

Quality Assurance

ISO 9001:2008 Registration

Tigerflex™ hoses are manufactured in our own plant with ISO 9001:2008 registered quality management systems.

The ISO 9001 family of standards represents an international consensus on good manufacturing practices with the aim of ensuring that the organization consistently delivers the product or services that meet the customer's quality requirements.

ISO 9001 is a quality assurance model against which a plant's quality system can be independently audited.

Compliance Footnotes for Tigerflex™ Catalog Products

- (01) 3A – Material approved by 3-A Sanitary Standards, Inc. for multi-use plastic materials, number: 20-25, as product contact surfaces in equipment for production, processing and handling of milk and milk products.
- (02) BSE/TSE – The majority of the raw materials used in our formulations are not manufactured or derived from materials of animal origin. Nor do our products come into contact with materials of animal origin during processing. Our suppliers of raw materials have assured us their compounds exceed the relevant European Guidance on minimizing the Risk of Transmitting Animal Spongiform Encephalopathy Agents Via Human and Veterinary Medical Products.
- (03) FDA – Material conforms to CFR title 21, parts 170-199.
- (04) FDA – Material conforms to CFR title 21, parts 177.1680 and 177.2600.
- (05) FDA – Material conforms to CFR title 21, parts 177.2600 and 175.105.
- (06) FDA – Material conforms to CFR title 21, parts 177.2800 (5)(i), 21 CFR 170.39.
- (07) IAPMO – Hose conforms to IAPMO PS 33-2007 of the International Association of Plumbing and Mechanical Officials for use on circulating, return and main drain piping on spas, hot tubs and swimming pools.
- (08) MSHA – Hose approved by the United States Department of Labor's Mine Safety and Health Administration as having met Part 18, Title 30 CFR, and the Interim Fire Criteria for Acceptance of Products Taken into Underground Mines as water transfer hose.
- (09) MSHA – Hose approved by the United States Department of Labor's Mine Safety and Health Administration as having met the Interim Fire Criteria Acceptance of Products Taken Into Underground Mines as a hydraulic hose/hose bundle protection sleeve. Not intended for protection of electrical cables, and not intended for the repair or conveying of damaged hydraulic hoses.
- (10) Phthalate Free – Manufactured from all phthalate free materials.
- (11) RoHS – The product complies with the requirements of the EU directive 2002/95/EC which is on the restriction of the use of certain hazardous substances in electrical and electronic equipment.
- (12) USDA – Hose approved by the US Department of Agriculture for use in federally inspected meat and poultry plants.

Flexibility

The terms Flexibility and Minimum Bend Radius are often used interchangeably. However, while closely related, their meanings are different.

Minimum Bend Radius is generally defined as the smallest radius to which a hose can be bent without damage. Tigerflex™ defines damage as a 5% reduction of the hose OD at the bend point (before kinking/collapse). Other manufacturers may define damage as complete hose kinking/collapse.

Flexibility is defined as the amount of force required in order to bend the hose to a specified radius without kinking. In order to provide a better understanding of the flexibility of Tigerflex™ hoses we've performed extensive force-to-bend testing. This data provides a clearer picture of the actual flexibility of our hoses in order to assist in your hose selection process.

Food Grade			
Series	Force to Bend (Lbs./F) *		
	2" ID x 3 ft.	3" ID x 5 ft.	4" ID x 7 ft.
GTF/GTFE	0.3	0.8	3.5
UVF	2.5	3.6	5.5
WT	4.5	6.5	16.0
WE	5.5	8.8	21.4
2001	5.6	9.0	21.0
WBS	5.5	13.1	22.0
WSTF	-	14.0	22.0
VOLT	7.8	15.0	22.0
MILK-LT	10.0	15.0	-
MILK	11.0	17.0	-
FT	13.0	24.0	41.0
2020	-	31.0	41.0
VLT-SD	-	33.0	42.4

Material Handling			
Series	Force to Bend (Lbs./F) *		
	2" ID x 3 ft.	3" ID x 5 ft.	4" ID x 7 ft.
UV2	3.4	5.5	7.0
BARK	-	-	7.6
MULCH-LT	-	-	8.0
TR1	3.4	5.0	8.0
GC/GC-C	-	-	9.0
UBK	6	8	11.5
UV3	-	7.0	13.0
UFC	4.8	8.0	12.2
UF1	4.8	8.0	12.2
UVPE	5.5	7.5	-
AMPH	5.5	10.0	15.5
UF2	5.5	10.1	17.2
MULCH	-	-	18.2
PF	-	13.0	19.0

Ducting			
Series	Force to Bend (Lbs./F) *		
	2" ID x 3 ft.	3" ID x 5 ft.	4" ID x 7 ft.
CG/CG-SL	0.5	1.2	2.1
GT/GTG	0.5	1.5	2.8
LK/LKC	-	1.8	3.0
UV1/UVF	3.0	3.7	5.5

Liquid Suction			
Series	Force to Bend (Lbs./F) *		
	2" ID x 3 ft.	3" ID x 5 ft.	4" ID x 7 ft.
WH/SH	2.8	2.5	3.5
MH	2.8	-	-
WOR	2.8	5.3	10.0
W	4.0	9.5	7.3
WG	4.5	10.0	15.0
BW	7.8	12.3	19.5
ORV	10.0	12.0	-
TG/TY	12.0	11.2	22.0
TRED/TBLU	12.0	11.2	22.0
WST	-	14.0	21.0
CF	14.5	14.0	28.5
TSD	14.8	18.8	-
H/J/K	12.1	24.0	34.0
OV	19.0	29.0	-
S	24.6	29.0	35.5
F/G	26.0	31.0	47.0

A lower force-to-bend value indicates a more flexible hose.

*Values listed indicated pounds of force required to bend a straight length of hose to 180° at 68°F.

These recommendations are based on our laboratory test reports which are, to the best of our knowledge, complete and accurate. However, actual hose force-to-bend requirements can vary due to many factors such as hose age and manufacturing tolerances. Therefore, no guarantee is expressed or implied by our publication of this chart. If doubt exists, we advise that a sample of the hose in question be obtained and tested under actual conditions. These values are provided for reference only and are subject to change.

Care and Maintenance

Hoses have a limited service life and users must be alert to signs of impending failure. Users of industrial hose should have safety and inspection procedures in place. Hose users should be trained how to properly inspect a hose for signs of impending failure. Hose should be routinely inspected for signs of damage.

Length of hose service life is affected by several factors including the type of material conveyed, pressure, vacuum, number and degree of bends, amount of flexing and exposure to environmental elements. Since we have no control over the way in which the hose is used, we do not warrant our hose for any particular service life.

Hoses and fittings should be routinely inspected for signs of damage, such as:

- Cuts, cracks, severe abrasions or holes in the hose tube, helical support or grounding wire
- Ovaling, kinking, bulging or any other deformation of the hose's normal shape
- Hardening or soft spots
- Flaking or chipping
- Misalignment or weakening of the coupling retention
- Fitting or clamp damage such as loose clamps, missing pins, worn threads excessive corrosion

If any of these signs of damage are observed, contact your hose supplier for replacement or repair.

Recommended Practices

Hoses should only be used to convey materials compatible with hose construction. Refer to the Chemical Resistance and Application Guides in this catalog.

Hoses should not be used at levels that exceed their working pressure or vacuum ratings, and should not be subjected to severe pressure spikes or abrupt drops in pressure.

Hoses can sustain damage at high temperatures. Care should be exercised to not exceed the temperature limits of the hose. Hose should not be installed near sources of high heat.

Do not subject hose to abuse during service. Hose should not be thrown, dropped or subjected to severe impacts. Machinery should not be moved by pulling on the hose. Protect the hose from sharp edges and corners by using

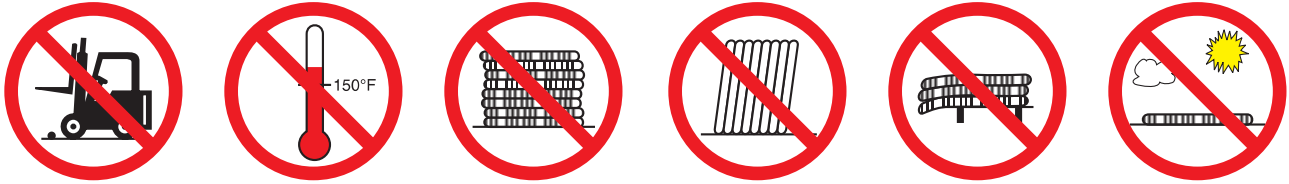
appropriate hose covers or sleeves.

If hose is used in a suspended position it should be supported in multiple points with use of proper hose slings in order to evenly distribute the hose weight.

Hose should not be used in applications where hose failure would result in contents exposure to open flame or other ignition sources.

When not in service hoses should be drained and stored properly.

Storage and Handling



The following storage conditions and handling procedures can enhance and substantially extend the ultimate life of Tigerflex™ hose.

Upon receipt of Tigerflex™ product, skids should be broken down and product inspected for shipping damage. Skids are configured for shipping purposes only.

Hose should be stored indoors out of direct sunlight. Hose should be stored a minimum of ten feet from fluorescent light fixtures.

Hose should always be stored flat on smooth surfaces. Hose should not be stored on its side as this can cause the section of the hose resting on the ground to become deformed, or “egg shaped”.

Hose coils should not be stacked more than six coils high. Larger diameter hoses, 4” and above, should be stacked fewer than six coils high. Please refer to the following chart for recommended maximum stacking height requirements by hose size:

Hose Size (ID)	3/4”	1”	1-1/4”	1-1/2”	2”	2-1/2”	3”	4”	5”	6”	8”+
Max Coil Stack Height	6	6	6	6	6	6	6	5	3	2	1

Exceeding these coil stacking requirements may cause the compression load factor on the bottom coil to exceed the hose’s load limitations, causing the bottom coil to flatten out.

Hose should be pulled from inventory on a first-in, first-out (FIFO) basis.

During storage, hose should be kept in its original wrapping when possible, and kept free of dust and dirt.

Hose should not be exposed to water, oils, solvents, or corrosive liquids and fumes during storage. Hose should be protected from rodents and insects.

Rubber hoses should not be stored near electrical equipment. The motor in the equipment can generate ozone, which can attack and damage rubber hose.

Hose should not be subjected to extreme temperatures. Ideal hose storage temperature is between 50°F and 70°F, and ideally should not exceed 100°F. Be aware, when the air temperature is over 90°F outdoor ground surfaces such as asphalt, concrete and gravel can be in excess of 150°F. Such extreme heat conditions could reduce service life of thermoplastic products. Do not store hoses near heat sources such as heat vents, heaters or radiators. Hoses should not be exposed to dampness or high humidity during storage.

Hose should not be kinked or run over by any equipment. Do not drag the hose during storage & shipping. In the handling of larger ID hose, dollies should be used in transporting whenever possible. Slings or handling rigs, properly placed in multiple locations throughout the hose, should be used to support heavier hose. Hanging and supporting coils using forklift forks without protection may damages hose.

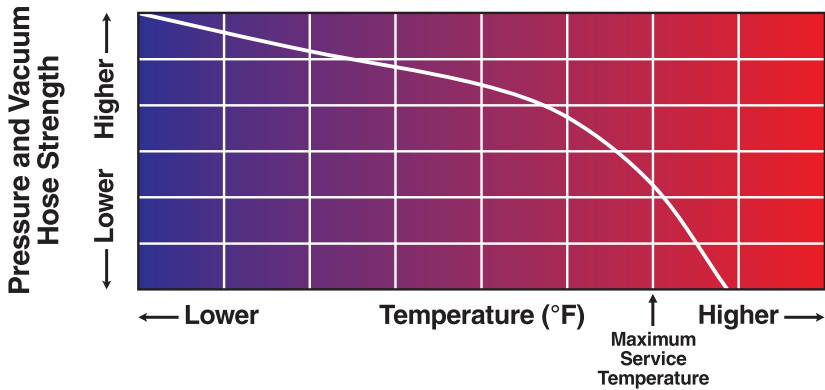
The Effect of Temperature on Working Pressure & Vacuum Ratings

As a general rule, the working pressure and vacuum ratings for plastic reinforced hoses are based on room temperature conditions. The maximum allowable working pressure or vacuum/suction for a hose decreases as the temperature increases and the material becomes softer and more elastic. Excessive bending of a hose while in service can

also affect the allowable service application working pressure and vacuum.

Working pressure and vacuum ratings can be affected significantly by the type of fitting used, the method of attachment, and the temperature to which the hose assembly is exposed in service. The graph below demonstrates the overall trend.

Pressure and vacuum hose strength decreases as temperature increases



Working Pressure Ratings

Working pressure and vacuum ratings are given in this catalog at 68°F and 104°F. Between 104°F and the maximum service temperature, it must be noted that a rapid decline in the pressure or vacuum rating of the hose may occur, and all factors relating to the hose, fittings and service conditions must be taken into consideration.

No warranty is expressed or implied, as applications and methods of fitting installation may vary widely. Before placing a hose in service, the user must determine the suitability of the product under the correct working conditions, and assumes all risk and liability in connection therewith.

Chemical Resistance Guides

Many new materials have been developed to handle the wide range of modern chemicals being used in industry today. Many of these materials are now being used in the construction of Tigerflex™ hose.

The Chemical Resistance Guides which appears on the following pages have been prepared to assist the user in the selection of the correct hose for the application.

These recommendations are based on laboratory and test reports which are, to the best of our knowledge, complete and accurate. However, the degree of chemical resistance of any given material depends upon many variables, including such factors as length of exposure, temperature, pressure, fluid velocity, and chemical concentration.

Therefore, no guarantee is expressed or implied by our publication of these Chemical Resistance Guides. If an element of doubt exists, we advise that a sample of the specific hose selected be obtained and tested under actual conditions.

Furthermore, listings in these Chemical Resistance Guides do not imply conformance to any U. S. Department of Agriculture (USDA), Food and Drug Administration (FDA) or any other federal, provincial or state laws which may be applicable when handling food products. For information on the conformance of any specific hose product with FDA, USDA, or 3-A Sanitary Standards, please refer to the notes accompanying the information and specifications for each hose featured in this catalog.

Warning

The Chemical Resistance Guides shown on the following pages are intended for general guidance only. The information contained therein is based upon tests we believe to be reliable, but the accuracy or completeness thereof is not guaranteed. No warranty is expressed or implied, as specific application parameters, such as temperature,

pressure and chemical concentrations vary widely. Furthermore, use of these hoses for handling multiple chemical products, either singly or as a mixture, may introduce uncontrollable factors relating to chemical resistance.

Before using any hose, the user is responsible for determining the suitability of the hose for the intended application. Therefore, the user assumes all risk and responsibility for determining the suitability of any hose for handling any chemical or chemicals.

PVC and Polyurethane Chemical Resistance Guide

Key: E – Excellent

G – Good

L – Limited

U – Unsatisfactory

Material Handled	Hose Materials of Construction and Temperatures			
	PVC		Thermoplastic Polyurethane	
	68°F	104°F	68°F	104°F
Acetaldehyde	U	U	U	U
Acetaldehyde 40 Pct.	—	—	—	—
Acetate Solvents-Crude	U	U	L	U
Acetate Solvents-Pure	U	U	L	U
Acetic Acid 0-10 Pct.	G	L	U	U
Acetic Acid 10-20 Pct.	G	L	U	U
Acetic Acid 20-30 Pct.	G	L	U	U
Acetic Acid 30-60 Pct.	G	L	U	U
Acetic Acid 80 Pct.	L	L	U	U
Acetic Acid Vapors	G	G	U	U
Acetic Acid-Glacial	L	U	U	U
Acetic Anhydride	U	U	U	U
Acetone	U	U	L	U
Acetylene	E	E	E	E
Acrylonitrile	E	G	—	—
Adipic Acid	G	L	U	U
Alcohol (See Type)	—	—	—	—
Allyl Alcohol 96 Pct.	U	U	U	U
Allyl Chloride	L	L	U	U
Alum	E	E	E	E
Aluminum Acetate	G	L	—	—
Aluminum Chloride	E	E	L	L
Aluminum Fluoride	E	E	E	E
Aluminum Hydroxide	E	L	G	L
Aluminum Nitrate	E	E	E	E
Aluminum Oxalate	—	—	—	—
Aluminum Oxychloride	E	E	—	—
Aluminum Sulfate	E	E	E	E
Ammonia – Aqueous	L	U	L	U
Ammonia – Dry Gas	L	U	L	U
Ammonia-Liquid	U	U	L	U
Ammoniated Latex	E	L	—	—
Ammonium Bicarbonate	—	—	—	—
Ammonium Carbonate	E	E	E	E
Ammonium Chloride	E	E	G	L
Ammonium Fluoride 25 Pct.	U	U	L	U
Ammonium Hydrosulphide	—	—	—	—
Ammonium Hydroxide 28 Pct.	G	G	L	U
Ammonium Metaphosphate	E	E	G	G
Ammonium Nitrate	E	E	G	G
Ammonium Persulfate	E	E	G	G
Ammonium Phosphate (Ammoniacal)	—	—	—	—
Ammonium Phosphate-Neutral	E	E	G	G
Ammonium Sulfate	E	E	E	E
Ammonium Sulfide	E	E	E	E
Ammonium Thiocyanate	E	E	G	G
Amyl Acetate	U	U	U	U
Amyl Alcohol	L	U	U	U
Amyl Chloride	U	U	—	—
Aniline	L	U	U	U
Aniline Chlorohydrate	U	U	U	U
Aniline Hydrochloride	U	U	U	U
Aniline Sulphate	—	—	—	—
Animal Oils	E	G	—	—
Anthraquinone	E	E	—	—
Anthraquinonesulfonic Acid	E	E	U	U
Antimony Pentacalcide	—	—	—	—
Antimony Trichloride	E	E	E	E
Apple (Sauce or Juice)	E	E	—	—
Aqua Regia	L	U	U	U
Aromatic Hydrocarbons	U	U	—	—
Arsenic Acid 80 Pct.	E	G	U	U
Arylsulfonic Acid	L	U	U	U
Asphalt	U	U	E	E
ASTM Fuel #1 Oil	G	L	E	E
ASTM Fuel #3 Oil	L	U	E	E
ASTM Fuel A	G	L	E	E
ASTM Fuel B	U	U	G	L
ASTM Fuel C	U	U	G	L
Baby Food	E	E	—	—
Barium Carbonate	E	E	E	E
Barium Chloride	E	E	E	E
Barium Hydroxide	E	E	G	L
Barium Sulfate	E	E	E	E
Barium Sulfide	E	E	E	E

Material Handled	Hose Materials of Construction and Temperatures			
	PVC		Thermoplastic Polyurethane	
	68°F	104°F	68°F	104°F
Barley	E	U	—	—
Beer	E	E	—	—
Beet-Sugar Liquor	E	E	—	—
Benzaldehyde	U	U	U	U
Benzene	U	U	L	U
Benzene-Sulfonic Acid 10 Pct.	E	E	U	U
Benzoic Acid	G	L	U	U
Benzol	U	U	L	U
Benzyl Alcohol	—	—	—	—
Berries	E	E	—	—
Bismuth Carbonate	E	E	E	E
Black Liquor (Paper industry)	E	E	—	—
Bleach-12.5 Pct. Active CL	G	L	L	U
Borax	E	G	E	E
Bordeaux Mixture	E	E	—	—
Boric Acid	E	E	U	U
Boron Trifluoride	E	E	E	E
Brine	E	E	G	U
Bromic Acid	E	L	U	U
Bromine-Liquid	U	U	U	U
Bromine-Water	U	U	U	U
Brussel Sprouts	E	E	—	—
Butadiene	L	U	—	—
Butane	E	E	E	E
Butanediol	—	—	—	—
Butanol-Primary	U	U	L	U
Butanol-Secondary	U	U	L	U
Butter	G	L	—	—
Butyl Acetate	U	U	L	U
Butyl Alcohol	E	L	L	U
Butyl Cellosolve	U	U	—	—
Butyl Phenol	L	U	—	—
Butylene	E	G	E	E
Butynediol (Erythritol)	U	U	U	U
Butyraldehyde	—	—	—	—
Butyric Acid 20 Pct.	L	U	L	U
Calcium Bisulfite	E	E	E	E
Calcium Carbonate	E	E	E	E
Calcium Chlorate	E	E	G	L
Calcium Chloride	E	E	L	U
Calcium Hydroxide	E	E	G	L
Calcium Hypochlorite	E	E	U	U
Calcium Nitrate	E	E	E	E
Calcium Phosphate	—	—	—	—
Calcium Sulfate	E	E	E	E
Camphor Oil	—	—	—	—
Cane Sugar Liquors	E	E	—	—
Carbon Bisulfide	U	U	—	—
Carbon Dioxide (Aqueous Solution)	E	E	E	E
Carbon Dioxide Gas (Wet)	E	E	E	E
Carbon Disulphide	U	U	—	—
Carbon Monoxide	E	E	E	E
Carbon Tetrachloride	U	U	L	U
Carbonic Acid	E	E	U	U
Carrots	E	E	—	—
Casein	E	E	E	E
Castor Oil	E	G	E	E
Catsup	E	G	—	—
Caustic Potash	E	E	L	U
Caustic Soda	L	L	L	U
Cellosolve	L	U	G	L
Cheese	E	G	—	—
Cherries	E	E	—	—
Chloracetic Acid	E	U	U	U
Chloral Hydrate	E	E	G	L
Chloric Acid 20 Pct.	E	E	U	U
Chlorinated Hydrocarbons	U	U	—	—
Chlorine Gas (Dry)	E	E	U	U
Chlorine Gas (Moist)	L	U	U	U
Chlorine Water 2 Pct.	L	U	L	U
Chlorine Water Saturated	—	—	—	—
Chlorobenzene	U	U	U	U
Chloroform	U	U	U	U
Chlorosulfonic Acid	L	U	U	U
Chocolate	G	L	—	—
Chrome Alum	E	E	E	E

Because we continually examine ways to improve our products, we reserve the right to alter specifications or discontinue products without prior notice.

PVC and Polyurethane Chemical Resistance Guide

Key: E – Excellent G – Good L – Limited U – Unsatisfactory

Material Handled	Hose Materials of Construction and Temperatures			
	PVC		Thermoplastic Polyurethane	
	68°F	104°F	68°F	104°F
Chromic Acid 10 Pct.	G	L	U	U
Chromic Acid 25 Pct.	G	L	U	U
Chromic Acid 30 Pct.	L	U	U	U
Chromic Acid 40 Pct.	L	U	U	U
Chromic Acid 50 Pct.	L	U	U	U
Chromic Acid Plating Solution	—	—	U	U
Cider	—	—	—	—
Citric Acid	E	E	U	U
Coal Tar	U	U	U	U
Coconut Oil	L	U	E	E
Cola Drinks	E	E	—	—
Copper Chloride	E	G	E	E
Copper Cyanide	E	E	—	—
Copper Fluoride 2 Pct.	E	E	E	E
Copper Nitrate	E	G	E	E
Copper Sulfate	E	G	E	E
Core Oils	E	E	E	E
Corn Oils	E	G	—	—
Cottonseed Oil	G	L	E	E
Creosote	U	U	—	—
Cresol	U	U	L	U
Cresylic Acid 50 Pct.	U	U	U	U
Crude Oil-Sour	E	E	E	E
Crude Oil-Sweet	E	E	E	E
Cyclohexane	L	U	—	—
Cyclohexanol	U	U	L	U
Cyclohexanone	U	U	U	U
Deminerlized Water	E	E	G	U
Detergents, Synthetic	E	G	—	—
Developers, Photographic	E	E	—	—
Dextrin	E	E	E	E
Dextrose	E	G	E	E
Di-acetone Alcohol	—	—	—	—
Di-isodecyl Phthalate	U	U	—	—
Diazo Salts	E	E	—	—
Dibutyl Phthalate	U	U	—	—
Dichlorobenzene	U	U	—	—
Diesel Oils	L	U	—	—
Diethyl Ether	—	—	—	—
Diethyl Ether	L	U	—	—
Diethylene Glycol	E	E	—	—
Diglycolic Acid	E	G	—	—
Dimethylamine	U	U	U	U
Diocetyl Phthalate	U	U	—	—
Diethylphthalate	U	U	E	E
Disodium Phosphate	E	E	G	L
Distilled Water	E	E	G	U
Eggs (yolks or white)	E	E	—	—
Emulsifiers	E	E	—	—
Emulsions, Photographic	E	E	—	—
Ethers	U	U	G	L
Ethyl Acetate	U	U	L	U
Ethyl Acrylate	U	U	—	—
Ethyl Alcohol	G	L	—	—
Ethyl Alcohol 0-50 Pct.	G	L	G	L
Ethyl Alcohol 50-98 Pct.	L	U	L	U
Ethyl Butyrate	—	—	—	—
Ethyl Chloride	U	U	U	U
Ethyl Ether	U	U	G	L
Ethyl Formate	—	—	—	—
Ethylene Bromide	E	U	U	U
Ethylene Dichloride	U	U	U	U
Ethylene Glycol	E	E	G	L
Ethylene Oxide	U	U	U	U
Fatty Acids	E	G	G	L
Ferric Chloride	E	E	G	L
Ferric Nitrate	E	E	E	E
Ferric Sulfate	E	E	E	E
Ferrous Ammonium Citrate	—	—	—	—
Ferrous Chloride	E	E	E	E
Ferrous Sulfate	E	E	E	E
Figs	E	E	—	—
Fish Solubles	E	E	E	G
Fixing Solution Photographic	E	G	—	—
Flour	E	U	—	—
Fluorine Gas-Dry	U	U	U	U

Material Handled	Hose Materials of Construction and Temperatures			
	PVC		Thermoplastic Polyurethane	
	68°F	104°F	68°F	104°F
Fluorine Gas-Wet	U	U	U	U
Fluoroboric Acid	E	E	E	E
Fluorosilicic Acid	E	E	U	U
Fluorosilicic Acid 40 Pct.	—	—	—	—
Fluorosilicic Acid Concentrate	—	—	—	—
Food Products, such as Milk, Buttermilk, Molasses, Salad Oils, Fruit	E	E	—	—
Formic Acid	E	L	U	U
Formaldehyde 40 Pct. Aqueous	U	U	—	—
Formic Acid 10 Pct.	E	G	U	U
Formic Acid 100 Pct.	U	U	U	U
Formic Acid 25 Pct.	E	G	—	—
Formic Acid 3 Pct.	E	G	U	U
Formic Acid 50 Pct.	L	U	U	U
Freon-12	E	G	E	E
Fructose	E	E	E	E
Fruit Pulps and Juices	E	E	E	E
Fuel Oil	G	L	E	E
Furfural	U	U	U	U
Furfuryl Alcohol	E	L	—	—
Gallic Acid	E	E	—	—
Gas-Coke Oven	G	G	G	G
Gas-Manufactured	U	U	—	—
Gas-Natural (Dry)	E	E	E	E
Gas-Natural (Wet)	E	E	E	E
Gasoline	U	U	—	—
Gasoline – Refined	L	U	E	G
Gasoline – Sour	L	U	E	G
Gelatine	E	E	E	E
Gin	E	G	—	—
Ginger Ale	E	E	—	—
Glucose	E	E	E	E
Glycerine (Glycerol)	E	E	E	E
Glycol	E	E	G	G
Glycolic Acid 30 Pct.	E	E	U	U
Grade Sugar	—	—	—	—
Grape Juice	E	E	—	—
Grapefruit Juice	E	E	—	—
Grease	E	L	—	—
Green Liquor (Paper industry)	E	E	—	—
Heptachlor	E	L	—	—
Heptane	L	U	E	—
Hexadecanol	—	—	—	—
Hexane	L	U	—	—
Hexanol, Tertiary	L	U	G	—
Honey	E	E	—	—
Hydrochloric Acid 10 Pct.	E	E	U	U
Hydrochloric Acid 48 Pct.	E	L	U	U
Hydrocyanic Acid 10 Pct.	—	—	—	—
Hydrofluoric Acid 10 Pct.	G	L	U	U
Hydrofluoric Acid 4 Pct.	G	G	U	U
Hydrofluoric Acid 48 Pct.	G	U	U	U
Hydrofluoric Acid 60 Pct.	G	U	U	U
Hydrofluoroboric Acid	E	E	—	—
Hydrofluorosilicic Acid	G	L	U	U
Hydrogen	E	G	E	E
Hydrogen Bromide (Dry)	—	—	—	—
Hydrogen Chloride (Dry) (Liquid)	—	—	E	E
Hydrogen Cyanide	E	E	U	U
Hydrogen Peroxide 3 – 12 Pct.	E	G	—	—
Hydrogen Peroxide 30 Pct.	E	G	G	L
Hydrogen Peroxide 50 Pct.	E	L	L	U
Hydrogen Peroxide 90 Pct.	U	U	U	U
Hydrogen Phosphide	E	L	—	—
Hydrogen Sulfide – Aqueous Solution	E	E	—	—
Hydrogen Sulfide – Dry	E	E	—	—
Hydrobromic Acid 20 Pct.	E	G	U	U
Hydroquinone	E	E	E	E
Hydroxylamine Sulfate	E	E	—	—
Hypochlorous Acid	E	E	L	U
Inks	—	—	—	—
Iodine (In Alcohol)	U	U	U	U
Iso-octane	G	L	—	—
Isopropyl Acetate	U	U	—	—
Isopropyl Alcohol	E	G	—	—
Jelly	E	E	—	—

Because we continually examine ways to improve our products, we reserve the right to alter specifications or discontinue products without prior notice.

PVC and Polyurethane Chemical Resistance Guide

Key: E — Excellent

G — Good

L — Limited

U — Unsatisfactory

Material Handled	Hose Materials of Construction and Temperatures			
	PVC		Thermoplastic Polyurethane	
	68°F	104°F	68°F	104°F
Jet Fuels JP 3,4,5	U	U	G	L
Kerosene	U	U	E	G
Ketones	U	U	—	—
Kraft Liquor (Paper industry)	E	E	—	—
Lacquer Thinners	L	U	G	—
Lactic Acid 28 Pct.	E	E	U	U
Lard (marginal)	G	L	—	—
Lard Oil	E	G	E	G
Lauric Acid	E	E	L	U
Lauryl Chloride	E	E	E	G
Lauryl Sulfate	E	E	—	—
Lead Acetate	E	E	E	E
Lead Arsenate	—	—	—	—
Lead Nitrate	—	—	—	—
Lead Tetra-ethyl	—	—	—	—
Lemon Juice	E	G	—	—
Lime Sulfur	E	E	—	—
Linoleic Acid	E	E	L	U
Linseed Oil	E	E	E	E
Liquors (Chemical)	E	G	—	—
Lubricating Oils	U	U	E	E
Magnesium Carbonate	E	E	E	E
Magnesium Chloride	E	E	G	L
Magnesium Hydroxide	E	E	G	L
Magnesium Nitrate	E	E	E	E
Magnesium Sulfate	E	E	E	E
Maleic Acid 25 Pct. Aqueous	E	E	L	U
Maleic Acid 50 Pct.	—	—	—	—
Maleic Acid Concentrated	—	—	—	—
Malic Acid	E	E	L	U
Manganese Suphate	—	—	—	—
Mayonnaise	E	E	—	—
Mercuric Chloride	G	G	G	L
Mercuric Cyanide	G	G	—	—
Mercurous Nitrate	G	G	G	G
Mercury	G	G	—	—
Metallic Soaps	—	—	—	—
Methyl Acetate	U	U	—	—
Methyl Alcohol	L	U	L	U
Methyl Bromide	U	U	—	—
Methyl Chloride	U	U	U	U
Methyl Ethyl Ketone	U	U	L	U
Methyl Isobutyl Ketone	U	U	—	—
Methyl Sulfate	E	G	E	G
Methyl Sulfuric Acid	E	E	U	U
Methylated Spirit	—	—	—	—
Methylene Chloride	U	U	U	U
Milk	E	E	—	—
Mineral Oils	E	G	E	E
Mineral Spirits	—	—	—	—
Molasses	E	E	E	E
Monochlorobenzene	U	U	—	—
Naphtha	U	U	E	E
Naphthalene	L	U	—	—
Nickel Acetate	E	E	E	E
Nickel Chloride	E	E	E	E
Nickel Nitrate	E	E	E	E
Nickel Sulphate	E	E	E	E
Nicotine	E	E	E	E
Nicotine Acid	E	G	L	U
Nitric Acid (Anhydrous)	U	U	U	U
Nitric Acid 10 Pct.	E	G	U	U
Nitric Acid 25 Pct.	G	L	U	U
Nitric Acid 35 Pct.	G	L	U	U
Nitric Acid 40 Pct.	G	L	U	U
Nitric Acid 50 Pct.	—	—	—	—
Nitric Acid 60 Pct.	G	U	U	U
Nitric Acid 68 Pct.	L	U	U	U
Nitric Acid 70 Pct.	U	U	—	—
Nitrobenzene	U	U	U	U
Nitrous Oxide	E	E	E	E
Oats	E	U	—	—
Octyl Alcohol	—	—	—	—
Oils and Fats	E	G	E	E
Oils, Petroleum	E	G	E	E
Oleic Acid	G	L	U	U

Material Handled	Hose Materials of Construction and Temperatures			
	PVC		Thermoplastic Polyurethane	
	68°F	104°F	68°F	104°F
Oleum	U	U	U	U
Olives	E	E	—	—
Orange Juice	E	E	—	—
Oxalic Acid	E	E	U	U
Oxygen	E	E	E	E
Ozone	L	U	—	—
Palmitic Acid 10 Pct.	E	G	U	U
Palmitic Acid 70 Pct.	L	U	U	U
Paraffin	E	G	—	—
Peaches	E	E	—	—
Peanut Butter	E	G	—	—
Peas	E	E	—	—
Pentachlorophenol in Oil	G	L	—	—
Pentane	G	U	—	—
Peracetic Acid 40 Pct.	U	U	U	U
Perchloric Acid 10 Pct.	G	L	U	U
Perchloric Acid 70 Pct.	L	U	U	U
Perchloroethylene	U	U	—	—
Petrol	U	U	—	—
Petroleum Ether	L	L	—	—
Phenol	U	U	U	U
Phenylhydrazine	U	U	—	—
Phenylhydrazine Hydrochloride	L	U	—	—
Phosgene (Gas)	E	G	—	—
Phosgene (Liquid)	U	U	—	—
Phosphoric Acid — 0-25 Pct.	E	E	U	U
Phosphoric Acid — 25-50 Pct.	E	E	U	U
Phosphoric Acid — 50-90 Pct.	E	E	U	U
Phosphorus (Yellow)	G	L	—	—
Phosphorus Pentoxide	U	U	—	—
Phosphorus Trichloride	U	U	—	—
Photographic Chemicals	E	E	E	G
Photographic Developers	—	—	—	—
Photographic Emulsions	—	—	—	—
Photographic Fixers	—	—	—	—
Picric Acid	U	U	U	U
Pineapple Juice	E	E	—	—
Pitch	G	L	—	—
Plating Solutions	—	—	—	—
Brass	E	E	E	E
Cadmium	E	E	E	E
Chromium	G	G	G	G
Copper	E	E	E	E
Gold	E	E	E	E
Iridium	E	E	E	E
Lead	E	E	E	E
Nickel	E	E	E	E
Rhodium	E	E	E	E
Silver	E	E	E	E
Tin	E	E	E	E
Zinc	E	G	E	E
Potassium Acid Sulfate	E	E	E	E
Potassium Antimonate	E	E	E	E
Potassium Bicarbonate	E	E	E	E
Potassium Bichromate	E	E	E	E
Potassium Bisulfite	E	E	E	E
Potassium Bisulphate	—	—	—	—
Potassium Borate 1 Pct.	E	E	E	E
Potassium Bromate 10 Pct.	E	E	E	E
Potassium Bromide	E	E	E	E
Potassium Carbonate	E	E	E	E
Potassium Chlorate	E	E	G	G
Potassium Chloride	E	E	E	G
Potassium Chromate 40 Pct.	E	E	G	G
Potassium Cuprocyanide	E	E	—	—
Potassium Cyanide	E	E	E	E
Potassium Dichromate 40 Pct.	E	E	G	G
Potassium Ferricyanide	E	E	E	E
Potassium Fluoride	E	E	E	G
Potassium Hydroxide 10 Pct.	E	E	L	U
Potassium Hydroxide 20 Pct.	E	E	U	U
Potassium Hydroxide 35 Pct.	E	E	U	U
Potassium Hydroxide Conc.	—	—	—	—
Potassium Hypochlorite	G	L	U	U
Potassium Nitrate	E	E	E	E
Potassium Perborate	E	E	E	E

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PVC and Polyurethane Chemical Resistance Guide

Key: E – Excellent G – Good L – Limited U – Unsatisfactory

Material Handled	Hose Materials of Construction and Temperatures			
	PVC		Thermoplastic Polyurethane	
	68°F	104°F	68°F	104°F
Potassium Perchlorite	E	E	G	L
Potassium Permanganate 10 Pct.	G	G	G	L
Potassium Persulfate	E	E	E	E
Potassium Phosphate	—	—	—	—
Potassium Sulfate	E	E	E	E
Potassium Sulfide	E	E	E	E
Potassium Thiosulfate	E	E	E	E
Potatoes	E	E	—	—
Propane	E	E	E	E
Propargyl Alcohol	E	E	—	—
Propyl Alcohol	E	L	G	L
Propylene Dichloride	U	U	U	U
Propylene Glycol	U	U	U	U
Prune Juice	E	E	—	—
Raisins	E	E	—	—
Ritchfield "A" Weed Killer	E	L	—	—
Salicylic Acid	—	—	—	—
Salt Water	E	E	G	U
Selenic Acid	E	G	U	U
Shortening	G	L	—	—
Silicic Acid	E	E	U	U
Silicone Fluids	—	—	—	—
Silver Cyanide	E	E	E	E
Silver Nitrate	E	E	E	E
Silver Plating Solutions	E	G	E	E
Soap Solution	E	E	G	U
Soda	E	E	—	—
Sodium Acetate	E	E	E	E
Sodium Acid Sulfate	E	E	E	E
Sodium Aluminate	—	—	—	—
Sodium Antimonate	E	E	E	E
Sodium Arsenite	E	E	E	E
Sodium Benzoate	E	G	E	E
Sodium Bicarbonate	E	E	E	E
Sodium Bisulfate	E	E	E	E
Sodium Bisulfite	E	E	E	E
Sodium Bromide	E	E	E	E
Sodium Carbonate (Soda Ash)	E	E	E	G
Sodium Chlorate	G	L	G	G
Sodium Chloride	E	E	E	G
Sodium Cyanide	E	E	E	E
Sodium Dichromate	E	G	E	E
Sodium Ferricyanide	E	E	E	E
Sodium Ferrocyanide	E	E	E	E
Sodium Fluoride	E	E	E	G
Sodium Hydroxide 10 Pct.	E	E	L	U
Sodium Hydroxide 35 Pct.	E	G	U	U
Sodium Hydroxide 50 Pct.	E	L	—	—
Sodium Hydroxide Saturated	E	E	U	U
Sodium Hypochlorite	E	E	U	U
Sodium Nitrate	E	E	E	E
Sodium Nitrite	E	E	E	E
Sodium Phosphate-Acid	G	G	U	U
Sodium Silicate	E	E	E	E
Sodium Sulfate	E	E	E	E
Sodium Sulfide	E	E	E	E
Sodium Sulfite	E	E	E	E
Sodium Thiosulfate (Hypo)	E	E	E	G
Soya Beans	E	U	—	—
Soya Oil	E	G	—	—
Soybean Oil	E	E	—	—
Spinach	E	E	—	—
Squash	E	E	—	—
Stannic Chloride	E	E	E	G
Stannous Chloride	E	G	E	G
Starch	—	—	—	—
Stearic Acid	E	G	L	U
Stoddard Solvent	L	U	G	G
Styrene	U	U	—	—
Sucrose	—	—	—	—
Sugar (All Forms)	E	E	—	—
Sulfur	G	G	—	—
Sulfuric Acid 0-10 Pct.	E	G	L	U
Sulfuric Acid 10-40 Pct.	E	G	U	U
Sulfuric Acid 50-60 Pct.	E	G	U	U
Sulfuric Acid 70 Pct.	E	G	U	U

Material Handled	Hose Materials of Construction and Temperatures			
	PVC		Thermoplastic Polyurethane	
	68°F	104°F	68°F	104°F
Sulfuric Acid 95 Pct.	U	U	U	U
Sulfuric Acid 95 Pct. to Fuming	L	L	U	U
Sulfurous Acid	G	L	U	U
Sulphur Dioxide Gas-Dry	E	E	—	—
Sulphur Dioxide Gas-Wet	U	U	—	—
Sulphur Dioxide-Liquid	L	U	—	—
Sulphur Trioxide	E	G	—	—
Sulphurous Acid 10 Pct.	—	—	—	—
Sulphurous Acid 30 Pct.	—	—	—	—
Tall Oil	U	U	—	—
Tallow	—	—	—	—
Tannic Acid	E	E	L	U
Tanning Extracts	—	—	—	—
Tanning Liquors	E	E	—	—
Tartaric Acid	E	G	L	U
Tea (Brewed)	E	E	—	—
Tetraethyl Lead	G	L	G	G
Tetrahydrofurane	U	U	U	U
Tetrahydroaphthalene	—	—	—	—
Thionyl Chloride	U	U	U	U
Tin Chloride	E	E	E	E
Titanium Tertachloride	E	U	L	U
Titanium Trichloride	—	—	—	—
Toluol or Toluene	U	U	L	U
Tomato Juice	E	E	—	—
Tomato Puree & Paste	E	E	—	—
Tomatoes	E	E	—	—
Transformer Oil	—	—	—	—
Tributyl Phosphate	U	U	—	—
Trichlorobenzene	—	—	—	—
Trichloroethylene	U	U	L	U
Tricresyl Phosphate	U	U	U	U
Triethanolamine	L	U	—	—
Triethylamine	G	L	—	—
Trimethyl Propane	L	U	—	—
Trisodium Phosphate	E	E	E	E
Turpentine	L	U	E	G
Urea	E	G	E	E
Urine	E	E	E	E
Vanilla Extract	—	—	—	—
Varnish	U	U	E	G
Vegetable Oils	G	L	—	—
Vinegar	E	G	G	L
Vinyl Acetate	U	U	U	U
Vinyl Chloride	U	U	—	—
Vodka	E	G	—	—
Water-Acid Mine Water	E	E	G	U
Water-Distilled	E	E	G	U
Water-Fresh	E	E	G	U
Water-Salt	E	E	G	U
Wetting Agents	—	—	—	—
Whey	—	—	—	—
Whiskey	E	G	—	—
White Gasoline	E	E	—	G
White Liquor (Paper industry)	E	E	—	—
Wines	E	G	—	—
Xylene or Xylol	U	U	G	L
Yeast	E	U	—	—
Yogurt	E	G	—	—
Zinc Chloride	E	E	E	E
Zinc Chromate	E	E	E	E
Zinc Cyanide	E	E	E	E
Zinc Nitrate	E	E	E	E
Zinc Sulfate	E	E	E	E
Mixtures of Acids:				
Nitric 15 Pct., Hydrofluoric 4 Pct.	E	G	U	U
Sodium Dichromate 13 Pct., Nitric Acid 16 Pct., Water 71 Pct.	E	G	U	U

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EPDM Chemical Resistance Guide

Key: G — Good L — Limited U — Unsatisfactory

Material Handled	68°F	104°F	Material Handled	68°F	104°F	Material Handled	68°F	104°F
Acetic Acid	G	G	Development Sol.	L	L	Monochloro Benzene	U	U
Acetone	G	G	Dextrin	G	G	Nitric Acid - 5%	L	L
Aluminum Acetate	G	G	Dichlorethylene	U	U	- 50%	L	L
Aluminum Chloride	G	G	Dichloro Benzene	U	U	- 70%	U	U
Aluminum Hydroxide	G	G	Diethyl Ether	G	G	- 95%	U	U
Aluminum Sulfate	G	G	Emulsifier	G	G	Oleic Acid	L	L
Ammonia (Gas)	G	G	Ether	G	G	Ozone	G	G
Ammonia (Liquid)	G	G	Ethyl Acetate	L	L	Parraffin	U	U
Ammonium Acetate (Conc.)	G	G	Ethyl Alcohol - 6%	G	G	Perchloroethylene	U	U
Ammonium Chloride	G	G	- 100%	G	G	Phenol	L	L
Ammonium Hydroxide	G	G	Ethylene Chloride	L	L	Phosphoric Acid - 30%	G	G
Ammonium Nitrate	G	G	Ethylene Glycol	G	G	Photosensitive Emulsion	G	G
Aniline	L	L	Fluorine	U	U	Potassium Bichromate	U	U
Aniline Sulfate	U	U	Glycerol	G	G	Potassium Bromide	G	G
Barium Chloride	G	G	Grape Sugar	G	G	Potassium Chloride	G	G
Barium Hydroxide	G	G	Hormamide- 40%	G	G	Potassium Cyanide	G	G
Beer	G	G	Hydrochloric Acid - 10%	G	L	Potassium Fluoride	G	G
Benzen Alcohol	L	L	- 20%	G	L	Potassium Hydroxide - 10%	G	G
Benzene	U	U	Concentrate	G	L	(Conc.)	G	G
Bromine	U	U	Hydrogen	G	G	Potassium Permanganate	U	U
Butyl Alcohol	L	L	Hydrogen Chloride (Anhydrous)	G	L	Potassium Phosphate	G	G
Calcium Carbonate	G	G	Hydrogen Peroxide - 3%	U	U	Propylene Glycol	G	G
Calcium Chloride (Conc.)	G	G	- 30%	U	U	Sake (Alcohol)	G	G
Calcium Hydroxide (Conc.)	L	L	(Above 80%)	U	U	Salt Water	G	G
Carbon Monoxide	G	G	Hydrogen Sulfide	G	G	Sauce	G	G
Carbon Tetrachloride	L	L	Iodine	U	U	Sodium Bicarbonate	G	G
Carbonic Acid	G	G	Iron Chloride	G	G	Sodium Chloride	G	G
Carbonic Acid Gas	G	G	Iron Sulfate	G	G	Sodium Hydroxide - 10%	G	G
Cetyl Alcohol	L	L	Isopropyl Alcohol	G	G	(Conc.)	G	G
Chlorine - 10% Gas	L	L	Magnesium Carbonate	G	G	Sodium Hypochlorite - 15%	G	G
- 100% Gas	L	L	Magnesium Chloride	G	G	Soy Sauce	G	G
(Solution)	L	L	Magnesium Hydroxide	G	G	Stearic acid	L	L
Chloroform	U	U	Magnesium Sulfate	G	G	Sulfur Dioxide	U	U
Chromate (Plating Solution)	L	L	Methanol - 20%	G	G	Sulfuric Acid	L	L
Citric Acid	G	G	Methyl Alcohol- 6%	G	G	Sulfurous Acid - 30%	L	L
Copper Chloride	G	G	- 100%	G	G	Tetrahydrofuron	L	L
Copper Nitrate	G	G	Methyl Ethel Ketone	G	G	Toluene	U	U
Copper Sulfate	G	G	Methylene Chloride	L	L	Transformer Oil	U	U
Creosote Oil	U	U	Mineral Oil	U	U	Water	G	G
						Zinc Chloride	G	G

SBR Chemical Resistance Guide

Key: G — Good L — Limited U — Unsatisfactory

Material Handled	68°F	Material Handled	68°F	Material Handled	68°F
1,1-dichloroethylene	U	Chromate (25%)	U	Methyl Ethyl Ketone (MEK)	U
1,2-dichloroethane	U	Citric Acid	G	Mineral Oil	U
Acetic Acid (10%)	L	Copper Chloride	G	Monochlorobenzene	U
Acetone	L	Copper Nitrate	G	Nitric Acid (5%)	U
Aluminum Acetate	L	Copper Sulfate	L	Nitric Acid (50%)	U
Aluminum Chloride	G	Creosote Oil	U	Nitric Acid (70%)	U
Aluminum Hydroxide	G	Dextrin	G	Nitric Acid (95%)	U
Aluminum Sulfide	L	Dichlorobenzene	U	Nitrous Acid (10%)	L
Ammonia (Gas)	G	Dichloromethane	U	Oleic Acid	U
Ammonia (Liquid)	G	Diethyl Ether	U	Oxalic Acid	L
Ammonium Acetate (Conc.)	G	Emulsifier	G	Ozone	U
Ammonium Bicarbonate	G	Ether	L	Paraffin	U
Ammonium Chloride	G	Ethyl Acetate	U	Perchloroethylene	U
Ammonium Hydroxide	U	Ethyl Alcohol (100%)	G	Phenol	U
Ammonium Nitrate	G	Ethyl Alcohol (6%)	G	Phosphoric Acid (30%)	U
Aniline	U	Ethylene Glycol	G	Potassium Bichromate	U
Aniline Sulfate	U	Fluorine	U	Potassium Bromide	G
Barium Chloride	G	Formaldehyde (40%)	L	Potassium Chloride	G
Barium Hydroxide	G	Glycerol	G	Potassium Cyanide	G
Beer	L	Grape Sugar	G	Potassium Fluoride	G
Benzene	U	Hydrochloric Acid (10%)	L	Potassium Hydroxide (10%)	L
Benzyl Alcohol	U	Hydrochloric Acid (20%)	L	Potassium Hydroxide (Conc.)	L
Bromine	U	Hydrochloric Acid (Conc.)	L	Potassium Permanganate	U
Butyl Alcohol	G	Hydrogen	L	Potassium Sulfate	G
Calcium Carbonate	G	Hydrogen Chloride (Anhydride)	L	Propylene Glycol	L
Calcium Chloride (Conc.)	G	Hydrogen Peroxide (3%)	U	Sake	G
Calcium Chloride (in 20% Mesh)	G	Hydrogen Peroxide (30%)	U	Salt Water	G
Calcium Hypochlorite (15% Cl ₂)	U	Hydrogen Peroxide (80% or more)	U	Sodium Bicarbonate	G
Calcium Hypochlorite (Conc.)	U	Hydrogen Sulfide	U	Sodium Chloride	G
Carbon Dioxide	U	Iodine	U	Sodium Hydroxide (10%)	G
Carbon Monoxide	L	Iron Chloride	G	Sodium Hydroxide (Conc.)	G
Carbon Tetrachloride	U	Iron Sulfate	G	Soy Sauce	G
Carbonic Acid	L	Isopropyl Alcohol	L	Stearic Acid	L
Carbonic Acid Gas	G	Magnesium Carbonate	G	Sulfuric Acid (10%)	U
Cetyl Alcohol	L	Magnesium Chloride	G	Tetrahydrofuran	U
Chlorine (10% Gas)	U	Magnesium Hydroxide	L	Toluene	U
Chlorine (100% Gas)	U	Magnesium Sulfate	L	Transformer Oil	U
Chlorine (Solution)	U	Methyl Alcohol (100%)	G	Water	G
Chloroform	U	Methyl Alcohol (6%)	G	Zinc chloride	G