CHEMICAL RESISTANCE CHART FOR VARIOUS PUMP MATERIALS

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The recommendations listed on the following pages are based upon information from material suppliers and careful examination of available information and are believed to be accurate. However, since the resistance of metals, plastics, and elastomers can be affected by concentration, temperature, presence of other chemicals and other factors, this information should be considered as a general guide rather than an unqualified guarantee. Ultimately the customer must determine the suitability of the pump used in various solutions.

All recommendations assume ambient temperatures unless otherwise noted. The ratings for these materials are based upon the chemical resistance only. Added consideration must be given to pump selections when the chemical is abrasive, viscous in nature, or has a specific gravity greater than 1:1.

How to use this chart: Column at left lists chemicals in alphabetic order. Columns at right list various pump materials, and their resistance to the chemicals are rated by a letter code.

Chemical Effect Ratings

A – No Effect - Acceptable

B – Minor Effect - Acceptable

C – Moderate Effect - Questionable

D – Severe Effect - Not Recommended

* – Not Tested

The performance comments and limitations listed above by Little Giant Pump Company are supplied by Harwil Corporationt for information only. Ultimately the customer must determine the suitability of Harwil Corporation products used in various solutions, situations and environments.

	316 Stainless	Titanium	Hastelloy C	PVC (Type 1)	Teflon	Noryl	Polypropylene	Ryton (Fortron)	Viton	Buna N	Neoprene	Ethylene Propylene	Epoxy
A													
Acetaldehyde	A	A	A	D	A	*	B	A	A	B	D	B	A
Acetamide	A	*	*	*	*	*	*	*	A	A	A	A	A
Acetate Solvent	A	*	*	B	A	*	D	*	D	D	D	*	A
Acetic Acid, Glacial	A	A	A	C	A	C	B	A	D	D	C	B	B
Acetic Acid 20%	A	A	A	B	A	A	A	A	D	C	C	*	B
Acetic Acid 80%	A	A	A	D	A	B	B	*	D	C	D	*	B
Acetic Acid	A	A	A	A	A	A	A	A	C	C	C	B	A
Acetic Anhydride	A	A	A	D	A	D	A	A	D	A	B	B	A
Acetone	A	A	A	D	A	D	B	A	D	D	C	A	B
Acetyl Chloride	A	*	*	*	A	*	*	A	*	*	*	*	A
Acetylene	A	*	*	B	*	*	D	A	A	A	B	A	A
Acrylonitrile	C	*	B	*	*	*	B	A	C	D	D	D	A
Alcohols													
Amyl	A	A	A	A	A	C	B	A	A	A	A	A	A
Benzyl	A	A	A	D	*	A	A	*	A	D	B	B	A
Butyl	A	B	A	A	A	A	B	A	A	A	A	A	A
Diacetone	A	A	A	D	*	A	D	*	D	D	D	A	A
Ethyl	A	A	A	A	*	A	A	*	A	A	A	B	A
Hexyl	A	A	A	A	*	A	A	*	A	A	B	A	A

	316 Stainless	Titanium	Hastelloy C	PVC (Type 1)	Teflon	Noryl	Polypropylene	Ryton (Fortron)	Viton	Buna N	Neoprene	Ethylene Propylene	Epoxy
Isobutyl	A	A	A	*	*	A	*	*	A	C	A	A	A
Isopropyl	A	A	A	*	*	A	A	*	A	C	B	A	A
Methyl	A	A	A	B	A	A	A	*	C	B	A	A	A
Octyl	A	A	A	*	*	A	*	*	A	B	B	A	A
Propyl	A	A	A	A	A	A	A	*	A	A	A	A	A
Alum Potassium Sulfate (Alum 10%)	*	*	B	A	A	*	*	*	A	*	A	*	A
Alum Potassium Sulfate (Alum 100%)	A	*	B	A	A	A	A	*	A	A	A	*	A
Aluminum Chloride	C	C	A	A	A	A	A	A	A	A	A	*	A
Aluminum Chloride 20%	C	A	A	A	*	A	A	A	A	A	A	A	A
Aluminum Flouride	C	D	B	A	A	A	A	*	A	A	A	*	A
Aluminum Hydroxide	A	*	*	A	A	A	A	*	A	A	A	*	A
Aluminum Sulfate	C	A	A	A	A	A	A	A	A	A	A	A	A
Amines	A	B	A	C	A	B	*	*	D	D	B	B	A
Ammonia 10%	A	A	A	A	A	A	A	A	A	D	A	*	B
Ammonia, Anhydrous	A	B	A	A	A	A	A	B	D	B	A	A	A
Ammonia, Liquids	A	*	B	A	A	A	A	*	D	B	A	A	A
Ammonia, Nitrate	A	*	*	B	*	A	A	*	*	A	C	*	A
Ammonium Bifluoride	A	*	B	A	*	A	A	*	A	A	A	*	A

	316 Stainless	Titanium	Hastelloy C	PVC (Type 1)	Teflon	Noryl	Polypropylene	Ryton (Fortron)	Viton	Buna N	Neoprene	Ethylene Propylene	Epoxy
Ammonium Carbonate	A	A	B	A	A	A	A	*	B	D	A	A	A
Ammonium Casenite	A	*	*	*	*	A	*	*	*	*	A	*	A
Ammonium Chloride	C	A	A	A	A	A	A	A	A	A	A	A	A
Ammonium Hydroxide	A	A	A	A	A	A	A	A	B	B	A	A	A
Ammonium Nitrate	A	A	A	A	A	A	A	A	A	A	A	A	A
Ammonium Oxalate	A	*	A	*	*	*	*	*	*	A	A	*	A
Ammonium Persulfate	A	A	A	A	A	A	A	*	C	A	A	A	A
Ammonium Phosphate Dibasic	A	A	A	A	A	A	A	*	A	A	A	A	A
Ammonium Phosphate Monobasic	A	A	A	A	A	A	A	*	A	A	A	A	A
Ammonium Phosphate Tribasic	A	A	A	A	A	A	A	*	A	A	A	A	A
Ammonium Sulfate	B	A	A	A	A	A	A	A	D	A	A	A	A
Ammonium Thiosulfate	A	A	*	*	*	*	*	*	*	A	A	*	A
Amyl Acetate	A	A	A	D	A	D	D	A	D	D	D	A	A
Amyl Alcohol	A	A	A	A	A	C	A	*	B	B	A	A	A
Amyl Chloride	B	*	A	D	A	D	D	*	A	D	D	D	A
Aniline	A	C	B	D	A	D	B	A	D	D	D	B	A
Anti-Freeze	A	*	A	A	A	A	A	A	A	A	A	A	A
Antimony-Trichloride	D	*	A	A	A	*	*	*	*	*	C	*	A
Aqua Regia (80%, HCL, 20%, HNO)	D	A	D	D	A	D	C	*	C	D	D	D	D
Arochlor 1248	*	*	*	*	*	D	*	*	A	D	D	B	A
Aromatic Hydrocarbons	A	*	*	D	*	D	*	*	A	D	D	D	A
Arsenic Acid A	A	*	*	A	A	A	A	*	A	A	A	*	A
Asphalt	A	*	*	A	*	*	A	A	A	B	B	D	A
B													
Barium Carbonate	A	A	A	A	A	A	A	*	A	A	A	*	A
Barium Chloride	A	A	A	A	A	A	A	A	A	A	A	A	A
Barium Cyanide	A	*	*	*	*	*	*	*	A	C	A	A	A
Barium Hydroxide	A	B	B	A	A	A	A	A	A	A	A	A	A
Barium Nitrate	A	A	*	B	*	A	*	*	A	A	A	A	B
Barium Sulfate	A	A	A	A	A	A	A	A	A	A	A	A	B
Barium Sulfide	A	*	*	A	A	A	A	*	A	A	A	A	A
Beer	A	A	A	A	A	A	D	*	A	D	A	A	A
Beet Sugar Liquids	A	*	*	A	A	A	A	*	A	A	B	A	A
Benzaldehyde	A	A	A	D	A	D	D	A	D	D	D	A	A
Benzene	A	A	B	D	A	D	D	A	A	D	D	D	A
Benzoic Acid	A	A	A	A	A	A	D	*	A	D	D	D	A
Benzol	A	A	A	D	A	D	A	*	D	D	D	*	A
Borax (Sodium Borate)	A	*	A	A	A	A	A	A	A	B	A	A	A
Boric Acid	A	A	A	A	A	A	A	*	A	A	A	A	A
Brewery Slop	A	*	*	*	*	*	*	*	A	A	A	*	A
Bromine (Wet)	D	A	A	B	A	D	D	D	A	B	D	D	C
Butadiene	A	*	*	A	A	*	*	B	A	A	B	A	A

	316 Stainless	Titanium	Hastelloy C	PVC (Type 1)	Teflon	Noryl	Polypropylene	Ryton (Fortron)	Viton	Buna N	Neoprene	Ethylene Propylene	Epoxy
Butane	A	*	*	A	A	D	C	D	*	A	B	D	A
Butanol	A	*	A	*	A	*	*	*	*	*	*	*	*
Butter	A	*	*	*	*	B	*	*	A	A	B	A	A
Buttermilk	A	*	*	*	A	A	*	*	A	A	A	*	A
Butylene	A	*	*	B	A	*	*	A	A	B	*	D	A
Butyl Acetate	C	*	A	D	A	D	D	A	D	B	D	B	A
Butyric Acid	A	A	A	B	A	A	A	*	D	D	D	B	A
C													
Calcium Bisulfate	A	*	*	A	A	*	*	*	A	A	C	*	A
Calcium Bisulfide	B	A	A	A	A	A	A	*	A	A	A	D	A
Calcium Bisulfite	A	A	A	A	A	A	A	*	A	A	A	*	*
Calcium Carbonate	A	A	A	A	A	A	A	*	A	A	A	*	A
Calcium Chlorate	A	*	B	A	A	*	*	*	A	*	A	*	A
Calcium Chloride	D	A	A	A	A	A	A	A	A	A	D	A	A
Calcium Hydroxide	A	A	A	A	A	A	A	*	A	A	A	A	A
Calcium Hypochlorite	C	A	B	D	A	A	A	*	A	B	D	A	A
Calcium Sulfate	A	A	B	A	A	A	A	A	A	A	D	*	A
Calgon	A	*	*	*	*	A	A	*	A	A	A	*	A
Cane Juice	A	*	*	A	*	*	D	*	*	A	A	*	A
Carbolic Acid (See Phenol)	*	*	*	*	*	*	*	*	*	*	*	*	*
Carbon Bisulfide	A	*	*	D	*	*	D	*	A	D	D	D	A
Carbon Dioxide (Wet)	A	*	A	*	A	*	*	*	*	*	*	*	*
Carbon Disulfide	A	*	*	D	A	D	D	A	A	D	D	D	A
Carbon Monoxide	A	*	*	A	*	B	A	*	A	A	B	A	A
Carbon Tetrachloride	B	A	A	C	A	D	D	C	A	C	D	*	C
Carbonated Water	A	*	*	A	*	A	A	*	A	A	A	A	A
Carbonic Acid	B	*	A	A	A	A	A	*	A	B	A	A	A
Catsup	A	*	*	A	*	A	A	*	A	A	C	*	A
Chloracetic Acid	D	A	A	A	A	*	D	*	A	D	D	B	B
Chloric Acid	D	*	*	D	A	*	*	*	*	D	D	*	D
Chlorinated Glue	A	*	*	*	*	C	*	*	A	C	D	*	A
Chlorine													
Anhydrous Liquid	D	D	A	D	A	A	D	C	A	D	D	B	B
Chlorine (Dry)	A	D	A	*	A	*	*	C	D	*	D	*	D
Chlorine Water	D	A	B	A	A	C	D	C	A	D	D	*	*
Chlorobenzene (Mono)	A	*	A	D	A	D	D	A	A	D	D	D	A
Chloroform	A	A	A	D	A	D	D	C	A	D	D	D	A
Chlorosultonic Acid	*	A	B	C	A	D	D	D	D	D	D	D	C
Chlorox (Bleach)	A	*	A	A	A	A	D	C	A	C	B	B	A
Chocolate Syrup	A	*	*	*	*	A	A	*	A	A	A	*	A
Chromic Acid 5%	A	A	A	A	*	C	A	A	A	D	D	A	B
Chromic Acid 10%	*	A	A	A	A	A	A	*	A	D	D	*	C
Chromic Acid 30%	*	A	A	A	A	D	A	*	A	D	D	*	D
Chromic Acid 50%	B	A	A	B	A	D	B	B	A	D	D	A	C
Cider	A	*	*	A	*	A	*	*	A	A	A	*	A

	316 Stainless	Titanium	Hastelloy C	PVC (Type 1)	Teflon	Noryl	Polypropylene	Ryton (Fortron)	Viton	Buna N	Neoprene	Ethylene Propylene	Epoxy
Citric Acid	A	A	A	A	A	A	B	*	A	D	A	A	A
Citric Oils	A	*	*	*	*	A	A	*	A	A	D	*	A
Coffee	A	*	*	*	A	A	A	*	A	A	A	*	A
Copper Chloride	D	A	A	A	A	A	A	A	A	A	A	A	A
Copper Cyanide	A	A	A	A	A	A	A	A	B	B	A	A	C
Copper Floborate	D	*	B	A	A	*	*	*	A	B	A	*	A
Copper Nitrate	A	A	A	A	A	A	A	*	A	A	A	*	A
Copper Sulfate													
(5% Solution)	A	A	A	A	A	A	A	A	A	A	A	*	A
Copper Sulfate	*	A	A	A	A	A	A	*	B	B	A	A	A
Cream	A	*	*	*	*	A	A	*	A	A	C	*	A
Cresols	A	*	*	D	*	*	C	A	A	D	D	D	A
Cresylic Acid	A	A	B	B	A	*	*	*	A	D	D	D	A
Cyclohexane	*	A	*	*	*	D	D	A	A	A	D	D	A
Cyanic Acid	*	*	*	*	*	*	*	*	*	C	D	*	A
D													
Detergents	A	*	*	A	*	A	A	A	A	A	B	A	A
Dichlorethane	A	*	A	D	A	*	*	*	C	*	D	*	A
Diesel Fuel	A	*	*	*	*	D	D	A	A	A	D	D	A
Diethylamine	*	*	*	D	A	B	C	*	D	B	B	B	A
Diethylene Glycol	*	*	*	*	*	A	*	*	A	A	A	A	A
Diphenyl Oxide	*	*	*	*	*	*	*	*	A	D	D	D	A
Dyes	A	*	*	*	*	A	*	*	A	*	C	*	A
E													
Epsom Salts													
(Magnesium Sulfate)	A	A	B	A	*	A	A	*	A	A	A	*	A
Ethane	*	*	*	*	*	D	*	*	A	A	B	D	A
Ethanolamine	A	*	*	*	*	*	*	A	D	B	B	*	A
Ether	A	*	B	D	*	D	A	C	D	D	C	A	A
Ethyl Acetate	A	*	B	D	A	D	C	A	D	D	D	B	A
Ethyl Chloride	A	A	B	D	A	D	D	A	A	D	C	A	A
Ethyl Sulfate	*	*	*	*	*	*	*	*	A	A	*	*	A
Ethylene Chloride	A	B	B	D	A	D	D	A	A	D	D	C	A
Ethylene Dichloride	A	A	B	D	A	D	A	A	A	D	D	C	A
Ethylene Glycol	A	*	A	A	A	A	A	A	A	A	A	A	A
Ethylene Oxide	A	*	*	D	A	A	*	*	D	D	D	C	A
F													
Fatty Acids	A	A	A	A	A	B	A	*	A	C	B	C	A
Ferric Chloride	D	A	B	A	A	A	A	A	A	D	B	A	A
Ferric Nitrate	A	A	A	A	A	A	A	A	A	A	A	A	A
Ferric Sulfate	C	A	A	A	A	A	A	A	A	B	A	*	A
Ferrous Chloride	D	A	B	A	A	A	A	A	A	B	A	*	A
Ferrous Sulfate	C	A	B	A	A	A	A	A	A	B	A	*	A
Fluboric Acid	B	D	A	A	A	B	A	*	A	B	A	*	A
Fluorine	D	D	A	C	C	*	*	*	*	*	*	*	D
Fluosilicic Acid	B	D	B	A	A	A	A	*	B	A	A	*	C
Formaldehyde 40%	A	A	A	B	A	A	A	A	D	B	A	*	A

	316 Stainless	Titanium	Hastelloy C	PVC (Type 1)	Teflon	Noryl	Polypropylene	Ryton (Fortron)	Viton	Buna N	Neoprene	Ethylene Propylene	Epoxy
Formaldehyde	A	A	B	A	A	D	A	A	A	C	D	B	A
Formic Acid	B	C	A	D	A	A	A	A	B	D	D	A	B
Freon 11	A	*	*	B	A	D	*	A	C	C	D	D	A
Freon 12 (Wet)	D	*	*	B	A	D	A	A	A	A	B	B	A
Freon 22	A	*	*	D	*	B	*	A	D	D	A	A	A
Freon 113	A	*	*	C	*	*	*	A	C	A	A	*	A
Freon T.F.	A	*	*	B	*	D	D	A	B	A	A	D	A
Fruit Juice	A	*	*	A	D	A	A	*	A	A	A	*	A
Fuel Oils	A	A	A	A	A	A	B	A	A	A	B	D	A
Furan Resin	A	*	*	*	A	*	*	A	A	D	D	*	A
Furfural	A	*	B	D	A	D	D	A	D	D	D	B	A
G													
Gallic Acid	A	*	A	A	A	*	*	*	B	A	*	*	*
Gasoline	A	D	A	C	A	D	C	A	A	A	D	C	A
Gelatin	A	*	A	A	A	A	A	*	A	A	A	A	A
Glucose	A	*	*	A	A	B	A	*	A	A	A	A	A
Glue P.V.	A	A	A	*	A	A	*	*	A	A	A	*	A
Glycerine	A	A	A	A	A	A	A	*	A	A	A	A	A
Gycolic Acid	*	*	A	A	A	C	A	A	A	*	*	*	A
Gold Monocyanide	A	*	*	*	*	*	*	*	A	A	A	*	A
Grape Juice	A	*	*	A	*	A	*	*	A	A	A	*	A
Grease	A	*	*	*	*	A	*	A	A	*	*	*	A
H													
Heptane	A	*	A	A	A	D	D	A	A	A	B	D	A
Hexane	A	*	A	C	A	D	C	A	A	A	B	D	A
Honey	A	*	*	A	*	A	A	*	A	A	A	A	A
Hydraulic Oils (Petroleum)	A	*	*	*	A	*	D	*	A	A	B	D	A
Hydraulic Oils (Synthetic)	A	*	*	*	*	*	D	*	A	C	*	*	A
Hydrazine	A	*	*	*	*	*	*	*	A	B	B	A	A
Hydrobromic Acid (20%)	D	A	A	A	A	A	A	*	A	D	C	*	B
Hydrobromic Acid	D	A	A	B	C	D	*	A	A	D	D	A	A
Hydrochloric Acid (Dry Gas)	A	*	A	A	A	*	*	*	*	*	*	A	A
Hydrochloric Acid (20%)	D	C	B	A	A	A	A	D	A	C	C	A	A
Hydrochloric Acid (37%)	D	C	B	A	A	A	A	D	A	C	C	C	A
Hydrochloric Acid (100%)	D	D	C	A	A	*	*	*	C	D	C	*	A
Hydrocyanic Acid	A	A	A	A	A	A	A	*	A	C	B	*	A
Hydrocyanic Acid (Gas 10%)	D	*	*	A	A	*	*	*	*	*	C	A	A
Hydrofluoric Acid (20%)	D	D	B	D	A	A	A	C	A	D	C	A	B
Hydrofluoric Acid (75%)	D	D	C	C	A	D	B	C	A	D	D	C	C
Hydrofluoric Acid (100%)	D	D	B	C	A	*	*	C	*	D	D	*	A
Hydrofluosilicic Acid (20%)	D	D	B	D	A	B	A	*	A	B	B	A	C

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Hydrofluosilicic Acid	D	*	C	*	A	*	*	*	*	*	A	*	*
Hydrogen Gas	A	*	*	A	A	*	*	*	A	*	*	*	A
Hydrogen Peroxide (10%)	C	C	A	A	A	*	*	B	*	A	D	*	D
Hydrogen Peroxide (30%)	B	B	A	A	A	*	A	C	A	D	C	*	B
Hydrogen Peroxide	B	B	A	A	A	B	A	C	A	D	D	C	A
Hydrogen Sulfide													
Aqueous Solution	A	A	A	A	A	A	A	A	B	C	B	A	A
Hydrogen Sulfide (Dry)	A	*	A	A	A	*	*	A	A	*	*	*	A
Hydroxyacetic Acid (70%)	*	B	*	A	*	*	*	*	A	A	A	A	A
I													
Ink	A	*	*	*	*	B	*	*	A	A	A	*	A
Iodine	D	A	B	D	A	A	D	*	A	B	D	B	A
Iodine (in Alcohol)	B	D	A	D	A	C	B	*	A	D	D	*	*
Iodoform	A	*	*	*	A	*	*	*	C	*	*	*	*
Isotane	*	*	*	*	*	D	D	*	A	A	*	*	A
Isopropyl Acetate	B	*	*	*	*	*	*	*	D	D	D	B	A
Isopropyl Ether	A	*	*	*	A	D	D	*	D	B	D	D	*
J													
Jet Fuel (JP3, JP4, JP5)	A	*	*	A	A	D	D	A	A	A	D	D	A
K													
Kerosene	A	A	A	A	A	D	D	A	A	A	D	A	A
Ketones	A	A	A	D	A	D	D	A	D	D	D	D	C
L													
Lacquers	A	*	*	*	*	C	A	*	D	D	D	*	A
Lacquer Thinners	A	A	A	C	A	D	B	*	*	D	D	A	*
Lactic Acid	B	A	A	A	A	A	A	A	B	B	A	B	A
Lard	A	*	*	A	*	*	A	*	A	A	B	*	A
Latex	A	*	*	*	*	A	*	*	A	A	C	A	A
Lead Acetate	A	A	A	A	A	A	A	*	D	B	D	A	A
Lead Sulfamate	*	*	*	*	*	*	A	*	A	B	A	D	A
Ligroin	A	*	*	*	*	D	D	*	A	A	B	A	A
Lime	A	A	*	A	*	A	*	*	A	A	B	D	A
Lubricants	A	A	A	A	A	*	A	A	A	A	D	*	A
M													
Magnesium Carbonate	A	*	B	A	*	A	A	*	*	A	A	A	A
Magnesium Chloride	B	A	A	A	A	A	A	A	A	A	A	A	A
Magnesium Hydroxide	A	A	A	A	A	A	A	A	A	B	B	*	A
Magnesium Nitrate	A	A	A	A	A	A	A	*	A	A	A	*	A
Magnesium Oxide	A	*	*	*	*	*	*	*	*	A	A	A	A
Magnesium Sulfate	A	A	B	A	A	A	A	A	A	A	A	D	A
Maleic Acid	A	A	A	A	A	A	C	*	A	D	A	D	A
Maleic Anhydride	*	*	A	*	*	*	*	*	A	D	D	*	A
Malic Acid	A	*	A	A	A	*	*	*	C	*	A	*	*
Mash	A	*	*	*	*	A	*	*	*	A	A	*	A
Mayonnaise	A	*	*	*	A	A	A	*	A	A	*	*	A

	316 Stainless	Titanium	Hastelloy C	PVC (Type 1)	Teflon	Noryl	Polypropylene	Ryton (Fortron)	Viton	Buna N	Neoprene	Ethylene Propylene	Epoxy
Melamine	D	*	*	*	*	*	*	*	*	C	*	*	A
Mercuric Chloride													
(Dilute Solution)	D	A	B	A	A	A	A	*	A	A	A	A	A
Mercuric Cyanide	A	A	*	A	A	A	A	*	*	A	*	*	A
Mercury	A	C	A	A	A	A	A	*	A	A	A	A	A
Methanol													
(See Alcohol, Methyl)	*	*	*	*	*	*	*	*	*	*	*	*	*
Methyl Acetate	A	*	A	*	A	*	*	*	D	D	B	B	*
Methyl Acrylate	*	*	*	*	*	*	*	*	D	D	B	B	A
Methyl Acetone	A	*	*	*	A	D	*	*	D	D	D	*	C
Methyl Alcohol (10%)	A	*	A	A	a	A	*	*	*	B	*	*	A
Methyl Bromide	*	*	*	*	*	*	*	*	A	B	D	D	B
Methyl Butyl Ketone	A	*	*	*	*	D	*	*	D	D	D	A	B
Methyl Cellosolve	*	*	*	*	*	C	A	*	D	D	D	B	C
Methyl Chloride	A	A	A	D	A	D	D	*	A	D	D	C	A
Methyl Dichloride	*	*	*	*	*	D	*	*	A	D	D	D	A
Methyl Ethyl Ketone	A	A	A	D	A	D	A	A	D	D	D	A	A
Methylisobutyl Ketone	A	A	A	D	A	D	C	A	D	D	D	C	B
Methyl Isobutyl Ketone	A	*	*	*	*	D	*	*	D	D	D	B	B
Methyl Methacrylate	*	*	*	*	*	*	*	*	D	D	D	D	A
Methylamine	A	*	*	*	*	B	*	*	*	B	*	*	A
Methylene Chloride	A	A	A	D	A	D	D	*	B	D	D	D	A
Milk	A	*	*	A	*	A	A	*	A	A	A	A	A
Molasses	A	*	*	A	*	B	A	*	A	A	A	*	A
Mustard	A	*	*	A	*	B	A	*	A	B	C	*	A
N													
Naptha	A	A	A	A	A	D	A	A	A	B	D	D	A
Napthalene	B	A	A	D	A	D	B	A	C	D	D	D	A
Nickel Chloride	B	A	A	A	A	A	A	*	A	A	A	A	A
Nickel Sulfate	B	A	B	A	A	A	A	*	A	A	A	A	A
Nitric Acid (10% Solution)	A	A	A	A	A	A	A	D	A	D	D	B	A
Nitric Acid (20% Solution)	A	A	A	A	A	A	A	C	A	D	D	D	B
Nitric Acid (50% Solution)	A	A	A	A	A	A	D	C	A	D	D	D	D
Nitric Acid													
(Concentrated Soultion)	B	A	B	D	A	D	D	C	B	D	D	D	D
Nitrobenzene	B	A	B	D	A	D	C	B	D	D	D	D	B
O													
OILS													
Aniline	A	A	D	D	A	D	A	*	A	D	D	B	A
Anise	A	*	*	*	*	*	*	*	*	*	D	*	A
Bay	A	*	*	*	*	*	*	*	A	*	D	*	A
Bone	A	*	*	*	*	*	*	*	A	A	D	*	A
Castor	A	*	*	A	*	*	*	*	A	A	A	B	A
Cinnamon	A	*	*	*	A	*	A	*	D	*	D	*	A
Citric	A	*	*	*	*	*	A	*	A	A	D	*	A

	316 Stainless	Titanium	Hastelloy C	PVC (Type 1)	Teflon	Noryl	Polypropylene	Ryton (Fortron)	Viton	Buna N	Neoprene	Ethylene Propylene	Epoxy
Clove	A	*	*	*	*	*	B	*	*	A	*	*	A
Coconut	A	*	*	*	*	*	A	*	A	A	A	A	A
Cod Liver	A	*	*	*	*	*	A	*	A	A	B	A	A
Corn	A	*	*	*	*	*	A	*	A	A	D	C	A
Cottonseed	A	*	*	A	A	*	A	A	A	A	D	C	A
Cresote	A	*	*	*	*	*	D	*	A	A	B	D	A
Diesel Fuel (2D 3D 4D 5D)	A	*	*	*	*	D	A	A	A	A	D	D	A
Fuel (1 2 3 5A 5B 6)	A	A	A	A	A	D	B	*	A	B	D	D	A
Ginger	A	*	*	*	*	*	*	*	A	A	A	*	A
Hydraulic (See Hydraulic)													
Lemon	A	*	*	*	*	*	D	*	A	*	D	*	A
Linseed	A	*	*	A	*	*	A	*	A	A	D	D	A
Mineral	A	*	A	*	B	B	A	A	A	B	D	A	A
Olive	A	*	*	A	A	*	A	*	A	A	B	*	A
Orange	A	*	*	*	A	*	A	*	A	A	D	*	A
Palm	A	*	*	A	*	*	*	*	A	A	D	*	A
Peanut	A	*	*	A	*	*	D	*	A	A	D	*	A
Peppermint	A	*	*	*	*	*	D	*	A	D	D	*	A
Pine	A	*	*	A	A	*	*	*	A	A	D	*	A
Rape Seed	A	*	*	A	*	*	*	*	A	B	D	*	A
Rosin	A	*	*	*	*	*	A	*	A	A	*	*	A
Sesame Seed	A	*	*	A	*	*	*	*	A	A	D	*	A
Silicone	A	*	*	*	*	A	A	*	A	A	A	*	A
Soybean	A	*	*	A	*	*	A	*	A	A	D	*	A
Sperm	A	*	*	A	*	*	*	*	A	A	D	*	A
Tanning	A	*	*	*	*	*	*	*	A	A	D	*	A
Turbine	A	*	*	A	*	*	*	*	A	A	D	*	A
Oleic Acid	A	*	B	A	A	C	C	*	B	B	D	D	A
Oleum 25%	*	*	A	D	A	D	*	*	A	D	D	D	D
Oleum	A	*	*	D	A	*	D	*	A	C	D	D	A
Oxalic Acid (Cold)	B	C	B	A	A	C	A	*	A	B	B	A	A
P													
Paraffin	A	*	*	A	A	B	A	*	A	A	*	*	A
Pentane	C	*	B	*	A	D	*	*	A	A	B	D	A
Perchlorethylene	A	*	*	*	A	D	D	A	A	C	D	D	A
Petrolatum	A	*	*	*	A	D	*	*	A	A	B	A	A
Phenol (10%)	A	*	B	A	A	*	*	A	B	D	C	D	C
Phenol (Carbolic Acid)	A	C	A	A	A	C	B	A	A	D	D	D	B
Phosphoric Acid													
(to 40% Solution)	A	A	A	A	A	A	A	A	A	D	D	B	A
Phosphoric Acid													
(40% - 100% Solution)	B	B	A	A	A	A	A	A	A	D	D	B	C
Phosphoric Acid (Crude)	C	C	A	*	A	*	*	A	A	D	D	B	A
Phosphoric Anhydride	A	*	*	D	A	*	*	*	D	D	D	*	*
Phosphoric Anhydride													

	316 Stainless	Titanium	Hastelloy C	PVC (Type 1)	Teflon	Noryl	Polypropylene	Ryton (Fortron)	Viton	Buna N	Neoprene	Ethylene Propylene	Epoxy
(Molten)	A	*	*	D	A	*	*	*	D	C	D	*	A
Photographic (Developer)	A	A	A	A	*	A	A	*	A	A	A	*	A
Phthalic Anhydride	B	*	A	*	A	*	*	*	A	C	*	*	*
Picric Acid	A	*	A	A	A	*	*	*	A	A	A	*	A
Plating Solutions													
Antimony Plating 130°F	A	A	A	A	A	A	A	*	A	A	A	*	B
Arsenic Plating 110°F	A	A	A	A	A	A	A	*	A	A	A	*	B
Black Chrome Bath 115°F	C	A	A	A	A	D	A	*	C	D	D	*	D
Barrel Chrome Bath 95°F	D	C	A	A	A	D	A	*	C	D	D	*	D
Brass Plating													
Regular													
Brass Bath 100°F	A	A	A	A	A	A	A	*	A	A	A	*	B
High Speed Brass Bath													
110°F	A	A	A	A	A	A	A	*	A	A	A	*	B
Bronze Plating													
Copper Cadmium													
Bronze Bath R T	A	A	A	A	A	A	A	*	A	A	A	*	B
Copper-Tin Bronze													
Bath 160°F	A	A	A	D	A	A	A	*	A	A	B	*	C
Copper-Zinc Bronze													
Bath 100°F	A	A	A	A	A	A	A	*	A	A	A	*	B
Cadmium Plating													
Cyanide Bath 90°F	A	A	A	A	A	A	A	*	A	A	A	*	B
Fluoborate Bath 100°F	A	D	A	A	A	A	A	*	A	B	C	*	B
Chromium Plating													
Chromic-Sulphuric Bath													
130°F	C	A	A	A	A	D	A	*	C	D	D	*	D
Fluosilicate Bath 95°F	C	C	A	A	A	D	A	*	C	D	D	*	D
Fluoride Bath 130°F	D	C	A	A	A	D	A	*	C	D	D	*	D
Copper Plating (Acid)													
Copper Sulfate Bath R T	D	A	A	A	A	A	A	*	A	A	A	*	D
Copper Fluorborate Bath													
120°F	D	D	A	A	A	A	A	*	A	B	C	*	D
Copper Plating (Cyanide)													
Copper Strike Bath 120°F	A	A	A	A	A	A	A	*	B	*	A	*	B
Rochelle Salt Bath 150°F	A	A	A	D	A	A	A	*	A	A	B	*	C
High Speed Bath 180°F	A	A	A	D	A	A	A	*	A	A	B	*	C
Copper (Misc.)													
Copper													
Pyrophosphate 140°F	A	A	A	A	A	A	A	*	A	A	A	*	B
Copper (Electroless)													
140°F	*	*	*	A	A	A	A	*	A	D	D	*	B

	316 Stainless	Titanium	Hastelloy C	PVC (Type 1)	Teflon	Noryl	Polypropylene	Ryton (Fortron)	Viton	Buna N	Neoprene	Ethylene Propylene	Epoxy
Gold Plating													
Cyanide 150°F	A	A	A	D	A	A	A	*	A	A	A	*	D
Neutral 75°F	C	A	A	A	A	A	A	*	A	A	A	*	A
Acid 75°F	C	A	A	A	A	A	A	*	A	A	A	*	A
Indium Sulfamate													
Plating R T	C	A	A	A	A	A	A	*	A	A	A	*	A
Iron Plating													
Ferrous													
Chloride Bath 190°F	D	A	D	D	A	A	C	*	A	B	D	*	D
Ferrous Sulfate Bath													
150°F	C	A	A	D	A	A	A	*	A	A	B	*	D
Ferrous Am Sulfate													
Bath 150°F	C	A	A	D	A	A	A	*	A	A	B	*	D
Sulfate Chloride Bath													
160°F	D	A	D	D	A	A	A	*	A	B	C	*	D
Fluorobate Bath 145°F	D	D	B	D	A	A	A	*	A	B	C	*	D
Sulfamate 140°F	D	A	B	A	A	A	A	*	A	A	A	*	A
Lead Fluoborate Plating	C	D	A	A	A	A	A	*	A	B	C	*	A
Nickel Plating													
Watts Type 115-160°F	C	A	A	D	A	A	A	*	A	A	A	*	D
High Chloride 130-160°F	C	A	A	D	A	A	A	*	A	A	B	*	D
Fluoborate 100-170°F	C	D	A	D	A	A	A	*	A	B	C	*	D
Sulfamate 100-140°F	C	A	A	A	A	A	A	*	A	A	A	*	A
Electroless 200°F	*	*	*	D	A	D	D	*	A	D	D	*	B
Rhodium Plating 120°F	D	D	D	A	A	A	A	*	A	A	B	*	A
Silver Plating 80-120°F	A	A	A	A	A	A	A	*	A	A	A	*	A
Tin-Fluorobate Plating													
100°F	C	D	A	A	A	A	A	*	A	B	C	*	A
Tin-Lead Plating 100°F	C	D	A	A	A	A	A	*	A	B	C	*	A
Zinc Plating													
Acid Chloride 140°F	D	A	D	A	A	A	A	*	A	A	A	*	A
Acid Sulfate Bath 150°F	C	A	A	D	A	A	A	*	*	A	B	*	D
Acid Fluorobate Bath R T	*	D	*	A	A	A	A	*	A	B	C	*	A
Alkaline Cyanide Bath R T	*	A	A	A	A	A	A	*	A	A	A	*	A
Potash	*	*	A	A	*	A	A	*	A	A	B	*	A
Potassium Bicarbonate	*	B	A	A	A	A	A	A	A	A	A	*	A
Potassium Bromide	*	A	B	A	A	A	A	C	*	A	A	A	A
Potassium Carbonate	*	A	A	A	A	A	A	A	A	B	A	*	A
Potassium Chlorate	A	A	B	A	A	A	A	A	A	A	A	*	A
Potassium Chloride	A	A	A	A	A	A	A	A	A	A	A	A	A
Potassium Chromate	B	*	B	A	*	A	*	A	A	A	A	*	C
Potassium Cyanide													
Solutions	B	A	A	A	A	A	A	A	B	A	A	A	A

	316 Stainless	Titanium	Hastelloy C	PVC (Type 1)	Teflon	Noryl	Polypropylene	Ryton (Fortron)	Viton	Buna N	Neoprene	Ethylene Propylene	Epoxy
Potassium Dichromate	A	A	B	A	A	A	A	A	B	A	A	A	A
Potassium Ferrocyanide	*	*	B	A	A	*	*	*	*	D	*	*	A
Potassium Hydroxide													
(50%)	B	C	A	A	A	A	A	A	B	B	A	A	A
Potassium Nitrate	B	A	B	A	A	A	A	C	B	A	A	A	A
Potassium Permanganate	B	B	B	A	A	A	B	A	B	A	A	*	B
Potassium Sulfate	B	A	A	A	A	A	A	A	A	A	A	A	A
Potassium Sulfide	*	*	B	A	A	*	*	*	*	A	*	*	*
Propane (Liquified)	*	*	*	D	A	D	D	*	A	A	B	D	A
Propylene Glycol	*	*	*	*	A	*	*	*	A	A	C	*	A
Pyridine	*	*	*	*	A	D	B	A	D	D	D	B	A
Pyrogallic Acid	A	*	A	A	A	*	*	*	A	A	*	*	A
R													
Rosins	A	*	B	*	A	*	A	*	*	A	*	*	A
Rum	*	*	*	A	*	A	A	*	A	A	A	*	A
Rust Inhibitors	*	*	*	*	*	*	A	*	A	A	C	*	A
S													
Salad Dressing	*	*	*	A	*	A	A	*	A	A	*	*	A
Sea Water	C	A	*	A	A	A	A	*	A	A	B	A	A
Shellac (Bleached)	*	*	*	*	A	*	A	*	*	A	*	*	A
Shellac (Orange)	*	*	*	*	A	*	A	*	*	A	*	*	A
Silicone	*	*	*	*	*	A	A	*	A	A	A	A	A
Silver Bromide	C	*	*	*	*	A	*	*	*	*	*	*	A
Silver Nitrate	B	A	A	A	A	A	A	*	A	C	A	C	A
Soap Solutions	A	A	B	B	A	A	A	A	A	A	B	*	A
Soda Ash (See Sodium Carbonate)													
Sodium Borate	*	*	A	C	A	*	*	*	A	*	A	*	*
Sodium Hydrosulfite	*	*	A	C	A	*	*	*	A	*	A	*	*
Sodium Acetate	A	A	A	A	A	A	A	*	D	C	C	*	A
Sodium Aluminate	*	B	B	*	A	A	*	A	A	A	A	A	A
Sodium Bicarbonate	A	A	*	A	A	A	A	A	A	A	A	A	A
Sodium Bisulfate	*	B	B	A	A	A	A	A	B	A	A	*	A
Sodium Bisulfite	*	A	B	A	A	A	A	A	A	A	A	*	A
Sodium Carbonate	B	A	A	A	A	A	A	A	A	A	A	A	A
Sodium Chlorate	*	A	B	A	A	A	A	A	A	D	A	*	A
Sodium Chloride	C	A	A	A	A	A	A	A	A	A	A	A	A
Sodium Cyanide	*	A	*	A	A	A	A	A	A	A	A	A	A
Sodium Fluoride	*	A	A	D	A	*	*	*	C	D	D	*	A
Sodium Hydroxide (20%)	A	A	A	A	A	A	A	A	A	A	B	A	A
Sodium Hydroxide (50% Solution)	B	A	A	A	A	A	A	B	A	D	C	*	A
Sodium Hydroxide (80% Solution)	D	A	B	A	A	A	A	B	B	D	C	*	A
Sodium Hypochlorite	A	A	A	A	A	A	A	C	D	B	A	*	A
Sodium Metaphosphate	A	*	*	*	A	*	D	*	A	A	B	A	A
Sodium Metasilicate	A	*	*	*	A	*	*	*	A	A	A	*	A
Sodium Nitrate	A	A	B	A	A	A	A	*	B	C	B	A	A

	316 Stainless	Titanium	Hastelloy C	PVC (Type 1)	Teflon	Noryl	Polypropylene	Ryton (Fortron)	Viton	Buna N	Neoprene	Ethylene Propylene	Epoxy
Sodium Perborate	C	*	*	*	A	A	A	*	A	B	B	A	A
Sodium Peroxide	A	*	B	A	A	*	*	*	A	C	B	A	A
Sodium Polyphosphate (Mono Di Tribasic)	A	A	A	*	A	A	*	*	A	A	D	A	A
Sodium Silicate	B	A	B	A	A	A	A	*	A	A	A	A	A
Sodium Sulfate	A	A	B	A	A	A	A	A	A	A	A	A	A
Sodium Sulfide	B	A	B	A	A	A	A	A	A	C	A	A	A
Sodium Sulfite	C	A	A	A	A	*	*	*	A	A	A	*	A
Sodium Tetraborate	A	*	*	A	*	A	*	*	A	A	*	*	A
Sodium Thiosulphate ("Hypo")	A	A	*	A	A	A	A	A	A	B	A	A	A
Sorghum	A	*	*	*	*	*	*	*	A	A	A	*	A
Soy Sauce	A	*	*	*	*	A	*	*	A	A	A	*	A
Stannic Chloride	D	A	B	A	A	A	A	*	A	A	A	A	A
Stannic Fluoborate	A	*	*	*	*	A	*	*	A	A	A	*	A
Stannous Chloride	C	A	A	A	A	*	*	*	B	C	D	*	A
Starch	A	*	*	A	A	A	*	*	A	A	A	*	A
Stearic Acid	A	A	A	A	A	A	D	*	A	B	B	B	A
Stoddard Solvent	A	A	A	A	A	D	D	A	A	B	D	D	A
Styrene	A	*	*	*	A	A	*	*	B	D	D	D	A
Sugar (Liquids)	A	*	A	*	A	A	A	*	A	A	B	*	A
Sulfate Liquors	C	*	A	*	*	*	A	*	*	*	C	*	A
Sulfur Dioxide	A	A	B	D	A	D	D	A	D	D	B	A	A
Sulfur Trioxide (Dry)	C	*	*	A	A	D	*	*	A	D	D	B	A
Sulfuric Acid (to 10%)	C	A	A	A	A	A	A	A	A	C	D	D	A
Sulfurous Acid	B	A	B	A	A	A	A	*	A	C	B	B	A
Sulfuryl Chloride	*	*	*	A	A	*	*	*	*	*	*	*	A
Syrup	A	*	*	A	*	A	A	*	A	A	B	*	A
T													
Tallow	A	*	*	*	*	A	*	*	A	A	*	*	A
Tannic Acid	A	A	B	A	A	A	A	*	A	D	A	A	A
Tanning Liquors	A	A	A	A	A	*	A	*	A	C	*	*	A
Tartaric Acid	B	A	B	A	A	A	A	*	A	D	A	*	A
Tetrachlorethane	A	A	A	D	A	D	A	*	A	D	*	D	A
Tetrahydrofuran	A	*	*	D	A	D	C	A	B	D	D	B	A
Toluene Toluoi	A	A	A	D	A	D	D	A	C	D	D	D	A
Tomato Juice	A	*	*	A	A	A	A	A	A	A	A	*	A
Trichlorethane	A	A	A	*	A	D	*	*	A	D	D	D	A
Trichlorethylene	A	A	A	D	A	D	D	C	A	D	D	D	A
Trichloropropane	A	*	*	*	*	D	*	*	A	A	A	*	A
Tricresylphosphate	A	B	A	D	A	A	*	*	B	D	D	A	A
Triethylamine	*	*	*	A	*	B	*	*	A	A	B	*	A
Turpentine	A	*	A	A	A	D	B	A	A	D	D	D	A
U													
Urine	A	*	*	A	*	A	A	*	A	A	D	A	A
V													
Vegetable Juice	A	*	*	*	*	A	*	*	A	A	D	*	A
Vinegar	A	A	A	A	A	A	A	A	A	C	B	A	A
Varnish (Use Viton for Aromatic)	A	*	*	*	A	D	A	*	A	B	D	*	A
W													
Water, Acid Mine	A	*	*	A	*	A	A	B	A	A	B	*	A
Water, Distilled Lab Grade 7	A	*	*	A	A	A	A	A	A	A	B	A	A
Water, Fresh	A	*	*	A	A	A	A	A	A	A	B	A	A
Water, Salt	A	*	*	A	*	A	A	A	A	A	B	A	A
Weed Killers	A	*	*	*	*	*	*	*	A	B	C	*	A
Whey	A	*	*	*	*	*	*	*	A	*	*	*	A
Whiskey & Wines	A	*	*	A	A	A	A	*	A	A	A	A	A
White Liquor (Pulp Mill)	A	*	A	A	A	A	A	*	A	A	A	*	A
White Water (Paper Mill)	A	*	*	*	*	*	A	*	A	*	A	*	A
X													
Xylene	A	*	A	D	A	D	D	A	A	D	D	D	A
Z													
Zinc Chloride	B	A	B	A	A	A	A	A	A	A	A	A	A
Zinc Hydrosulphite	A	*	*	*	*	A	*	A	*	A	A	A	A
Zinc Sulfate	A	A	B	C	A	A	A	A	A	A	A	A	A