

Glove Material Breakthrough Time after Total Immersion

(times given in minutes)

Legend

	Break through time less than 15 minutes
	Break through time equal to or more than 15 minutes and less than 180 minutes
	Break through time equal to or more than 180 minutes

Chemical Name	DOT Class	Category	Nitrile	Neoprene	Latex
Acetaldehyde	3	A	4	10.2	4
Acetic Acid	8	Co-Ac	5	360	21
Acetic Anhydride	8	Co		210	3
Acetone	3	A	3	2.4	2.4
Acetonitrile (Methyl Cyanide)	3	B	<5	<10.8	<0.6
Acetyl Chloride	3	Fl			
Acrolein	6.1	Fl	4.2		
Acrylamide	6.1	P			
Acrylic Acid	8	Fl		70	80
Acrylonitrile	3	Fl	<5		
Aldehyde	3	A	4		
Allyl Alcohol	6.1	Fl		94.8	
Allylamine	6.1	Fl			<1.2
Allyl Chloride	3	Fl			
Ammonia	2.3	Co-Ba			
Ammonium Fluoride	6.1	Co	>360	>360	>360
Ammonium Hydroxide	2.3	Co-Ba	360	360	90
Amyl Acetate (Isoamyl Acetate)	3	A	<5	5.4	5.4
Amyl Alcohol	3	A	30	321	7.2
Amyl Nitrile	3		175.8	46.8	

Chemical Name	DOT Class	Category	Nitrile	Neo-prene	Latex
Aniline	6.1	B	18	30	25
Benzaldehyde	9	A	<5	39	10
Benzene	3	A	4.2	1.2	0.6
Benzenesulfonic Acid		NR		>1200	
Benzethonium Chloride		NR		>480	>480
Benzonitrile (Phenyl Cyanide)	6.1	NR			<0.6
Benzoyl Chloride	8	Fl		15	
Bisphthalate			259.8	120	>360
Boric Acid		NR	>480	>480	
Bromoacetonitrile					<0.6
Bromobenzene	3	C	13.2		
Bromoethanol					1.2
Bromopropanol		Co		>480	1.2
Bromopropionic Acid		Co-Ac		180	190
Butadiene	2.1			46.8	<1.2
Butanol (Isobutanol)	3	A	30	10	1.2
Butyl Acetate	3	A	<5	3.6	1.8
Butyl Acrylate	3	Fl	67.8		
Butylamine	3	B	19.8	12	1.2
Butyl Cellosolve (Butoxyethanol)		A	9	90	45
Butyl Chloride (Chlorobutane)	3	C	12		
Butyl Nitrite	3	OP	97.8		
Butyltoluene	6.1	A	>360	73.2	
Butyraldehyde	3	A		25.2	
Butyrolactone		A		10	60
Carbon Disulfide	3	Fl	1	2	1
Carbon Tetrachloride	6.1	C	5	4.8	3.6
Cellosolve (Ethoxyethanol)		A		45	25
Cellosolve Acetate (Ethoxyethyl Acetate)		A	<5	25	10
Chlorine	2.3			>480	
Chloroacetonitrile					<0.6

Chemical Name	DOT Class	Category	Nitrile	Neo-prene	Latex
Chlorobenzene	3	C	<5	10.8	<5
Chlorobutadiene (Chloroprene)		C	3.6	3	
Chloroethanol (Ethylene Chlorohydrin)	6.1			298.8	
Chloroform	6.1	C	2.4	0.6	0.6
Chloronaphthalene		P	174		<5
Chloronitropropane					1.2
Chloropropanol					<0.6
Chlorotoluene (Benzyl Chloride)	3	Fl	15		
Chromic Acid	8	Ox	240	75	70.2
Citric Acid				>360	>360
Copper				>360	
Creosote		Fl		270	
Cresol	6.1	Fl	<5	>60	13.8
Crotonaldehyde	6.1	Fl		21	
Cyclohexane	3	A	360	6	1.8
Cyclohexanol		A	360	150	10
Cyclohexanone	3	A	<5		
Cyclohexylamine	8	B		36	1.2
Cyclopentanone	3	A			
Decanal (Decyl Aldehyde)		NR		240	
Diacetone Alcohol (Hydroxy Methyl Pentanone)	3	A		300	15
Diamylamine		B	>480	129	
Dibromoethane (Ethylene Dibromide)	6.1	Fl	27	4.8	<1.2
Dibutylamine		B	>480		
Dibutyl Phthalate (Butyl Phthalate)		A	30	120	16.8
Dichloroaniline	6.1	NR			
Dichlorobenzene	6.1	P	<5		
Dichlorobutene	8	C	2.4	10.2	
Dichloroethane (Ethylene Dichloride)	3	C	2.4	1.8	0.6
Dichloroethylene	3	C	7.2		
Dichloromethane	6.1	C	6	6	2
Dichloropropene	3	C			

Chemical Name	DOT Class	Category	Nitrile	Neo-prene	Latex
Diesel	3	A	>240		
Diethanolamine		B	>480	>480	
Diethylamine	3	B	<5	34	4
Diethylamino-ethanol	3	B	>480		
Diethylenedioxide (Dioxane)	3	A	<5	6.4	2.4
Diethylenetriamine	8	B		>480	
Diisobutylamine	3	B	>480	52.2	
Diisobutyl Ketone	3	A	120	15	15
Diisopropylamine	3	B	195	40.2	
Dimethylacetamide		B	<5		15
Dimethylamine	2.1			>480	1.8
Dimethylamino-propylamine		B		28.8	0.6
Dimethylbutylamine	3		81		
Dimethyl-ethanolamine (Dimethyl-aminoethanol)	8	B	>480	235.2	4.8
Dimethylformamide	3	B	<5	1.2	25
Dimethylhydrazine	6.1	Fl	6	37.8	3.6
Dimethylmercury					0.25
Dimethylsulfoxide		Fl	28.2	60	79.8
Dimethyl-vinylchloride			9		
Diethylphthalate		A		>360	<5
Divinylbenzene		Fl	60		
Dodecane		A			
Epichlorohydrin	6.1	Fl	19.8	15	<1.2
Epoxybutane (Butylene Oxide)	3	A		4.2	
Ethanol	3	A	240	49.2	12
Ethanolamine	8	B	360	360	210
Ether (Ethyl Ether Diethyl Ether)	3	A	13.8	10	10.2
Ethyl Acetate	3	A	<5	12	4.8
Ethyl Acrylate	3	Fl		48	
Ethylamine	2.1	B	66		66
Ethylbenzene	3	A	<5		
Ethylbromide	6.1	C		4.2	
Ethylbutylamine		B		73.2	

Chemical Name	DOT Class	Category	Nitrile	Neo-prene	Latex
Ethyl Cellosolve (Ethoxyethanol)			91.8	244.8	<0.6
Ethyl Cyanide					<0.6
Ethylenediamine		B		399	4.8
Ethylene Glycol		A	360	360	360
Ethyleneimine	6.1	FI		<4.8	
Ethylene Oxide	2.3	FI			
Ethylglycol Ether				45	25
Ethylhexanoic Acid		NR	>240	>240	
Ethylhexanol		A		>480	
Ethyl Methacrylate		FI	22.8		
Formaldehyde	8	A	>1260	120	6
Formic Acid	8	Co-Ac	5	>360	120
Freon (Dichlorodifluoromethane)	2.2	C	10.2	3	2.4
Furaldehyde (Furfural)	3	FI	<5	19.8	15
Furfuryl Alcohol	6.1	A	28		28
Gasoline	3	A	30		<5
Glutaraldehyde		A	>240	>480	
Heptane	3	A	360	45	1.2
Hexachlorocyclopentadiene	6.1	FI	>480		
Hexamethyl-disilazane		FI		50	15
Hexamethylphosphoramide		NR	90		
Hexane	3	A	78.6	3.6	4.8
Hydraulic Fluid		MP	>240		<5
Hydrazine	8	FI	>480	>960	150
Hydrochloric Acid (Muriatic Acid)	8	Co-Ac	360	360	290
Hydrofluoric Acid	8	Co-Ac	120	60	90
Hydrogen Peroxide	5.1	Ox	>360	4.8	>480
Hydrogen Phosphide				10.2	30
Hydroquinone	6.1	NR	>360	>360	>360
Imino-bispropylamine		B		>480	6
Isoprene	3		52.2	16.2	
Kerosene	3	A	>360	>360	<5
Lactic Acid		Co-Ac	>360	>360	
Lauric Acid		NR	>360	>360	>360

Chemical Name	DOT Class	Category	Nitrile	Neo-prene	Latex
Maleic Acid	8	NR	>360	>360	>360
Methacrylic Acid	8	NR	10.2		
Methacrylonitrile	3	FI	7		<1.2
Methanesulfonic Acid		Co-Ac		>240	
Methanol	3	A	10.8	15	1.8
Methoxymethyl-pentanone	3	A		99	
Methyl acetate	3	A			<1.2
Methyl Acrylate	3	FI		15	1.2
Methylamine	2.1		>480	270	25.2
Methylamino-propylamine				63	3
Methyl Bromide	2.3				<5
Methyl Butyl Ether	3	A	5		<5
Methyl Cellosolve		A	40.2	25	20
Methyl Chloride	2.1	C			0.6
Methylene Dichloride (Methylene Chloride)		C	1.8	0.6	4
Methylethanolamine		B		>480	
Methyl Ethyl Ketone	3		3.6	2.4	1.2
Methyl Ethyl Ketone Peroxide	N	OP		>240	45
Methyl Glycol Ether				25	20
Methylhexanone (Methyl Isoamyl Ketone)	3	A	<5		
Methyl Iodide	6.1	C	0.6	0.6	1.8
Methyl Isobutyl Ketone	3	A	12	15	6
Methyl Isocyanate	6.1	FI		0.6	0.6
Methyl Mercaptan	2.3				
Methyl Methacrylate	3	FI	<5		<1.2
Methylpyrrolidone		B	<5		75
Mineral Oil		MP	>240		
Mineral Spirits		A	>360	90	<5
Monoethanolamine	8		360	360	50
Monoethylamine	2.1		66		
Morpholine	3	B	<5		20
Naphtha	3	A	>360	15	<5

Chemical Name	DOT Class	Category	Nitrile	Neo-prene	Latex
Nickel				>360	
Nitric Acid	8	Co-Ac	5	79.8	<5
Nitrobenzene	6.1	B	<5	40.2	4.8
Nitroethane	3	B		49.2	1.8
Nitrohydrochloric acid	8	Co-Ac		45	<5
Nitromethane	3	B	30	60	<1.2
Nitropropane	3	Fl	12	5	1.8
Nonylphenol		NR		>1200	
Octane (Isoctane)	3	A	360	60	<5
Octanol		A	360	360	30
Oleic Acid		NR	>360	60	30
Oxalic Acid		NR	360	360	360
Palmitic Acid		NR	30	>360	4.8
Parathion	6.1	P			
Pentachlorophenol	6.1	P	>780	6	<5
Pentane	3	A	1.8	6.6	0.6
Perchloric Acid	5.1	Ox	360	360	360
Perchloroethylene	6.1				<5
Petroleum Ether		A	>240		
Phenol	6.1	A	31.8	40.2	16.2
Phenolphthalein		NR	>480	>480	>480
Phosphoric Acid	8	Co-Ac	360	360	360
Picric Acid	1.1	Fl		150	<5
Polychlorinated Biphenyl	9	P		1440	4.8
Potassium Hydroxide	8	Co-Ba	360	180	79.8
Promethazine Hydrochloride		NR	>480		
Propanol (Isopropanol)	3	A	30	90	7.2
Propanolamine (Monoiso-propanolamine)				>480	30
Propiolactone					19.8
Propionaldehyde	3	A		12	
Propiophenone		A			
Propylacetate	3	A	16.8		4.8
Propylamine	3	B		13.8	
Propylenediamine (Diaminopropane)		B		271.9	3
Propyleneglycol		NR			>360
Propylene Oxide	3	A			<0.6

Chemical Name	DOT Class	Category	Nitrile	Neo-prene	Latex
Propyl Ether (Isopropyl Ether)			>60	42.6	3.6
Propylmethacrylate			60		
Pyridine	3	B	5.4	1.8	2.4
Pyrrolidine	3	B			
Rubber Solvent	3			30	<5
Silicon Etch				>360	<5
Silver Cyanide	6.1	P-Cn			
Sodium Cyanide	6.1	P-Cn			
Sodium Hydroxide	8	Co-Ba	360	360	360
Sodium Hypochlorite	5.1	Ox	360	360	360
Stoddard Solvent		A	>240	180	<5
Styrene	3	Fl	30	12	10.2
Sulfuric Acid (Oleum)	8	Co-Ac	5	70.2	<5
Tannic Acid		NR	>360	>360	>360
Tetrachloroethane	6.1	C	13.2	5.4	1.8
Tetrachloro-ethylene	6.1	C	5	6	<1.2
Tetraethylene-pentamine	8	NR		>480	106
Tetrafluoro-ethylene	2.1			>480	
Tetrahydrofuran	3	A	0.6	1.2	1.2
Tetramethylene-diamine		NR	108		
Toluene	3	A	<5	1.2	0.6
Toluene Diisocyanate	6.1	P	222		7
Toluenesulfonic Acid	8	NR		>480	
Triallylamine	3	B	>480	63	
Trichloro-acetonitrile		C		67.2	
Trichlorobenzene	6.1	C	<5	60	4.8
Trichloroethane	6.1	C	1.8	2.4	1.2
Trichloroethanol		C			
Trichloroethylene	6.1	C	<5	1.8	0.6
Trichloropropane		C	21		
Tricresylphosphate	6.1	NR	60	>360	45
Triethanolamine		B	>480	>360	60
Triethylamine	3	B	>480	37.2	

Chemical Name	DOT Class	Category	Nitrile	Neo-prene	Latex
Triethylene Tetramine	8	B	>480	>480	
Trifluoroethanol			7.2	>60	>60
Tripropylamine	3	B	>480	>480	
Turpentine	3	A	30		<5
Valeronitrile				40.8	1.8
Vinyl Acetate	3	Fl			
Vinyl Chloride	2.1		342		342
Vinylcyclohexane		Fl	391.8		
Vinylidene fluoride				<1.2	<1.2
Xylene	3	A	<5	3	1.2

Classification

Category

Explosive 1.1	1.1	Mixed CHO Compounds	A
Flammable Gas	2.1	Acid - Heavy Metal	Ac-HM
Nonflammable Gas	2.2	Nitrogenated Hydrocarbons	B
Poison Gas/Toxic Gas	2.3	Halogenated Hydrocarbons	C
Flammable Liquid	3	Corrosive	Co
Flammable Solid	4.1	Corrosive - Acidic	Co-Ac
Spontaneously Combustible	4.2	Corrosive - Basic	Co-Ba
Dangerous when Wet	4.3	Explosive	Ex
Oxidizer	5.1	Flammable	Fl
Organic Peroxide	5.2	Organic Peroxide	OP
Poison/Toxic	6.1	Oxidizer	Ox
Infectious Substance	6.2	Poison	P
Radioactive Material	7	Poison - Cyanide	P - Cn
Corrosive Material	8	Poison - Mercury	P - Hg
		Poison - Heavy Metal	P - HM
		Water Reactive	

The permeation times are based on the lowest common denominator of the following sources. They are intended only as a guide. The suitability of each product must be determined by the user through their own testing. This guide should not be construed as a warranty or that any product is fit for a particular purpose.

4H® Chemical Protection Guide, Nov '97
 ACGIH Guidelines for the Selection of Chemical Protective Clothing, 3rd ed., Feb '87
 Ansell Edmont® Chemical Resistance Guide, 5th ed., '90
 Best® Intermittent Chemical Exposure Guide for Best® N-Dex Nitrile Glove, '94
 Driver's Guide to Hazardous Materials, Am Trucking Association, '96
 DuPont® TyFax Data Service TyChem 9400, May '94
 Fisher Scientific Catalogue, '95/'96
 Hazardous Materials 181, J.J.Keller&Assoc., '92
 Sorenson, Brenda, Sr. Haz-Mat Tech, OSU-EHS