohol, tert-	310	313
67-63-0	Isopropyl alcohol	IPA (Isopropyl alcohol), Isopropanol	310	312	75-73-0	Tetrafluoromethane		260	261
67-64-1	Acetone		390	391	75-75-2	Methanesulfonic acid		500	504
67-66-3	Chloroform		260	261	75-78-5	Dimethyldichlorosilane		480	480
67-68-5	Dimethyl sulfoxide		500	503	75-79-6	Methyl trichlorosilane		480	480
68-11-1	Thioglycolic acid		100 / 500	103 / 501	75-86-5	Acetone cyanohydrin		310 / 430	313 / 431
68-12-2	Dimethylformamide, N,N-	N,N-Dimethylformamide	130	132	75-89-8	Trifluoroethanol, 2,2,2-		310	315
71-36-3	Butanol, n-		310	311	75-94-5	Trichlorovinylsilane		480	480
71-41-0	Pentanol, n-		310	311	76-03-9	Trichloroacetic acid		100	103
71-43-2	Benzene		290	292	76-05-1	Trifluoroacetic acid		100 / 260	103 / 261
71-55-6	Trichloroethane, 1,1,1-		260	261	76-06-2	Chloropicrin		260	261
74-82-8	Methane		290	291	76-13-1	Trichloro-1,2,2-trifluoroethane, 1,1,2-	1,1,2-Trichloro-1,2,2-trifluoroethane	260	261
74-83-9	Methyl bromide		260	261	76-16-4	Hexafluoroethane		260	261
74-85-1	Ethylene		290	294	77-47-4	Hexachlorocyclopentadiene		260	264
74-87-3	Methyl chloride		260	261	77-78-1	Dimethyl sulfate		500	507
74-88-4	Methyl iodide		260	261	77-81-6	Tabun		460	462
74-89-5	Methylamine		140	141	77-92-9	Citric acid		100	104
74-90-8	Hydrogen cyanide	HCN (Hydrogen cyanide), Hydrocyanic acid	340 / 350 / 370	345 / 350 / 370	77-98-5	Tetraethyl Ammonium Hydroxide	Tetraethylammonium hydroxide; N,N,N,	550	550
74-93-1	Methyl mercaptan		500	501	78-00-2	Tetraethyl lead		470	470
74-95-3	Methylene bromide		260	261	78-10-4	Tetraethoxysilane		480	480
74-97-5	Bromochloromethane		260	261	78-79-5	Isoprene		290	296
74-98-6	Propane		290	291	78-83-1	Isobutanol		310	311
75-00-3	Ethyl chloride		260	261	78-87-5	Propylene dichloride		260	261

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
78-88-6	Dichloropropene, 2,3-	Dichloropropene,2,3-	260	261	97-93-8	Triethylaluminum		470	470
78-93-3	Methyl ethyl ketone	MEK (Methyl ethyl ketone)	390	391	98-01-1	Furfural		120 / 270	122 / 277
78-95-5	Chloroacetone		390	391	98-07-7	Benzotrithloride		260	263
79-00-5	Trichloroethane, 1,1,2-		260	261	98-09-9	Benzene sulfonyl chloride		500	505
79-01-6	Trichloroethylene		260	264	98-13-5	Trichlorophenylsilane		480	480
79-04-9	Chloroacetyl chloride		110	111	98-56-6	Chloro-benzotrifluoride, 4-		260	263
79-06-1	Acrylamide		130	135	98-82-8	Cumene		290	292
79-09-4	Propionic acid		100	102	98-85-1	Phenylethanol, 1-		310	318
79-10-7	Acrylic acid		100	102	98-88-4	Benzoyl chloride		110	112
79-11-8	Chloroacetic acid		100	103	98-95-3	Nitrobenzene		440	441
79-14-1	Glycolic acid		100	103	99-99-0	Nitrotoluene, p-		440	442
79-22-1	Methyl chloroformate		110	113	100-00-5	Nitrochlorobenzene, p-		260 / 440	263 / 442
79-27-6	Tetrabromoethane		260	261	100-02-7	Nitrophenol, p-		310 / 440	316 / 442
79-34-5	Tetrachloroethane, 1,1,2,2-		260	261	100-41-4	Ethyl benzene		290	292
79-36-7	Dichloroacetyl chloride		110	111	100-42-5	Styrene		290	292
79-41-4	Methacrylic acid		100	102	100-43-6	Vinylpyridine, 4-		270	271
79-46-9	Nitropropane, 2-		440	441	100-44-7	Benzyl chloride		260	266
79-95-8	Tetrachloro-bisphenol -A, 2,2',6,6'	Tetrachloro-bisphenol -A, 2,2',6,6'	260 / 310	263 / 316	100-47-0	Benzonitrile		430	432
80-62-6	Methyl methacrylate		220	223	100-51-6	Benzyl alcohol		310	312
87-68-3	Hexachlorobutadiene		260	264	101-02-0	Triphenyl phosphite		460	462
87-86-5	Pentachlorophenol		310	316	101-14-4	Methylene bis (o-chloroaniline), 4,4'-		140	149
88-72-2	Nitrotoluene, o-		440	442	101-68-8	Diphenylmethane Diisocyanate 4,4-	Methylene diphenyl isocyanate	210	212
88-73-3	Nitrochlorobenzene, o-		260 / 440	263 / 442	101-77-9	Methylene dianiline, 4,4'-		140	145 / 149
88-75-5	Nitrophenol, o-		310 / 440	316 / 442	102-69-2	Tripropylamine		140	143
91-20-3	Naphthalene		290	293	102-82-9	Tributylamine		140	143
91-20-3	Naphthalene		290	293	103-67-3	Methylbenzylamine	Benzyl (Methyl) amine	140	142
91-66-7	Diethylaniline		140	146	104-49-4	Paraphenylene diisocyanate (PPDI) crude		210	212
91-66-7	Diethylaniline crude		140	146	106-46-7	Dichlorobenzene, 1,4	Dichlorobenzene, 1,4-	260	263
91-67-8	Diethyl-m-toluidine crude		140	145	106-47-8	Chloroaniline, p-	Chloroaniline, 4-	140	145
92-67-1	Aminodiphenyl, 4-		140	145	106-48-9	Chlorophenol, 4-		260 / 310	263 / 316
92-87-5	Benzidine		140	145 / 149	106-88-7	Butylene oxide, 1,2-		270	275
95-47-6	Xylene, o-		290	292	106-89-8	Epichlorohydrin		260 / 270	261 / 275
95-48-7	Cresol, o-		310	316	106-93-4	Ethylene dibromide		260	261
95-49-8	Chlorotoluene, o-		260	263	106-94-5	Propylbromide, n-	1-Bromopropane, 1-Propyl bromide, Bromopropane, 1-, Propyl bromide, 1-, n-Propylbromide	260	261
95-50-1	Dichlorobenzene, 1,2-		260	263	106-99-0	Butadiene, 1,3-	1,3-Butadiene	290	296
95-53-4	Toluidine, o-		140	145	107-02-8	Acrolein		120	121
95-68-1	Xylidin, 2,4-		140	145	107-05-1	Allyl chloride		260	265
95-76-1	Dichloroaniline, 3,4-		140 / 260	145 / 263	107-06-2	Ethylene dichloride	1,2-Dichloroethane	260	261
96-12-8	Dibromo-3-chloropropane, 1,2-		260	261	107-07-3	Chloroethanol, 2-		260 / 310	261 / 315
96-24-2	Chloro-1,2-propanediol, 3-		310	314	107-10-8	Propylamine, n-		140	141
96-29-7	Methyl ethyl ketoxime		150	150	107-13-1	Acrylonitrile		430	431
96-33-3	Methyl acrylate		220	223	107-15-3	Ethylenediamine		140	148
96-48-0	gamma Butyrolactone			225	107-18-6	Allyl alcohol		310	311
96-64-0	Soman		460	462	107-19-7	Propargyl alcohol	2-Propyn-1-ol, Propyn-1-ol, 2-	310	311
97-63-2	Ethyl methacrylate		220	223	107-21-1	Ethylene glycol		310	314

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
107-30-2	Chloromethyl methyl ether		240	241	112-20-9	Nonylamine		140	141
107-31-3	Methyl formate		220	221	112-24-3	Triethylenetetramine			
107-44-8	Sarin		460	462	112-34-5	2-(2-Butoxyethoxy)-ethanol	Butyl Carbitol, DEG Monobutyl Ether, Diethylene Glycol Monobutyl Ether	240 / 310	245 / 311
107-92-6	Butyric acid		100	102	112-57-2	Tetraethylenepentamine		140	148
108-05-4	Vinyl acetate		220	222	115-10-6	Dimethyl ether		240	241
108-10-1	Hexone	MIBK (Methyl isobutyl ketone), Methyl isobutyl ketone	390	391	115-20-8	Trichloroethanol, 2,2,2-		310	315
108-24-7	Acetic anhydride		160	161	117-81-7	Diethylhexyl phthalate		220	226
108-31-6	Maleic anhydride		160	161	118-79-6	Tribromophenol, 2,4,6-	Tribromophenol, 2,4,6-	310	316
108-44-1	Toluidine, m-		140	145	119-36-8	Methyl salicylate		220	226
108-77-0	Cyanuric chloride		260	263	120-12-7	Anthracene		290	293
108-88-3	Toluene		290	292	120-82-1	Trichlorobenzene, 1,2,4-		260	263
108-90-7	Chlorobenzene		260	263	121-44-8	Triethylamine		140	143
108-91-8	Cyclohexylamine		140	141	121-45-9	Trimethyl phosphite		460	462
108-94-1	Cyclohexanone		390	391	121-69-7	Dimethylaniline, N,N-		140	146
108-95-2	Phenol		310	316	121-75-5	Malathion		460	462
108-98-5	Phenyl mercaptan		500	501	122-60-1	Phenyl glycidyl ether		270	275
108-99-6	Picoline, 3-		270	271	123-38-6	Propionaldehyde		120	121
109-02-4	N-Methylmorpholine (NMM)	NMM (N-Methylmorpholine)	140	142	123-39-7	Methylformamide, N-		130	132
109-06-8	Picoline, 2-		270	271	123-51-3	Isoamyl alcohol		310	312
109-63-7	Boron trifluoride etherate		590	590	123-72-8	Butyraldehyde, n-	Butanal	120	121
109-73-9	Butylamine, n-	1-Aminobutane, Aminobutane, 1-, Butan-1-amine	140	141	123-73-9	trans-Crotonaldehyde		120	121
109-86-4	Methyl Cellosolve®		240 / 310	245 / 311	123-75-1	Pyrrolidine		270	274
109-89-7	Diethylamine		140	142	123-86-4	Butyl acetate, n-		220	222
109-92-2	Ethyl vinyl ether		240 / 260	246 / 261	123-91-1	Dioxane, 1,4-		270	278
109-99-9	Tetrahydrofuran		240	241	124-09-4	Hexamethylenediamine, 1,6-		140	148
110-16-7	Maleic acid		100	104	124-40-3	Dimethylamine		140	142
110-18-9	Tetramethylethylenediamine (TMEDA)	TMEDA (Tetramethylethylenediamine)	140	148	124-41-4	Sodium methylate		550	550
110-49-6	Methyl Cellosolve® acetate		240	245	124-63-0	Methane sulfonyl chloride		500	505
110-51-0	Borane-pyridine complex		590	590	126-99-8	Chloro-1,3-butadiene, 2-		260	264
110-54-3	Hexane, n-	n-Hexane	290	291	127-08-2	Potassium acetate		340	340
110-57-6	trans-1,4-Dichloro-2-butene		260	264	127-18-4	Tetrachloroethylene, 1,1,2,2-	1,1,2,2-Tetrachloroethylene	260	264
110-80-5	Ethyl Cellosolve®		240	245	127-19-5	Dimethylacetamide, N,N-	DMAc, N,N-	130	132
110-82-7	Cyclohexane		290	291	140-29-4	Benzyl cyanide		430	432
110-86-1	Pyridine		270	271	140-31-8	Aminoethylpiperazine		140 / 270	148 / 274
110-91-8	Morpholine		140	142	140-88-5	Ethyl acrylate		220	223
111-15-9	Ethyl Cellosolve® acetate		240	245	141-32-2	Butyl acrylate, n-		220	223
111-30-8	Glutaraldehyde	1,5-Pentanedial, Glutaric acid dialdehyde, Glutaric aldehyde, Glutaraldehyde, Pentanedial, 1,5-	120	121	141-43-5	Ethanolamine		140 / 310	141 / 311
111-40-0	Diethylenetriamine		140	148	141-78-6	Ethyl acetate		220	222
111-41-1	Aminoethylethanolamine	N-Aminoethyl ethanolamine	140 / 310	148 / 311	141-79-7	Mesityl oxide		390	391
111-42-2	Diethanolamine		140	142	142-82-5	Heptane		290	291
111-44-4	Dichloroethyl ether		240 / 260	241 / 261	142-96-1	Butyl ether, n-		240	241
111-65-9	Octane, n-		290	291	143-33-9	Sodium cyanide		340	345
111-69-3	Adiponitrile		430	431	144-62-7	Oxalic acid		100	104
111-76-2	Butyl Cellosolve®		240	245	151-50-8	Potassium cyanide		340	345
111-90-0	(2-Ethoxyethoxy)-ethanol, 2-		240	245	151-56-4	Ethyleneimine		270	274

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

CAS Number	Chemical Name	Synonym	Class	Sub-Class
154-93-8	Carmustine		990	990
156-60-5	trans-1,2-Dichloroethylene		260	264
298-00-0	Methyl parathion		460	462
302-01-2	Hydrazine		280	280
353-42-4	Boron trifluoride dimethyletherate		590	590
354-32-5	Trifluoroacetyl chloride		110	111
382-10-5	Hexafluoroisobutylene		260	261
460-00-4	Bromofluorobenzene, 4-		260	263
461-82-5	Aniline, 4-trifluoromethoxy		140 / 240	145 / 242
462-06-6	Fluorobenzene		260	263
501-53-1	Benzyl chloroformate		110	113
504-29-0	Aminopyridine, 2-		270	271
505-60-2	Sulfur mustard		500	502
506-77-4	Cyanogen chloride	CK (Cyanogen chloride)	340	345
512-56-1	Trimethyl phosphate		460	462
526-73-8	Trimethylbenzene, 1,2,3-		290	292
529-34-0	Tetralone		290	292
532-27-4	Chloroacetophenone		260	261
534-07-6	Dichloroacetone		260 / 390	261 / 391
534-52-1	Dinitrocresol		310 / 440	316 / 442
538-93-2	Isobutylbenzene		290	292
541-25-3	Lewisite		470	470
541-73-1	Dichlorobenzene, 1,3-		260	263
542-75-6	Dichloropropene, 1,3-		260	261
584-08-7	Potassium carbonate		340	340
584-84-9	Toluene-2,4-diisocyanate		210	212
592-41-6	Hexene, 1-		290	294
593-53-3	Methyl fluoride		260	261
593-60-2	Vinyl bromide		260	264
593-74-8	Dimethyl mercury in decane		470	470
624-48-6	Dimethylmaleate		220	224
624-83-9	Methyl isocyanate		210	211
624-92-0	Dimethyl disulfide		500	502
628-63-7	Amyl acetate, n-		220	222
630-08-0	Carbon monoxide		350	350
755-95-3	Diiodo-1,1,2,2-tetrafluorobutane, 1,4-		260	261
764-41-0	Dichloro-2-butene, 1,4-		260	264
811-97-2	Tetrafluoroethane, 1,1,1,2-		260	261
814-68-6	Acryloyl Chloride	Acrylic Acid Chloride	110	111
818-61-1	Ethylene glycol acrylate		220	223
822-06-0	Hexamethylene diisocyanate		210	211
872-50-4	Methyl-2-pyrrolidone, N-		130	132
920-37-6	Chloroacrylonitrile, 2-		260 / 430	264 / 431
921-03-9	Trichloroacetone, 1,1,3-		260 / 390	261 / 391
998-30-1	Triethoxysilane		480	480

CAS Number	Chemical Name	Synonym	Class	Sub-Class
999-97-3	Hexamethyldisilazane	Hexamethyldisilazane	140 / 480	142 / 480
1310-58-3	Potassium hydroxide	Caustic potash, KOH (Potassium hydroxide), Potash lye	380	380
1310-65-2	Lithium hydroxide		380	380
1310-73-2	Sodium hydroxide	Caustic soda, Lye, NaOH (Sodium hydroxide)	380	380 / 591 / 592
1313-82-2	Sodium sulfide	Disodium sulfide	340	340
1319-77-3	Cresol, mixed isomers		310	316
1330-20-7	Xylene, mixed isomers		290	292
1332-21-4	Asbestos (all forms)		sol	sol1
1333-82-0	Chromic acid		370	370
1336-21-6	Ammonium hydroxide		380	380
1341-49-7	Ammonium Bifluoride	Ammonium Hydrofluoride, Ammonium Hydrogen Difluoride	340	340
1493-13-6	Trifluoromethane sulfonic acid		500	504
1552-12-1	Cyclooctadiene		290	296
1634-04-4	Methyl tert-butyl ether		240	241
1675-54-3	Bisphenol-A diglycidyl ether		270	275
1761-71-3	Methylene bis-cyclohexane diamine, 4,4'-		140	148
2062-98-8	Perfluoro-2-propoxy propionyl fluoride	2-(Hepta Fluoro Propoxy) Tetra Fluoro Propionyl Fluoride, HFPO Dimer	110 / 240 / 260	110 / 240 / 260
2068-78-2	Vincristine sulfate		990	990
2551-62-4	Sulfur hexafluoride		350 / 500	350 / 509
3173-53-3	Cyclohexyl isocyanate		210	211
3536-96-7	Vinylmagnesium chloride		470	470
3778-73-2	Ilfosfamide		990	990
3887-02-3	N-Methylmethacrylamide	Methylmethacrylamide, N-	130	135
4098-71-9	Isophorone diisocyanate		210	211
4109-96-0	Dichlorosilane		480	480
4553-62-2	Methyl-1,5-pentantenedinitrile, 2-	Methylglutaronitrile, 2-	430	431
4635-87-4	Pentenenitrile, 3-		430	431
5076-20-0	Tetramethylethylene oxide		270	275
5216-25-1	Chlorobenzotrithloride, 4-		260	263
5329-14-6	Sulfamic acid		370 / 500	370 / 509
5394-63-8	Diketene Acetone		220 / 240 / 270 / 390	223 / 244 / 278 / 390
5989-27-5	d-Limonene		290	296
6143-29-9	Norbomene-2-yl acetate, 5-		220	222
6303-21-5	Hypophosphorus acid		370	370
6834-92-0	Sodium silicate		340	340
7087-68-5	Diisopropylethylamine (DIPEA)	DIPEA (Diisopropylethylamine)	140	141
7439-92-1	Lead		sol	sol1
7439-97-6	Mercury		330	330
7440-41-7	Beryllium		sol	sol1
7446-09-5	Sulfur dioxide		350 / 360	350 / 365
7446-11-9	Sulfur trioxide		360	365
7447-41-8	Lithium chloride		340	340
7487-94-7	Mercuric chloride		340	340
7550-45-0	Titanium tetrachloride		360	360
7553-56-2	Iodine		330	330

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
7601-90-3	Perchloric acid		370	370	8030-30-6	VM&P Naphtha		290	291
7632-51-1	Vanadium tetrachloride		360	360	8052-41-3	Stoddard solvent		290	291
7637-07-2	Boron trifluoride		350 / 360	350 / 360	9016-87-9	Polymethylene polyphenyl-polyisocyanate		210	212
7647-01-0	Hydrochloric acid	Muriatic acid	370	370	10024-97-2	Nitrous oxide		350	350
7647-01-0	Hydrogen chloride		350	350	10025-67-9	Sulfur monochloride	Disulfur dichloride, Sulfur chloride	500	502
7647-14-5	Sodium chloride		990	990	10025-78-2	Trichlorosilane		480	480
7647-18-9	Antimony pentachloride		360	360	10025-87-3	Phosphorus oxychloride		360	360
7664-38-2	Phosphoric acid		370	370	10026-04-7	Silicon tetrachloride		360 / 480	360 / 480
7664-39-3	Hydrofluoric acid		370	370	10034-85-2	Hydriodic acid		370	370
7664-39-3	Hydrogen fluoride		350 / 370	350 / 370	10035-10-6	Hydrobromic acid		370	370
7664-41-7	Ammonia	Anhydrous ammonia	350 / 380	350 / 380	10035-10-6	Hydrogen bromide		350 / 370	350 / 370
7664-93-9	Sulfuric acid		370	370	10043-52-4	Calcium chloride		340	340
7681-49-4	Sodium fluoride		340	340	10049-04-4	Chlorine dioxide		350	350
7681-52-9	Sodium hypochlorite		340	340	10102-43-9	Nitric oxide		350	350
7681-57-4	Sodium metabisulfite	Sodium disulfite, Sodium pyrosulfite	340	340	10102-44-0	Nitrogen dioxide		350	350
7697-37-2	Nitric acid		370	370	10217-52-4	Hydrazine hydrate		280	280
7705-08-0	Ferric chloride	Iron trichloride, Iron(III) chloride	340	340	10294-34-5	Boron trichloride		350 / 360	350 / 360
7719-09-7	Thionyl chloride		360	360	10544-72-6	Nitrogen tetroxide		350	350
7719-12-2	Phosphorus trichloride		360	360	10545-99-0	Chlorine sulfide	Sulfur dichloride	500	502
7722-64-7	Potassium permanganate		340	340	10588-01-9	Sodium dichromate		340	340
7722-84-1	Hydrogen peroxide		300	300	11097-69-1	PCB 1254	Polychlorinated biphenyl 1254	260	263
7726-95-6	Bromine		330	330	12125-01-8	Ammonium fluoride		340	340
7758-94-3	Ferrous chloride	Iron (II) chloride, Iron dichloride	340	340	12125-02-9	Ammonium chloride		340	340
7782-41-4	Fluorine		350	350	13284-42-9	Pentenenitrile, 2-		430	431
7782-50-5	Chlorine		330 / 350	330 / 350	13463-39-3	Nickel carbonyl		470	470
7783-06-4	Hydrogen sulfide		350 / 500	350 / 502	15520-10-2	Dytek® A		140	148
7783-07-5	Hydrogen selenide		350	350	15663-27-1	Cisplatin		990	990
7783-54-2	Nitrogen trifluoride		350	350	16721-80-5	Sodium hydrosulfide		340	340
7783-82-6	Tungsten hexafluoride		350	350	16752-77-5	Methomyl		230	233
7784-34-1	Arsenic trichloride		340	340	16872-11-0	Fluoroboric acid		370	370
7784-42-1	Arsine		350	350	16961-83-4	Fluorosilicic acid		370	370
7789-00-6	Potassium chromate		340	340	17927-65-0	Aluminum sulfate hydrate		340	340
7789-21-1	Fluorosulfonic acid		370	370	19287-45-7	Diborane		350	350
7790-91-2	Chlorine trifluoride		350	350	24991-55-7	Polyethylene glycol dimethyl ether	Selexol	240	245
7790-94-5	Chlorosulfonic acid		370 / 500	370 / 504	25136-40-9	Doxorubicin HCl		990	990
7791-25-5	Sulfonyl chloride		350 / 360	350 / 360	25340-17-4	Diethylbenzene		290	290
7803-51-2	Phosphine		350	350	25899-50-7	cis-2-Pentenenitrile		430	431
7803-62-5	Silane		480	480	26471-62-5	Toluene-1,3-diisocyanate		210	212
8001-58-9	Creosote		310	316	30894-74-7	Dichloro-6-isopropyl-S-triazine, 2,4-		270	274
8002-05-9	Crude oil		290	294	33069-62-4	Paclitaxel	Taxol	990	990
8004-13-5	Dowtherm heat transfer fluid		590	590	33419-42-0	Etoposide	Toposar®	990	990
8006-64-2	Turpentine		290	294	50782-69-9	VX Nerve agent		460	462
8008-20-6	Kerosene	Jet A fuel	290	291	50815-00-4	JP-4 jet fuel		290	291
8012-95-1	Mineral oil		290	291	52583-42-3	Nitric acid, red fuming		370	370
8014-95-7	Oleum		370	370	63121-00-6	Oxaliplatin		990	990

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

CAS Number	Chemical Name	Synonym	Class	Sub-Class
64475-85-0	Mineral spirits		290	291
68131-30-6	Green liquor		590	590
68131-33-9	White liquor		590	590
68334-30-5	Diesel fuel		290	291
68476-30-2	Fuel oil		290	291
71486-22-1	Vinorelbine		990	990
82410-32-0	Ganciclovir		990	990
86290-81-5	Gasoline		290	291
94114-58-6	JP-8 jet fuel		290	291
95058-81-4	Gemcitabine		990	990
95660-51-8	Skydrol®		460	462
100286-90-6	Irinotecan		990	990
106602-80-6	Otto fuel II		590	590
191681-14-8	AFFF		590	590
308066-70-8	Gasoline, E-10		290	291
308074-23-9	Black liquor		590	590
441575-94-4	Carboplatin		990	990
mixture	Astromat Orange			590
mixture	Chemidize 727 ND		590	590
mixture	Crude oil on wildlife		liq	liq4
mixture	Decontaminating agent (DS-2)		590	590
mixture	Diesel automotive test fuel		290	291
mixture	DuPont Activator 193S		590	590
mixture	DuPont Activator 4505S		590	590
mixture	DuPont Activator 4507S		590	590
mixture	Ethylene oxide mixture		270	275
mixture	Formalin	Formalin	120	121
mixture	Hexamethylene diisocyanate in DuPont Activator 193S		210	211
mixture	Hexamethylene diisocyanate in DuPont Activator 4505S		210	211
mixture	Hexamethylene diisocyanate in DuPont Activator 4507S		210	211
mixture	Lime		sol	sol1
mixture	Organo-Tin Paint		470	470
mixture	PCB	Polychlorinated biphenyl	260	263
mixture	PCB 1254	Polychlorinated biphenyl 1254	260	263
mixture	PCB gas condensate		260	263
mixture	PCB in transformer oil		260	263
mixture	Tetramethyltin		590	590
mixture	m-Cresol 55%, p-Cresol 30%, Phenol 15%		310	316
mixture	t-Sodium-amylate / t-amyl alcohol		590	590