

**Chemical Resistance Data**

※The following table should be referred to select a hose for a specific working fluid.

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Product	Soft PVC	Polyolefin	Silicon Rubber	Fluoride Polymer (ETFE)
	TOYORON SUPER TOYORON TOYOSIGNAL TOYOSPRING TOYORING	ECORON ECORON-S (Inner layer)	TOYOSILICONE TOYOSILICONE-S TOYOSILICONE-P	TOYOFUSSO TOYOFUSSO-E (Most Inner layer)
Chemical Name				
11 Freon			×	
113 Freon			×	
114 Freon			×	
12 Freon			×	
21 Freon			×	
22 Freon			×	
A (ASTM standard fuel)		△	×	
Acetaldehyde	△	○	◎	◎
Acetamide	△	○	○	
Acetic acid 10 % RT	○	◎	○	◎
Acetic acid 100 % RT	×	×	○	
Acetic acid 50 % 70°C	×	×	○	
Acetic acid 50 % RT	×	◎	○	◎
Acetic acid anhydride	×	◎	△	
Acetone (RT)	×	△	△	
Acetonitrile				◎
Acetophenone (RT)				◎
Acetylene	◎	◎	△	◎
Acidic cone suger Liguors			◎	
Acrylonitrile	×		×	◎
Aluminium fluoride	△	○	○	◎
Aluminium sulfate (cake alum, filter alum)	◎	◎	◎	
Aluminum acetate	◎	◎	×	◎
Aluminum bromide		◎	○	
Aluminum chloride	○	◎	○	◎
Aluminum fluoride	◎	◎	◎	◎
Aluminum nitrate	○	◎	○	
Ammonia (no water)		◎	△	
Ammonia gas [cold]	×	○	◎	◎
Ammonia gas [hot]	×	△	◎	◎
Ammonia liquid	○	○	◎	
Ammonia water (Ammonium hydroxide)	○	◎	◎	◎
Ammonium carbonate	◎	○	○	◎
Ammonium chloride	◎	◎	○	◎
Ammonium hydroxide (Ammonia water)	○	◎	◎	◎
Ammonium nitrate	○	○		◎
Ammonium nitrite		◎	○	
Ammonium phosphate	△	◎	◎	
Ammonium sulfate	◎	◎	◎	
Amyl acetate		△	×	
Amyl alcohol	△	○	×	◎
Amyl naphthalene		○	×	
Aniline	×	○	○	◎
Aqua regia	×	△	△	◎
Argon gas	◎	◎		
Arsenic acid	○	△	◎	◎
Asphalt	◎	◎	×	

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	Chemical Name				
B	B (ASTM standard fuel)		△	×	
	Barium chloride	◎	◎	◎	◎
	Barium hydroxide	◎	○	◎	◎
	Barium sulfate	◎	◎	○	
	Barium sulfide	○	○	○	
	Beer		◎	◎	
	Beet sugar liquors		◎	◎	
	Benzaldehyde	×	△	◎	◎
	Benzene (Benzol)	×	○	△	◎
	Benzine	△	△	×	
	Benzoic acid				◎
	Benzoyl chloride				◎
	Benzyl alcohol	×			◎
	Bleacher			○	
	Blue vitriol	○	◎	◎	
	Borax (Sodium tetraborate)	△	◎	◎	◎
	Boric acid	○	◎	○	◎
	Brake oil DOT3				◎
	Bromine	×	×	△	◎
	Butane	○	◎	×	
	Butyl acetate		△	×	◎
	Butyl acrylate		×	◎	
	Butyl alcohol	×		○	◎

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	Chemical Name				
C	C (ASTM standard fuel)		△	×	
	Calcium acetate	◎	◎		
	Calcium bisulfite		◎	○	
	Calcium chloride	◎	◎	◎	◎
	Calcium hydroxide	◎	○	○	◎
	Calcium hypochlorite		◎	○	◎
	Calcium nitrate	◎	◎		◎
	Calcium sulfide	◎		○	
	Carbitol			◎	
	Carbon dioxide	◎	◎	◎	◎
	Carbon dioxide (carbonic acid gas)	◎	◎	◎	◎
	Carbon disulfide	×	×	△	◎
	Carbon monoxide				◎
	Carbon tetrachloride	×	×	×	◎
	Carbonic acid	○	○	×	◎
	Castor oil	△	◎	×	
	Caustic soda (Sodium hydroxide) 30% 70°C	×	×		◎
	Caustic soda (Sodium hydroxide) 30% RT	△	◎		◎
	Cellosolve	×	△		◎
	Cellosolve acetate			○	
	China wood (tung) oil	△	○	×	
	Chlorinated solvent	×		×	
	Chlorine gas (dry)	△	△		◎
	Chlorine gas (wet)		△		◎
	Chlorine liquid	×	×		
	Chloro naphthalene			×	
	Chloroacetic acid				◎
	Chloroacetone		△	×	
	Chlorobenzene	×	△	×	◎
	Chloroform	×	×	×	◎
	Chlorosulfonic acid	×	×	×	◎
	Chlorotoluene	×	△	×	
	Chromic acid [ 2% 50°C ]	△	△	△	◎
	Chromic acid [ 2% 70°C ]	△	×	△	◎
	Chromic acid 5% 70°C	△	×	△	◎
	Chromic acid 10% 70°C	△	×	△	◎
	Chromic acid 25% 70°C	△	×	△	◎
	Citric acid	○	◎	◎	◎
	Coconut oil	△	○	△	
	Copper chloride	○	◎	◎	◎
	Copper cyanide	△	◎	◎	◎
	Corn oil	△	○	△	
	Cotton seed oil		○	△	
	Creosote oil	×		×	
	Cresol	△	○	△	◎
	Cyclohexane		△	×	◎
	Cyclohexanol	×	○		◎
Cyclohexanone	×	△	△	◎	

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	Chemical Name					
D	Developer (Sodium thiosulfate)		◎	◎		
	Diacetone alcohol				◎	
	Dibutyl ether	×	○	×		
	Dibutyl phthalate	×	△	○	◎	
	Dichlorobenzene		△	×		
	Diethyl Ether (Ether, Ethyl ther)	×	△	×	◎	
	Diethyl sebacate		△	○		
	Diethylamine				◎	
	Diethylene glycol		◎	○		
	Dimethyl formamide	×	△	◎	◎	
	Dimethylacetamide				◎	
	Dioctyl phthalate			◎		
	Dioctyl sebacate			◎		
	Dioxane			△	◎	
	Diphenyl			△		
	Diphenyl oxide			○		
	E	Epichlorohydrin	×		×	◎
		Ethanolamine		○	○	
		Ether (Diethyl ether, Ethyl	×	△	×	◎
		ethyl acetate	×	△	△	◎
Ethyl acetoacetate				△		
Ethyl acrylate			△	○		
Ethyl alcohol(Ethanol)		×	○	○	◎	
Ethyl benzene			△	×		
Ethyl cellulose			◎	○		
Ethyl chloride			△	△		
Ethyl ether (Ether, Diethyl		×	△	×	◎	
ethylene chlorohydrin			△	△		
Ethylene diamine		×	○	◎	◎	
Ethylene dichloride		×		△	◎	
Ethylene glycol	×	○	◎	◎		
Ethylene oxide	×	◎	△	◎		

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	Chemical Name					
F	Fatty acid	○	△	△	◎	
	Ferric chloride	◎	◎	○	◎	
	Ferric nitrate	◎	◎	△		
	Ferric sulfate	○	◎	○		
	Flax seed oil	△	○	△	◎	
	Fluorboric acid	△	○		◎	
	Fluorine		×			
	Fluorobenzene		△	×		
	Formaldehyde 40 % 20°C	○	○		◎	
	Formic acid 25% RT	△	○	○	◎	
	Formic acid 50% RT	×	○	○	◎	
	Formic acid 90% RT	×	○	○	○	
	Fuel oil (heavy oil)			×		
	Furfural	×	×	◎	◎	
	Gasoline	×	△	×	◎	
	Gelatin		◎	◎		
	Glacial acetic acid				◎	
	G	Glauber's salt (Sodium sulfate)	○	◎	◎	
		Glucose		◎	◎	◎
		Glycerin	△	◎	◎	◎
Glycolic acid					◎	
Grease		×	△			
Helium gas		◎	◎			
Heptane			×		◎	
Hexaldehyde				◎		
Hexan		×	△	×	◎	
Hexyl alcohol				○		
H	High-test hypochlorite (Calcium hypochlorite)		◎	○	◎	
	Hydraulic oil	△				
	Hydrazine		△	△	◎	
	Hydrobromic acid [20% 70°C]	×	×			
	Hydrobromic acid [20% RT]	×	○		◎	
	Hydrobromic acid 37 % RT	×	○	×	◎	
	Hydrochloric acid 10% RT	○	◎	○	◎	
	Hydrochloric acid 20% (80°C)	×	×	×	×	
	Hydrochloric acid 20% RT	○	○	○	◎	
	Hydrochloric acid 38% RT	△	○	×	○	
	Hydrocyanic acid	○	◎			
	Hydrofluoric acid anhydrous		×	×		
	Hydrofluoride 10 % RT	○	△			
	Hydrofluoride 40 % RT	×	△	×		
	Hydrogen	◎	◎	○	◎	
	Hydrogen fluoride				◎	
	Hydrogen peroxide 30% RT	○	◎	◎	◎	
	Hydrogen peroxide 5% 50°C	○	◎	◎		
	Hydrogen peroxide 5% RT	○	◎	◎		
	Hydrogen sulfide	○	◎	△		
Hydroquinone	○	◎				
Hypochierous acid	○		×			

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	Chemical Name				
I	Isobutyl alcohol		◎	◎	
	Isooctane			×	◎
	Isopropyl alcohol	×	○	◎	◎
K	Kerosene	×	△	×	◎
	Kerosene (light oil)	×	△	×	
	Ketone	×	○		
L	Lacquer	×	△	×	
	Lactic acid	○	◎	◎	◎
	Lard	△	○	△	
	Lead acetate	○	◎	×	◎
	Lead nitrate	○	△		◎
	Lead sulfamate			○	
	Linolenic acid			○	
	Liquified petroleum gas	△			
	Lubricating oil	△	○	×	
	Magnesium chloride	◎	◎	◎	◎
M	Magnesium hydroxide	◎	○		◎
	Magnesium sulfate	◎	◎	◎	
	Maleic acid	△	◎		◎
	Malic acid			○	
	Mercuric chloride	○	◎		◎
	Mercury	◎	◎		◎
	Methane gas	◎	◎		◎
	Methyl acetate		△	×	
	Methyl alcohol (Methanol)	×	○	○	◎
	Methyl chloride	×	△	×	◎
	Methyl ethyl ketone	×	△	△	◎
	Methyl isobutyl ketone	×	△	○	◎
	Methyl methacrylate		△	△	
	Methylene dichloride	×	△	×	◎
	Milk		○	◎	
	Mineral oil	△	△	×	◎
	Monochloroacetic acid	△	×		◎
Monochlorobenzene	×	△	×	◎	
Monoethanolamine			○		

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	Chemical Name					
N	Naphtha	△	△	△	◎	
	Naphthalene	○	△	×	◎	
	Naphthenic acid	○	◎			
	Natural gas	◎	○	○	◎	
	n-Dibutylamine				◎	
	Nickel acetate	○	◎			
	Nickel chloride	◎	◎	◎	◎	
	Nickel sulfate	◎	◎	◎		
	Nikawa (Collagen based glue)		◎	◎		
	Nitric acid [10% 70°C]	×	×			
	Nitric acid 10% RT	○	◎	○	◎	
	Nitric acid 30% RT	△	○		◎	
	Nitric acid 61.3% RT	×	○	×	◎	
	Nitric acid Fuming RT	×	×	×		
	Nitrobenzene	×	×	×	◎	
	Nitroethane		×	△		
	Nitrogen	◎	◎	◎		
	Nitromethane		×	△		
	Nitropropane		×	△		
	n-Methylaniline				◎	
	n-Methylpyrrolidone(40°C)				◎	
	No.1 (ASTM oil)		○	×		
	No.2 (ASTM oil)		○	×		
	No.3 (ASTM oil)		○	×	◎	
	O	Octane (70°C)				◎
		Octene (70°C)				◎
		Octylalcohol			○	
Oleic acid		×	○	×	◎	
Olive oil		△	○	△		
Oxalic acid		○	◎	○	◎	
Oxygen		◎	○	◎	◎	
Ozone	○	△	◎	◎		

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	Chemical Name				
P	Palmitic acid	△	○	×	◎
	Perchloric acid	△	△	×	◎
	Petroleum			×	
	Phenol	×	◎	◎	◎
	Phenylhydrazine	×			◎
	Phosphoric acid 50 % 70°C	△			◎
	Phosphoric acid 50 % RT	◎	◎	◎	◎
	Phosphoric acid 75 % RT	○	◎		◎
	Phosphoric acid 85 % 70°C				◎
	Phosphorus oxychloride (70°C)				◎
	Phosphorus trichloride				◎
	Phthalic acid (70°C)				◎
	Picric acid	×	△	×	◎
	Pine oil	×	○		
	Pinene			×	
	Potassium chloride	◎	◎	◎	◎
	Potassium cyanide	◎	◎		
	potassium dichromate 10% RT	◎	◎	◎	
	Potassium hydroxide	◎	○	△	
	Potassium hydroxide 20% 70°C				◎
	Potassium nitrate	○	◎		◎
	Potassium permanganate 5%	○	◎		◎
	Potassium sulfate	◎	◎	◎	
	Propane	◎	◎	△	
	Propyl acetate		△	△	
	Propyl alcohol		○	○	◎
	Propylene	△	△		
	Propylene oxide				◎
	Pyridine	×			◎

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	Chemical Name				
	Salad oil				◎
	Salicylic acid	◎	◎		◎
	Salt	◎	◎		◎
	Salt water		◎	◎	
	Sea water				◎
	Silicon grease	△	○	△	
	Silicon oil	△	○	△	
	Silicon tetrachloride (55°C)				◎
	Silver nitrate	○	◎		◎
	Soap solution	◎	◎	◎	
	Soda ash (Sodium carbonate)	◎	◎	◎	◎
	Sodium bisulfite		◎	◎	
	Sodium carbonate (soda ash)	◎	◎	◎	◎
	Sodium cyanide	◎	◎	◎	
	Sodium hydrogen carbonate		◎	◎	
	sodium hydrogen sulfite		◎	◎	
	Sodium hydroxide (caustic soda) [30% 70°C]	×	×		◎
	Sodium hydroxide (caustic soda) [30% RT]	△	◎		◎
	Sodium hypochlorite [30% RT]		○	○	
	Sodium hypochlorite [5% 70°C]	△	×	○	◎
	Sodium hypochlorite [5% RT]	○	○	○	◎
	Sodium nitrate	◎	◎		◎
S	Sodium perborate		◎	○	
	Sodium peroxide	○	◎	△	◎
	Sodium phosphate	○	◎	◎	
	Sodium silicate				◎
	Sodium sulfate (Glauber's salt)	○	◎	◎	
	Sodium tetraborate (borax)	△	◎	◎	◎
	Sodium thiosulfate	◎	◎	◎	◎
	Soy bean oil	△	○	△	
	Steam	×	○	×	◎
	Stearic acid	○	◎	△	◎
	Styrene	×	○	×	
	Sulfur	○	◎	◎	◎
	Sulfuric acid 10 % 70°C	×	×		
	Sulfuric acid 10 % RT	◎	◎		
	Sulfuric acid 30 % 70°C	×	×	○	
	Sulfuric acid 30 % RT	○	◎	○	
	Sulfuric acid 98 % 70°C	×	×	×	◎
	Sulfuric acid 98 % RT	×	○	×	
	Sulfuric acid Fuming RT	×		×	
	Sulfurous acid				◎
	Sulfurous acid gas	○	◎	○	◎
	Sulfurous acid natrium	○	◎	○	◎
	Sulfurous acid10% RT			○	

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	Chemical Name				
	Tannic acid			○	
	Tar	×		○	
	Tartaric acid			◎	
	Tetrachloroethylene	×	△	○	◎
	Tetraethyl lead		○	×	
	Tetrahydrofuran	×	△	×	◎
	Tetralin			△	
	Thionyl chloride	×			
	Tin(II)chloride	△	○	○	◎
T	Toluene	×	△	×	◎
	Trichloroacetic acid				◎
	Trichloroethylene	×		×	◎
	Tricresyl phosphate			△	
	Triethanolamine			×	
	Triethylamine				◎
	Turbine oil	×			
	Turpentine oil	△		×	
V	Vinegar	○	◎		
W	Water	◎	◎	○	◎
	Whiskey,Wine		○	◎	
X	Xylene	×	△	×	◎
	Zinc acetate	◎	◎	×	
Z	Zinc chloride	◎	◎		◎
	Zinc sulfide	◎	◎	◎	