

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](#) 27
- [Tyvek® Chemical Permeation Data Table](#) 28
- Appendix
 - [Alphabetical Index](#) 44
 - [CAS Number Index](#) 57

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.

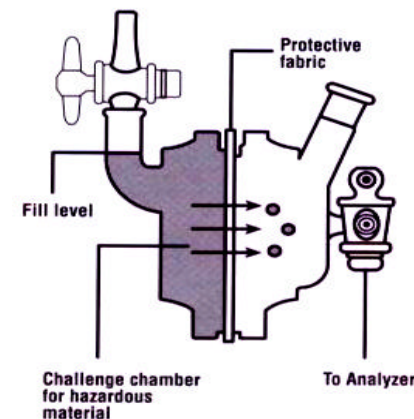
To help you understand the difference between these two mechanisms, consider this example. Have you ever opened a bottle of soda to find out that it was flat? There aren't any holes in the bottle. The liquid is still inside. Why is the soda flat? It's flat because the carbon dioxide that gives soda its 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 Vinyllic

260 Halogen Compounds

- 261 Aliphatic and Alicyclic
- 263 Aromatic
- 264 Vinyllic
- 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)

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

Sub-class	Chemical Name	CAS Number	Phase	Normalized Breakthrough Time (Minutes)										
				Tyvek® 800	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	67-64-1	L			imm	13	462	>480	>480	>480	>480	>480	>480
430	Acetonitrile	75-05-8	L			imm	60	imm	131	>480	>480	>480	>480	>480
350 / 380	Ammonia (gaseous)	7664-41-7	G			imm	26	imm	20	90	105*/133	105*/133	>480	>480
290	Butadiene, 1,3- (gaseous)	106-99-0	G			imm	>480	>480	>480	>480	>480	>480	>480	>480
500	Carbon disulfide	75-15-0	L			imm	imm	imm	>480	>480	>480	>480	>480	>480
330 / 350	Chlorine (gaseous)	7782-50-5	G			imm	>480	imm	>480	>480	>480	>480	>480	>480
260	Dichloromethane	75-09-2	L			imm	imm	imm	imm	imm	>480	>480	>480	>480
140	Diethylamine	109-89-7	L			imm	15	>480	>480	>480	>480	>480	>480	>480
130	Dimethylformamide, N,N-	68-12-2	L			imm	90	>480	>480	>480	>480	>480	>480	>480
220	Ethyl acetate	141-78-6	L			imm	imm	>480	>480	>480	>480	>480	>480	>480
270	Ethylene oxide (gaseous)	75-21-8	G			imm	imm	>480	126	>480	>480	>480	>480	>480
290	Hexane, n-	110-54-3	L			imm	imm	>480	>480	>480	>480	>480	>480	>480
350	Hydrogen chloride (gaseous)	7647-01-0	G			imm	>480	>480	>480	>480	>480	>480	>480	>480
310	Methanol	67-56-1	L			imm	>480	imm	117	117	185	>480	>480	>480
260	Methyl chloride (gaseous)	74-87-3	G			imm	>480	>480	>480	>480	>480	>480	>480	>480
440	Nitrobenzene	98-95-3	L			imm	59	>480	>480	>480	>480	>480	>480	>480
380	Sodium hydroxide (50%)	1310-73-2	L	>30	>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-	127-18-4	L			imm	imm	>480	>480	>480	>480	>480	>480	>480
240	Tetrahydrofuran	109-99-9	L			imm	imm	>480	>480	>480	>480	>480	>480	>480
290	Toluene	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® 800	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 (5%)	64-19-7	Liquid	imm										
		Acetic acid (84%)	64-19-7	Liquid											
		Acetic acid (30%)	64-19-7	Liquid	imm										
		Acetic acid (10%)	64-19-7	Liquid	imm										
		Acetic acid (2%)	64-19-7	Liquid	imm										
		Acetic acid (>95%)	64-19-7	Liquid			imm	>480	84	>480	>480	352	>480	>480	>480
		Acrylic acid	79-10-7	Liquid			imm	>480		>480	>480	270	>480	>480	270
		Formic acid (90%)	64-18-6	Liquid											
		Formic acid (>95%)	64-18-6	Liquid					>480	260	260	>480	>480	>480	>480
		Formic acid (30%)	64-18-6	Liquid											
		Methacrylic acid	79-41-4	Liquid					81	>480	>480	>480	>480	>480	>480
		Oleic Acid	112-80-1	Liquid											
		Peracetic Acid (39%)	79-21-0	Liquid											
103 Aliphatic and Alicyclic, Substituted															
		Chloroacetic acid (80%)	79-11-8	Liquid				>480	>480	>480	>480	>480	>480	>480	>480
		Glycolic acid (sat)	79-14-1	Liquid								>480	>480	>480	>480
		Lactic Acid (85%)	50-21-5	Liquid											
		Thioglycolic acid	68-11-1	Liquid					>480	>480	>480	>480	>480	>480	>480
		Trichloroacetic acid (sat)	76-03-9	Liquid						>480	>480				
		Trifluoroacetic acid	76-05-1	Liquid				>480		>480	>480		>480		
104 Aliphatic and Alicyclic, Polybasic															
		Citric acid (50%)	77-92-9	Liquid					>480						
		Citric acid (30%)	77-92-9	Liquid											
		Oxalic acid (10.5%)	144-62-7	Liquid								>480	>480	>480	>480
		Oxalic acid (sat)	144-62-7	Liquid					>480	>480	>480				
110 Acid Halides, Carboxylic															
110 Acid Halides, Carboxylic - All															
		Perfluoro-2-propoxy propionyl fluoride	2062-98-8	Liquid								>480	>480	>480	>480
111 Aliphatic and Alicyclic															
		Acetoxyacetyl Chloride	13831-31-7	Liquid											
		Acetyl chloride	75-36-5	Liquid				39*/63	>480	>480	>480	>480	>480	>480	>480
		Acryloyl Chloride	814-68-6	Liquid				imm	55	334	334				
		Chloroacetyl chloride	79-04-9	Liquid				120	77			160	160	160	160
		Dichloroacetyl chloride	79-36-7	Liquid						160	160	100	100	>480	100
112 Aromatic															
		Benzoyl chloride	98-88-4	Liquid					>480	>480	>480	>480	>480	>480	>480
113 Chloroformates															

Chemical Permeation Data Tables

C	S	C	C	C	C	C	Breakthrough Time (Minutes)							Tychem® RESPONDER® CSM	Tychem® 10000	Tychem® 10000 FR		
							Tyvek® 800	Tychem® 2000 SFR	Tychem® 2000	Tychem® 4000	Tychem® 5000	Tychem® 6000	Tychem® 6000 FR				Tychem® 9000	
l	a	a	a	a	a	a	Chemical Name	CAS	Phase									
							Benzyl chloroformate	501-53-1	Liquid					>480				
							Methyl chloroformate	79-22-1	Liquid					204*/308	204*/308	>480	>480	>480
120 Aldehydes																		
121 Aliphatic and Alicyclic																		
							Acetaldehyde	75-07-0	Liquid					19	imm	>480	>480	>480
							Acrolein	107-02-8	Liquid					25*/178	75*/101	75*/101	>480	>480
							Acrolein (10 g/m ²)	107-02-8	Liquid					>480	>480			
							Butyraldehyde, n-	123-72-8	Liquid			imm	41	>480		>480	>480	>480
							Formaldehyde (100 ppm)	50-00-0	Vapor							>480	>480	>480
							Formalin (37% (10-15% Methanol))	mixture	Liquid			imm	>480	>480	>480	>480	>480	>480
							Formalin (3.7%, 1-1.5% Methanol)	mixture	Liquid			>480						
							Glutaraldehyde (50%)	111-30-8	Liquid				>480	170	170	>480	>480	>480
							Glutaraldehyde (5%)	111-30-8	Liquid			>480				>480	>480	>480
							trans-Crotonaldehyde	123-73-9	Liquid				34	147		>480	>480	>480
122 Aromatic																		
							Benzaldehyde	100-52-7	Liquid									
							Furfural	98-01-1	Liquid				198*/227	>480	>480	>480	>480	>480
130 Amides																		
132 Aliphatic and Alicyclic																		
							Dimethylacetamide, N,N-	127-19-5	Liquid			imm	96	>480	>480	>480	>480	>480
							Dimethylacetamide, N,N- (8%)	127-19-5	Liquid			>480	>480					
							Dimethylformamide, N,N-	68-12-2	Liquid			imm	90	>480	>480	>480	>480	>480
							Methyl-2-pyrrolidone, N-	872-50-4	Liquid				>480	>480	>480	>480	>480	>480
							Methylformamide, N-	123-39-7	Liquid					>480	>480	>480		
135 Acrylamides																		
							Acrylamide (50%)	79-06-1	Liquid				>480	>480	>480	>480	>480	>480
140 Amines																		
141 Aliphatic and Alicyclic, Primary																		
							Butylamine, n-	109-73-9	Liquid					>480	200	200	>480	>480
							Butylamine, tert-	75-64-9	Liquid							>480	>480	>480
							Diisopropylethylamine (DIPEA)	7087-68-5	Liquid					>480	>480			
							Ethanolamine	141-43-5	Liquid					>480	>480	>480	>480	>480
							Ethylamine (70%)	75-04-7	Liquid									
							Ethylamine (15 °C, liquid)	75-04-7	Liquid							361	361	>480
							Isopropylamine	75-31-0	Liquid				15	>480	>480	>480	>480	>480
							Methylamine (50%)	74-89-5	Liquid							232	232	232
							Methylamine (gaseous)	74-89-5	Vapor					>480	>480	105	105	>480
							Methylamine (40%)	74-89-5	Liquid				140			261	261	261
							Propylamine, n-	107-10-8	Liquid				100	16*/21	16*/21			

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® 800	Tychem® 2000 SFR	Tychem® 2000	Tychem® 4000	Tychem® 5000	Tychem® 6000	Tychem® 6000 FR	Tychem® 9000	Tychem® RESPONDER® CSM	Tychem® 10000	Tychem® 10000 FR
142 Aliphatic and Alicyclic, Secondary															
		Diethanolamine	111-42-2	Liquid					>480				>480		
		Diethylamine	109-89-7	Liquid			imm	15	>480	>480	>480	>480	>480	>480	>480
		Dimethylamine	124-40-3	Vapor					>480	>480	>480			>480	
		Dimethylamine (40%)	124-40-3	Liquid											
		Hexamethyldisilazane	999-97-3	Liquid				>480				>480	>480	>480	>480
		Methylbenzylamine	103-67-3	Liquid						>480	>480				
		Morpholine	110-91-8	Liquid				158				>480	>480	>480	>480
		N-Methylmorpholine (NMM)	109-02-4	Liquid					>480		>480				
143 Aliphatic and Alicyclic, Tertiary															
		Tributylamine (95%)	102-82-9	Liquid					>480	>480	>480				
		Triethanolamine	102-71-6	Liquid											
		Triethylamine	121-44-8	Liquid				12*/22		>480	>480	>480	>480	>480	>480
		Trimethylamine	75-50-3	Vapor										>480	
		Tripropylamine	102-69-2	Liquid								>480	>480	>480	>480
145 Aromatic, Primary															
		Aminodiphenyl, 4- (1 mg/ml in Methanol)	92-67-1	Liquid						>480	>480				
		Aniline	62-53-3	Liquid			imm	>480	320	>480	>480	>480	>480	>480	>480
		Aniline, 4-trifluoromethoxy	461-82-5	Liquid						>480	>480				
		Benzidine (25% in Methanol)	92-87-5	Liquid								>480	>480	>480	>480
		Benzidine (75% in Methanol)	92-87-5	Liquid										>480	
		Chloroaniline, p- (70 °C, molten)	106-47-8	Liquid				imm		imm	imm	272*/323	272*/323	272*/323	272*/323
		Chloroaniline, p-	106-47-8	Solid								>480	>480	>480	>480
		Dichloroaniline, 3,4-	95-76-1	Solid								>480	>480	>480	>480
		Dichloroaniline, 3,4- (70 °C, molten)	95-76-1	Liquid				imm				216*/284	216*/284	216*/284	216*/284
		Diethyl-m-toluidine crude	91-67-8	Liquid				>480					>480		
		Methylene dianiline, 4,4'- (190 °C, liquid)	101-77-9	Liquid											
		Methylene dianiline, 4,4'-	101-77-9	Liquid										>480	
		Methylene dianiline, 4,4'- (15% in Methyl Ethyl Ketone)	101-77-9	Liquid								>480	>480	>480	>480
		Toluidine, m-	108-44-1	Liquid				>480					>480		
		Toluidine, o-	95-53-4	Liquid				>480		>480	>480	>480	>480	>480	>480
		Xylidine, 2,4-	95-68-1	Liquid						>480					
146 Aromatic, Secondary and Tertiary															
		Diethylaniline	91-66-7	Liquid					>480			>480		>480	>480
		Diethylaniline crude	91-66-7	Liquid				>480					>480		
		Dimethylaniline, N,N-	121-69-7	Liquid					imm	>480	>480	>480	>480	>480	>480
148 Aliphatic and Alicyclic Polyamines															
		1,3-Propanediamine, N,N'-Dimethyl	109-55-7	Liquid											
		Aminoethylethanolamine	111-41-1	Liquid				imm	>480	>480	>480	>480	>480	>480	>480

Chemical Permeation Data Tables

C	l	a	s	S	u	b	-	C	l	a	s	Breakthrough Time (Minutes)																				
												Chemical Name	CAS	P	h	a	s	e	Tyvek® 800	Tychem® 2000 SFR	Tychem® 2000	Tychem® 4000	Tychem® 5000	Tychem® 6000	Tychem® 6000 FR	Tychem® 9000	Tychem® RESPONDER® CSM	Tychem® 10000	Tychem® 10000 FR			
												Aminoethylethanolamine (60%)	111-41-1	Liquid					>480	>480	>480	>480	>480	>480	>480	>480	>480	>480	>480	>480		
												Aminoethylpiperazine	140-31-8	Liquid					>480	>480	>480	>480	>480	>480	>480	>480	>480	>480	>480	>480		
												Citrus Terpenes Mixture	68956-56-9	Liquid																		
												Diethylenetriamine	111-40-0	Liquid					imm*/321	>480	>480	>480	>480	>480	>480	>480	>480	>480	>480	>480	>480	
												Dytek® A	15520-10-2	Liquid							>480	>480	>480	>480	>480	>480	>480	>480	>480	>480	>480	
												Ethylenediamine	107-15-3	Liquid					>480	>480	>480	>480	>480	>480	>480	>480	>480	>480	>480	>480	>480	
												Hexamethylenediamine, 1,6- (50 °C, molten)	124-09-4	Liquid					80	45						80						
												Hexamethylenediamine, 1,6- (45 °C, molten)	124-09-4	Liquid								>480	>480	>480	>480	>480	>480	>480	>480	>480	>480	
												Tetraethylenepentamine	112-57-2	Liquid							>480	>480	>480	>480	>480	>480	>480	>480	>480	>480	>480	>480
												Tetramethylethylenediamine (TMEDA)	110-18-9	Liquid							>480	>480										
149 Aromatic Polyamines																																
												Benzidine (75% in Methanol)	92-87-5	Liquid																>480		
												Benzidine (25% in Methanol)	92-87-5	Liquid										>480	>480	>480	>480	>480	>480	>480	>480	
												Methylene bis (o-chloroaniline), 4,4'- (sat in Methanol)	101-14-4	Liquid							>480				>480	>480	>480	>480	>480	>480	>480	
												Methylene dianiline, 4,4'-	101-77-9	Liquid															>480			
												Methylene dianiline, 4,4'- (15% in Methyl Ethyl Ketone)	101-77-9	Liquid											>480	>480	>480	>480	>480	>480	>480	>480
												Methylene dianiline, 4,4'- (190 °C, liquid)	101-77-9	Liquid												>480	>480	>480	>480	>480	>480	>480
150 Hydroxylamines and Ketoximes																																
150 Hydroxylamines and Ketoximes - All																																
												Methyl ethyl ketoxime	96-29-7	Liquid							>480			>480	>480	>480	>480	>480	>480	>480	>480	>480
160 Anhydrides																																
161 Aliphatic and Alicyclic																																
												Acetic anhydride	108-24-7	Liquid							12*/48	>480	>480	>480	>480	>480	>480	>480	>480	>480	>480	>480
210 Isocyanates																																
211 Aliphatic and Alicyclic																																
												Cyclohexyl isocyanate	3173-53-3	Liquid							36*/54							36*/54				
												Hexamethylene diisocyanate	822-06-0	Liquid							>480	>480	>480	>480	>480	>480	>480	>480	>480	>480	>480	>480
												Methyl isocyanate	624-83-9	Liquid							imm	12	imm	imm	>480	>480	>480	>480	>480	>480	>480	>480
212 Aromatic																																
												Diphenylmethane Diisocyanate 4,4- (50 °C, molten)	101-68-8	Liquid							>480	>480	>480	>480	>480	>480	>480	>480	>480	>480	>480	>480
												Diphenylmethane Diisocyanate 4,4-	101-68-8	Solid											>480	>480	>480	>480	>480	>480	>480	>480
												Paraphenylene diisocyanate (PPDI) crude	104-49-4	Liquid											>480	>480	>480	>480	>480	>480	>480	>480
												Polymethylene polyphenyl-polyisocyanate	9016-87-9	Liquid							>480	>480	>480	>480	>480	>480	>480	>480	>480	>480	>480	>480
												Toluene-1,3-diisocyanate	26471-62-5	Liquid											>480	>480	>480	>480	>480	>480	>480	>480
												Toluene-2,4-diisocyanate (80%)	584-84-9	Liquid							60	>480	>480	>480	>480	>480	>480	>480	>480	>480	>480	>480
												Toluene-2,4-diisocyanate	584-84-9	Liquid							imm	>480	>480	>480	>480	>480	>480	>480	>480	>480	>480	>480
220 Carboxylic Esters																																
221 Formates																																
												Methyl formate	107-31-3	Liquid																	>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® 800	Tychem® 2000 SFR	Tychem® 2000	Tychem® 4000	Tychem® 5000	Tychem® 6000	Tychem® 6000 FR	Tychem® 9000	Tychem® RESPONDER® CSM	Tychem® 10000	Tychem® 10000 FR
222 Acetates															
		Amyl acetate, n-	628-63-7	Liquid					>480	>480	>480	>480	>480	>480	>480
		Bromoethyl Acetate, 2-	927-68-4	Liquid											
		Butyl acetate, n-	123-86-4	Liquid					>480	>480	>480	>480	>480	>480	>480
		Ethyl acetate	141-78-6	Liquid			imm	imm	>480	>480	>480	>480	>480	>480	>480
		Iso Amyl Acetate	123-92-2	Liquid											
		Isopropyl Acetate	108-21-4	Liquid											
		Methyl Acetate	79-20-9	Liquid											
		Propyl Acetate	109-60-4	Liquid											
		Vinyl acetate	108-05-4	Liquid				24	>480	>480	>480	>480	>480	>480	>480
223 Acrylates and Methacrylates															
		Butyl acrylate, n-	141-32-2	Liquid					>480	>480	51	51	>480	51	
		Diketene Acetone (95%)	5394-63-8	Liquid					>480						
		Ethyl acrylate	140-88-5	Liquid					imm*/162		14	14	>480	14	
		Ethylene glycol acrylate	818-61-1	Liquid					>480						
		Methyl acrylate	96-33-3	Liquid					>480	>480	>480	>480	>480	>480	>480
		Methyl methacrylate	80-62-6	Liquid			23		imm*/53	imm*/53	>480	>480	>480	>480	>480
224 Aliphatic, Others															
		Dimethylmaleate	624-48-6	Liquid				>480	>480				>480		
226 Benzoates and Phthalates															
		Diethylhexyl phthalate	117-81-7	Liquid					>480			>480	>480	>480	>480
		Methyl salicylate	119-36-8	Liquid			<15	>480				>480			
230 Non-Carboxylic Esters															
233 Carbamates and Others															
		Methomyl (29%)	16752-77-5	Liquid								>480	>480	>480	>480
240 Ethers															
240 Ethers - All															
		Perfluoro-2-propoxy propionyl fluoride	2062-98-8	Liquid								>480	>480	>480	>480
241 Aliphatic and Alicyclic															
		Butyl ether, n-	142-96-1	Liquid					117	223*/285	>480	>480	>480	>480	>480
		Chloromethyl methyl ether	107-30-2	Liquid						imm*/37	imm*/37	>480	>480	>480	>480
		Dichloroethyl ether	111-44-4	Liquid					>480	>480	>480	>480	>480	>480	>480
		Dimethyl ether	115-10-6	Vapor										>480	
		Ethyl ether	60-29-7	Liquid				imm	>480	>480	>480	>480	>480	>480	>480
		Methyl tert-butyl ether	1634-04-4	Liquid				>480	>480	>480	>480	>480	>480	>480	>480
		Tetrahydrofuran	109-99-9	Liquid				imm	imm	>480	>480	>480	>480	>480	>480
242 Aromatic															
		Aniline, 4-trifluoromethoxy	461-82-5	Liquid						>480	>480				
		Dowtherm, Biphenyl (27%)	92-52-4	Liquid											

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® 800	Tychem® 2000 SFR	Tychem® 2000	Tychem® 4000	Tychem® 5000	Tychem® 6000	Tychem® 6000 FR	Tychem® 9000	Tychem® RESPONDER® CSM	Tychem® 10000	Tychem® 10000 FR		
244 Ketals and Acetals																	
		Diketene Acetone (95%)	5394-63-8	Liquid													
245 Glycol Ethers																	
		(2-Ethoxyethoxy)-ethanol, 2-	111-90-0	Liquid													
		2-(2-Butoxyethoxy)-ethanol	112-34-5	Liquid													
		Butoxytriglycol	143-22-6	Liquid													
		Butyl Cellosolve Acetate	112-07-2	Liquid													
		Butyl Cellosolve®	111-76-2	Liquid													
		Butyl Dipropasol Solvent	29911-28-2	Liquid													
		Diethylene Glycol Monomethyl Ether	111-77-3	Liquid													
		Diethylene Glycol Monopropyl Ether	6881-94-3	Liquid													
		Dipropylene Glycol Monopropyl Ether	29911-27-1	Liquid													
		Ethoxytriglycol	112-50-5	Liquid													
		Ethyl Cellosolve®	110-80-5	Liquid													
		Ethyl Cellosolve® acetate	111-15-9	Liquid													
		Ethylene Glycol Monohexyl Ether	112-25-4	Liquid													
		Hexyl Carbitol Solvent	112-59-4	Liquid													
		Methoxytriglycol	112-35-6	Liquid													
		Methyl Cellosolve®	109-86-4	Liquid													
		Methyl Cellosolve® acetate	110-49-6	Liquid													
		Polyethylene glycol dimethyl ether	24991-55-7	Liquid													
		Propoxypropanol	1569-01-3	Liquid													
		Propyl Cellosolve N-	2807-30-9	Liquid													
		Urethane Catalyst Alkanol	83016-70-0	Liquid													
260 Halogen Compounds																	
260 Halogen Compounds - All																	
		Perfluoro-2-propoxy propionyl fluoride	2062-98-8	Liquid													
261 Aliphatic and Alicyclic																	
		Bromoethyl Acetate, 2-	927-68-4	Liquid													
		Bromoform	75-25-2	Liquid													
		Carbon tetrachloride	56-23-5	Liquid													
		Chlordane (60-75%)	57-74-9	Liquid													
		Chlordane (44%)	57-74-9	Liquid													
		Chloroethanol, 2-	107-07-3	Liquid													
		Chloroform	67-66-3	Liquid													
		Chloropicrin	76-06-2	Liquid													
		Dibromo-3-chloropropane, 1,2-	96-12-8	Liquid													
		Dichloroacetone (45 °C, molten)	534-07-6	Liquid													
		Dichloroacetone (95% at 40 °C, molten)	534-07-6	Liquid													

Chemical Permeation Data Tables

C	S	C	C	C	P	Breakthrough Time (Minutes)							Tychem® RESPONDER® CSM	Tychem® 10000	Tychem® 10000 FR	
						Tyvek® 800	Tychem® 2000 SFR	Tychem® 2000	Tychem® 4000	Tychem® 5000	Tychem® 6000	Tychem® 6000 FR				Tychem® 9000
l	a	a	a	a	a	Chemical Name	CAS	h	a	a	a	a	a	a	a	a
					Liquid	Chlorophenol, 4- (sat in Methanol)	106-48-9						>480	>480	>480	>480
					Liquid	Chlorotoluene, o-	95-49-8			13	>480	>480	>480	>480	>480	>480
					Liquid	Cyanuric chloride (20% in Toluene)	108-77-0						>480	>480	>480	>480
					Liquid	Dichloroaniline, 3,4- (70 °C, molten)	95-76-1			imm			216*/284	216*/284	216*/284	216*/284
					Solid	Dichloroaniline, 3,4-	95-76-1						>480	>480	>480	>480
					Liquid	Dichlorobenzene, 1,2-	95-50-1			76	>480	>480	>480	>480	>480	>480
					Liquid	Dichlorobenzene, 1,3-	541-73-1			45	>480	>480	>480	>480	>480	>480
					Liquid	Dichlorobenzene, 1,4 (50% in Ethanol)	106-46-7			>480	131	>480	>480	>480	>480	>480
					Liquid	Fluorobenzene	462-06-6			imm	>480	>480	>480	>480	>480	>480
					Solid	Nitrochlorobenzene, o-	88-73-3									
					Solid	Nitrochlorobenzene, p-	100-00-5		15	imm						
					Liquid	PCB (50% in Trichlorobenzene)	mixture				>480		>480	>480	>480	>480
					Liquid	PCB 1254 (90%)	11097-69-1			>480						
					Liquid	PCB 1254 (50% in Mineral Oil)	11097-69-1			>480				>480		
					Liquid	PCB 1254 (95%)	11097-69-1									
					Liquid	PCB in transformer oil (mix)	mixture			>480	>480	>480				
					Solid	Tetrachloro-bisphenol -A, 2,2',6,6'	79-95-8					>480	>480			
					Liquid	Trichlorobenzene, 1,2,4-	120-82-1		imm	87	>480	>480	>480	>480	>480	>480
					Liquid	Trifluoromethylbenzene	98-08-8									
264 Vinylic																
					Liquid	Chloro-1,3-butadiene, 2- (50% in Butanol)	126-99-8						>480	>480		
					Liquid	Chloroacrylonitrile, 2-	920-37-6				146	>480	>480		>480	
					Liquid	Hexachlorobutadiene	87-68-3						>480	>480	>480	>480
					Liquid	Tetrachloroethylene, 1,1,2,2-	127-18-4		imm	imm	>480	>480	>480	>480	>480	>480
					Liquid	Trichloroethylene	79-01-6			imm	>480	>480	>480	>480	>480	>480
					Vapor	Vinyl chloride	75-01-4			>480	>480	>480	>480	>480	>480	>480
					Liquid	Vinylidene chloride	75-35-4				170	>480	>480	>480	>480	>480
265 Alylic																
					Liquid	Allyl chloride	107-05-1				12	381*/447	381*/447	>480	>480	>480
266 Benzyllic																
					Liquid	Benzyl chloride	100-44-7						>480	>480	>480	>480
270 Heterocyclic Compounds																
271 Nitrogen, Pyridines																
					Liquid	Aminopyridine, 2- (sat)	504-29-0				>480				>480	
					Liquid	Nicotine	54-11-5					>480	>480	>480	>480	>480
					Liquid	Picoline, 2-	109-06-8					>480	>480	>480	>480	>480
					Liquid	Picoline, 3-	108-99-6					>480	>480	>480	>480	>480
					Liquid	Pyridine	110-86-1			31	>480	>480	>480	>480	>480	>480
					Liquid	Vinylpyridine, 4-	100-43-6			15				15		

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® 800	Tychem® 2000 SFR	Tychem® 2000	Tychem® 4000	Tychem® 5000	Tychem® 6000	Tychem® 6000 FR	Tychem® 9000	Tychem® RESPONDER® CSM	Tychem® 10000	Tychem® 10000 FR
274 Nitrogen, Others															
		Aminoethylpiperazine	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	151-56-4	Liquid								59	59	>480	59
		Propylene imine (90%)	75-55-8	Liquid								150	150	150	150
		Pyrrrolidine	123-75-1	Liquid				342	45*/100	45*/100		413	413	413	413
		Vinyl Pyrrolidinone	88-12-0	Liquid											
275 Oxygen, Epoxides															
		Bisphenol-A diglycidyl ether	1675-54-3	Liquid						>480	>480	>480	>480	>480	>480
		Epichlorohydrin	106-89-8	Liquid			15	36*/67	395	395	>480	>480	>480	>480	>480
		Ethylene oxide (11 °C, liquid)	75-21-8	Liquid				18							
		Ethylene oxide (0 °C, liquid)	75-21-8	Liquid								>480	>480	>480	>480
		Ethylene oxide (10% in HCFC)	75-21-8	Vapor										>480	
		Ethylene oxide (gaseous)	75-21-8	Vapor			imm	imm	>480	126	>480	>480	>480	>480	>480
		Ethylene oxide (-70 °C, liquid)	75-21-8	Liquid										>180	
		Phenyl glycidyl ether	122-60-1	Liquid				>480					>480		
		Propylene oxide, 1,2-	75-56-9	Liquid					47	43	13*/20	>480	>480	>480	>480
277 Oxygen, Furans															
		Furfural	98-01-1	Liquid				198*/227	>480	>480	>480	>480	>480	>480	>480
278 Oxygen, Others															
		Diketene Acetone (95%)	5394-63-8	Liquid						>480					
		Dioxane, 1,4-	123-91-1	Liquid					>480	>480	>480	>480	>480	>480	>480
280 Hydrazines															
280 Hydrazines - All															
		Dimethylhydrazine, 1,1-	57-14-7	Liquid				13				>480 ⁸	>480 ⁸	>480 ⁸	>480 ⁸
		Hydrazine (85%)	302-01-2	Liquid											
		Hydrazine	302-01-2	Liquid			>480		283	283	>480	>480	>480	>480	>480
		Hydrazine hydrate (85%)	10217-52-4	Liquid							440	440	440	440	440
		Hydrazine hydrate (51%)	10217-52-4	Liquid										>480	
		Hydrazine hydrate	10217-52-4	Liquid											>480
		Methyl hydrazine	60-34-4	Liquid						183*/283	183*/283	>480	>480	>480	>480
290 Hydrocarbons															
290 Hydrocarbons - All															
		Diethylbenzene (95%)	25340-17-4	Liquid				31		>480	>480	>480	>480	>480	>480
291 Aliphatic and Alicyclic, Saturated															
		Cyclohexane	110-82-7	Liquid					>480	>480	>480	>480	>480	>480	>480
		Diesel automotive test fuel	mixture	Liquid			imm								
		Diesel fuel	68334-30-5	Liquid					199	>480	>480	>480	>480	>480	>480
		Fuel oil	68476-30-2	Liquid			imm	>480					>480		

Chemical Permeation Data Tables

C	S	C	C	C	P	Breakthrough Time (Minutes)											
						Tyvek® 800	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	Chemical Name	CAS	h	a	a	a	a	a	a	a	a	
						Trichloroethanol, 2,2,2-	115-20-8	Liquid				>480	>480	>480	>480	>480	>480
						Trifluoroethanol, 2,2,2-	75-89-8	Liquid			imm				>480	>480	>480
316 Aromatic, Phenols																	
						Chlorophenol, 4- (sat in Methanol)	106-48-9	Liquid							>480	>480	>480
						Creosote	8001-58-9	Liquid					>480	>480			
						Cresol, mixed isomers	1319-77-3	Liquid			71	100		>480	>480	>480	>480
						Cresol, o-	95-48-7	Liquid			13	>480	198	179	179		>480
						Dinitrocresol (sat in Methanol)	534-52-1	Liquid							>480	>480	>480
						Nitrophenol, o- (70 °C, molten)	88-75-5	Liquid				imm			208	208	208
						Pentachlorophenol (5% in Kerosene)	87-86-5	Liquid									
						Pentachlorophenol (sat in Methanol)	87-86-5	Liquid							>480	>480	>480
						Phenol (89%)	108-95-2	Liquid									
						Phenol (85% at 45 °C)	108-95-2	Liquid							113	149	>480
						Phenol (60 °C, molten)	108-95-2	Liquid				imm	imm	imm	25	121	125
						Phenol (molten at 45 °C)	108-95-2	Liquid				44	17	25	25	101	101
						Phenol (85%)	108-95-2	Liquid				11	>480	341	>480	>480	>480
						Tetrachloro-bisphenol -A, 2,2',6,6'	79-95-8	Solid						>480	>480		
						m-Cresol 55%, p-Cresol 30%, Phenol 15% (mix)	mixture	Liquid							>480	>480	>480
318 Aromatic, Others																	
						Phenethyl alcohol, 2-	60-12-8	Liquid					>480				
						Phenylethanol, 1-	98-85-1	Liquid					>480	>480	>480	>480	>480
330 Elements																	
330 Elements - All																	
						Bromine (sat vapour)	7726-95-6	Vapor									30*/40
						Bromine	7726-95-6	Liquid			imm		imm	imm	imm	imm	15
						Bromine (10 g/m ²)	7726-95-6	Liquid									>480
						Chlorine (gaseous)	7782-50-5	Vapor			imm	>480	imm	>480	>480	>480	>480
						Chlorine (20 ppm)	7782-50-5	Vapor				>480 ⁸					
						Chlorine (-70 °C, liquid)	7782-50-5	Liquid					>480			441	>480
						Iodine	7553-56-2	Solid									
						Mercury	7439-97-6	Liquid				>480	>480	>480	>480	>480	>480
340 Inorganic Salts and Inorganic Salt Solutions																	
340 Inorganic Salts and Inorganic Salt Solutions - All																	
						Ammonium Bifluoride (sat)	1341-49-7	Liquid						>480	>480		
						Ammonium chloride (sat)	12125-02-9	Liquid					>480				
						Ammonium fluoride (40%)	12125-01-8	Liquid						>480	>480	>480	>480
						Arsenic trichloride	7784-34-1	Liquid						32*/38	32*/38		
						Ferric chloride (50%)	7705-08-0	Liquid				>480				>480	
						Lithium chloride (20%)	7447-41-8	Liquid				>480					

Chemical Permeation Data Tables

C	l	a	s	S	u	b	-	C	l	a	s	Breakthrough Time (Minutes)																			
												Chemical Name	CAS	P	h	a	s	e	Tyvek® 800	Tychem® 2000 SFR	Tychem® 2000	Tychem® 4000	Tychem® 5000	Tychem® 6000	Tychem® 6000 FR	Tychem® 9000	Tychem® RESPONDER® CSM	Tychem® 10000	Tychem® 10000 FR		
													Benzyl cyanide	140-29-4	Liquid							>480	>390	>390							
440 Nitro Compounds																															
441 Unsubstituted																															
													Nitrobenzene	98-95-3	Liquid				imm	59	>480	>480	>480	>480	>480	>480	>480	>480	>480		
													Nitromethane	75-52-5	Liquid							>480	233	233	>480	>480	>480	>480	>480	>480	
													Nitropropane, 2-	79-46-9	Liquid							>480	>480	>480	>480	>480	>480	>480	>480	>480	
442 Substituted																															
													Dinitroresol (sat in Methanol)	534-52-1	Liquid										>480	>480	>480	>480	>480		
													Nitrochlorobenzene, o-	88-73-3	Solid				15												
													Nitrochlorobenzene, p-	100-00-5	Solid				imm												
													Nitrophenol, o- (70 °C, molten)	88-75-5	Liquid					imm					208	208	208	208	208	208	208
													Nitrotoluene, o-	88-72-2	Liquid						95		>480				95				
													Nitrotoluene, p-	99-99-0	Solid				imm												
450 Nitroso Compounds																															
450 Nitroso Compounds - All																															
													Dimethyl nitrosamine	62-75-9	Liquid									>480	>480						
460 Organo-Phosphorus Compounds																															
462 Derivatives of Phosphorus-based acids																															
													Dimethyl Methyl Phosphonate	756-79-6	Liquid																
													Ethyl parathion	56-38-2	Liquid											>480	>480	>480	>480	>480	
													Malathion	121-75-5	Liquid											>480	>480	>480	>480	>480	
													Malathion (50%)	121-75-5	Liquid											>480	>480	>480	>480	>480	
													Safrofin	31218-83-4	Liquid																
													Sarin (10 g/m ²)	107-44-8	Liquid						>480 ^B	120 ^B				>480 ^B	>480 ^B	>480 ^B	>480 ^B	>480 ^B	
													Sarin (100 g/m ²)	107-44-8	Liquid									>480 ^B	>480 ^B	>480 ^B	>480 ^B	>480 ^B	>480 ^B	>480 ^B	
													Skydrol 500 B-4	126-73-8	Liquid																
													Soman (100 g/m ²)	96-64-0	Liquid											>480 ^B	>480 ^B	>480 ^B	>480 ^B	>480 ^B	
													Soman (10 g/m ²)	96-64-0	Liquid											>480 ^B	>480 ^B	>480 ^B	>480 ^B	>480 ^B	
													Tabun (10 g/m ²)	77-81-6	Liquid											>480 ^B	>480 ^B	>480 ^B	>480 ^B	>480 ^B	
													Tabun (100 g/m ²)	77-81-6	Liquid											>480 ^B	>480 ^B	>480 ^B	>480 ^B	>480 ^B	
													Triethyl Phosphate	78-40-0	Liquid																
													Trimethyl phosphate	512-56-1	Liquid											>480	>480	>480	>480	>480	
													Trimethyl phosphite	121-45-9	Liquid					210						>480	>480	>480	>480	>480	
													VX Nerve agent (100 g/m ²)	50782-69-9	Liquid										>480 ^B	>480 ^B	>480 ^B	>480 ^B	>480 ^B	>480 ^B	
													VX Nerve agent (10 g/m ²)	50782-69-9	Liquid										>480 ^B	>480 ^B	>480 ^B	>480 ^B	>480 ^B	>480 ^B	
470 Organo-Metallic Compounds																															
470 Organo-Metallic Compounds - All																															
													Dimethyl mercury in decane (100 ppm in Decane)	593-74-8	Liquid										>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® 800	Tychem® 2000 SFR	Tychem® 2000	Tychem® 4000	Tychem® 5000	Tychem® 6000	Tychem® 6000 FR	Tychem® 9000	Tychem® RESPONDER® CSM	Tychem® 10000	Tychem® 10000 FR
		Lewisite (100 g/m ²)	541-25-3	Liquid						360 ⁸	360 ⁸	120 ⁸	120 ⁸	>480 ⁸	120 ⁸
		Lewisite (10 g/m ²)	541-25-3	Liquid			>360 ⁸	120 ⁸				>480 ⁸	>480 ⁸	>480 ⁸	>480 ⁸
		Nickel carbonyl	13463-39-3	Liquid										>480	
		Tetraethyl lead	78-00-2	Liquid				>480				>480	>480	>480	>480
		Triethylaluminum (93%)	97-93-8	Liquid										>480	
		Vinylmagnesium chloride (16.5% in Tetrahydrofuran)	3536-96-7	Liquid								>480	>480	>480	>480
		Vinylmagnesium chloride (15% in Tetrahydrofuran)	3536-96-7	Liquid			imm						imm		
480 Organo-Silicon Compounds															
480 Organo-Silicon Compounds - All															
		Dichlorosilane	4109-96-0	Vapor								>480	>480	>480	>480
		Dimethyldichlorosilane	75-78-5	Liquid			46			>480	>480		46	>480	
		Hexamethyldisilazane	999-97-3	Liquid			>480					>480	>480	>480	>480
		Methyl trichlorosilane	75-79-6	Liquid				>480	>480	>480	>480	>480	>480	>480	>480
		Silane	7803-62-5	Vapor					>480	>480	>480	>480	>480	>480	>480
		Silicon tetrachloride	10026-04-7	Liquid			35	>480	>480	>480	>480	>480	>480	>480	>480
		Tetraethoxysilane	78-10-4	Liquid								>480	>480	>480	>480
		Trichlorophenylsilane	98-13-5	Liquid			>480		>480	>480		>480	>480	>480	>480
		Trichlorosilane	10025-78-2	Liquid			60			>480	>480	>480	>480	>480	>480
		Trichlorovinylsilane	75-94-5	Liquid			100						100		
500 Sulfur Compounds															
501 Thiols															
		Ethyl Mercaptan	75-08-1	Liquid			imm	>480	>480	>480	>480	>480	>480	>480	>480
		Mercaptoethanol	60-24-2	Liquid					>480	>480				>480	
		Methyl mercaptan	74-93-1	Vapor				>480	>480	>480	>480	>480	>480	>480	>480
		Phenyl mercaptan	108-98-5	Liquid							>480	>480	>480	>480	>480
		Thioglycolic acid	68-11-1	Liquid				>480	>480	>480	>480	>480	>480	>480	>480
502 Sulfides and Disulfides															
		Carbon disulfide	75-15-0	Liquid			imm	imm	imm	>480	>480	>480	>480	>480	>480
		Chlorine sulfide (80%)	10545-99-0	Liquid					imm			70	70	>480	70
		Chlorine sulfide	10545-99-0	Liquid										440	
		Dimethyl sulfide	75-18-3	Liquid						271	271				
		Hydrogen sulfide	7783-06-4	Vapor					imm		>480	>480	>480	>480	>480
		Sulfur monochloride	10025-67-9	Liquid							>480	>480	>480	>480	>480
		Sulfur mustard (10 g/m ²)	505-60-2	Liquid			>480 ⁸	120 ⁸				>480 ⁸	>480 ⁸	>480 ⁸	>480 ⁸
		Sulfur mustard (100 g/m ²)	505-60-2	Liquid						>480 ⁸	>480 ⁸	>480 ⁸	>480 ⁸	>480 ⁸	>480 ⁸
503 Sulfones and Sulfoxides															
		Dimethyl sulfoxide	67-68-5	Liquid					>480	>480	>480	>480	>480	>480	>480
504 Sulfonic Acids															
		Chlorosulfonic acid	7790-94-5	Liquid			>480	330	>480	17	180	>480	>480	>480	180

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® 800	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	>240											
		Ifosfamide (50 mg/ml)	3778-73-2	Liquid	>240											
		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	>240											
		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											
		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® 800
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	>240	>240
		Carmustine (3.3 mg/ml, 10 % Ethanol)	154-93-8	Liquid	imm	imm	>240
		Cisplatin (1 mg/ml)	15663-27-1	Liquid	>240	>240	>240
		Cyclophosphamide (20 mg/ml)	50-18-0	Liquid	>240	>240	>240
500 Sulfur Compounds							
507 Sulfonates, Sulfates, and Sulfites							
		Dimethyl sulfate	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	>240
310 Hydroxylic Compounds (includes alcohols)							
314 Aliphatic and Alicyclic, Polyols							
		Ethylene glycol	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	>240	>240
		Fluorouracil, 5- (50 mg/ml)	51-21-8	Liquid	imm	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® 800
990 Cytostatic drugs (Active Pharmaceutical Potent Compound)							
990 Cytostatic drugs (Active Pharmaceutical Potent Compound) - All							
		Ganciclovir (3 mg/ml)	82410-32-0	Liquid	>240	>240	
		Gemcitabine (38 mg/ml)	95058-81-4	Liquid	>60	>60	>240
370 Inorganic Acids							
370 Inorganic Acids - All							
		Hydrochloric acid (16%)	7647-01-0	Liquid	imm	imm	imm
		Hydrochloric acid (32%)	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	>240	>240
		Irinotecan (20 mg/ml)	100286-90-6	Liquid	>240	>240	
340 Inorganic Salts and Inorganic Salt Solutions							
340 Inorganic Salts and Inorganic Salt Solutions - All							
		Mercuric chloride (sat)	7487-94-7	Liquid	>480	>480	
990 Cytostatic drugs (Active Pharmaceutical Potent Compound)							
990 Cytostatic drugs (Active Pharmaceutical Potent Compound) - All							
		Methotrexate (25 mg/ml, 0.1 N NaOH)	59-05-2	Liquid	>240	>240	>240
		Mitomycin (0.5 mg/ml)	50-07-7	Liquid	>240	>240	>240
		Oxaliplatin (5 mg/ml)	63121-00-6	Liquid	imm	imm	>240
		Paclitaxel (6 mg/ml, 49.7 % (v/v) Ethanol)	33069-62-4	Liquid	>240	>240	>240
370 Inorganic Acids							
370 Inorganic Acids - All							
		Phosphoric acid (50%)	7664-38-2	Liquid	>480	>480	>480
340 Inorganic Salts and Inorganic Salt Solutions							
340 Inorganic Salts and Inorganic Salt Solutions - All							

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® 800
		Potassium chromate (sat)	7789-00-6	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	>240	
380 Inorganic Bases							
380 Inorganic Bases - All							
		Sodium hydroxide (40%)	1310-73-2	Liquid	>30	>30	
		Sodium hydroxide (50%)	1310-73-2	Liquid	>30	>30	>30
		Sodium hydroxide (10%)	1310-73-2	Liquid	>480	>480	>480
340 Inorganic Salts and Inorganic Salt Solutions							
340 Inorganic Salts and Inorganic Salt Solutions - All							
		Sodium hypochlorite (5.25-6%)	7681-52-9	Liquid	>480	>480	>480
370 Inorganic Acids							
370 Inorganic Acids - All							
		Sulfuric acid (18%)	7664-93-9	Liquid	>240	>240	>480
		Sulfuric acid (30%)	7664-93-9	Liquid	>240	>240	>480
		Sulfuric acid (50%)	7664-93-9	Liquid	>30	>30	
990 Cytostatic drugs (Active Pharmaceutical Potent Compound)							
990 Cytostatic drugs (Active Pharmaceutical Potent Compound) - All							
		Thiotepa (10 mg/ml)	52-24-4	Liquid	imm	imm	>240
		Vincristine sulfate (1 mg/ml)	2068-78-2	Liquid	>240	>240	
		Vinorelbine (0.1 mg/ml)	71486-22-1	Liquid	>240	>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>							

CAS Number	Chemical Name	Synonym	Class	Sub-Class	CAS Number	Chemical Name	Synonym	Class	Sub-Class
111-90-0	(2-Ethoxyethoxy)-ethanol, 2-	2-(2-Ethoxyethoxy) ethanol	240	245	98-07-7	Benzotrichloride	Benzo trichloride	260	263
109-55-7	1,3-Propanediamine, N,N'-Dimethyl		140	148	98-88-4	Benzoyl chloride	Benzene carbonyl chloride	110	112
112-34-5	2-(2-Butoxyethoxy)-ethanol	2-(2-Butoxyethoxy) ethanol, Diethylene glycol monobutyl ether	240 / 310	245 / 311	100-51-6	Benzyl alcohol	Hydroxy toluene	310	312
75-07-0	Acetaldehyde		120	121	100-44-7	Benzyl chloride	Chloro toluene, alpha-	260	266
64-19-7	Acetic acid		100	102	501-53-1	Benzyl chloroformate	Benzyl chloro formate	110	113
108-24-7	Acetic anhydride		160	161	140-29-4	Benzyl cyanide	Benzyl cyanide, Phenyl acetonitrile	430	432
67-64-1	Acetone	Dimethyl ketal, Dimethyl ketone, Ketone propane, Methyl acetyl, Methyl ketone, Propan -2-one, Pyroacetic ether	390	391	7440-41-7	Beryllium		sol	sol1
75-86-5	Acetone cyanohydrin	Cyanopropan-2-ol, 2-, Hydroxy 2-methylpropionitrile, 2-, Hydroxy isobutyronitrile	310 / 430	313 / 431	1675-54-3	Bisphenol-A diglycidyl ether	Bis (4-(2,3-epoxypropoxy)phenyl)propane, Bis phenol A diglycidyl ether, Isopropylidenediphenol diglycidyl ether, 4,4'-	270	275
75-05-8	Acetonitrile	Cyanomethane, Ethane nitrile, Ethyl nitrile, Methyl cyanide	430	431	mixture	Black liquor	Black Liquor	590	590
13831-31-7	Acetoxyacetyl Chloride		110	111	110-51-0	Borane-pyridine complex		590	590
75-36-5	Acetyl chloride	Acetic chloride, Ethanoyl chloride	110	111	90043-35-4	Boric Acid-Sulfuric Acid			none
107-02-8	Acrolein	Prop-2-en-1-al	120	121	10294-34-5	Boron trichloride		350 / 360	350 / 360
79-06-1	Acrylamide	Acryl amide, Acrylic amide, Propenamamide	130	135	7637-07-2	Boron trifluoride		350 / 360	350 / 360
79-10-7	Acrylic acid	Acroleic acid, Ethylene carboxylic acid, Propene acid	100	102	353-42-4	Boron trifluoride dimethyletherate	Boron trifluoride dimethyl etherate	590	590
107-13-1	Acrylonitrile	Cyanoethylene, Propenenitrile, 2-, Propenoic acid nitrile, Vinyl cyanide	430	431	109-63-7	Boron trifluoride etherate	Boron fluoride ethyl ether, Boron trifluoride diethyl etherate	590	590
814-68-6	Acryloyl Chloride		110	111	7726-95-6	Bromine		330	330
111-69-3	Adiponitrile	Adipic acid dinitrile, Adipic acid nitrile, Adipyl dinitrile, Dicyanobutane, 1,4-	430	431	74-97-5	Bromochloromethane		260	261
191681-14-8	AFFF		590	590	927-68-4	Bromoethyl Acetate, 2-		220 / 260	222 / 261
107-18-6	Allyl alcohol	Hydroxy propene, Propen 1-ol, 2-, Vinyl carbinol	310	311	460-00-4	Bromofluorobenzene, 4-	Bromo 4-fluorobenzene, 1-, Bromo fluorobenzene, 4-	260	263
107-05-1	Allyl chloride	Chlor allylene, Chloro prene, 3-	260	265	75-25-2	Bromoform		260	261
17927-65-0	Aluminum sulfate hydrate		340	340	106-99-0	Butadiene, 1,3-	Vinyl ethylene	290	296
92-67-1	Aminodiphenyl, 4-	Amino diphenyl, 4-	140	145	75-65-0	Butanol tert.	Butanol, tert-, Methyl propan-2-ol, 2-	310	313
111-41-1	Aminoethylethanolamine	Amino ethylethanolamine	140 / 310	148 / 311	71-36-3	Butanol, n-	Butanol, 1-, Butyl alcohol, n-	310	311
140-31-8	Aminoethylpiperazine	Amino ethylpiperazine	140 / 270	148 / 274	143-22-6	Butoxytriglycol		240	245
504-29-0	Aminopyridine, 2-	Amino pyridine, 2-	270	271	123-86-4	Butyl acetate, n-		220	222
7664-41-7	Ammonia		350 / 380	350 / 380	141-32-2	Butyl acrylate, n-	Acrylic acid n-butyl ester, Propenoic acid butyl ester, 2-	220	223
1341-49-7	Ammonium Bifluoride	Ammonium bifluoride, Ammonium hydrogendifluoride	340	340	112-07-2	Butyl Cellosolve Acetate		240	245
12125-02-9	Ammonium chloride		340	340	111-76-2	Butyl Cellosolve®	Butoxy ethanol, 2-, Ethylene glycol monobutyl ether	240	245
12125-01-8	Ammonium fluoride		340	340	29911-28-2	Butyl Dipropasol Solvent		240	245
1336-21-6	Ammonium hydroxide	Caustic ammonia	380	380	142-96-1	Butyl ether, n-		240	241
628-63-7	Amyl acetate, n-	Acetic acid pentyl ester, Amyl ester acetic acid, Pentyl acetate	220	222	109-73-9	Butylamine, n-	Butyl amine	140	141
62-53-3	Aniline	Amino benzene, Benzenamine, Phenyl amine	140	145	75-64-9	Butylamine, tert-	Amino 2-methylpropane, 2-, Butyl amine, tert-, Trimethyl aminomethane	140	141
461-82-5	Aniline, 4-trifluoromethoxy	Anilin, 4-Trifluoromethoxy-	140 / 240	145 / 242	106-88-7	Butylene oxide, 1,2-		270	275
120-12-7	Anthracene	Anthracene , Anthracin	290	293	123-72-8	Butyraldehyde, n-	Butanal, n-	120	121
7647-18-9	Antimony pentachloride	Pentachloroantimony	360	360	107-92-6	Butyric acid	Butyric Acid		102
7784-34-1	Arsenic trichloride	Arsenic (III) chloride	340	340	10043-52-4	Calcium chloride		340	340
7784-42-1	Arsine		350	350	75-15-0	Carbon disulfide		500	502
1332-21-4	Asbestos (all forms)		sol	sol1	630-08-0	Carbon monoxide		350	350
mixture	Astromat Orange			590	56-23-5	Carbon tetrachloride	Tetrachloro methane	260	261
100-52-7	Benzaldehyde		120	122	441575-94-4	Carboplatin		990	990
71-43-2	Benzene		290	292	154-93-8	Carmustine		990	990
98-09-9	Benzene sulfonyl chloride	Benzene sulfone chloride	500	505	mixture	Chemidize 727 ND		590	590
328-84-7	Benzene, Dichloro-4-Trifluoro		260	263	57-74-9	Chlordane		260	261
					7782-50-5	Chlorine		330 / 350	330 / 350
					10049-04-4	Chlorine dioxide		350	350

	328-84-7 Benzene, Dichloro-4-Trifluoro		260	263
92-87-5	Benzidine	Biphenyl 4,4'-diamine, 1,1'-Diaminobiphenyl, 4,4'-, Diaminodiphenyl, p-	140	145 / 149
100-47-0	Benzonitrile	Benzo nitrile, Cyanobenzene, Phenyl cyanide	430	432

CAS Number	Chemical Name	Synonym	Class	Sub-Class	CAS Number	Chemical Name	Synonym	Class	Sub-Class
10545-99-0	Chlorine sulfide	Sulphur dichloride	500	502	96-12-8	Dibromo-3-chloropropane, 1,2-	Dibromo -3-chloropropane, 1,2-	260	261
7790-91-2	Chlorine trifluoride		350	350	84-74-2	Dibutyl Phthalate N-	Propan -1-ol, Propanol, 1-, Propanol, n-, Propyl alcohol		
96-24-2	Chloro-1,2-propanediol, 3-	Chloro 1,2-propanediol, 3-	310	314	764-41-0	Dichloro-2-butene, 1,4-		260	264
126-99-8	Chloro-1,3-butadiene, 2-	Chloro 1,3-butadiene, 2-, Chloro buta-1,3-diene, 2-, Chloro prene, Neoprene	260	264	30894-74-7	Dichloro-6-isopropyl-S-triazine, 2,4-	Dichloro -6-isopropyl-S-triazine, 2,4-	270	274
98-56-6	Chloro-benzotrifluoride, 4-	Chloro benzotrifluoride, 4-	260	263	534-07-6	Dichloroacetone	Dichloro -2-propanone, 1,3-, Dichloro acetone, 1,3-	260 / 390	261 / 391
79-11-8	Chloroacetic acid	Chloro acetic acid	100	103	79-36-7	Dichloroacetyl chloride	Dichloro acetyl chloride	110	111
78-95-5	Chloroacetone	Chloro acetone, Chloro propan-2-one, 1-	390	391	95-76-1	Dichloroaniline, 3,4-	Amino 3,4-dichlorobenzene, 1-, Dichloro aniline, 3,4-	140 / 260	145 / 263
532-27-4	Chloroacetophenone		260	261	95-50-1	Dichlorobenzene, 1,2-	Dichlorbenzen, 1,2-	260	263
79-04-9	Chloroacetyl chloride	Chloro acetyl chloride	110	111	541-73-1	Dichlorobenzene, 1,3-	Dichlorbenzen, 1,3-	260	263
920-37-6	Chloroacrylonitrile, 2-	Chloro acrylonitrile, 2-	260 / 430	264 / 431	106-46-7	Dichlorobenzene, 1,4	Dichlorbenzen, 1,4-	260	263
106-47-8	Chloroaniline, p-	Chloro aniline, p-, Chloro benzenamine, 4-	140	145	111-44-4	Dichloroethyl ether	Dichloro ethyl ether	240 / 260	241 / 261
108-90-7	Chlorobenzene	Chloro benzene, Phenyl chloride	260	263	75-09-2	Dichloromethane	Dichloro methane, Methylene chloride	260	261
5216-25-1	Chlorobenzotrichloride, 4-	Chloro benzotrichloride, 4-	260	263	628-76-2	Dichloropentane		260	261
107-07-3	Chloroethanol, 2-	Chloro ethanol, 2-, Ethylene chlorohydrin, Glycol chlorohydrin	260 / 310	261 / 315	542-75-6	Dichloropropene, 1,3-	Dichloro propene, 1,3-	260	261
67-66-3	Chloroform	Chloro form, Trichloro methane	260	261	78-88-6	Dichloropropene, 2,3-	Dichloro propene, 2,3-	260	261
107-30-2	Chloromethyl methyl ether	Chloro methyl methyl ether, Methoxy chloromethane	240	241	4109-96-0	Dichlorosilane	Dichloro silane	480	480
106-48-9	Chlorophenol, 4-	Chloro phenol, p-, Hydroxy chlorobenzene	260 / 310	263 / 316		mixture Diesel automotive test fuel		290	291
76-06-2	Chloropicrin	Chlor trinitromethan, Chloro picrin, Nitro chlormethan	260	261	68334-30-5	Diesel fuel		290	291
7790-94-5	Chlorosulfonic acid	Chlorsulfonic acid	370 / 500	370 / 504	111-42-2	Diethanolamine		140	142
95-49-8	Chlorotoluene, o-	Chloro 1-methylbenzene, 2-, Chloro toluene, o-	260	263	64-67-5	Diethyl sulfate	Sulfuric acid diethyl ester	500	507
1333-82-0	Chromic acid	Chromic acid (CrO3)	370	370	91-67-8	Diethyl-m-toluidine crude	Diethyl m-toluidine, N,N-	140	145
25899-50-7	cis-2-Pentenenitrile	Pentene nitrile, cis-2-	430	431	109-89-7	Diethylamine	Diethyl amine, Ethyl ethanamine, N-	140	142
15663-27-1	Cisplatin		990	990	91-66-7	Diethylaniline	Diethyl aniline, N,N-	140	146
77-92-9	Citric acid	Hydroxy 1,2,3-propanetricarboxylic acid, 2-	100	104	91-66-7	Diethylaniline crude	Diethyl aniline crude	140	146
68956-56-9	Citrus Terpenes Mixture		140	148	25340-17-4	Diethylbenzene	Diethyl benzene	290	290
8001-58-9	Creosote		310	316	111-46-6	Diethylene Glycol		310	314
1319-77-3	Cresol, mixed isomers	Cresols, mixed isomers, Cresylic acid, Methyl phenols	310	316	111-77-3	Diethylene Glycol Monomethyl Ether		240	245
95-48-7	Cresol, o-	Cresol o-, Hydroxy toluene, o-	310	316	6881-94-3	Diethylene Glycol Monopropyl Ether		240	245
8002-05-9	Crude oil	Crude oil, California, Mineral oil	290	294	111-40-0	Diethylenetriamine	Diethylene triamine	140	148
	mixture Crude oil on wildlife		liq	liq4	117-81-7	Diethylhexyl phthalate	DEHP, Diethyl hexyl phthalate	220	226
98-82-8	Cumene	Isopropyl benzene, Phenyl propane, 2-	290	292	755-95-3	Diiodo-1,1,2,2-tetrafluorobutane, 1,4-		260	261
506-77-4	Cyanogen chloride		340	345	7087-68-5	Diisopropylethylamine (DIPEA)		140	141
108-77-0	Cyanuric chloride	Cyanide chloride, Trichloro 1,3,5-triazine, 2,4,6-	260	263	5394-63-8	Diketene Acetone		220 / 240 / 270 / 390	223 / 244 / 278 / 390
110-82-7	Cyclohexane	Cyclo hexane	290	291	624-92-0	Dimethyl disulfide		500	502
108-93-0	Cyclohexanol		310	312	115-10-6	Dimethyl ether		240	241
108-94-1	Cyclohexanone	Cyclo hexanone, Hexanone, Pimelic ketone	390	391	593-74-8	Dimethyl mercury in decane		470	470
3173-53-3	Cyclohexyl isocyanate	Cyclo hexyl isocanyte	210	211	756-79-6	Dimethyl Methyl Phosphonate		460	462
108-91-8	Cyclohexylamine		140	141	62-75-9	Dimethyl nitrosamine	Methyl N-nitrosomethanamine, N-	450	450
1552-12-1	Cyclooctadiene	Cyclo octadiene	290	296	77-78-1	Dimethyl sulfate	Sulfuric acid dimethyl ester	500	507
50-18-0	Cyclophosphamide	Cyclo phosphamide	990	990	75-18-3	Dimethyl sulfide		500	502
5989-27-5	d-Limonene	Limonene d-, Methyl 4-isopropenyl-1-cyclohexene, 1-	290	296	67-68-5	Dimethyl sulfoxide		500	503
	mixture Decontaminating agent (DS-2)		590	590	127-19-5	Dimethylacetamide, N,N-	Dimethyl acetamide, N,N-	130	132
108-83-8	Di-Isobutyl Ketone	Di Isobutyl Ketone	390	391	124-40-3	Dimethylamine	Dimethyl amine	140	142
123-42-2	Diacetone Alcohol		390	391	121-69-7	Dimethylaniline, N,N-	Dimethyl aniline, N,N-, Dimethyl phenylamine, N,N-	140	146
123-42-2	Diacetone Alcohol		390	391	75-78-5	Dimethyldichlorosilane	Dimethyl dichlorosilane	480	480
19287-45-7	Diborane		350	350					

CAS Number	Chemical Name	Synonym	Class	Sub-Class
68-12-2	Dimethylformamide, N,N-	Dimethyl formamide, N,N-	130	132
57-14-7	Dimethylhydrazine, 1,1-	Dimethyl hydrazine, N,N-	280	280
624-48-6	Dimethylmaleate	Dimethyl maleate	220	224
534-52-1	Dinitrocresol	Dinitro-o-cresol, 4,6-	310 / 440	316 / 442
123-91-1	Dioxane, 1,4-		270	278
101-68-8	Diphenylmethane Diisocyanate 4,4-	Diphenyl methane diisocyanate, 4,4'-, Methylene diphenyl diisocyanate, 4,4'-	210	212
29911-27-1	Dipropylene Glycol Monopropyl Ether		240	245
1321-74-0	Divinyl Benzene		290	292
8004-13-5	Dowtherm heat transfer fluid		590	590
92-52-4	Dowtherm, Biphenyl		240	242
25136-40-9	Doxorubicin HCl		990	990
mixture	DuPont Activator 193S		590	590
mixture	DuPont Activator 4505S		590	590
mixture	DuPont Activator 4507S		590	590
15520-10-2	Dytek® A		140	148
106-89-8	Epichlorohydrin	Chloro 2,3-epoxy propane, 1-	260 / 270	261 / 275
141-43-5	Ethanolamine	Amino ethanol, 2-, Ethanol amine	140 / 310	141 / 311
112-50-5	Ethoxytriglycol		240	245
141-78-6	Ethyl acetate	Acetic acid ethyl ester	220	222
140-88-5	Ethyl acrylate	Acrylic acid ethyl ester	220	223
64-17-5	Ethyl alcohol	Ethanol, Spiritus	310	311
100-41-4	Ethyl benzene	Phenyl ethane	290	292
97-95-0	Ethyl Butanol		310	312
110-80-5	Ethyl Cellosolve®	Ethoxy ethanol, 2-, Ethyl Cellosolve®, Ethylene glycol monoethyl ether	240	245
111-15-9	Ethyl Cellosolve® acetate	Acetic acid 2 ethoxy ethyl ester, Ethoxy ethylacetat, Ethyl glycol acetate, Ethylene glycol mono ethyl ether acetate	240	245
75-00-3	Ethyl chloride		260	261
60-29-7	Ethyl ether	Diethyl ether	240	241
75-08-1	Ethyl Mercaptan	Ethane thiol, Ethyl mercaptan	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	Ethyl amine	140	141
74-85-1	Ethylene		290	294
106-93-4	Ethylene dibromide	Dibromoethane, 1,2-	260	261
107-06-2	Ethylene dichloride	Dichlorethane, 1,2.-	260	261
107-21-1	Ethylene glycol	Ethane 1,2-diol, Glycol alcohol	310	314
818-61-1	Ethylene glycol acrylate		220	223
112-25-4	Ethylene Glycol Monoethyl Ether		240	245
75-21-8	Ethylene oxide	Epoxy ethane	270	275
mixture	Ethylene oxide mixture			275
107-15-3	Ethylenediamine	Diaminoethane, 1,2-, Ethylene diamine	140	148
151-56-4	Ethyleneimine	Aziridine, Ethylene imine	270	274
33419-42-0	Etoposide	Etoposide (Toposar®, Teva)	990	990
7705-08-0	Ferric chloride	Ferric (III) chloride	340	340
7758-94-3	Ferrous chloride	Ferric (II) chloride	340	340

CAS Number	Chemical Name	Synonym	Class	Sub-Class
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	Fluorosulfonic acid	370	370
51-21-8	Fluorouracil, 5-		990	990
50-00-0	Formaldehyde	Formalin	120	121
mixture	Formalin		120	121
64-18-6	Formic acid		100	102
68476-30-2	Fuel oil	Fuel-oil no 2	290	291
98-01-1	Furfural	Furaldehyde, 2-	120 / 270	122 / 277
96-48-0	gamma Butyrolactone			225
82410-32-0	Ganciclovir		990	990
86290-81-5	Gasoline	Gasoline, unleaded	290	291
308066-70-8	Gasoline, E-10	Gasoline, unleaded E10 (87 Octane)	290	291
95058-81-4	Gemcitabine		990	990
111-30-8	Glutaraldehyde	Glutaral, Pentanedial, 1,5-	120	121
79-14-1	Glycolic acid	Hydroxy acetic acid	100	103
mixture	Green liquor	Green Liquor	590	590
142-82-5	Heptane		290	291
87-68-3	Hexachlorobutadiene	Hexachloro butadiene	260	264
77-47-4	Hexachlorocyclopentadiene		260	264
76-16-4	Hexafluoroethane	Hexafluoro ethane, Perfluoroethane	260	261
382-10-5	Hexafluoroisobutylene	Hexafluoro isobutylene, Trifluoro 2-(trifluoromethyl)propene, 3,3,3-	260	261
999-97-3	Hexamethyldisilazane	Hexamethyl disilazane, Hexamethyl disilazane, 1,1,1,3,3,3-	140 / 480	142 / 480
822-06-0	Hexamethylene diisocyanate		210	211
mixture	Hexamethylene diisocyanate in DuPont Activator 193S	HDI in DuPont Activator 193S	210	211
mixture	Hexamethylene diisocyanate in DuPont Activator 4505S	HDI in DuPont Activator 4505S	210	211
mixture	Hexamethylene diisocyanate in DuPont Activator 4507S	HDI in DuPont Activator 4507S	210	211
124-09-4	Hexamethylenediamine, 1,6-	Hexamethylene diamine	140	148
110-54-3	Hexane, n-		290	291
592-41-6	Hexene, 1-	Hexene	290	294
108-10-1	Hexone	Isobutyl methyl ketone, Methyl pentan-2-one, 4-	390	391
112-59-4	Hexyl Carbitol Solvent		240	245
460-73-1	Hfc-245Fa		260	261
302-01-2	Hydrazine	Diamine	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		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		340 / 350 / 370	345 / 350 / 370
7664-39-3	Hydrogen fluoride		350 / 370	350 / 370

CAS Number	Chemical Name	Synonym	Class	Sub-Class
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	Phosphinic acid	370	370
3778-73-2	Ifosfamide		990	990
7553-56-2	Iodine		330	330
100286-90-6	Irinotecan		990	990
123-92-2	Iso Amyl Acetate		220	222
123-51-3	Isoamyl alcohol	Methyl butan-1-ol, 3-	310	312
75-28-5	Isobutane		290	291
78-83-1	Isobutanol		310	311 / 312
538-93-2	Isobutylbenzene		290	292
4098-71-9	Isophorone diisocyanate		210	211
78-79-5	Isoprene		290	296
108-21-4	Isopropyl Acetate		220	222
67-63-0	Isopropyl alcohol	Isopropanol, Propan -2-ol	310	312
75-31-0	Isopropylamine	Amino propane, 2-, Isopropyl amine	140	141
50815-00-4	JP-4 jet fuel	JP-4 Jet Fuel	290	291
94114-58-6	JP-8 jet fuel	JP-8 Jet Fuel	290	291
8008-20-6	Kerosene		290	291
50-21-5	Lactic Acid		100	103
7439-92-1	Lead		sol	sol1
541-25-3	Lewisite	Lewisite (L), MIL-STD-282	470	470
mixture	Lime		sol	sol1
58-89-9	Lindane	Hexachloro cyclohexane, 1,2,3,4,5,6-	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			161
60-24-2	Mercaptoethanol	Hydroxy 1-ethanethiol, 2-, Mercapto ethanol	310 / 500	311 / 501
7487-94-7	Mercuric chloride	Mercuric II chloride	340	340
7439-97-6	Mercury		330	330
141-79-7	Mesityl oxide		390	391
79-41-4	Methacrylic acid	Methyl propenoic acid, 2-	100	102
74-82-8	Methane		290	291
124-63-0	Methane sulfonyl chloride	Methanesulfonyl chloride	500	505
75-75-2	Methanesulfonic acid	Methanesulphonic acid	500	504
67-56-1	Methanol		310	311
16752-77-5	Methomyl		230	233
59-05-2	Methotrexate		990	990
112-35-6	Methoxytriglycol		240	245
79-20-9	Methyl Acetate		220	222
96-33-3	Methyl acrylate		220	223

CAS Number	Chemical Name	Synonym	Class	Sub-Class
74-83-9	Methyl bromide	Bromo methane	260	261
109-86-4	Methyl Cellosolve®	Ethylene glycol monomethyl ether, Methoxy ethanol, 2	240 / 310	245 / 311
110-49-6	Methyl Cellosolve® acetate	Acetic acid 2 methoxy ethyl ester, Ethylene glycol monomethyl ether acetate, Methoxy ethylacetate, 2-	240	245
74-87-3	Methyl chloride		260	261
79-22-1	Methyl chloroformate	Methyl chloro formate	110	113
78-93-3	Methyl ethyl ketone	Butanone, MEK	390	391
96-29-7	Methyl ethyl ketoxime	Butanone oxime, 2-	150	150
593-53-3	Methyl fluoride		260	261
107-31-3	Methyl formate		220	221
60-34-4	Methyl hydrazine		280	280
74-88-4	Methyl iodide	Iodomethane	260	261
105-44-2	Methyl Isobutyl Ketoxime			none
624-83-9	Methyl isocyanate		210	211
563-80-4	Methyl Isopropyl Ketone		390	391
74-93-1	Methyl mercaptan	Methanethiol	500	501
80-62-6	Methyl methacrylate	Methyl 2-methyl-2-propenoate	220	223
298-00-0	Methyl parathion		460	462
98-86-2	Methyl Phenyl Ketone			392
107-87-9	Methyl Propyl Ketone		390	391
119-36-8	Methyl salicylate		220	226
1634-04-4	Methyl tert-butyl ether	Methoxy 2-methylpropane, 2-	240	241
75-79-6	Methyl trichlorosilane		480	480
4553-62-2	Methyl-1,5-pentantedinitrile, 2-	Methyl 1,5-pentantedinitrile, 2-	430	431
872-50-4	Methyl-2-pyrrolidone, N-	Methyl 2-pyrrolidon, N-	130	132
74-89-5	Methylamine	Methyl amine	140	141
103-67-3	Methylbenzylamine	Benzyl methylamine, N-, Methyl benzylamine, N-	140	142
101-14-4	Methylene bis (o-chloroaniline), 4,4'-	Dichloro -4,4'-methylenedianiline, 2,2'-, Methylene bis(2-Chloroaniline), 4,4'-	140	149
1761-71-3	Methylene bis-cyclohexane diamine, 4,4'-	Methylen Isocyclohexylamine, 4,4'-		148
74-95-3	Methylene bromide		260	261
101-77-9	Methylene dianiline, 4,4'-	Diaminodiphenylmethane, 4,4'-, Methylene dianiline	140	145 / 149
123-39-7	Methylformamide, N-	Methyl formamide, N-	130	132
8012-95-1	Mineral oil		290	291
64475-85-0	Mineral spirits	Mineral spirit	290	291
50-07-7	Mitomycin		990	990
110-91-8	Morpholine	Diethylene imide oxide	140	142
3887-02-3	N-Methylmethacrylamide	Methylmethacrylamide, N-	130	135
109-02-4	N-Methylmorpholine (NMM)		140	142
8032-32-4	Naphtha		290	292
91-20-3	Naphthalene			293
91-20-3	Naphthalene		290	293
13463-39-3	Nickel carbonyl	Tetracarbonylnickel	470	470
54-11-5	Nicotine		270	271
7697-37-2	Nitric acid		370	370
52583-42-3	Nitric acid, red fuming		370	370
10102-43-9	Nitric oxide		350	350

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
97697-37-4	Nitric/Hydrofluoric Pickling Solution			none	98-85-1	Phenylethanol, 1-	Phenyl ethanol, 1-	310	318
98-95-3	Nitrobenzene	Nitro benzene	440	441	75-44-5	Phosgene		350	350
88-73-3	Nitrochlorobenzene, o-	Chloro 2-nitrobenzene, 1-	260 / 440	263 / 442	7803-51-2	Phosphine		350	350
100-00-5	Nitrochlorobenzene, p-	Nitro chlorobenzene, p-	260 / 440	263 / 442	7664-38-2	Phosphoric acid		370	370
10102-44-0	Nitrogen dioxide		350	350	10025-87-3	Phosphorus oxychloride		360	360
10544-72-6	Nitrogen tetroxide		350	350	7719-12-2	Phosphorus trichloride		360	360
7783-54-2	Nitrogen trifluoride		350	350	109-06-8	Picoline, 2-	Methyl pyridine, 2-	270	271
8007-56-5	Nitrohydrochloric Acid			none	108-99-6	Picoline, 3-	Methyl pyridine, 3-	270	271
75-52-5	Nitromethane	Nitro methane	440	441	24991-55-7	Polyethylene glycol dimethyl ether		240	245
88-75-5	Nitrophenol, o-	Hydroxy 2-nitrobenzene, 1-, Nitro phenol, o-	310 / 440	316 / 442	9016-87-9	Polymethylene polyphenyl-polyisocyanate (p-MDI)	Polymethylene polyphenyle isocyanate (p-MDI)	210	212
100-02-7	Nitrophenol, p-	Nitro phenol, p-	310 / 440	316 / 442	127-08-2	Potassium acetate		340	340
79-46-9	Nitropropane, 2-	Nitro propane, 2-	440	441	584-08-7	Potassium carbonate		340	340
88-72-2	Nitrotoluene, o-	Nitro toluene, 2-	440	442	7789-00-6	Potassium chromate		340	340
99-99-0	Nitrotoluene, p-	Nitro toluene, p-	440	442	151-50-8	Potassium cyanide		340	345
10024-97-2	Nitrous oxide		350	350	1310-58-3	Potassium hydroxide		380	380
112-20-9	Nonylamine		140	141	7722-64-7	Potassium permanganate		340	340
6143-29-9	Norbornene-2-yl acetate, 5-		220	222	74-98-6	Propane		290	291
111-65-9	Octane, n-		290	291	71-23-8	Propanol N-			311
111-87-5	Octanol N-	Octanol, n-	310	311	107-19-7	Propargyl alcohol	Prop-2-yn-1-ol	310	311
112-80-1	Oleic Acid		100	102	123-38-6	Propionaldehyde		120	121
8014-95-7	Oleum	Sulfuric acid fuming	370	370	79-09-4	Propionic acid	Propanoic acid		102
	mixture Organo-Tin Paint		470	470	1569-01-3	Propoxypropanol		240	245
106602-80-6	Otto fuel II		590	590	109-60-4	Propyl Acetate		220	222
144-62-7	Oxalic acid	Ethane dioic acid	100	104	2807-30-9	Propyl Cellosolve N-	Propyl Cellosolve, n-	240	245
63121-00-6	Oxaliplatin		990	990	107-10-8	Propylamine, n-	Propyl amine, n-	140	141
98-51-1	P-Tert Butyl Toluene		290	292	106-94-5	Propylbromide, n-	Propyl bromide, n-	260	261
33069-62-4	Paclitaxel	Paclitaxel (Hospira)	990	990	78-87-5	Propylene dichloride		260	261
104-49-4	Paraphenylene diisocyanate (PPDI) crude		210	212	57-55-6	Propylene Glycol		310	314
	mixture PCB		260	263	75-55-8	Propylene imine		270	274
	mixture PCB 1254	Polychlorinated biphenyl 1254		263	75-56-9	Propylene oxide, 1,2-	Epoxy propane, 1,2-	270	275
11097-69-1	PCB 1254		260	263	110-86-1	Pyridine		270	271
	mixture PCB gas condensate		260	263	123-75-1	Pyrrrolidine	Azolidine	270	274
	mixture PCB in transformer oil		260	263	306-83-2	Refrigerant 123A		260	261
87-86-5	Pentachlorophenol		310	316	1717-00-6	Refrigerant 141B		260	261
109-66-0	Pentane		290	291	31218-83-4	Safrotin		460	462
71-41-0	Pentanol, n-	Amyl alcohol, Pentanol, 1-	310	311	107-44-8	Sarin	Sarin (GB), MIL-STD-282	460	462
13284-42-9	Pentenenitrile, 2-	Pentene nitrile, 2-	430	431	7803-62-5	Silane		480	480
4635-87-4	Pentenenitrile, 3-	Pentene nitrile, 3-	430	431	10026-04-7	Silicon tetrachloride		360 / 480	360 / 480
79-21-0	Peracetic Acid		100	102 / 302	126-73-8	Skydrol 500 B-4		460	462
7601-90-3	Perchloric acid		370	370	95660-51-8	Skydrol®		460	462
2062-98-8	Perfluoro-2-propoxy propionyl fluoride	Perfluoro 2-propoxy propionyl fluoride	110 / 240 / 260	110 / 240 / 260	7647-14-5	Sodium chloride		990	990
60-12-8	Phenethyl alcohol, 2-		310	318	143-33-9	Sodium cyanide		340	345
108-95-2	Phenol		310	316	10588-01-9	Sodium dichromate		340	340
122-60-1	Phenyl glycidyl ether		270	275	7681-49-4	Sodium fluoride		340	340
108-98-5	Phenyl mercaptan	Benzene thiol	500	501	16721-80-5	Sodium hydrosulfide		340	340

CAS Number	Chemical Name	Synonym	Class	Sub-Class
1310-73-2	Sodium hydroxide	Caustic soda	380	380 / 591 / 592
7681-52-9	Sodium hypochlorite		340	340
7681-57-4	Sodium metabisulfite	Sodium metabisulphite	340	340
124-41-4	Sodium methyrate		550	550
6834-92-0	Sodium silicate		340	340
1313-82-2	Sodium sulfide	Disodium sulfide	340	340
96-64-0	Soman	Soman (GD), MIL-STD-282	460	462
8052-41-3	Stoddard solvent	Low boiling point naphtha - unspecified	290	291
100-42-5	Styrene	Phenethylene, Vinyl benzol	290	292
5329-14-6	Sulfamic acid	Amido sulfonic acid, Sulfamidic acid	370 / 500	370 / 509
7791-25-5	Sulfonyl chloride	Sulfuryl chloride	350 / 360	350 / 360
7446-09-5	Sulfur dioxide		350 / 360	350 / 365
2551-62-4	Sulfur hexafluoride		350 / 500	350 / 509
10025-67-9	Sulfur monochloride	Disulphur dichloride	500	502
505-60-2	Sulfur mustard	Sulfur Mustard (HD), MIL-STD-282	500	502
7446-11-9	Sulfur trioxide		360	365
7664-93-9	Sulfuric acid		370	370
	mixture t-Sodium-amylate / t-amyl alcohol		590	590
77-81-6	Tabun	Tabun (GA), MIL-STD-282	460	462
75-65-0	tert-Butyl alcohol	Butyl alcohol, tert-	310	313
79-27-6	Tetrabromoethane		260	261
79-95-8	Tetrachloro-bisphenol -A, 2,2',6,6'	Tetrachloro bisphenol-A, 2,2',6,6'-	260 / 310	263 / 316
79-34-5	Tetrachloroethane, 1,1,2,2,-	Tetrachloro ethane, 1,1,2,2,-	260	261
127-18-4	Tetrachloroethylene, 1,1,2,2,-	Ethylene tetrachloride, Tetrachloro ethylene, 1,1,2,2,-	260	264
78-10-4	Tetraethoxysilane		480	480
77-98-5	Tetraethyl Ammonium Hydroxide	Tetraethyl ammonium hydroxide	550	550
78-00-2	Tetraethyl lead		470	470
112-57-2	Tetraethylenepentamine	Tetraethylene pentamine	140	148
811-97-2	Tetrafluoroethane, 1,1,1,2,-	Norflurane	260	261
75-73-0	Tetrafluoromethane	Carbon tetrafluoride	260	261
109-99-9	Tetrahydrofuran		240	241
529-34-0	Tetralone			292
75-59-2	Tetramethylammonium hydroxide	Tetramethyl ammonium hydroxide	550	550
5076-20-0	Tetramethylethylene oxide		270	275
110-18-9	Tetramethylethylenediamine (TMEDA)	Tetramethylethylene diamine (TMEDA)	140	148
	mixture Tetramethyltin	Tetramethyl tin	590	590
68-11-1	Thioglycolic acid	Mercapto acetic acid	100 / 500	103 / 501
7719-09-7	Thionyl chloride		360	360
52-24-4	Thiotepa		990	990
7550-45-0	Titanium tetrachloride	Titan(IV) chloride	360	360
108-88-3	Toluene	Methyl benzol	290	292
26471-62-5	Toluene-1,3-diisocyanate	Toluene diisocyanate, 1,3-	210	212
584-84-9	Toluene-2,4-diisocyanate	Toluene diisocyanate, 2,4-	210	212
108-44-1	Toluidine, m-		140	145
95-53-4	Toluidine, o-	Methyl aniline, o-	140	145

CAS Number	Chemical Name	Synonym	Class	Sub-Class
156-60-5	trans-1,2-Dichloroethylene	Dichloro ethylene, trans-1,2,-	260	264
110-57-6	trans-1,4-Dichloro-2-butene	Dichloro -2-butene, trans-1,4,-	260	264
123-73-9	trans-Crotonaldehyde	Butenal, 2-, Croton aldehyde, Ethane diol dipropanoate, 1,2-, Methyl acrolein, Propylene aldehyde	120	121
118-79-6	Tribromophenol,2,4,6-	Tribromophenol, 2,4,6-	310	316
102-82-9	Tributylamine	Tributyl amine	140	143
76-13-1	Trichloro-1,2,2-trifluoroethane, 1,1,2-	Trichloro 1,2,2-trifluoroethane, 1,1,2,-	260	261
76-03-9	Trichloroacetic acid	Trichloro acetic acid	100	103
921-03-9	Trichloroacetone, 1,1,3-	Trichloro acetone, 1,1,3-	260 / 390	261 / 391
120-82-1	Trichlorobenzene, 1,2,4-	Trichloro benzene, 1,2,4,-	260	263
71-55-6	Trichloroethane, 1,1,1,-	Methyl chloroform, Methyl trichloromethane, Trichloro ethane, 1,1,1,-	260	261
79-00-5	Trichloroethane, 1,1,2,-	Ethane trichloride, Trichloro ethane, 1,1,2,-	260	261
115-20-8	Trichloroethanol, 2,2,2-	Trichloro ethanol, 2,2,2,-	310	315
79-01-6	Trichloroethylene	Ethylene trichloride, Trichloro ethylene	260	264
98-13-5	Trichlorophenylsilane	Phenyl trichlorosilane, Trichloro phenylsilane	480	480
10025-78-2	Trichlorosilane	Trichloro silane	480	480
75-94-5	Trichlorovinylsilane	Trichloro vinylsilane	480	480
102-71-6	Triethanolamine		140	143
998-30-1	Triethoxysilane		480	480
78-40-0	Triethyl Phosphate		460	462
97-93-8	Triethylaluminum	Triethyl aluminum	470	470
121-44-8	Triethylamine	Diethyl ethanamine, N,N-, Triethyl amine	140	143
112-24-3	Triethylenetetramine	Triethylenetetramine		
98-08-8	Trifluoromethylbenzene		260	263
76-05-1	Trifluoroacetic acid	Trifluoro acetic acid	100 / 260	103 / 261
354-32-5	Trifluoroacetyl chloride		110	111
75-89-8	Trifluoroethanol, 2,2,2-	Trifluoro ethanol, 2,2,2,-	310	315
75-46-7	Trifluoromethane	Trifluoro methane	260	261
1493-13-6	Trifluoromethane sulfonic acid	Trifluoro methansulfonic acid	500	504
512-56-1	Trimethyl phosphate		460	462
121-45-9	Trimethyl phosphite		460	462
75-50-3	Trimethylamine	Trimethyl amine	140	143
526-73-8	Trimethylbenzene, 1,2,3-		290	292
101-02-0	Triphenyl phosphite		460	462
102-69-2	Tripopylamine	Tripopyl amine	140	143
7783-82-6	Tungsten hexafluoride		350	350
8006-64-2	Turpentine		290	294 / 296
83016-70-0	Urethane Catalyst Alkanol		240	245
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	Acetic acid ethenyl ester	220	222
593-60-2	Vinyl bromide		260	264
75-01-4	Vinyl chloride	Chloro ethene	260	264
88-12-0	Vinyl Pyrrolidinone		270	274
75-35-4	Vinylidene chloride	Dichloro ethylene, 1,1,-	260	264

APPENDIX
CHEMICAL INDEX - Alphabetical Listing - Chemical Names and Synonyms

CAS Number	Chemical Name	Synonym	Class	Sub-Class
3536-96-7	Vinylmagnesium chloride	Vinyl magnesium chloride	470	470
100-43-6	Vinylpyridine, 4-	Vinyl pyridine, 4-	270	271
8030-30-6	VM&P Naphtha	VM & P Naphtha	290	291
50782-69-9	VX Nerve agent	VX Nerve Agent, MIL-STD-282	460	462
	mixture	White liquor	590	590
1330-20-7	Xylene, mixed isomers		290	292
95-47-6	Xylene, o-		290	292
95-68-1	Xylidine, 2,4-	Xylidine, 2,4-	140	145

CAS Number	Chemical Name	Synonym	Class	Sub-Class	CAS Number	Chemical Name	Synonym	Class	Sub-Class
50-00-0	Formaldehyde	Formalin	120	121	74-97-5	Bromochloromethane		260	261
50-07-7	Mitomycin		990	990	74-98-6	Propane		290	291
50-18-0	Cyclophosphamide	Cyclo phosphamide	990	990	75-00-3	Ethyl chloride		260	261
50-21-5	Lactic Acid		100	103	75-01-4	Vinyl chloride	Chloro ethene	260	264
51-21-8	Fluorouracil, 5-		990	990	75-04-7	Ethylamine	Ethyl amine	140	141
52-24-4	Thiotepa		990	990	75-05-8	Acetonitrile	Cyanomethane, Ethane nitrile, Ethyl nitrile, Methyl cyanide	430	431
54-11-5	Nicotine		270	271	75-07-0	Acetaldehyde		120	121
56-23-5	Carbon tetrachloride	Tetrachloro methane	260	261	75-08-1	Ethyl Mercaptan	Ethane thiol, Ethyl mercaptan	500	501
56-38-2	Ethyl parathion		460	462	75-09-2	Dichloromethane	Dichloro methane, Methylene chloride	260	261
57-14-7	Dimethylhydrazine, 1,1-	Dimethyl hydrazine, N,N-	280	280	75-15-0	Carbon disulfide		500	502
57-55-6	Propylene Glycol		310	314	75-18-3	Dimethyl sulfide		500	502
57-74-9	Chlordane		260	261	75-21-8	Ethylene oxide	Epoxy ethane	270	275
58-89-9	Lindane	Hexachloro cyclohexane, 1,2,3,4,5,6-	260	261	75-25-2	Bromoform		260	261
59-05-2	Methotrexate		990	990	75-28-5	Isobutane		290	291
60-12-8	Phenethyl alcohol, 2-		310	318	75-31-0	Isopropylamine	Amino propane, 2-, Isopropyl amine	140	141
60-24-2	Mercaptoethanol	Hydroxy 1-ethanethiol, 2-, Mercapto ethanol	310 / 500	311 / 501	75-35-4	Vinylidene chloride	Dichloro ethylene, 1,1-	260	264
60-29-7	Ethyl ether	Diethyl ether	240	241	75-36-5	Acetyl chloride	Acetic chloride, Ethanoyl chloride	110	111
60-34-4	Methyl hydrazine		280	280	75-44-5	Phosgene		350	350
62-53-3	Aniline	Amino benzene, Benzenamine, Phenyl amine	140	145	75-46-7	Trifluoromethane	Trifluoro methane	260	261
62-75-9	Dimethyl nitrosamine	Methyl N-nitrosomethanamine, N-	450	450	75-50-3	Trimethylamine	Trimethyl amine	140	143
64-17-5	Ethyl alcohol	Ethanol, Spiritus	310	311	75-52-5	Nitromethane	Nitro methane	440	441
64-18-6	Formic acid		100	102	75-55-8	Propylene imine		270	274
64-19-7	Acetic acid		100	102	75-56-9	Propylene oxide, 1,2-	Epoxy propane, 1,2-	270	275
64-67-5	Diethyl sulfate	Sulfuric acid diethyl ester	500	507	75-59-2	Tetramethylammonium hydroxide	Tetramethyl ammonium hydroxide	550	550
67-56-1	Methanol		310	311	75-64-9	Butylamine, tert-	Amino 2-methylpropane, 2-, Butyl amine, tert-, Trimethyl aminomethane	140	141
67-63-0	Isopropyl alcohol	Isopropanol, Propan -2-ol	310	312	75-65-0	Butanol tert.	Butanol, tert-, Methyl propan-2-ol, 2-	310	313
67-64-1	Acetone	Dimethyl ketal, Dimethyl ketone, Ketone propane, Methyl acetyl, Methyl ketone, Propan -2-one, Pyroacetic ether	390	391	75-65-0	tert-Butyl alcohol	Butyl alcohol, tert-	310	313
67-66-3	Chloroform	Chloro form, Trichloro methane	260	261	75-73-0	Tetrafluoromethane	Carbon tetrafluoride	260	261
67-68-5	Dimethyl sulfoxide		500	503	75-75-2	Methanesulfonic acid	Methanesulphonic acid	500	504
68-11-1	Thioglycolic acid	Mercapto acetic acid	100 / 500	103 / 501	75-78-5	Dimethyldichlorosilane	Dimethyl dichlorosilane	480	480
68-12-2	Dimethylformamide, N,N-	Dimethyl formamide, N,N-	130	132	75-79-6	Methyl trichlorosilane		480	480
71-23-8	Propanol N-			311	75-86-5	Acetone cyanohydrin	Cyanopropan-2-ol, 2-, Hydroxy 2-methylpropionitrile, 2-, Hydroxy isobutyronitrile	310 / 430	313 / 431
71-36-3	Butanol, n-	Butanol, 1-, Butyl alcohol, n-	310	311	75-89-8	Trifluoroethanol, 2,2,2-	Trifluoro ethanol, 2,2,2-	310	315
71-41-0	Pentanol, n-	Amyl alcohol, Pentanol, 1-	310	311	75-94-5	Trichlorovinylsilane	Trichlor vinylsilane	480	480
71-43-2	Benzene		290	292	76-03-9	Trichloroacetic acid	Trichloro acetic acid	100	103
71-55-6	Trichloroethane, 1,1,1-	Methyl chloroform, Methyl trichloromethane, Trichloro ethane, 1,1,1-	260	261	76-05-1	Trifluoroacetic acid	Trifluoro acetic acid	100 / 260	103 / 261
74-82-8	Methane		290	291	76-06-2	Chloropicrin	Chlor trinitromethan, Chloro picrin, Nitro chlormethan	260	261
74-83-9	Methyl bromide	Bromo methane	260	261	76-13-1	Trichloro-1,2,2-trifluoroethane, 1,1,2-	Trichloro 1,2,2-trifluoroethane, 1,1,2-	260	261
74-85-1	Ethylene		290	294	76-16-4	Hexafluoroethane	Hexafluoro ethane, Perfluoroethane	260	261
74-87-3	Methyl chloride		260	261	77-47-4	Hexachlorocyclopentadiene		260	264
74-88-4	Methyl iodide	Iodomethane	260	261	77-78-1	Dimethyl sulfate	Sulfuric acid dimethyl ester	500	507
74-89-5	Methylamine	Methyl amine	140	141	77-81-6	Tabun	Tabun (GA), MIL-STD-282	460	462
74-90-8	Hydrogen cyanide		340 / 350 / 370	345 / 350 / 370	77-92-9	Citric acid	Hydroxy 1,2,3-propanetricarboxylic acid, 2-	100	104
74-93-1	Methyl mercaptan	Methanethiol	500	501	77-98-5	Tetraethyl Ammonium Hydroxide	Tetraethyl ammonium hydroxide	550	550
74-95-3	Methylene bromide		260	261	78-00-2	Tetraethyl lead		470	470

CAS Number	Chemical Name	Synonym	Class	Sub-Class	CAS Number	Chemical Name	Synonym	Class	Sub-Class
78-10-4	Tetraethoxysilane		480	480	95-53-4	Toluidine, o-	Methyl aniline, o-	140	145
78-40-0	Triethyl Phosphate		460	462	95-68-1	Xylidine, 2,4-	Xylidine, 2,4-	140	145
78-79-5	Isoprene		290	296	95-76-1	Dichloroaniline, 3,4-	Amino 3,4-dichlorobenzene, 1-, Dichloro aniline, 3,4-	140 / 260	145 / 263
78-83-1	Isobutanol		310	311 / 312	96-12-8	Dibromo-3-chloropropane, 1,2-	Dibromo -3-chloropropane, 1,2-	260	261
78-87-5	Propylene dichloride		260	261	96-24-2	Chloro-1,2-propanediol, 3-	Chloro 1,2-propanediol, 3-	310	314
78-88-6	Dichloropropene, 2,3-	Dichloro propene, 2,3-	260	261	96-29-7	Methyl ethyl ketoxime	Butanone oxime, 2-	150	150
78-93-3	Methyl ethyl ketone	Butanone, MEK	390	391	96-33-3	Methyl acrylate		220	223
78-95-5	Chloroacetone	Chloro acetone, Chloro propan-2-one, 1-	390	391	96-48-0	gamma Butyrolactone			225
79-00-5	Trichloroethane, 1,1,2-	Ethane trichloride, Trichloro ethane, 1,1,2-	260	261	96-64-0	Soman	Soman (GD), MIL-STD-282	460	462
79-01-6	Trichloroethylene	Ethylene trichloride, Trichloro ethylene	260	264	97-63-2	Ethyl methacrylate		220	223
79-04-9	Chloroacetyl chloride	Chloro acetyl chloride	110	111	97-93-8	Triethylaluminum	Triethyl aluminum	470	470
79-06-1	Acrylamide	Acryl amide, Acrylic amide, Propenamamide	130	135	97-95-0	Ethyl Butanol		310	312
79-09-4	Propionic acid	Propanoic acid		102	98-01-1	Furfural	Furaldehyde, 2-	120 / 270	122 / 277
79-10-7	Acrylic acid	Acroleic acid, Ethylene carboxylic acid, Propene acid	100	102	98-07-7	Benzotrchloride	Benzo trichloride	260	263
79-11-8	Chloroacetic acid	Chloro acetic acid	100	103	98-08-8	Trifluoromethylbenzene		260	263
79-14-1	Glycolic acid	Hydroxy acetic acid	100	103	98-09-9	Benzene sulfonyl chloride	Benzene sulfone chloride	500	505
79-20-9	Methyl Acetate		220	222	98-13-5	Trichlorophenylsilane	Phenyl trichlorosilane, Trichloro phenylsilane	480	480
79-21-0	Peracetic Acid		100	102 / 302	98-51-1	P-Tert Butyl Toluene		290	292
79-22-1	Methyl chloroformate	Methyl chloro formate	110	113	98-56-6	Chloro-benzotrifluoride, 4-	Chloro benzotrifluoride, 4-	260	263
79-27-6	Tetrabromoethane		260	261	98-82-8	Cumene	Isopropyl benzene, Phenyl propane, 2-	290	292
79-34-5	Tetrachloroethane, 1,1,2,2,-	Tetrachloro ethane, 1,1,2,2,-	260	261	98-85-1	Phenylethanol, 1-	Phenyl ethanol, 1-	310	318
79-36-7	Dichloroacetyl chloride	Dichloro acetyl chloride	110	111	98-86-2	Methyl Phenyl Ketone			392
79-41-4	Methacrylic acid	Methyl propenoic acid, 2-	100	102	98-88-4	Benzoyl chloride	Benzene carbonyl chloride	110	112
79-46-9	Nitropropane, 2-	Nitro propane, 2-	440	441	98-95-3	Nitrobenzene	Nitro benzene	440	441
79-95-8	Tetrachloro-bisphenol -A, 2,2',6,6'	Tetrachloro bisphenol-A, 2,2',6,6'	260 / 310	263 / 316	99-99-0	Nitrotoluene, p-	Nitro toluene, p-	440	442
80-62-6	Methyl methacrylate	Methyl 2-methyl-2-propenoate	220	223	100-00-5	Nitrochlorobenzene, p-	Nitro chlorobenzene, p-	260 / 440	263 / 442
84-74-2	Dibutyl Phthalate N-	Propan -1-ol, Propanol, 1-, Propanol, n-, Propyl alcohol			100-02-7	Nitrophenol, p-	Nitro phenol, p-	310 / 440	316 / 442
87-68-3	Hexachlorobutadiene	Hexachloro butadiene	260	264	100-41-4	Ethyl benzene	Phenyl ethane	290	292
87-86-5	Pentachlorophenol		310	316	100-42-5	Styrene	Phenethylene, Vinyl benzol	290	292
88-12-0	Vinyl Pyrrolidinone		270	274	100-43-6	Vinylpyridine, 4-	Vinyl pyridine, 4-	270	271
88-72-2	Nitrotoluene, o-	Nitro toluene, 2-	440	442	100-44-7	Benzyl chloride	Chloro toluene, alpha-	260	266
88-73-3	Nitrochlorobenzene, o-	Chloro 2-nitrobenzene, 1-	260 / 440	263 / 442	100-47-0	Benzonitrile	Benzo nitrile, Cyanobenzene, Phenyl cyanide	430	432
88-75-5	Nitrophenol, o-	Hydroxy 2-nitrobenzene, 1-, Nitro phenol, o-	310 / 440	316 / 442	100-51-6	Benzyl alcohol	Hydroxy toluene	310	312
91-20-3	Naphthalene			293	100-52-7	Benzaldehyde		120	122
91-20-3	Naphthalene		290	293	101-02-0	Triphenyl phosphite		460	462
91-66-7	Diethylaniline	Diethyl aniline, N,N-	140	146	101-14-4	Methylene bis (o-chloroaniline), 4,4'-	Dichloro -4,4'-methylenedianiline, 2,2'-, Methylene bis(2-Chloroaniline), 4,4'-	140	149
91-66-7	Diethylaniline crude	Diethyl aniline crude	140	146	101-68-8	Diphenylmethane Diisocyanate 4,4'-	Diphenyl methane diisocyanate, 4,4'-, Methylene diphenyl diisocyanate, 4,4'-	210	212
91-67-8	Diethyl-m-toluidine crude	Diethyl m-toluidine, N,N-	140	145	101-77-9	Methylene dianiline, 4,4'-	Diaminodiphenylmethane, 4,4'-, Methylene dianiline	140	145 / 149
92-52-4	Dowtherm, Biphenyl		240	242	102-69-2	Tripropylamine	Tripropyl amine	140	143
92-67-1	Aminodiphenyl, 4-	Amino diphenyl, 4-	140	145	102-71-6	Triethanolamine		140	143
92-87-5	Benzidine	Biphenyl 4,4'-diamine, 1,1'-, Diaminobiphenyl, 4,4'-, Diaminodiphenyl, p-	140	145 / 149	102-82-9	Tributylamine	Tributyl amine	140	143
95-47-6	Xylene, o-		290	292	103-67-3	Methylbenzylamine	Benzyl methylamine, N-, Methyl benzylamine, N-	140	142
95-48-7	Cresol, o-	Cresol o-, Hydroxy toluene, o-	310	316	104-49-4	Paraphenylene diisocyanate (PPDI) crude		210	212
95-49-8	Chlorotoluene, o-	Chloro 1-methylbenzene, 2-, Chloro toluene, o-	260	263	105-44-2	Methyl Isobutyl Ketoxime			none
95-50-1	Dichlorobenzene, 1,2-	Dichlorbenzen, 1,2-	260	263	106-46-7	Dichlorobenzene, 1,4	Dichlorbenzen, 1,4-	260	263

CAS Number	Chemical Name	Synonym	Class	Sub-Class
106-47-8	Chloroaniline, p-	Chloro aniline, p-, Chloro benzenamine, 4-	140	145
106-48-9	Chlorophenol, 4-	Chloro phenol, p-, Hydroxy chlorobenzene	260 / 310	263 / 316
106-88-7	Butylene oxide, 1,2-		270	275
106-89-8	Epichlorohydrin	Chloro 2,3-epoxy propane, 1-	260 / 270	261 / 275
106-93-4	Ethylene dibromide	Dibromoethane, 1,2-	260	261
106-94-5	Propylbromide, n-	Propyl bromide, n-	260	261
106-99-0	Butadiene, 1,3-	Vinyl ethylene	290	296
107-02-8	Acrolein	Prop-2-en-1-al	120	121
107-05-1	Allyl chloride	Chlor allylene, Chloro prene, 3-	260	265
107-06-2	Ethylene dichloride	Dichlorethane, 1,2.-	260	261
107-07-3	Chloroethanol, 2-	Chloro ethanol, 2-, Ethylene chlorohydrin, Glycol chlorohydrin	260 / 310	261 / 315
107-10-8	Propylamine, n-	Propyl amine, n-	140	141
107-13-1	Acrylonitrile	Cyanoethylene, Propenenitrile, 2-, Propenoic acid nitrile, Vinyl cyanide	430	431
107-15-3	Ethylenediamine	Diaminoethane, 1,2-, Ethylene diamine	140	148
107-18-6	Allyl alcohol	Hydroxy propene, Propen 1-ol, 2-, Vinyl carbinol	310	311
107-19-7	Propargyl alcohol	Prop-2-yn-1-ol	310	311
107-21-1	Ethylene glycol	Ethane 1,2-diol, Glycol alcohol	310	314
107-30-2	Chloromethyl methyl ether	Chloro methyl methyl ether, Methoxy chloromethane	240	241
107-31-3	Methyl formate		220	221
107-44-8	Sarin	Sarin (GB), MIL-STD-282	460	462
107-87-9	Methyl Propyl Ketone		390	391
107-92-6	Butyric acid	Butyric Acid		102
108-05-4	Vinyl acetate	Acetic acid ethenyl ester	220	222
108-10-1	Hexone	Isobutyl methyl ketone, Methyl pentan-2-one, 4-	390	391
108-21-4	Isopropyl Acetate		220	222
108-24-7	Acetic anhydride		160	161
108-31-6	Maleic anhydride			161
108-44-1	Toluidine, m-		140	145
108-77-0	Cyanuric chloride	Cyanide chloride, Trichloro 1,3,5-triazine, 2,4,6-	260	263
108-83-8	Di-Isobutyl Ketone	Di Isobutyl Ketone	390	391
108-88-3	Toluene	Methyl benzol	290	292
108-90-7	Chlorobenzene	Chloro benzene, Phenyl chloride	260	263
108-91-8	Cyclohexylamine		140	141
108-93-0	Cyclohexanol		310	312
108-94-1	Cyclohexanone	Cyclo hexanone, Hexanone, Pimelic ketone	390	391
108-95-2	Phenol		310	316
108-98-5	Phenyl mercaptan	Benzene thiol	500	501
108-99-6	Picoline, 3-	Methyl pyridine, 3-	270	271
109-02-4	N-Methylmorpholine (NMM)		140	142
109-06-8	Picoline, 2-	Methyl pyridine, 2-	270	271
109-55-7	1,3-Propanediamine, N,N'-Dimethyl		140	148
109-60-4	Propyl Acetate		220	222
109-63-7	Boron trifluoride etherate	Boron fluoride ethyl ether, Boron trifluoride diethyl etherate	590	590
109-66-0	Pentane		290	291
109-73-9	Butylamine, n-	Butyl amine	140	141
109-73-9	Butylamine, n-	Butyl amine	140	141

CAS Number	Chemical Name	Synonym	Class	Sub-Class
109-86-4	Methyl Cellosolve®	Ethylene glycol monomethyl ether, Methoxy ethanol, 2	240 / 310	245 / 311
109-89-7	Diethylamine	Diethyl amine, Ethyl ethanamine, N-	140	142
109-92-2	Ethyl vinyl ether		240 / 260	246 / 261
109-99-9	Tetrahydrofuran		240	241
110-16-7	Maleic acid		100	104
110-18-9	Tetramethylethylenediamine (TMEDA)	Tetramethylethylene diamine (TMEDA)	140	148
110-49-6	Methyl Cellosolve® acetate	Acetic acid 2 methoxy ethyl ester, Ethylene glycol monomethyl ether acetate, Methoxy ethylacetate, 2-	240	245
110-51-0	Borane-pyridine complex		590	590
110-54-3	Hexane, n-		290	291
110-57-6	trans-1,4-Dichloro-2-butene	Dichloro -2-butene, trans-1,4-	260	264
110-80-5	Ethyl Cellosolve®	Ethoxy ethanol, 2-, Ethyl Cellosolve®, Ethylene glycol monoethyl ether	240	245
110-82-7	Cyclohexane	Cyclo hexane	290	291
110-86-1	Pyridine		270	271
110-91-8	Morpholine	Diethylene imide oxide	140	142
111-15-9	Ethyl Cellosolve® acetate	Acetic acid 2 ethoxy ethyl ester, Ethoxy ethylacetate, Ethyl glycol acetate, Ethylene glycol mono ethyl ether acetate	240	245
111-30-8	Glutaraldehyde	Glutaral, Pentanedial, 1,5-	120	121
111-40-0	Diethylenetriamine		140	148
111-41-1	Aminoethylethanolamine	Amino ethylethanolamine	140 / 310	148 / 311
111-42-2	Diethanolamine		140	142
111-44-4	Dichloroethyl ether	Dichloro ethyl ether	240 / 260	241 / 261
111-46-6	Diethylene Glycol		310	314
111-65-9	Octane, n-		290	291
111-69-3	Adiponitrile	Adipic acid dinitrile, Adipic acid nitrile, Adipyl dinitrile, Dicyanobutane, 1,4-	430	431
111-76-2	Butyl Cellosolve®	Butoxy ethanol, 2-, Ethylene glycol monobutyl ether	240	245
111-77-3	Diethylene Glycol Monomethyl Ether		240	245
111-87-5	Octanol N-	Octanol, n-	310	311
111-90-0	(2-Ethoxyethoxy)-ethanol, 2-	2-(2-Ethoxyethoxy) ethanol	240	245
112-07-2	Butyl Cellosolve Acetate		240	245
112-20-9	Nonylamine		140	141
112-24-3	Triethylenetetramine	Triethylenetetramine		
112-25-4	Ethylene Glycol Monoethyl Ether		240	245
112-34-5	2-(2-Butoxyethoxy)-ethanol	2-(2-Butoxyethoxy) ethanol, Diethylene glycol monobutyl ether	240 / 310	245 / 311
112-35-6	Methoxytriglycol		240	245
112-50-5	Ethoxytriglycol		240	245
112-57-2	Tetraethylenepentamine	Tetraethylene pentamine	140	148
112-59-4	Hexyl Carbitol Solvent		240	245
112-80-1	Oleic Acid		100	102
115-10-6	Dimethyl ether		240	241
115-20-8	Trichloroethanol, 2,2,2-	Trichloro ethanol, 2,2,2-	310	315
117-81-7	Diethylhexyl phthalate	DEHP, Diethyl hexyl phthalate	220	226
118-79-6	Tribromophenol, 2,4,6-	Tribromophenol, 2,4,6-	310	316
119-36-8	Methyl salicylate		220	226
120-12-7	Anthracene	Anthracene , Anthracin	290	293
120-82-1	Trichlorobenzene, 1,2,4-	Trichloro benzene, 1,2,4-	260	263
121-44-8	Triethylamine	Diethyl ethanamine, N,N-, Triethyl amine	140	143

CAS Number	Chemical Name	Synonym	Class	Sub-Class
121-45-9	Trimethyl phosphite		460	462
121-69-7	Dimethylaniline, N,N-	Dimethyl aniline, N,N-, Dimethyl phenylamine, N,N-	140	146
121-75-5	Malathion		460	462
122-60-1	Phenyl glycidyl ether		270	275
123-38-6	Propionaldehyde		120	121
123-39-7	Methylformamide, N-	Methyl formamide, N-	130	132
123-42-2	Diacetone Alcohol		390	391
123-51-3	Isoamyl alcohol	Methyl butan-1-ol, 3-	310	312
123-72-8	Butyraldehyde, n-	Butanal, n-	120	121
123-73-9	trans-Crotonaldehyde	Butenal, 2-, Croton aldehyde, Ethane diol dipropionate, 1,2-, Methyl acrolein, Propylene aldehyde	120	121
123-75-1	Pyrrolidine	Azolidine	270	274
123-86-4	Butyl acetate, n-		220	222
123-91-1	Dioxane, 1,4-		270	278
123-92-2	Iso Amyl Acetate		220	222
124-09-4	Hexamethylenediamine, 1,6-	Hexamethylene diamine	140	148
124-40-3	Dimethylamine	Dimethyl amine	140	142
124-41-4	Sodium methylate		550	550
124-63-0	Methane sulfonyl chloride	Methanesulfonyl chloride	500	505
126-73-8	Skydrol 500 B-4		460	462
126-99-8	Chloro-1,3-butadiene, 2-	Chloro 1,3-butadiene, 2-, Chloro buta-1,3-diene, 2-, Chloro prene, Neoprene	260	264
127-08-2	Potassium acetate		340	340
127-18-4	Tetrachloroethylene, 1,1,2,2-	Ethylene tetrachloride, Tetrachloro ethylene, 1,1,2,2-	260	264
127-19-5	Dimethylacetamide, N,N-	Dimethyl acetamide, N,N-	130	132
140-29-4	Benzyl cyanide	Benzyl cyanide, Phenyl acetonitrile	430	432
140-31-8	Aminoethylpiperazine	Amino ethylpiperazine	140 / 270	148 / 274
140-88-5	Ethyl acrylate	Acrylic acid ethyl ester	220	223
141-32-2	Butyl acrylate, n-	Acrylic acid n-butyl ester, Propenoic acid butyl ester, 2-	220	223
141-43-5	Ethanolamine	Amino ethanol, 2-, Ethanol amine	140 / 310	141 / 311
141-78-6	Ethyl acetate	Acetic acid ethyl ester	220	222
141-79-7	Mesityl oxide		390	391
142-82-5	Heptane		290	291
142-96-1	Butyl ether, n-		240	241
143-22-6	Butoxytriglycol		240	245
143-33-9	Sodium cyanide		340	345
144-62-7	Oxalic acid	Ethane dioic acid	100	104
151-50-8	Potassium cyanide		340	345
151-56-4	Ethyleneimine	Aziridine, Ethylene imine	270	274
154-93-8	Carmustine		990	990
156-60-5	trans-1,2-Dichloroethylene	Dichloro ethylene, trans-1,2-	260	264
298-00-0	Methyl parathion		460	462
302-01-2	Hydrazine	Diamine	280	280
306-83-2	Refrigerant 123A		260	261
328-84-7	Benzene, Dichloro-4-Trifluoro		260	263
353-42-4	Boron trifluoride dimethyletherate	Boron trifluoride dimethyl etherate	590	590
354-32-5	Trifluoroacetyl chloride		110	111

CAS Number	Chemical Name	Synonym	Class	Sub-Class
382-10-5	Hexafluoroisobutylene	Hexafluoro isobutylene, Trifluoro 2-(trifluoromethyl)propene, 3,3,3-	260	261
460-00-4	Bromofluorobenzene, 4-	Bromo 4-fluorobenzene, 1-, Bromo fluorobenzene, 4-	260	263
460-73-1	Hfc-245Fa		260	261
461-82-5	Aniline, 4-trifluoromethoxy	Anilin, 4-Trifluoromethoxy-	140 / 240	145 / 242
462-06-6	Fluorobenzene		260	263
501-53-1	Benzyl chloroformate	Benzyl chloro formate	110	113
504-29-0	Aminopyridine, 2-	Amino pyridine, 2-	270	271
505-60-2	Sulfur mustard	Sulfur Mustard (HD), MIL-STD-282	500	502
506-77-4	Cyanogen chloride		340	345
512-56-1	Trimethyl phosphate		460	462
526-73-8	Trimethylbenzene, 1,2,3-		290	292
529-34-0	Tetralone			292
532-27-4	Chloroacetophenone		260	261
534-07-6	Dichloroacetone	Dichloro -2-propanone, 1,3-, Dichloro acetone, 1,3-	260 / 390	261 / 391
534-52-1	Dinitrocresol	Dinitro-o-cresol, 4,6-	310 / 440	316 / 442
538-93-2	Isobutylbenzene		290	292
541-25-3	Lewisite	Lewisite (L), MIL-STD-282	470	470
541-73-1	Dichlorobenzene, 1,3-	Dichlorobenzen, 1,3-	260	263
542-75-6	Dichloropropene, 1,3-	Dichloro propene, 1,3-	260	261
563-80-4	Methyl Isopropyl Ketone		390	391
584-08-7	Potassium carbonate		340	340
584-84-9	Toluene-2,4-diisocyanate	Toluene diisocyanate, 2,4-	210	212
592-41-6	Hexene, 1-	Hexene	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	Dimethyl maleate	220	224
624-83-9	Methyl isocyanate		210	211
624-92-0	Dimethyl disulfide		500	502
628-63-7	Amyl acetate, n-	Acetic acid pentyl ester, Amyl ester acetic acid, Pentyl acetate	220	222
628-76-2	Dichloropentane		260	261
630-08-0	Carbon monoxide		350	350
755-95-3	Diiodo-1,1,2,2-tetrafluorobutane, 1,4-		260	261
756-79-6	Dimethyl Methyl Phosphonate		460	462
764-41-0	Dichloro-2-butene, 1,4-		260	264
811-97-2	Tetrafluoroethane, 1,1,1,2-	Norflurane	260	261
814-68-6	Acryloyl 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-	Methyl 2-pyrrolidon, N-	130	132
920-37-6	Chloroacrylonitrile, 2-	Chloro acrylonitrile, 2-	260 / 430	264 / 431
921-03-9	Trichloroacetone, 1,1,3-	Trichloro acetone, 1,1,3-	260 / 390	261 / 391
927-68-4	Bromoethyl Acetate, 2-		220 / 260	222 / 261
998-30-1	Triethoxysilane		480	480
999-97-3	Hexamethyldisilazane	Hexamethyl disilazane, Hexamethyl disilazane, 1,1,1,3,3,3-	140 / 480	142 / 480

CAS Number	Chemical Name	Synonym	Class	Sub-Class
1310-58-3	Potassium hydroxide		380	380
1310-65-2	Lithium hydroxide		380	380
1310-73-2	Sodium hydroxide	Caustic soda	380	380 / 591 / 592
1313-82-2	Sodium sulfide	Disodium sulfide	340	340
1319-77-3	Cresol, mixed isomers	Cresols, mixed isomers, Cresylic acid, Methyl phenols	310	316
1321-74-0	Divinyl Benzene		290	292
1330-20-7	Xylene, mixed isomers		290	292
1332-21-4	Asbestos (all forms)		sol	sol1
1333-82-0	Chromic acid	Chromic acid (CrO3)	370	370
1336-21-6	Ammonium hydroxide	Caustic ammonia	380	380
1341-49-7	Ammonium Bifluoride	Ammonium bifluoride, Ammonium hydrogendifluoride	340	340
1493-13-6	Trifluoromethane sulfonic acid	Trifluoro methansulfonic acid	500	504
1552-12-1	Cyclooctadiene	Cyclo octadiene	290	296
1569-01-3	Propoxypropanol		240	245
1634-04-4	Methyl tert-butyl ether	Methoxy 2-methylpropane, 2-	240	241
1675-54-3	Bisphenol-A diglycidyl ether	Bis (4-(2,3-epoxypropoxy)phenyl)propane, Bis phenol A diglycidyl ether, Isopropylidenediphenol diglycidyl ether, 4,4'-	270	275
1717-00-6	Refrigerant 141B		260	261
1761-71-3	Methylene bis-cyclohexane diamine, 4,4'	Methylen Isocyclohexylamine, 4,4-		148
2062-98-8	Perfluoro-2-propoxy propionyl fluoride	Perfluoro 2-propoxy propionyl fluoride	110 / 240 / 260	110 / 240 / 260
2068-78-2	Vincristine sulfate		990	990
2551-62-4	Sulfur hexafluoride		350 / 500	350 / 509
2807-30-9	Propyl Cellosolve N-	Propyl Cellosolve, n-	240	245
3173-53-3	Cyclohexyl isocyanate	Cyclo hexyl isocanyte	210	211
3536-96-7	Vinylmagnesium chloride	Vinyl magnesium chloride	470	470
3778-73-2	Ifosfamide		990	990
3887-02-3	N-Methylmethacrylamide	Methylmethacrylamide, N-	130	135
4098-71-9	Isophorone diisocyanate		210	211
4109-96-0	Dichlorosilane	Dichloro silane	480	480
4553-62-2	Methyl-1,5-pentantedinitrile, 2-	Methyl 1,5-pentantedinitrile, 2-	430	431
4635-87-4	Pentenenitrile, 3-	Pentene nitrile, 3-	430	431
5076-20-0	Tetramethylethylene oxide		270	275
5216-25-1	Chlorobenzotrichloride, 4-	Chloro benzotrighloride, 4-	260	263
5329-14-6	Sulfamic acid	Amido sulfonic acid, Sulfamidic acid	370 / 500	370 / 509
5394-63-8	Diketene Acetone		220 / 240 / 270 / 390	223 / 244 / 278 / 390
5989-27-5	d-Limonene	Limonene d-, Methyl 4-isopropenyl-1-cyclohexene, 1-	290	296
6143-29-9	Norbornene-2-yl acetate, 5-		220	222
6303-21-5	Hypophosphorus acid	Phosphinic acid	370	370
6834-92-0	Sodium silicate		340	340
6881-94-3	Diethylene Glycol Monopropyl Ether		240	245
7087-68-5	Diisopropylethylamine (DIPEA)		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

CAS Number	Chemical Name	Synonym	Class	Sub-Class
7447-41-8	Lithium chloride		340	340
7487-94-7	Mercuric chloride	Mercuric II chloride	340	340
7550-45-0	Titanium tetrachloride	Titan(IV) chloride	360	360
7553-56-2	Iodine		330	330
7601-90-3	Perchloric acid		370	370
7632-51-1	Vanadium tetrachloride		360	360
7637-07-2	Boron trifluoride		350 / 360	350 / 360
7647-01-0	Hydrochloric acid		370	370
7647-01-0	Hydrogen chloride		350	350
7647-14-5	Sodium chloride		990	990
7647-18-9	Antimony pentachloride	Pentachloroantimony	360	360
7664-38-2	Phosphoric acid		370	370
7664-39-3	Hydrofluoric acid		370	370
7664-39-3	Hydrogen fluoride		350 / 370	350 / 370
7664-41-7	Ammonia		350 / 380	350 / 380
7664-93-9	Sulfuric acid		370	370
7681-49-4	Sodium fluoride		340	340
7681-52-9	Sodium hypochlorite		340	340
7681-57-4	Sodium metabisulfite	Sodium metabisulphite	340	340
7697-37-2	Nitric acid		370	370
7705-08-0	Ferric chloride	Ferric (III) chloride	340	340
7719-09-7	Thionyl chloride		360	360
7719-12-2	Phosphorus trichloride		360	360
7722-64-7	Potassium permanganate		340	340
7722-84-1	Hydrogen peroxide		300	300
7726-95-6	Bromine		330	330
7758-94-3	Ferrous chloride	Ferric (II) chloride	340	340
7782-41-4	Fluorine		350	350
7782-50-5	Chlorine		330 / 350	330 / 350
7783-06-4	Hydrogen sulfide		350 / 500	350 / 502
7783-07-5	Hydrogen selenide		350	350
7783-54-2	Nitrogen trifluoride		350	350
7783-82-6	Tungsten hexafluoride		350	350
7784-34-1	Arsenic trichloride	Arsenic (III) chloride	340	340
7784-42-1	Arsine		350	350
7789-00-6	Potassium chromate		340	340
7789-21-1	Fluorosulfonic acid	Fluorosulfonic acid	370	370
7790-91-2	Chlorine trifluoride		350	350
7790-94-5	Chlorosulfonic acid	Chlorsulfonic acid	370 / 500	370 / 504
7791-25-5	Sulfonyl chloride	Sulfuryl chloride	350 / 360	350 / 360
7803-51-2	Phosphine		350	350
7803-62-5	Silane		480	480
8001-58-9	Creosote		310	316
8002-05-9	Crude oil	Crude oil, California, Mineral oil	290	294
8004-13-5	Dowtherm heat transfer fluid		590	590

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
8006-64-2	Turpentine		290	294 / 296	29911-27-1	Dipropylene Glycol Monopropyl Ether		240	245
8007-56-5	Nitrohydrochloric Acid			none	29911-28-2	Butyl Dipropasol Solvent		240	245
8008-20-6	Kerosene		290	291	30894-74-7	Dichloro-6-isopropyl-S-triazine, 2,4-	Dichloro -6-isopropyl-S-triazine, 2,4-	270	274
8012-95-1	Mineral oil		290	291	31218-83-4	Safrotin		460	462
8014-95-7	Oleum	Sulfuric acid fuming	370	370	33069-62-4	Paclitaxel	Paclitaxel (Hospira)	990	990
8030-30-6	VM&P Naphtha	VM & P Naphtha	290	291	33419-42-0	Etoposide	Etoposide (Toposar®, Teva)	990	990
8032-32-4	Naphtha		290	292	50782-69-9	VX Nerve agent	VX Nerve Agent, MIL-STD-282	460	462
8052-41-3	Stoddard solvent	Low boiling point naphtha - unspecified	290	291	50815-00-4	JP-4 jet fuel	JP-4 Jet Fuel	290	291
9016-87-9	Polymethylene polyphenyl-polyisocyanate	Polymethylene polyphenyle isocyanate (p-MDI)	210	212	52583-42-3	Nitric acid, red fuming		370	370
10024-97-2	Nitrous oxide		350	350	63121-00-6	Oxaliplatin		990	990
10025-67-9	Sulfur monochloride	Disulphur dichloride	500	502	64475-85-0	Mineral spirits	Mineral spirit	290	291
10025-78-2	Trichlorosilane	Trichloro silane	480	480	68334-30-5	Diesel fuel		290	291
10025-87-3	Phosphorus oxychloride		360	360	68476-30-2	Fuel oil	Fuel-oil no 2	290	291
10026-04-7	Silicon tetrachloride		360 / 480	360 / 480	68956-56-9	Citrus Terpenes Mixture		140	148
10034-85-2	Hydriodic acid		370	370	71486-22-1	Vinorelbine		990	990
10035-10-6	Hydrobromic acid		370	370	82410-32-0	Ganciclovir		990	990
10035-10-6	Hydrogen bromide		350 / 370	350 / 370	83016-70-0	Urethane Catalyst Alkanol		240	245
10043-52-4	Calcium chloride		340	340	86290-81-5	Gasoline	Gasoline, unleaded	290	291
10049-04-4	Chlorine dioxide		350	350	90043-35-4	Boric Acid-Sulfuric Acid			none
10102-43-9	Nitric oxide		350	350	94114-58-6	JP-8 jet fuel	JP-8 Jet Fuel	290	291
10102-44-0	Nitrogen dioxide		350	350	95058-81-4	Gemcitabine		990	990
10217-52-4	Hydrazine hydrate		280	280	95660-51-8	Skydrol®		460	462
10294-34-5	Boron trichloride		350 / 360	350 / 360	97697-37-4	Nitric/Hydrofluoric Pickling Solution			none
10544-72-6	Nitrogen tetroxide		350	350	100286-90-6	Irinotecan		990	990
10545-99-0	Chlorine sulfide	Sulphur dichloride	500	502	106602-80-6	Otto fuel II		590	590
10588-01-9	Sodium dichromate		340	340	191681-14-8	AFFF		590	590
11097-69-1	PCB 1254		260	263	308066-70-8	Gasoline, E-10	Gasoline, unleaded E10 (87 Octane)	290	291
12125-01-8	Ammonium fluoride		340	340	441575-94-4	Carboplatin		990	990
12125-02-9	Ammonium chloride		340	340	mixture	Astromat Orange			590
13284-42-9	Pentenenitrile, 2-	Pentene nitrile, 2-	430	431	mixture	Black liquor	Black Liquor	590	590
13463-39-3	Nickel carbonyl	Tetracarbonylnickel	470	470	mixture	Chemidize 727 ND		590	590
13831-31-7	Acetoxyacetyl Chloride		110	111	mixture	Crude oil on wildlife		liq	liq4
15520-10-2	Dytek® A		140	148	mixture	Decontaminating agent (DS-2)		590	590
15663-27-1	Cisplatin		990	990	mixture	Diesel automotive test fuel		290	291
16721-80-5	Sodium hydrosulfide		340	340	mixture	DuPont Activator 193S		590	590
16752-77-5	Methomyl		230	233	mixture	DuPont Activator 4505S		590	590
16872-11-0	Fluoroboric acid		370	370	mixture	DuPont Activator 4507S		590	590
16961-83-4	Fluorosilicic acid		370	370	mixture	Ethylene oxide mixture			275
17927-65-0	Aluminum sulfate hydrate		340	340	mixture	Formalin		120	121
19287-45-7	Diborane		350	350	mixture	Green liquor	Green Liquor	590	590
24991-55-7	Polyethylene glycol dimethyl ether		240	245	mixture	Hexamethylene diisocyanate in DuPont Activator 193S	HDI in DuPont Activator 193S	210	211
25136-40-9	Doxorubicin HCl		990	990	mixture	Hexamethylene diisocyanate in DuPont Activator 4505S	HDI in DuPont Activator 4505S	210	211
25340-17-4	Diethylbenzene	Diethyl benzene	290	290	mixture	Hexamethylene diisocyanate in DuPont Activator 4507S	HDI in DuPont Activator 4507S	210	211
25899-50-7	cis-2-Pentenenitrile	Pentene nitrile, cis-2-	430	431	mixture	Lime		sol	sol1
26471-62-5	Toluene-1,3-diisocyanate	Toluene diisocyanate, 1,3-	210	212	mixture	Organo-Tin Paint		470	470

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

CAS Number	Chemical Name	Synonym	Class	Sub-Class
mixture	PCB		260	263
mixture	PCB 1254	Polychlorinated biphenyl 1254		263
mixture	PCB gas condensate		260	263
mixture	PCB in transformer oil		260	263
mixture	Tetramethyltin	Tetramethyl tin	590	590
mixture	White liquor	White Liquor	590	590
mixture	m-Cresol 55%, p-Cresol 30%, Phenol 15%		310	316
mixture	t-Sodium-amylate / t-amyl alcohol		590	590