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DuPont Permeation Guide



Tychem®

Tyvek®

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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.

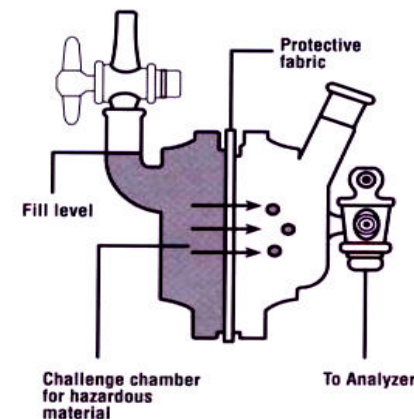
To help you understand the difference between these two mechanisms, consider this example. Have you ever opened a bottle of soda to find out that it was flat? There aren't any holes in the bottle. The liquid is still inside. Why is the soda flat? It's flat because the carbon dioxide that gives soda its 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 $\text{g/cm}^2/\text{min}$. This is defined in ASTM F739 test method. Normalized breakthrough times eliminate biased results due to differences in the sensitivity of the detection equipment and are thus the industry

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

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

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

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

Chemical Class & Subclass Listing*

100 Carboxylic acids

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

110 Acid Halides, Carboxylic

- 111 Aliphatic and Alicyclic
- 112 Aromatic
- 113 Chloroformates

120 Aldehydes

- 121 Aliphatic and Alicyclic
- 122 Aromatic

130 Amides

- 132 Aliphatic and Alicyclic
- 135 Acrylamides

140 Amines

- 141 Aliphatic and Alicyclic, Primary
- 142 Aliphatic and Alicyclic, Secondary
- 143 Aliphatic and Alicyclic, Tertiary
- 145 Aromatic, Primary
- 146 Aromatic, Secondary and Tertiary
- 148 Aliphatic and Alicyclic Polyamines
- 149 Aromatic Polyamines

150 Hydroxylamines and Ketoximes

160 Anhydrides

- 161 Aliphatic and Alicyclic

210 Isocyanates

- 211 Aliphatic and Alicyclic
- 212 Aromatic

220 Carboxylic Esters

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

230 Non-Carboxylic Esters

- 233 Carbamates and Others

240 Ethers

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

260 Halogen Compounds

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

270 Heterocyclic Compounds

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

280 Hydrazines

290 Hydrocarbons

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

300 Peroxides

310 Hydroxylic Compounds (includes alcohols)

- 311 Aliphatic and Alicyclic, Primary
- 312 Aliphatic and Alicyclic, Secondary
- 313 Aliphatic and Alicyclic, Tertiary
- 314 Aliphatic and Alicyclic, Polyols
- 315 Aliphatic and Alicyclic, Substituted

- 316 Aromatic, Phenols

- 318 Aromatic, Others

330 Elements

340 Inorganic Salts and Inorganic Salt Solutions

- 345 Inorganic Cyano Compounds

350 Inorganic Gases and Vapors

360 Inorganic Acid Halides

- 365 Inorganic Acid Oxides

370 Inorganic Acids

380 Inorganic Bases

390 Ketones

- 391 Aliphatic and Alicyclic

430 Nitriles

- 431 Aliphatic and Alicyclic
- 432 Aromatic

440 Nitro Compounds

- 441 Unsubstituted
- 442 Substituted

450 Nitroso Compounds

460 Organo-Phosphorus Compounds

- 462 Derivatives of Phosphorus-based acids

470 Organo-Metallic Compounds

480 Organo-Silicon Compounds

500 Sulfur Compounds

- 501 Thiols
- 502 Sulfides and Disulfides
- 503 Sulfones and Sulfoxides
- 504 Sulfonic Acids
- 505 Sulfonyl Chlorides
- 507 Sulfonates, Sulfates, and Sulfites
- 509 Other

550 Organic Salts and Organic Salt Solutions

590 Miscellaneous (Not classified)

990 Cytostatic drugs (Active Pharmaceutical Potent Compound)

*Partial list based on ASTM F1186. A complete copy of ASTM F1186 may be purchased from ASTM (www.astm.org).

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

Sub-class	Chemical Name	CAS Number	Phase	Normalized Breakthrough Time (Minutes)										
				Tyvek® 800J	Tychem® 2000 SFR	Tychem® 2000	Tychem® 4000	Tychem® 5000	Tychem® 6000	Tychem® 6000 FR	Tychem® 9000	Tychem® RESPONDER® CSM	Tychem® 10000	Tychem® 10000 FR
390	Acetone	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	u	b	-	C	l	a	s	P	h	a	s	Breakthrough Time (Minutes)										
																Tyvek® 800J	Tychem® 2000 SFR	Tychem® 2000	Tychem® 4000	Tychem® 5000	Tychem® 6000	Tychem® 6000 FR	Tychem® 9000	Tychem® RESPONDER® CSM	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	270	>480	>480	>480	>480	>480	>480
Acrylic acid						79-10-7		Liquid				imm	>480		>480	>480	>480	270	>480	>480	>480	>480	>480	270		
Formic acid (90%)						64-18-6		Liquid																		
Formic acid (>95%)						64-18-6		Liquid						>480	260	260	>480	>480	>480	>480	>480	>480	>480	>480	>480	
Formic acid (30%)						64-18-6		Liquid																		
Methacrylic acid						79-41-4		Liquid						81	>480	>480	>480	>480	>480	>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	>480	>480	>480	>480	>480	>480	>480
Glycolic acid (sat)						79-14-1		Liquid									>480	>480	>480	>480	>480	>480	>480	>480	>480	
Lactic Acid (85%)						50-21-5		Liquid																		
Thioglycolic acid						68-11-1		Liquid						>480	>480	>480	>480	>480	>480	>480	>480	>480	>480	>480	>480	
Trichloroacetic acid (sat)						76-03-9		Liquid							>480	>480	>480									
Trifluoroacetic acid						76-05-1		Liquid				>480			>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	>480	>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	>480	>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	>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	160	160	160	160	
Dichloroacetyl chloride						79-36-7		Liquid								160	160	100	100	100	100	>480	>480	100	100	
112 Aromatic																										
Benzoyl chloride						98-88-4		Liquid						>480	>480	>480	>480	>480	>480	>480	>480	>480	>480	>480	>480	
113 Chloroformates																										



Chemical Permeation Data Tables

C	l	a	s	S	u	b	-	C	l	a	s	Chemical Name	CAS	P	h	a	s	e	Breakthrough Time (Minutes)														
																			Tyvek® 800J	Tychem® 2000 SFR	Tychem® 2000	Tychem® 4000	Tychem® 5000	Tychem® 6000	Tychem® 6000 FR	Tychem® 9000	Tychem® RESPONDER® CSM	Tychem® 10000	Tychem® 10000 FR				
												Benzyl chloroformate	501-53-1	Liquid																			
												Methyl chloroformate	79-22-1	Liquid											204*/308	204*/308	>480	>480	>480	>480	>480		
120 Aldehydes																																	
121 Aliphatic and Alicyclic																																	
												Acetaldehyde	75-07-0	Liquid											19	imm	>480	>480	>480	>480	>480	>480	
												Acrolein	107-02-8	Liquid											25*/178	75*/101	75*/101	>480	>480	>480	>480	>480	
												Acrolein (10 g/m²)	107-02-8	Liquid												>480	>480						
												Butyraldehyde, n-	123-72-8	Liquid											imm	41		>480		>480	>480	>480	>480
												Formaldehyde (100 ppm)	50-00-0	Vapor														>480	>480	>480	>480	>480	
												Formalin (37% (10-15% Methanol))	mixture	Liquid										imm	>480	>480	>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	>480
												Glutaraldehyde (5%)	111-30-8	Liquid												>480			>480	>480	>480	>480	
												trans-Crotonaldehyde	123-73-9	Liquid											34		147		>480	>480	>480	>480	>480
122 Aromatic																																	
												Benzaldehyde	100-52-7	Liquid																			
												Furfural	98-01-1	Liquid												198*/227	>480	>480	>480	>480	>480	>480	>480
130 Amides																																	
132 Aliphatic and Alicyclic																																	
												Dimethylacetamide, N,N-	127-19-5	Liquid											imm				>480	>480	>480	>480	>480
												Dimethylacetamide, N,N- (8%)	127-19-5	Liquid											>480								
												Dimethylformamide, N,N-	68-12-2	Liquid											imm	90	>480	>480	>480	>480	>480	>480	>480
												Methyl-2-pyrrolidone, N-	872-50-4	Liquid												>480		>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	>480
140 Amines																																	
141 Aliphatic and Alicyclic, Primary																																	
												Butylamine, n-	109-73-9	Liquid												>480	200	200	>480	>480	>480	>480	>480
												Butylamine, tert-	75-64-9	Liquid															>480	>480	>480	>480	>480
												Diisopropylethylamine (DIPEA)	7087-68-5	Liquid												>480		>480					
												Ethanolamine	141-43-5	Liquid												>480	>480	>480	>480	>480	>480	>480	>480
												Ethylamine (70%)	75-04-7	Liquid																			
												Ethylamine (15 °C, liquid)	75-04-7	Liquid															361	361	>480		361
												Isopropylamine	75-31-0	Liquid											15	>480	>480	>480	>480	>480	>480	>480	>480
												Methylamine (50%)	74-89-5	Liquid															232	232	232	232	232
												Methylamine (gaseous)	74-89-5	Vapor												>480	>480	105	105	>480		105	
												Methylamine (40%)	74-89-5	Liquid											140				261	261	261	261	261
												Propylamine, n-	107-10-8	Liquid											100	16*/21	16*/21						

Chemical Permeation Data Tables

C	l	a	s	S u b - C l a s s		Chemical Name	CAS		P h a s e	Breakthrough Time (Minutes)							
										Tyvek® 800J	Tychem® 2000 SFR	Tychem® 2000	Tychem® 4000	Tychem® 5000	Tychem® 6000	Tychem® 6000 FR	Tychem® 9000
142 Aliphatic and Alicyclic, Secondary																	
						Diethanolamine	111-42-2	Liquid						>480			
						Diethylamine	109-89-7	Liquid			imm	15	>480	>480	>480	>480	
						Dimethylamine	124-40-3	Vapor					>480	>480	>480		
						Dimethylamine (40%)	124-40-3	Liquid									
						Hexamethyldisilazane	999-97-3	Liquid				>480			>480	>480	
						Methylbenzylamine	103-67-3	Liquid					>480	>480			
						Morpholine	110-91-8	Liquid				158			>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	
						Trimethylamine	75-50-3	Vapor							>480		
						Tripropylamine	102-69-2	Liquid						>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	
						Aniline, 4-trifluoromethoxy	461-82-5	Liquid						>480	>480		
						Benzidine (25% in Methanol)	92-87-5	Liquid						>480	>480	>480	
						Benzidine (75% in Methanol)	92-87-5	Liquid							>480		
						Chloroaniline, p- (70 °C, molten)	106-47-8	Liquid				imm	imm	272*/323	272*/323	272*/323	
						Chloroaniline, p-	106-47-8	Solid						>480	>480	>480	
						Dichloroaniline, 3,4-	95-76-1	Solid						>480	>480	>480	
						Dichloroaniline, 3,4- (70 °C, molten)	95-76-1	Liquid				imm		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	
						Toluidine, m-	108-44-1	Liquid				>480			>480		
						Toluidine, o-	95-53-4	Liquid				>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	
						Diethylaniline crude	91-66-7	Liquid				>480			>480		
						Dimethylaniline, N,N-	121-69-7	Liquid					imm	>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	

Chemical Permeation Data Tables

C	l	a	s	S	u	b	C	l	a	s	Chemical Name	CAS	P	h	a	s	Breakthrough Time (Minutes)									
																	Tyvek® 800J	Tychem® 2000 SFR	Tychem® 2000	Tychem® 4000	Tychem® 5000	Tychem® 6000	Tychem® 6000 FR	Tychem® 9000	Tychem® RESPONDER® CSM	Tychem® 10000
	Aminoethylethanolamine (60%)											111-41-1	Liquid					>480	>480	>480	>480	>480	>480	>480	>480	>480
	Aminoethylpiperazine											140-31-8	Liquid					>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
	Dytek® A											15520-10-2	Liquid						>480	>480	>480					
	Ethylenediamine											107-15-3	Liquid			>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	
	Tetraethylenepentamine											112-57-2	Liquid					>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		
Methylene bis (o-chloroaniline), 4,4'- (sat in Methanol)											101-14-4	Liquid					>480				>480	>480	>480	>480		
Methylene dianiline, 4,4'-											101-77-9	Liquid											>480	>480		
Methylene dianiline, 4,4'- (15% in Methyl Ethyl Ketone)											101-77-9	Liquid								>480	>480	>480	>480	>480		
Methylene dianiline, 4,4'- (190 °C, liquid)											101-77-9	Liquid														
150 Hydroxylamines and Ketoximes																										
150 Hydroxlamines and Ketoximes - All																										
Methyl ethyl ketoxime											96-29-7	Liquid						>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	
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		
Methyl isocyanate											624-83-9	Liquid					imm	12	imm	imm	>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		
Diphenylmethane Diisocyanate 4,4'-											101-68-8	Solid									>480	>480	>480	>480		
Paraphenylene diisocyanate (PPDI) crude											104-49-4	Liquid									>480	>480	>480	>480		
Polymethylene polyphenyl-polyisocyanate											9016-87-9	Liquid			>480	>480	>480	>480	>480	>480	>480	>480	>480	>480		
Toluene-1,3-diisocyanate											26471-62-5	Liquid								>480	>480	>480	>480	>480		
Toluene-2,4-diisocyanate (80%)											584-84-9	Liquid			60	>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		
220 Carboxylic Esters																										
221 Formates																										
Methyl formate											107-31-3	Liquid												>480		



Chemical Permeation Data Tables

Printed on August 27, 2019 Before relying on any performance data for the purchase or performance of products, you should check www.SafeSPEC.DuPont.com or contact DPP Customer Service at 1-800-931-3456 to determine whether there is new information that relates to your intended use or application of the product. page 11 of 57

Chemical Permeation Data Tables

C	l	a	s	S	u	b	-	C	l	a	s	P	h	a	s	Breakthrough Time (Minutes)									
																Tyvek® 800J	Tychem® 2000 SFR	Tychem® 2000	Tychem® 4000	Tychem® 5000	Tychem® 6000	Tychem® 6000 FR	Tychem® 9000	Tychem® RESPONDER® CSM	Tychem® 10000
244 Ketals and Acetals																									
Diketene Acetone (95%)						5394-63-8	Liquid							>480											
245 Glycol Ethers																									
(2-Ethoxyethoxy)-ethanol, 2-						111-90-0	Liquid				>480					>480									
2-(2-Butoxyethoxy)-ethanol						112-34-5	Liquid						>480	>480											
Butoxytriglycol						143-22-6	Liquid																		
Butyl Cellosolve Acetate						112-07-2	Liquid																		
Butyl Cellosolve®						111-76-2	Liquid				>480		>480	>480		>480									
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				>480	>480	>480	>480	>480	>480	>480								
Ethyl Cellosolve® acetate						111-15-9	Liquid			imm	116*/238	>480	>480	>480	>480	>480	>480								
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				>480	405	>480	>480	>480	>480	>480								
Methyl Cellosolve® acetate						110-49-6	Liquid				>480	>480	>480	>480	>480	>480	>480								
Polyethylene glycol dimethyl ether						24991-55-7	Liquid						>480												
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							>480	>480	>480	>480								
261 Aliphatic and Alicyclic																									
Bromoethyl Acetate, 2-						927-68-4	Liquid																		
Bromoform						75-25-2	Liquid																		
Carbon tetrachloride						56-23-5	Liquid					>480	imm*/11	imm*/11	>480	>480	>480								
Chlordane (60-75%)						57-74-9	Liquid								>480	>480	>480								
Chlordane (44%)						57-74-9	Liquid					>480													
Chloroethanol, 2-						107-07-3	Liquid			imm		>480	>480	>480	>480	>480	>480								
Chloroform						67-66-3	Liquid			imm	imm	imm	imm	imm	>480	>480	>480								
Chloropicrin						76-06-2	Liquid						>480	>480											
Dibromo-3-chloropropane, 1,2-						96-12-8	Liquid					>480													
Dichloroacetone (45 °C, molten)						534-07-6	Liquid						>480	>480											
Dichloroacetone (95% at 40 °C, molten)						534-07-6	Liquid									>480									



Chemical Permeation Data Tables

C	l	a	s	S	u	b	C	l	a	s	Chemical Name	CAS	P	h	a	s	e	Breakthrough Time (Minutes)													
																		Tyvek® 800J	Tychem® 2000 SFR	Tychem® 2000	Tychem® 4000	Tychem® 5000	Tychem® 6000	Tychem® 6000 FR	Tychem® 9000	Tychem® RESPONDER® CSM	Tychem® 10000	Tychem® 10000 FR			
											Dichloroethyl ether	111-44-4	Liquid						>480	>480	>480	>480	>480	>480	>480	>480	>480	>480	>480		
											Dichloromethane	75-09-2	Liquid													>480	>480	>480	>480	>480	
											Dichloropentane	628-76-2	Liquid																		
											Dichloropropene, 1,3- (95%)	542-75-6	Liquid													>480					
											Dichloropropene, 2,3-	78-88-6	Liquid													>480	>480	>480	>480	>480	
											Diiodo-1,1,2,2-tetrafluorobutane, 1,4-	755-95-3	Liquid												>480	>480	>480	>480	>480	>480	
											Epichlorohydrin	106-89-8	Liquid					15	36*/67	395	395		>480	>480	>480	>480	>480	>480	>480	>480	
											Ethyl chloride	75-00-3	Liquid															>480			
											Ethylene dibromide	106-93-4	Liquid							>480	144*/288	144*/288		>480	>480	>480	>480	>480	>480	>480	
											Ethylene dichloride	107-06-2	Liquid							>480	93	93		>480	>480	>480	>480	>480	>480	>480	
											Hexafluoroethane	76-16-4	Vapor												>480	>480	>480	>480	>480	>480	
											Hexafluoroisobutylene	382-10-5	Vapor												>480	>480	>480	>480	>480	>480	
											Lindane (sat in Acetone)	58-89-9	Liquid												>480	>480	>480	>480	>480	>480	
											Lindane (sat in Methanol)	58-89-9	Liquid															>480			
											Methyl bromide	74-83-9	Vapor						>480						>480	>480	>480	>480	>480	>480	
											Methyl chloride (gaseous)	74-87-3	Vapor												>480	>480	>480	>480	>480	>480	
											Methyl chloride (-70 °C, liquid)	74-87-3	Liquid															>180			
											Methyl fluoride	593-53-3	Vapor												>480	>480	>480	>480	>480	>480	
											Methyl iodide	74-88-4	Liquid												>480	>480	>480	>480	>480	>480	
											Methylene bromide	74-95-3	Liquid							40											
											Propylbromide, n-	106-94-5	Liquid							>480	>480						12				
											Propylene dichloride	78-87-5	Liquid												>480	>480	>480	>480	>480	>480	
											Refrigerant 141B	1717-00-6	Liquid																		
											Tetrachloroethane, 1,1,2,2-	79-34-5	Liquid												>480	>480	>480	>480	>480	>480	>480
											Tetrafluoroethane, 1,1,1,2-	811-97-2	Liquid												>480	>480	>480	>480	>480	>480	>480
											Tetrafluoromethane	75-73-0	Vapor												>480	>480	>480	>480	>480	>480	
											Trichloro-1,2,2-trifluoroethane, 1,1,2-	76-13-1	Liquid												>480	>480	>480	>480	>480	>480	
											Trichloroacetone, 1,1,3- (87.7%)	921-03-9	Liquid												467*/476	467*/476					
											Trichloroethane, 1,1,1-	71-55-6	Liquid												>480	>480	>480	>480	>480	>480	>480
											Trichloroethane, 1,1,2-	79-00-5	Liquid												164*/232	164*/232	>480	>480	>480	>480	>480
											Trifluoroacetic acid	76-05-1	Liquid												>480	>480		>480			
											Trifluoromethane	75-46-7	Vapor												>480	>480	>480	>480	>480	>480	
263 Aromatic																															
											Benzene, Dichloro-4-Trifluoro	328-84-7	Liquid																		
											Benzotrifluoride	98-07-7	Liquid												>480						
											Bromofluorobenzene, 4-	460-00-4	Liquid												>480	>480	>480	>480	>480	>480	>480
											Chloro-benzotrifluoride, 4-	98-56-6	Liquid												460						
											Chlorobenzene	108-90-7	Liquid												63	>480	>480	>480	>480	>480	>480
											Chlorobenzotrifluoride, 4-	5216-25-1	Liquid												>480						



Chemical Permeation Data Tables

C	l	a	s	S	u	b	C	l	a	s	Chemical Name	CAS	P	h	a	s	e	Breakthrough Time (Minutes)																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																											
																		Tyvek® 800J	Tychem® 2000 SFR	Tychem® 2000	Tychem® 4000	Tychem® 5000	Tychem® 6000	Tychem® 6000 FR	Tychem® 9000	Tychem® RESPONDER® CSM	Tychem® 10000	Tychem® 10000 FR																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																	

Chemical Permeation Data Tables

C	l	a	s	S	u	b	-	C	l	a	s	P	h	a	s	Breakthrough Time (Minutes)									
																Tyvek® 800J	Tychem® 2000 SFR	Tychem® 2000	Tychem® 4000	Tychem® 5000	Tychem® 6000	Tychem® 6000 FR	Tychem® 9000	Tychem® RESPONDER® CSM	Tychem® 10000
274 Nitrogen, Others																									
Aminoethylpiperazine						140-31-8	Liquid							>480	>480	>480	>480	>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	>480	>480	>480	>480	>480
Ethyleneimine						151-56-4	Liquid												59	59	>480	>480	59	59	59
Propylene imine (90%)						75-55-8	Liquid												150	150	150	150	150	150	150
Pyrrolidine						123-75-1	Liquid								342	45*/100	45*/100	413	413	413	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	>480	>480	>480	
Epichlorohydrin						106-89-8	Liquid					15	36*/67	395	395	>480	>480	>480	>480	>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	>480	>480	>480	>480	
Ethylene oxide (10% in HCFC)						75-21-8	Vapor														>480	>480	>480	>480	
Ethylene oxide (gaseous)						75-21-8	Vapor			imm	imm		>480	126	>480	>480	>480	>480	>480	>480	>480	>480	>480	>480	
Ethylene oxide (-70 °C, liquid)						75-21-8	Liquid														>180	>180	>180	>180	
Phenyl glycidyl ether						122-60-1	Liquid					>480							>480	>480	>480	>480	>480	>480	
Propylene oxide, 1,2-						75-56-9	Liquid						47	43	13*/20	>480	>480	>480	>480	>480	>480	>480	>480	>480	
277 Oxygen, Furans																									
Furfural						98-01-1	Liquid					198*/227	>480	>480	>480	>480	>480	>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	>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	>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	>480	>480	>480	>480	
Hydrazine hydrate (85%)						10217-52-4	Liquid									440	440	440	440	440	440	440	440	440	
Hydrazine hydrate (51%)						10217-52-4	Liquid													>480	>480	>480	>480	>480	
Hydrazine hydrate						10217-52-4	Liquid																	>480	
Methyl hydrazine						60-34-4	Liquid								183*/283	183*/283	>480	>480	>480	>480	>480	>480	>480	>480	
290 Hydrocarbons																									
290 Hydrocarbons - All																									
Diethylbenzene (95%)						25340-17-4	Liquid					31		>480	>480	>480	>480	>480	>480	>480	>480	>480	>480	>480	
291 Aliphatic and Alicyclic, Saturated																									
Cyclohexane						110-82-7	Liquid						>480	>480	>480	>480	>480	>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	>480	>480	>480	>480	>480	
Fuel oil						68476-30-2	Liquid				imm	>480						>480	>480	>480	>480	>480	>480	>480	

Chemical Permeation Data Tables

C	l	a	s	S	u	b	-	C	l	a	s	Chemical Name	CAS	P	h	a	s	e	Breakthrough Time (Minutes)																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																										
																			Tyvek® 800J	Tychem® 2000 SFR	Tychem® 2000	Tychem® 4000	Tychem® 5000	Tychem® 6000	Tychem® 6000 FR	Tychem® 9000	Tychem® RESPONDER® CSM	Tychem® 10000	Tychem® 10000 FR																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																
	Gasoline	86290-81-5	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® 800J	Tychem® 2000 SFR	Tychem® 2000	Tychem® 4000	Tychem® 5000	Tychem® 6000	Tychem® 6000 FR	Tychem® 9000	Tychem® RESPONDER® CSM	Tychem® 10000	Tychem® 10000 FR	
300 Peroxides																
300 Peroxides - All																
		Hydrogen peroxide (70%)	7722-84-1	Liquid		>480	>480				>480	>480	>480	>480	>480	>480
		Hydrogen peroxide (30%)	7722-84-1	Liquid			>480	>480						>480	>480	
		Hydrogen peroxide (50%)	7722-84-1	Liquid			>480		>480	>480	>480					
310 Hydroxylic Compounds (includes alcohols)																
311 Aliphatic and Alicyclic, Primary																
		2-(2-Butoxyethoxy)-ethanol	112-34-5	Liquid						>480	>480					
		Allyl alcohol	107-18-6	Liquid				>480	>480	>480	>480	>480	>480	>480	>480	>480
		Aminoethylethanolamine (60%)	111-41-1	Liquid				>480	>480	>480	>480	>480	>480	>480	>480	>480
		Aminoethylethanolamine	111-41-1	Liquid				imm	>480	>480	>480	>480	>480	>480	>480	>480
		Butanol, n-	71-36-3	Liquid				imm	>480	>480	>480	>480	>480	>480	>480	>480
		Ethanolamine	141-43-5	Liquid					>480	>480	>480	>480	>480	>480	>480	>480
		Ethyl alcohol	64-17-5	Liquid	imm			>480	>480	>480	>480		>480			
		Isobutanol	78-83-1	Liquid												
		Mercaptoethanol	60-24-2	Liquid						>480	>480				>480	
		Methanol	67-56-1	Liquid				imm	>480	imm	117	117	185	>480	>480	>480
		Methyl Cellosolve®	109-86-4	Liquid				>480	405	>480	>480	>480	>480	>480	>480	>480
		Octanol N-	111-87-5	Liquid												
		Pentanol, n-	71-41-0	Liquid					>480	>480	>480					
		Propargyl alcohol	107-19-7	Liquid						123	123				>480	
312 Aliphatic and Alicyclic,Secondary																
		Benzyl alcohol	100-51-6	Liquid				>480		>480	>480		>480			
		Cyclohexanol	108-93-0	Liquid												
		Ethyl Butanol	97-95-0	Liquid												
		Isoamyl alcohol	123-51-3	Liquid				>480					>480			
		Isobutanol	78-83-1	Liquid												
		Isopropyl alcohol (70%)	67-63-0	Liquid	imm			imm	>480		>480					
		Isopropyl alcohol	67-63-0	Liquid	imm			imm	>480	>480	>480	>480	>480	>480	>480	>480
313 Aliphatic and Alicyclic, Tertiary																
		Acetone cyanohydrin	75-86-5	Liquid						>480	>480	>480	>480	>480	>480	>480
		Butanol tert.	75-65-0	Liquid						37*/205	37*/205					
314 Aliphatic and Alicyclic, Polyols																
		Chloro-1,2-propanediol, 3-	96-24-2	Liquid								>480	>480	>480	>480	>480
		Diethylene Glycol	111-46-6	Liquid												
		Ethylene glycol	107-21-1	Liquid	imm			>480	>480		>480	>480	>480	>480	>480	>480
		Propylene Glycol	57-55-6	Liquid												
315 Aliphatic and Alicyclic, Substituted																
		Chloroethanol, 2-	107-07-3	Liquid				imm		>480	>480	>480	>480	>480	>480	>480

Chemical Permeation Data Tables

C	l	a	s	S u b - C l a s s		Chemical Name	CAS	P h a s e	Breakthrough Time (Minutes)								
									Tyvek® 800J	Tychem® 2000 SFR	Tychem® 2000	Tychem® 4000	Tychem® 5000	Tychem® 6000	Tychem® 6000 FR	Tychem® 9000	Tychem® RESPONDER® CSM
						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	>480
						Phenol (85%)	108-95-2	Liquid			11	>480	341	>480	>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/m²)	7726-95-6	Liquid								>480	imm
						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				>480					
						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
						Arsenic trichloride	7784-34-1	Liquid					32*/38	32*/38			
						Ferric chloride (50%)	7705-08-0	Liquid				>480	>480			>480	
						Lithium chloride (20%)	7447-41-8	Liquid			>480						

Chemical Permeation Data Tables

C	l	a	s	S ub - C l a s s		Chemical Name	CAS	P h a s e	Breakthrough Time (Minutes)										
									Tyvek® 800J	Tychem® 2000 SFR	Tychem® 2000	Tychem® 4000	Tychem® 5000	Tychem® 6000	Tychem® 6000 FR	Tychem® 9000	Tychem® RESPONDER® CSM	Tychem® 10000	Tychem® 10000 FR
						Mercuric chloride (sat)	7487-94-7	Liquid				>480				>480 ⁸	>480 ⁸	>480 ⁸	>480 ⁸
						Potassium acetate (sat)	127-08-2	Liquid				>480		>480 ⁸	>480 ⁸	>480 ⁸	>480 ⁸	>480 ⁸	>480 ⁸
						Potassium carbonate (sat)	584-08-7	Liquid				>480							
						Potassium chromate (sat)	7789-00-6	Liquid					>480	>480	>480	>480 ⁸	>480 ⁸	>480 ⁸	>480 ⁸
						Potassium permanganate (sat)	7722-64-7	Liquid			>480								
						Sodium fluoride (sat)	7681-49-4	Liquid			>480					>480			
						Sodium hypochlorite (5.25-6%)	7681-52-9	Liquid	>480		>480								
						Sodium hypochlorite (4-6%)	7681-52-9	Liquid											
						Sodium hypochlorite (15%)	7681-52-9	Liquid		>480	>480	>480	>480	>480	>480	>480	>480	>480	>480
						Sodium metabisulfite (38%)	7681-57-4	Liquid			imm	>480	23			>480	>480	>480	>480
						Sodium silicate (40-42%)	6834-92-0	Liquid			>480								
						Sodium sulfide (60% (slurry))	1313-82-2	Liquid			>480	>480				>480	>480	>480	>480
345 Inorganic Cyano Compounds																			
						Hydrogen cyanide (27 °C, gaseous)	74-90-8	Vapor					30			>480	>480	>480	>480
						Hydrogen cyanide (21 °C, liquid)	74-90-8	Liquid								135	135	>480	135
						Potassium cyanide (10%)	151-50-8	Liquid			>480								
						Sodium cyanide (45%)	143-33-9	Liquid				>480	>480	>480					
						Sodium cyanide (sat)	143-33-9	Liquid				>480		>480	>480		>480		
350 Inorganic Gases and Vapors																			
350 Inorganic Gases and Vapors - All																			
						Ammonia (-33 °C, liquid)	7664-41-7	Liquid							>480				
						Ammonia (-70 °C, liquid)	7664-41-7	Liquid					>480					>480	>480
						Ammonia (gaseous)	7664-41-7	Vapor				imm	26	imm	20	90	105*/133	105*/133	>480
						Arsine	7784-42-1	Vapor								>480	>480	>480	>480
						Boron trichloride	10294-34-5	Vapor								>480	>480	>480	>480
						Boron trifluoride	7637-07-2	Vapor								>480	>480	>480	>480
						Carbon monoxide	630-08-0	Vapor								330	330	330	330
						Chlorine (20 ppm)	7782-50-5	Vapor			>480 ⁸								
						Chlorine (-70 °C, liquid)	7782-50-5	Liquid				>480					441	>480	>480
						Chlorine (gaseous)	7782-50-5	Vapor			imm	>480	imm	>480	>480	>480	>480	>480	>480
						Chlorine trifluoride	7790-91-2	Vapor								45	45	45	45
						Diborane (10%)	19287-45-7	Vapor								>480	>480	>480	>480
						Fluorine	7782-41-4	Vapor										>480	
						Hydrogen bromide (gaseous)	10035-10-6	Vapor						>480	>480	>480	>480	>480	>480
						Hydrogen chloride (-90 °C, liquid)	7647-01-0	Liquid										>180	
						Hydrogen chloride (gaseous)	7647-01-0	Vapor			imm	>480	>480	>480	>480	>480	>480	>480	>480
						Hydrogen cyanide (27 °C, gaseous)	74-90-8	Vapor				30				>480	>480	>480	>480
						Hydrogen cyanide (21 °C, liquid)	74-90-8	Liquid								135	135	>480	135
						Hydrogen fluoride (20-27 °C, gaseous)	7664-39-3	Vapor			imm	93*/134	186	imm	imm	130	130	>480	>480



C	l	a	s	S ub- C l a s s		Chemical Name	CAS	P h a s e	Breakthrough Time (Minutes)						Tychem® RESPONDER® CSM	Tychem® 10000	Tychem® 10000 FR			
									Tyvek® 800J	Tychem® 2000 SFR	Tychem® 2000	Tychem® 4000	Tychem® 5000	Tychem® 6000				Tychem® 6000 FR	Tychem® 9000	
						Hydrogen selenide	7783-07-5	Vapor							>480	>480	>480			
						Hydrogen sulfide	7783-06-4	Vapor				imm	>480	>480	>480	>480	>480			
						Nitric oxide	10102-43-9	Vapor							>480					
						Nitrogen dioxide	10102-44-0	Vapor					<15	<15						
						Nitrogen tetroxide (21 °C, liquid)	10544-72-6	Liquid								450				
						Nitrogen tetroxide	10544-72-6	Liquid						>480	>480	>480	>480			
						Nitrogen tetroxide (gaseous)	10544-72-6	Vapor						90	90	90	90			
						Nitrogen trifluoride	7783-54-2	Vapor						>480	>480	>480	>480			
						Nitrous oxide	10024-97-2	Vapor						>480	>480	>480	>480			
						Phosgene	75-44-5	Vapor				>480	>480	>480	>480	>480	>480			
						Phosphine	7803-51-2	Vapor					imm	imm	>480	>480	>480	>480		
						Sulfonyl chloride	7791-25-5	Liquid				120	>480	>480	>480	>480	>480	>480		
						Sulfur dioxide	7446-09-5	Vapor				imm	>480	28*/46	26*/37	>480	>480	>480		
						Sulfur hexafluoride	2551-62-4	Vapor							>480	>480	>480	>480		
					Tungsten hexafluoride	7783-82-6	Liquid							>480	>480	>480	>480			
360 Inorganic Acid Halides																				
360 Inorganic Acid Halides - All																				
						Antimony pentachloride	7647-18-9	Liquid					>480		<15	<15	>480			
						Boron trichloride	10294-34-5	Vapor								>480	>480	>480	>480	
						Boron trifluoride	7637-07-2	Vapor								>480	>480	>480	>480	
						Phosphorus oxychloride	10025-87-3	Liquid								>480	>480	>480	>480	
						Phosphorus trichloride	7719-12-2	Liquid					imm	>480	>480	>480	>480	>480	>480	
						Silicon tetrachloride	10026-04-7	Liquid					35	>480	>480	>480	>480	>480	>480	
						Sulfonyl chloride	7791-25-5	Liquid					120	>480	>480	>480	>480	>480	>480	
						Thionyl chloride	7719-09-7	Liquid					15	21	21	<15*/35	35	90	35	
						Titanium tetrachloride	7550-45-0	Liquid				imm	120	>480	>480	>480	>480	>480	>480	
						Vanadium tetrachloride	7632-51-1	Liquid							>480					
365 Inorganic Acid Oxides																				
						Sulfur dioxide	7446-09-5	Vapor				imm	>480		28*/46	26*/37	>480	>480	>480	>480
						Sulfur trioxide	7446-11-9	Liquid						imm			90	90	90	90
370 Inorganic Acids																				
370 Inorganic Acids - All																				
						Chlorosulfonic acid	7790-94-5	Liquid					>480	330	>480	17	180	>480	>480	180
						Chromic acid (44.9%)	1333-82-0	Liquid			>480		>480		>480		>480	>480	>480	>480
						Fluoroboric acid (48-50%)	16872-11-													



Chemical Permeation Data Tables

Printed on August 27, 2019 Before relying on any performance data for the purchase or performance of products, you should check www.SafeSPEC.DuPont.com or contact DPP Customer Service at 1-800-931-3456 to determine whether there is new information that relates to your intended use or application of the product. page 21 of 57



Chemical Permeation Data Tables

C	l	a	s	S	u	b	C	l	a	s	Chemical Name	CAS	P	h	a	s	Breakthrough Time (Minutes)												
																	Tyvek® 800J	Tychem® 2000 SFR	Tychem® 2000	Tychem® 4000	Tychem® 5000	Tychem® 6000	Tychem® 6000 FR	Tychem® 9000	Tychem® RESPONDER® CSM	Tychem® 10000	Tychem® 10000 FR		
											Ammonia (-70 °C, liquid)	7664-41-7	Liquid															>480	>480
											Ammonium hydroxide (16%)	1336-21-6	Liquid	imm															
											Ammonium hydroxide (2-3% in Household cleaner)	1336-21-6	Liquid														>480		
											Ammonium hydroxide (28% - 30%)	1336-21-6	Liquid					imm									>480		
											Lithium hydroxide (14.9%)	1310-65-2	Liquid																
											Potassium hydroxide (45%)	1310-58-3	Liquid														>480		
											Sodium hydroxide (10%)	1310-73-2	Liquid	>480															
											Sodium hydroxide (50%)	1310-73-2	Liquid	>30													>480		
											Sodium hydroxide (40%)	1310-73-2	Liquid																
390 Ketones																													
390 Ketones - All																													
											Diketene Acetone (95%)	5394-63-8	Liquid																
391 Aliphatic and Alicyclic																													
											Acetone	67-64-1	Liquid					imm	13	462			>480	>480	>480	>480	>480	>480	>480
											Chloroacetone (95%)	78-95-5	Liquid						258	>480			>480	>480			>480 ⁸		
											Cyclohexanone	108-94-1	Liquid						136				>480	>480	>480	>480	>480	>480	>480
											Di-Isobutyl Ketone	108-83-8	Liquid																
											Diacetone Alcohol	123-42-2	Liquid																
											Dichloroacetone (95% at 40 °C, molten)	534-07-6	Liquid															>480	
											Dichloroacetone (45 °C, molten)	534-07-6	Liquid										>480	>480					
											Hexone	108-10-1	Liquid							>480			>480	>480	>480	>480	>480	>480	>480
											Methyl Isopropyl Ketone	563-80-4	Liquid																
											Methyl Propyl Ketone	107-87-9	Liquid																
											Methyl ethyl ketone	78-93-3	Liquid						18	>480			40*/64	40*/64	>480	>480	>480	>480	>480
											Trichloroacetone, 1,1,3- (87.7%)	921-03-9	Liquid										467*/476	467*/476					
430 Nitriles																													
431 Aliphatic and Alicyclic																													
											Acetone cyanohydrin	75-86-5	Liquid										>480	>480	>480	>480	>480	>480	>480
											Acetonitrile	75-05-8	Liquid					imm	60	imm			131	>480	>480	>480	>480	>480	>480
											Acrylonitrile	107-13-1	Liquid					imm	36*/48	31			73*/92	108	>480	>480	>480	>480	>480
											Adiponitrile	111-69-3	Liquid									>480	>480	>480	>480	>480	>480	>480	>480
											Chloroacrylonitrile, 2-	920-37-6	Liquid									146	>480	>480			>480		
											Methyl-1,5-pentantedinitrile, 2- (87%)	4553-62-2	Liquid												>480	>480	>480	>480	>480
											Methyl-1,5-pentantedinitrile, 2-	4553-62-2	Liquid										>480	>480					
											Pentenitrile, 2-	13284-42-9	Liquid										>480	>480			>480		
											Pentenitrile, 3-	4635-87-4	Liquid												>480	>480	>480	>480	>480
											cis-2-Pentenitrile (70%)	25899-50-7	Liquid												>480	>480	>480	>480	>480
432 Aromatic																													
											Benzonitrile	100-47-0	Liquid										450	>480	>480	>480	>480	>480	>480



Chemical Permeation Data Tables

C	l	a	s	S	u	b	-	C	l	a	s	P	h	a	s	Breakthrough Time (Minutes)																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																	
																Tyvek® 800J	Tychem® 2000 SFR	Tychem® 2000	Tychem® 4000	Tychem® 5000	Tychem® 6000	Tychem® 6000 FR	Tychem® 9000	Tychem® RESPONDER® CSM	Tychem® 10000	Tychem® 10000 FR																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																							

Chemical Permeation Data Tables

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											Lewisite (100 g/m ²)	541-25-3	Liquid																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																															



Chemical Permeation Data Tables

C	l	a	s	S	u	b	-	C	l	a	s	Chemical Name	CAS	P	h	a	s	e	Breakthrough Time (Minutes)													
																			Tyvek® 800J	Tychem® 2000 SFR	Tychem® 2000	Tychem® 4000	Tychem® 5000	Tychem® 6000	Tychem® 6000 FR	Tychem® 9000	Tychem® RESPONDER® CSM	Tychem® 10000	Tychem® 10000 FR			
												Methanesulfonic acid	75-75-2	Liquid																		
												Trifluoromethane sulfonic acid	1493-13-6	Liquid																		
505 Sulfonyl Chlorides																																
												Benzene sulfonyl chloride	98-09-9	Liquid																		
												Methane sulfonyl chloride	124-63-0	Liquid																		
507 Sulfonates, Sulfates,and Sulfites																																
												Diethyl sulfate	64-67-5	Liquid																		
												Dimethyl sulfate	77-78-1	Liquid																		
509 Other																																
												Sulfamic acid (15%)	5329-14-6	Liquid																		
												Sulfur hexafluoride	2551-62-4	Vapor																		
550 Organic Salts and Organic Salt Solutions																																
550 Organic Salts and Organic Salt Solutions - All																																
												Sodium methylate (50% in Methanol)	124-41-4	Liquid																		
												Tetraethyl Ammonium Hydroxide (35%)	77-98-5	Liquid																		
												Tetramethylammonium hydroxide (25%)	75-59-2	Liquid																		
590 Miscellaneous (Not classified)																																
590 Miscellaneous (Not classified) - All																																
												Black liquor (mix)	mixture	Liquid																		
												Boron trifluoride dimethyletherate	353-42-4	Liquid																		
												Boron trifluoride etherate	109-63-7	Liquid																		
												Chemidize 727 ND (mix)	mixture	Liquid																		
												DuPont Activator 193S (mix)	mixture	Liquid																		
												DuPont Activator 4505S (mix)	mixture	Liquid																		
												DuPont Activator 4507S (mix)	mixture	Liquid																		
												Green liquor (mix)	mixture	Liquid																		
												Tetramethyltin (0.5% in Pentane)	mixture	Liquid																		
												White liquor	mixture	Liquid																		
												t-Sodium-amylate / t-amyl alcohol (mix)	mixture	Solid																		
990 Cytostatic drugs (Active Pharmaceutical Potent Compound)																																
990 Cytostatic drugs (Active Pharmaceutical Potent Compound) - All																																
												Carboplatin (10 mg/ml)	441575-94-4	Liquid																		
												Carmustine (3.3 mg/ml, 10 % Ethanol)	154-93-8	Liquid																		
												Cisplatin (1 mg/ml)	15663-27-1	Liquid																		
												Cyclophosphamide (20 mg/ml)	50-18-0	Liquid																		
												Doxorubicin HCl (2 mg/ml)	25136-40-9	Liquid																		
												Etoposide (20 mg/ml, 33.2 % (v/v) Ethanol)	33419-42-0	Liquid																		
												Fluorouracil, 5- (50 mg/ml)	51-21-8	Liquid																		
												Ganciclovir (3 mg/ml)	82410-32-0	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® 800J	Tychem® 2000 SFR	Tychem® 2000	Tychem® 4000	Tychem® 5000	Tychem® 6000	Tychem® 6000 FR	Tychem® 9000	Tychem® RESPONDER® CSM	Tychem® 10000	Tychem® 10000 FR
		Gemcitabine (38 mg/ml)	95058-81-4	Liquid	>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® 800J
100 Carboxylic acids							
102 Aliphatic and Alicyclic, Unsubstituted							
		Acetic acid (30%)	64-19-7	Liquid	imm	imm	imm
380 Inorganic Bases							
380 Inorganic Bases - All							
		Ammonium hydroxide (16%)	1336-21-6	Liquid	imm	imm	imm
		Ammonium hydroxide (28% - 30%)	1336-21-6	Liquid	imm	imm	
990 Cytostatic drugs (Active Pharmaceutical Potent Compound)							
990 Cytostatic drugs (Active Pharmaceutical Potent Compound) - All							
		Carboplatin (10 mg/ml)	441575-94-4	Liquid	>240	>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® 800J
990 Cytostatic drugs (Active Pharmaceutical Potent Compound)							
990 Cytostatic drugs (Active Pharmaceutical Potent Compound) - All							
Ganciclovir (3 mg/ml)			82410-32-0	Liquid	>240	>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® 800J
		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	
> = 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.							

APPENDIX
CHEMICAL INDEX - Alphabetical Listing - Chemical Names and Synonyms



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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	Acetoxycetyl 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, Propenamide	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



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92-87-5	Benzidine	Biphenyl 4,4'-diamine, 1,1'-, Diaminobiphenyl, 4,4'-, Diaminodiphenyl, p-	430	432
100-47-0	Benzonitrile	Benzo nitrile, Cyanobenzene, Phenyl cyanide	430	432

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CAS Number	Chemical Name	Synonym	Class	Sub-Class
10545-99-0	Chlorine sulfide	Sulphur dichloride	500	502
7790-91-2	Chlorine trifluoride		350	350
96-24-2	Chloro-1,2-propanediol, 3-	Chloro 1,2-propanediol, 3-	310	314
126-99-8	Chloro-1,3-butadiene, 2-	Chloro 1,3-butadiene, 2-, Chloro buta-1,3-diene, 2-, Chloro prene, Neoprene	260	264
98-56-6	Chloro-benzotrifluoride, 4-	Chloro benzotrifluoride, 4-	260	263
79-11-8	Chloroacetic acid	Chloro acetic acid	100	103
78-95-5	Chloroacetone	Chloro acetone, Chloro propan-2-one, 1-	390	391
532-27-4	Chloroacetophenone		260	261
79-04-9	Chloroacetyl chloride	Chloro acetyl chloride	110	111
920-37-6	Chloroacrylonitrile, 2-	Chloro acrylonitrile, 2-	260 / 430	264 / 431
106-47-8	Chloroaniline, p-	Chloro aniline, p-, Chloro benzenamine, 4-	140	145
108-90-7	Chlorobenzene	Chloro benzene, Phenyl chloride	260	263
5216-25-1	Chlorobenzotrichloride, 4-	Chloro benzotrichloride, 4-	260	263
107-07-3	Chloroethanol, 2-	Chloro ethanol, 2-, Ethylene chlorohydrin, Glycol chlorohydrin	260 / 310	261 / 315
67-66-3	Chloroform	Chloro form, Trichloro methane	260	261
107-30-2	Chloromethyl methyl ether	Chloro methyl methyl ether, Methoxy chloromethane	240	241
106-48-9	Chlorophenol, 4-	Chloro phenol, p-, Hydroxy chlorobenzene	260 / 310	263 / 316
76-06-2	Chloropicrin	Chloro trinitromethan, Chloro picrin, Nitro chlormethan	260	261
7790-94-5	Chlorosulfonic acid	Chlorosulfonic acid	370 / 500	370 / 504
95-49-8	Chlorotoluene, o-	Chloro 1-methylbenzene, 2-, Chloro toluene, o-	260	263
1333-82-0	Chromic acid	Chromic acid (CrO3)	370	370
25899-50-7	cis-2-Pentenitrile	Pentene nitrile, cis-2-	430	431
15663-27-1	Cisplatin		990	990
77-92-9	Citric acid	Hydroxy 1,2,3-propanetricarboxylic acid, 2-	100	104
68956-56-9	Citrus Terpenes Mixture		140	148
8001-58-9	Creosote		310	316
1319-77-3	Cresol, mixed isomers	Cresols, mixed isomers, Cresylic acid, Methyl phenols	310	316
95-48-7	Cresol, o-	Cresol o-, Hydroxy toluene, o-	310	316
8002-05-9	Crude oil	Crude oil, California, Mineral oil	290	294
	mixture	Crude oil on wildlife	liq	liq4
98-82-8	Cumene	Isopropyl benzene, Phenyl propane, 2-	290	292
506-77-4	Cyanogen chloride		340	345
108-77-0	Cyanuric chloride	Cyanide chloride, Trichloro 1,3,5-triazine, 2,4,6-	260	263
110-82-7	Cyclohexane	Cyclo hexane	290	291
108-93-0	Cyclohexanol		310	312
108-94-1	Cyclohexanone	Cyclo hexanone, Hexanone, Pimelic ketone	390	391
3173-53-3	Cyclohexyl isocyanate	Cyclo hexyl isocanyte	210	211
108-91-8	Cyclohexylamine		140	141
1552-12-1	Cyclooctadiene	Cyclo octadiene	290	296
50-18-0	Cyclophosphamide	Cyclo phosphamide	990	990
5989-27-5	d-Limonene	Limonene d-, Methyl 4-isopropenyl-1-cyclohexene, 1-	290	296
	mixture	Decontaminating agent (DS-2)	590	590
108-83-8	Di-Isobutyl Ketone	Di Isobutyl Ketone	390	391
123-42-7	Diacetone Alcohol		390	391

CAS Number	Chemical Name	Synonym	Class	Sub-Class
96-12-8	Dibromo-3-chloropropane, 1,2-	Dibromo -3-chloropropane, 1,2-	260	261
84-74-2	Dibutyl Phthalate N-	Propan -1-ol, Propanol, 1-, Propanol, n-, Propyl alcohol		
764-41-0	Dichloro-2-butene, 1,4-		260	264
30894-74-7	Dichloro-6-isopropyl-S-triazine, 2,4-	Dichloro -6-isopropyl-S-triazine, 2,4-	270	274
534-07-6	Dichloroacetone	Dichloro -2-propanone, 1,3-, Dichloro acetone, 1,3-	260 / 390	261 / 391
79-36-7	Dichloroacetyl chloride	Dichloro acetyl chloride	110	111
95-76-1	Dichloroaniline, 3,4-	Amino 3,4-dichlorobenzene, 1-, Dichloro aniline, 3,4-	140 / 260	145 / 263
95-50-1	Dichlorobenzene, 1,2-	Dichlorbenzen, 1,2-	260	263
541-73-1	Dichlorobenzene, 1,3-	Dichlorbenzen, 1,3-	260	263
106-46-7	Dichlorobenzene, 1,4	Dichlorbenzen, 1,4-	260	263
111-44-4	Dichloroethyl ether	Dichloro ethyl ether	240 / 260	241 / 261
75-09-2	Dichloromethane	Dichloro methane, Methylene chloride	260	261
628-76-2	Dichloropentane		260	261
542-75-6	Dichloropropene, 1,3-	Dichloro propene, 1,3-	260	261
78-88-6	Dichloropropene, 2,3-	Dichloro propene, 2,3-	260	261
4109-96-0	Dichlorosilane	Dichloro silane	480	480
	mixture	Diesel automotive test fuel	290	291
68334-30-5	Diesel fuel		290	291
111-42-2	Diethanolamine		140	142
64-67-5	Diethyl sulfate	Sulfuric acid diethyl ester	500	507
91-67-8	Diethyl-m-toluidine crude	Diethyl m-toluidine, N,N-	140	145
109-89-7	Diethylamine	Diethyl amine, Ethyl ethanamine, N-	140	142
91-66-7	Diethylaniline	Diethyl aniline, N,N-	140	146
91-66-7	Diethylaniline crude	Diethyl aniline crude	140	146
25340-17-4	Diethylbenzene	Diethyl benzene	290	290
111-46-6	Diethylene Glycol		310	314
111-77-3	Diethylene Glycol Monomethyl Ether		240	245
6881-94-3	Diethylene Glycol Monopropyl Ether		240	245
111-40-0	Diethylenetriamine	Diethylene triamine	140	148
117-81-7	Diethylhexyl phthalate	DEHP, Diethyl hexyl phthalate	220	226
755-95-3	Diiodo-1,1,2,2-tetrafluorobutane, 1,4-		260	261
7087-68-5	Diisopropylethylamine (DIPEA)		140	141
5394-63-8	Diketene Acetone		220 / 240 / 270 / 390	223 / 244 / 278 / 390
624-92-0	Dimethyl disulfide		500	502
115-10-6	Dimethyl ether		240	241
593-74-8	Dimethyl mercury in decane		470	470
756-79-6	Dimethyl Methyl Phosphonate		460	462
62-75-9	Dimethyl nitrosamine	Methyl N-nitrosomethanamine, N-	450	450
77-78-1	Dimethyl sulfate	Sulfuric acid dimethyl ester	500	507
75-18-3	Dimethyl sulfide		500	502
67-68-5	Dimethyl sulfoxide		500	503
127-19-5	Dimethylacetamide, N,N-	Dimethyl acetamide, N,N-	130	132
124-40-3	Dimethylamine	Dimethyl amine	140	142
121-69-7	Dimethylaniline, N,N-	Dimethyl aniline, N,N-, Dimethyl phenylamine, N,N-	140	146
75-78-5	Dimethyldichlorosilane	Dimethyl dichlorosilane	480	480



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19287-45-7	Diborane		350	350
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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 ethylacetate, 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 Monohexyl 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

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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



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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	Pentenitrile, 2-	Pentene nitrile, 2-	430	431	7803-62-5	Silane		480	480
4635-87-4	Pentenitrile, 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

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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 methyolate		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 dipropionate, 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	Trichlor 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	Tripropylamine	Tripropyl 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

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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	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

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

CAS Number	Chemical Name	Synonym	Class	Sub-Class	CAS Number	Chemical Name	Synonym	Class	Sub-Class
50-00-0	Formaldehyde	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

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CAS Number	Chemical Name	Synonym	Class	Sub-Class
78-10-4	Tetraethoxysilane		480	480
78-40-0	Triethyl Phosphate		460	462
78-79-5	Isoprene		290	296
78-83-1	Isobutanol		310	311 / 312
78-87-5	Propylene dichloride		260	261
78-88-6	Dichloropropene, 2,3-	Dichloro propene, 2,3-	260	261
78-93-3	Methyl ethyl ketone	Butanone, MEK	390	391
78-95-5	Chloroacetone	Chloro acetone, Chloro propan-2-one, 1-	390	391
79-00-5	Trichloroethane, 1,1,2-	Ethane trichloride, Trichloro ethane, 1,1,2-	260	261
79-01-6	Trichloroethylene	Ethylene trichloride, Trichloro ethylene	260	264
79-04-9	Chloroacetyl chloride	Chloro acetyl chloride	110	111
79-06-1	Acrylamide	Acryl amide, Acrylic amide, Propenamamide	130	135
79-09-4	Propionic acid	Propanoic acid		102
79-10-7	Acrylic acid	Acroleic acid, Ethylene carboxylic acid, Propene acid	100	102
79-11-8	Chloroacetic acid	Chloro acetic acid	100	103
79-14-1	Glycolic acid	Hydroxy acetic acid	100	103
79-20-9	Methyl Acetate		220	222
79-21-0	Peracetic Acid		100	102 / 302
79-22-1	Methyl chloroformate	Methyl chloro formate	110	113
79-27-6	Tetrabromoethane		260	261
79-34-5	Tetrachloroethane, 1,1,2,2-	Tetrachloro ethane, 1,1,2,2,-	260	261
79-36-7	Dichloroacetyl chloride	Dichloro acetyl chloride	110	111
79-41-4	Methacrylic acid	Methyl propenoic acid, 2-	100	102
79-46-9	Nitropropane, 2-	Nitro propane, 2-	440	441
79-95-8	Tetrachloro-bisphenol -A, 2,2',6,6'	Tetrachloro bisphenol-A, 2,2',6,6'-	260 / 310	263 / 316
80-62-6	Methyl methacrylate	Methyl 2-methyl-2-propenoate	220	223
84-74-2	Dibutyl Phthalate N-	Propan -1-ol, Propanol, 1-, Propanol, n-, Propyl alcohol		
87-68-3	Hexachlorobutadiene	Hexachloro butadiene	260	264
87-86-5	Pentachlorophenol		310	316
88-12-0	Vinyl Pyrrolidinone		270	274
88-72-2	Nitrotoluene, o-	Nitro toluene, 2-	440	442
88-73-3	Nitrochlorobenzene, o-	Chloro 2-nitrobenzene, 1-	260 / 440	263 / 442
88-75-5	Nitrophenol, o-	Hydroxy 2-nitrobenzene, 1-, Nitro phenol, o-	310 / 440	316 / 442
91-20-3	Naphthalene			293
91-20-3	Naphthalene		290	293
91-66-7	Diethylaniline	Diethyl aniline, N,N-	140	146
91-66-7	Diethylaniline crude	Diethyl aniline crude	140	146
91-67-8	Diethyl-m-toluidine crude	Diethyl m-toluidine, N,N-	140	145
92-52-4	Dowtherm, Biphenyl		240	242
92-67-1	Aminodiphenyl, 4-	Amino diphenyl, 4-	140	145
92-87-5	Benzidine	Biphenyl 4,4'-diamine, 1,1', Diaminobiphenyl, 4,4', Diaminodiphenyl, p-	140	145 / 149
95-47-6	Xylene, o-		290	292
95-48-7	Cresol, o-	Cresol o-, Hydroxy toluene, o-	310	316
95-49-8	Chlorotoluene, o-	Chloro 1-methylbenzene, 2-, Chloro toluene, o-	260	263
95-50-1	Dichlorobenzene, 1,2-	Dichlorbenzen, 1,2-	260	263

CAS Number	Chemical Name	Synonym	Class	Sub-Class
95-53-4	Toluidine, o-	Methyl aniline, o-	140	145
95-68-1	Xylidine, 2,4-		140	145
95-76-1	Dichloroaniline, 3,4-	Amino 3,4-dichlorobenzene, 1-, Dichloro aniline, 3,4-	140 / 260	145 / 263
96-12-8	Dibromo-3-chloropropane, 1,2-	Dibromo -3-chloropropane, 1,2-	260	261
96-24-2	Chloro-1,2-propanediol, 3-	Chloro 1,2-propanediol, 3-	310	314
96-29-7	Methyl ethyl ketoxime	Butanone oxime, 2-	150	150
96-33-3	Methyl acrylate		220	223
96-48-0	gamma Butyrolactone			225
96-64-0	Soman	Soman (GD), MIL-STD-282	460	462
97-63-2	Ethyl methacrylate		220	223
97-93-8	Triethylaluminum	Triethyl aluminum	470	470
97-95-0	Ethyl Butanol		310	312
98-01-1	Furfural	Furaldehyde, 2-	120 / 270	122 / 277
98-07-7	Benzotrichloride	Benzo trichloride	260	263
98-08-8	Trifluoromethylbenzene		260	263
98-09-9	Benzene sulfonyl chloride	Benzene sulfone chloride	500	505
98-13-5	Trichlorophenylsilane	Phenyl trichlorosilane, Trichloro phenylsilane	480	480
98-51-1	P-Tert Butyl Toluene		290	292
98-56-6	Chloro-benzotrifluoride, 4-	Chloro benzotrifluoride, 4-	260	263
98-82-8	Cumene	Isopropyl benzene, Phenyl propane, 2-	290	292
98-85-1	Phenylethanol, 1-	Phenyl ethanol, 1-	310	318
98-86-2	Methyl Phenyl Ketone			392
98-88-4	Benzoyl chloride	Benzene carbonyl chloride	110	112
98-95-3	Nitrobenzene	Nitro benzene	440	441
99-99-0	Nitrotoluene, p-	Nitro toluene, p-	440	442
100-00-5	Nitrochlorobenzene, p-	Nitro chlorobenzene, p-	260 / 440	263 / 442
100-02-7	Nitrophenol, p-	Nitro phenol, p-	310 / 440	316 / 442
100-41-4	Ethyl benzene	Phenyl ethane	290	292
100-42-5	Styrene	Phenethylene, Vinyl benzol	290	292
100-43-6	Vinylpyridine, 4-	Vinyl pyridine, 4-	270	271
100-44-7	Benzyl chloride	Chloro toluene, alpha-	260	266
100-47-0	Benzonitrile	Benzo nitrile, Cyanobenzene, Phenyl cyanide	430	432
100-51-6	Benzyl alcohol	Hydroxy toluene	310	312
100-52-7	Benzaldehyde		120	122
101-02-0	Triphenyl phosphite		460	462
101-14-4	Methylene bis (o-chloroaniline), 4,4'-	Dichloro -4,4'-methylenedianiline, 2,2', Methylene bis(2-Chloroaniline), 4,4'-	140	149
101-68-8	Diphenylmethane Diisocyanate 4,4'-	Diphenyl methane diisocyanate, 4,4', Methylene diphenyl diisocyanate, 4,4'-	210	212
101-77-9	Methylene dianiline, 4,4'-	Diaminodiphenylmethane, 4,4', Methylene dianiline	140	145 / 149
102-69-2	Tripropylamine	Tripropyl amine	140	143
102-71-6	Triethanolamine		140	143
102-82-9	Tributylamine	Tributyl amine	140	143
103-67-3	Methylbenzylamine	Benzyl methylamine, N-, Methyl benzylamine, N-	140	142
104-49-4	Paraphenylene diisocyanate (PPDI) crude		210	212
105-44-2	Methyl Isobutyl Ketoxime			none
106-46-7	Dichlorobenzene, 1,4	Dichlorbenzen, 1,4-	260	263

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CAS Number	Chemical Name	Synonym	Class	Sub-Class	CAS Number	Chemical Name	Synonym	Class	Sub-Class
106-47-8	Chloroaniline, p-	Chloro aniline, p-, Chloro benzenamine, 4-	140	145	109-86-4	Methyl Cellosolve®	Ethylene glycol monomethyl ether, Methoxy ethanol, 2	240 / 310	245 / 311
106-48-9	Chlorophenol, 4-	Chloro phenol, p-, Hydroxy chlorobenzene	260 / 310	263 / 316	109-89-7	Diethylamine	Diethyl amine, Ethyl ethanamine, N-	140	142
106-88-7	Butylene oxide, 1,2-		270	275	109-92-2	Ethyl vinyl ether		240 / 260	246 / 261
106-89-8	Epichlorohydrin	Chloro 2,3-epoxy propane, 1-	260 / 270	261 / 275	109-99-9	Tetrahydrofuran		240	241
106-93-4	Ethylene dibromide	Dibromoethane, 1,2-	260	261	110-16-7	Maleic acid		100	104
106-94-5	Propylbromide, n-	Propyl bromide, n-	260	261	110-18-9	Tetramethylethylenediamine (TMEDA)	Tetramethylethylene diamine (TMEDA)	140	148
106-99-0	Butadiene, 1,3-	Vinyl ethylene	290	296	110-49-6	Methyl Cellosolve® acetate	Acetic acid 2 methoxy ethyl ester, Ethylene glycol monomethyl ether acetate, Methoxy ethylacetate, 2-	240	245
107-02-8	Acrolein	Prop-2-en-1-al	120	121	110-51-0	Borane-pyridine complex		590	590
107-05-1	Allyl chloride	Chlor allylene, Chloro prene, 3-	260	265	110-54-3	Hexane, n-		290	291
107-06-2	Ethylene dichloride	Dichlorethane, 1,2.-	260	261	110-57-6	trans-1,4-Dichloro-2-butene	Dichloro -2-butene, trans-1,4-	260	264
107-07-3	Chloroethanol, 2-	Chloro ethanol, 2-, Ethylene chlorohydrin, Glycol chlorohydrin	260 / 310	261 / 315	110-80-5	Ethyl Cellosolve®	Ethoxy ethanol, 2-, Ethyl Cellosolve®, Ethylene glycol monoethyl ether	240	245
107-10-8	Propylamine, n-	Propyl amine, n-	140	141	110-82-7	Cyclohexane	Cyclo hexane	290	291
107-13-1	Acrylonitrile	Cyanoethylene, Propenenitrile, 2-, Propenoic acid nitrile, Vinyl cyanide	430	431	110-86-1	Pyridine		270	271
107-15-3	Ethylenediamine	Diaminoethane, 1,2-, Ethylene diamine	140	148	110-91-8	Morpholine	Diethylene imide oxide	140	142
107-18-6	Allyl alcohol	Hydroxy propene, Propen 1-ol, 2-, Vinyl carbinol	310	311	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
107-19-7	Propargyl alcohol	Prop-2-yn-1-ol	310	311	111-30-8	Glutaraldehyde	Glutaral, Pentanedial, 1,5-	120	121
107-21-1	Ethylene glycol	Ethane 1,2-diol, Glycol alcohol	310	314	111-40-0	Diethylenetriamine	Diethylene triamine	140	148
107-30-2	Chloromethyl methyl ether	Chloro methyl methyl ether, Methoxy chloromethane	240	241	111-41-1	Aminoethylethanolamine	Amino ethylethanolamine	140 / 310	148 / 311
107-31-3	Methyl formate		220	221	111-42-2	Diethanolamine		140	142
107-44-8	Sarin	Sarin (GB), MIL-STD-282	460	462	111-44-4	Dichloroethyl ether	Dichloro ethyl ether	240 / 260	241 / 261
107-87-9	Methyl Propyl Ketone		390	391	111-46-6	Diethylene Glycol		310	314
107-92-6	Butyric acid	Butyric Acid		102	111-65-9	Octane, n-		290	291
108-05-4	Vinyl acetate	Acetic acid ethenyl ester	220	222	111-69-3	Adiponitrile	Adipic acid dinitrile, Adipic acid nitrile, Adipyl dinitrile, Dicyanobutane, 1,4-	430	431
108-10-1	Hexone	Isobutyl methyl ketone, Methyl pentan-2-one, 4-	390	391	111-76-2	Butyl Cellosolve®	Butoxy ethanol, 2-, Ethylene glycol monobutyl ether	240	245
108-21-4	Isopropyl Acetate		220	222	111-77-3	Diethylene Glycol Monomethyl Ether		240	245
108-24-7	Acetic anhydride		160	161	111-87-5	Octanol N-	Octanol, n-	310	311
108-31-6	Maleic anhydride			161	111-90-0	(2-Ethoxyethoxy)-ethanol, 2-	2-(2-Ethoxyethoxy) ethanol	240	245
108-44-1	Toluidine, m-		140	145	112-07-2	Butyl Cellosolve Acetate		240	245
108-77-0	Cyanuric chloride	Cyanide chloride, Trichloro 1,3,5-triazine, 2,4,6-	260	263	112-20-9	Nonylamine		140	141
108-83-8	Di-Isobutyl Ketone	Di Isobutyl Ketone	390	391	112-24-3	Triethylenetetramine	Triethylenetetramine		
108-88-3	Toluene	Methyl benzol	290	292	112-25-4	Ethylene Glycol Monoethyl Ether		240	245
108-90-7	Chlorobenzene	Chloro benzene, Phenyl chloride	260	263	112-34-5	2-(2-Butoxyethoxy)-ethanol	2-(2-Butoxyethoxy) ethanol, Diethylene glycol monobutyl ether	240 / 310	245 / 311
108-91-8	Cyclohexylamine		140	141	112-35-6	Methoxytriglycol		240	245
108-93-0	Cyclohexanol		310	312	112-50-5	Ethoxytriglycol		240	245
108-94-1	Cyclohexanone	Cyclo hexanone, Hexanone, Pimelic ketone	390	391	112-57-2	Tetraethylenepentamine	Tetraethylene pentamine	140	148
108-95-2	Phenol		310	316	112-59-4	Hexyl Carbitol Solvent		240	245
108-98-5	Phenyl mercaptan	Benzene thiol	500	501	112-80-1	Oleic Acid		100	102
108-99-6	Picoline, 3-	Methyl pyridine, 3-	270	271	115-10-6	Dimethyl ether		240	241
109-02-4	N-Methylmorpholine (NMM)		140	142	115-20-8	Trichloroethanol, 2,2,2-	Trichloro ethanol, 2,2,2-	310	315
109-06-8	Picoline, 2-	Methyl pyridine, 2-	270	271	117-81-7	Diethylhexyl phthalate	DEHP, Diethyl hexyl phthalate	220	226
109-55-7	1,3-Propanediamine, N,N'-Dimethyl		140	148	118-79-6	Tribromophenol, 2,4,6-	Tribromophenol, 2,4,6-	310	316
109-60-4	Propyl Acetate		220	222	119-36-8	Methyl salicylate		220	226
109-63-7	Boron trifluoride etherate	Boron fluoride ethyl ether, Boron trifluoride diethyl etherate	590	590	120-12-7	Anthracene	Anthracene , Anthracin	290	293
109-66-0	Pentane		290	291	120-82-1	Trichlorobenzene, 1,2,4-	Trichloro benzene, 1,2,4-	260	263
109-73-9	Butylamine, n-	Butyl amine	140	141	121-44-8	Triethylamine	Diethyl ethanamine, N,N-, Triethyl amine	140	143



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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-pyrrolidone, 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

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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	Pentenitrile, 3-	Pentene nitrile, 3-	430	431
5076-20-0	Tetramethylethylene oxide		270	275
5216-25-1	Chlorobenzotrichloride, 4-	Chloro benzotrichloride, 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

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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	Pentenitrile, 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	Acetoxycetyl 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-Pentenitrile	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

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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