



Worcester Controls Corrosion Data

Selection of materials for corrosive service

The following chart is intended as a guide to the engineer in the selection of materials for corrosive service.

No one material can be expected to resist the corrosive action of the wide variety of media found in the complex industries of today. However, experience and research have indicated to us that certain materials will perform satisfactorily under certain conditions and within certain limits.

The physical properties of a material are affected differently by each corrosive medium and it is sometimes necessary to sacrifice values in one property to gain a maximum value in another property. It is necessary, therefore, that the user decide, based on his experience, which property is of prime importance for his application.

Internal moving parts in contact with the media ideally should carry an **“A” rating**.

Body materials in direct contact with the media can, in many cases, carry a **“B” rating** because the rate of corrosion is not fast enough to become a serious problem.

Although most of the suggested ratings in the following chart are based on experience, it is strongly recommended that, if any question exists regarding the expected performance of a material in a given application, actual tests be performed to determine the suitability of the materials in question.

EXPLANATION OF RATINGS

A = Excellent	C = Poor
B = Good	D = Do not use
Blank = No information	

NOTE: Ratings are based on media at room temperatures unless otherwise specified.

When using the table, please remember that, in any given case, many factors such as solution, concentration, temperature, degree of agitation and presence of impurities influence the rate of corrosion. Particularly note the effect of increased temperature on Grafoil and Metal “G” in the presence of oxidizing agents. Corrosion rates generally increase dramatically under these conditions. Flowserve Corporation cannot accept responsibility for problems arising from the use of these data. We suggest that, in critical applications, tests be conducted to verify the ratings.

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For more information about Flowserve Corporation, visit www.flowserve.com or call USA 1-800-225-6989.

FLOWSERVE CORPORATION
FLOW CONTROL
1978 Foreman Drive
Cookeville, Tennessee 38501 USA
Phone: 931 432 4021
Facsimile: 931 432 5518

Corrosion Data

Chemicals	Brass	Carbon Steel	Ductile Iron/Cast Iron	316 Stainless Steel	17-4PH	Alloy 20	Monel	Hastelloy C	Buna N (Nitrile)	Delrin/Lubetal	EPDM/EPR	Viton	Neoprene	Celazole	Metal "A"	Grafoil	Metal "G"	TFE/TFM - Reinforced	High-per Fill	UHMWPE
Acetaldehyde	C	C	C	A		A	A	A	D	A	B	C	D	A	A	A	A	A	A	D
Acetamine	B	B	B	B				A	A				B	A	B	A	B	A	A	
Acetate Solvents	B	A	B	A			A	A	D	D		D	D	A	A	A	A	A	A	
Acetic Acid, aerated	D	D	D	A			A	A	C	D		C	C	A	A	A	A	A	A	
Acetic Acid, Air Free	B	D	D	A	A	A	A	A	C	D		D	C	A	A	A	A	A	A	
Acetic Acid, crude	C	C	C	A	A	A	B	A	D	D		D	D	A	A	A	A	A	A	
Acetic Acid, glacial				D	A			A	D		B	C	C	A	D	A	D	A	A	
Acetic Acid, pure	C	D	D	A	A	A	D	A	D	D		D	D	A	A	A	A	A	A	C
Acetic Acid, 10%	C	C	C	A	A	A	B	A	D	B	B	D	C	B	A	A	A	A	A	A
Acetic Acid, 80%	C	C	C	A	A	A	B	A	D	D	C	D	D	A	A	A	A	A	A	C
Acetic Acid Vapors	D			D	D	B	C	A	D					A	D	A	D	A	A	
Acetic Anhydride	D	D	D	B	B	B	B	A	D	C	C	D	C	A	B	A	B	A	A	C
Acetone	A	A	A	A	A	A	A	A	D	A	A	D	D	A	A	A	A	A	C	A
Other Ketones	A	A	A	A	A	A	A	A	D	A	D	D	D	A	A	A	A	A	C	
Acetyl Chloride	A		D	C			B	A	D	D	D	D	D	A	C	A	C	A	A	
Acetylene	B	A	A	A	A	A	A	A	B	A	A	A	C	A	A	A	A	A	A	
Acid Fumes	D	D	D	B		B			C	D			B	D	B	C	D	A	A	
Acrylonitrile	A	A	C	A		B	A	A	D	D	D	C	D	A	A	A	C	A	A	
Air	A	A	A		A	A	A	A	A	A	A	A	A	A	A	B	A	A	A	A
Alcohol, Amyl	B	B	C	A		B	B	B	C	A	A	B	C	A	A	A	A	A	A	
Alcohol, Butyl	B	B	C	A		A	A	A	B	A	C	A	B	A	A	A	A	A	A	
Alcohol, Diacetone	A	A	A	A		A	B	A	D	A	B	D	C	A	A	A	A	A	A	C
Alcohol, Ethyl	B	B	B	B		A	B	A	A	A	A	A	B	A	B	A	B	A	A	A
Alcohols, Fatty	B	B	B	A		A		A	B	A			B	A	A	A	A	A	A	
Alcohol, Isopropyl	B	B	B	B		A	B	B	C	A	A	A	B	A	B	A	B	A	A	
Alcohol, Methyl	B	B	B	A		A	A	A	B	A	A	C	A	A	A	A	A	A	A	
Alcohol, Propyl	A	B	B	A		A	A	A	B	A	A	A	B	A	A	A	A	A	A	
Alumina	A			A				A	A	A	A			A	A	A	A	A	A	
Aluminum Acetate	D		D	A	B	B	C	B	D	D	A	D	D	A	A	A	D	A	A	A
Aluminum Chloride dry	B	C	D	C		D	B	B	B	A	A	A	B	A	C	A	C	A	A	A
Aluminum Chloride solution				D	C	B	B	A	B	D		A	B	A	D	A	D	A	A	A
Aluminum Fluoride		D	D	C		B	B	A	A	C	A	A	A	A	C	A	C	A	A	A
Aluminum Hydroxide	A	D	D	A	B	B	B	B	A	C	A	A	A	A	A	A	A	A	A	A
Aluminum Nitrate	D		D	C		B	C	B	B	D	B	D	B	A	C	B	C	A	A	
Aluminum Oxalate				D		A	B	A						A	D		D	A	A	A
Alum (Aluminum Potassium Sulfate)	D		D	B	C	B	C	A	B	D		B	B	A	B	A	B	A	A	A
Aluminum Sulfate	C	D	D	B	A	B	C	A	A	D	A	A	A	A	B	A	B	A	A	A
Amines	B	B	C	A	A	A	B	B	D	C	C	D	D	B	A	A	A	A	A	
Ammonia, Alum				A		A		A	B	C			B	B	A	A	A	A	A	
Ammonia, Anhydrous Liquid	D	A	B	A	A	A	B	A	B	D	B	D	C	B	A	A	A	A	A	
Ammonia, Aqueous	D	A	A	A		A	B	B	B	D		A	B	B	A	A	A	A	A	
Ammonia Gas, hot	D		B	A		A	B	B	C	D	A	D	A	B	A	A	A	A	A	A
Ammonia Liquor				A		A		B						B	A	A	A	A	A	
Ammonia Solutions	D	B	B	A		A	B	B	B	D	B	D	B	A	A	A	A	A	A	
Ammonium Acetate	D		B	B		A	B	B	B	D	A	D	B	A	B	A	B	A	A	
Ammonium Bicarbonate	B	C	B	B		B	B		B	A	A	A	A	A	B	A	B	A	A	A
Ammonium Bromide 5%				B		B	B	B		A				A	B	A	B	A	A	A
Ammonium Carbonate	B	B	B	B		B	B	B	C	D	A	B	A	A	B	A	B	A	A	A
Ammonium Chloride	D	D	D	C		B	B	B	B	C	A	A	A	A	C	A	C	A	A	A
Ammonium Hydroxide 28%	D	C	C	B	A	A	D	B	B	D	B	A	A	A	B	A	B	A	A	A

Ratings: A—Excellent B—Good C—Poor D—Do not use Blank—No information

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Chemicals	Brass	Carbon Steel	Ductile Iron/Cast Iron	316 Stainless Steel	17-4PH	Alloy 20	Monel	Hastelloy C	Buna N (Nitrile)	Delrin/Lubetal	EPDM/EPR	Viton	Neoprene	Celazole	Metal "A"	Grafoil	Metal "G"	TFE/TFM - Reinforced	High-per Fill	UHMWPE
Ammonium Hydroxide Concentrated	D	C	C	B	A	A	C	B	C	D	A	A	A	B	B	A	B	A	A	A
Ammonium Monosulfate				A		B	B	B		D				A	A			A	A	A
Ammonium Nitrate	D	D	D	A	A	B	D	B	A	D	A	A	A	A	A	B	B	A	A	A
Ammonium Oxalate 5%				A		A	B	A		A				A	A			A	A	A
Ammonium Persulfate	C			A		A	D	A	D	D	B	B	C	A	A			A	A	A
Ammonium Phosphate	D	D	D	B		B	C	A	A	C	A	A	A	A	B	A	B	A	A	A
Ammonium Phosphate Di-basic	C	D	D	B		B	C	B	A	A		A	A	A	B	A	B	A	A	A
Ammonium Phosphate Tri-basic	C	D	D	B		B	C	B	A	A		A	A	A	B	A	B	A	A	A
Ammonium Sulfate	C	C	D	B	B	B	B	B	A	B	A	B	A	A	B	A	B	A	A	A
Ammonium Sulfide	D	D	D	B		B	B		A	A	A	D	B	A	B	A	B	A	A	A
Ammonium Sulfite	C	C	C	A		B	D	A	B	A	B	A	A	A	A	A	A	A	A	
Amyl Acetate	B	C	C	B	A	A	B	A	D	A	B	D	D	A	B	A	B	A	A	A
Amyl Chloride	B		B	A		A	B	B	D	A	D	D	C	A	A	A	A	A	A	D
Aniline	D	C	C	B		A	B	B	D	D	C	C	D	B	B	A	B	A	A	A
Aniline Dyes	C	C	C	A		A	A	A	C	A	C	B	C	B	A	A	A	A	A	A
Apple Juice	C	D	D	B		A	A		A	A	B	A	A	A	B	A	B	A	A	
Aqua Regia (Strong Acid)	D	D	D	B		B		D	D	D	D	D	D	D	B	D	D	A	C	C
Aromatic Solvents	A	C	B	A		A	B		D	A	D		D	A	A	A	A	A	A	
Arsenic Acid	D	D	D	B		B	D	B	A	D	B	A	A	B	B	A	B	A	A	A
Asphalt Emulsion	A	B	B	A		A	A	A	D	A	D	A	C	A	A	A	A	A	A	
Asphalt Liquid	A	B	B	A		A	A	A	C	A	D	A	C	A	A	A	A	A	A	
Barium Carbonate	B	B	B	B		B	B	A	B	A	A	A	A	A	B	A	B	A	A	A
Barium Chloride	B	C	C	B	B	C	B	A	A	A	A	A	A	A	B	A	B	A	A	A
Barium Cyanide	C		C	B		B	D		B	A	B	B	B	A	B	A	B	A	A	A
Barium Hydrate	D			A		A	B			A				A	A	A	A	A	A	
Barium Hydroxide	C	C	B	B	A	A	B	B	A	A	B	A	A	A	B	A	B	A	A	A
Barium Nitrate				A		A			A	A			B	A	A	B	B	A	A	A
Barium Sulfate	C	C	C	A		A	B		A	A	B	A	A	A	A	A	A	A	A	A
Barium Sulfide	D	C	D	B		B	C		A	A	A	A	B	A	B	A	B	A	A	A
Beer	B	D	D	A	A	A	A	A	B	A	B	A	B	A	A	A	A	A	A	A
Beet Sugar Liquors	A	B	B	A		A	A		A	A	B	A	A	A	A	A	A	A	A	
Benzaldehyde	A	A	C	A		A	B	B	D	A	A	D	D	A	A	A	A	A	A	D
Benzene (Benzol)	B	B	B	B	B	A	A	B	D	C	D	B	D	A	B	A	B	A	A	D
Benzoic Acid	B	D	D	B	A	B	B	A	C	A	D	B	C	A	B	A	B	A	A	A
Beryllium Sulfate	B		B	B		A	B		B	A	B	B	B	A	B	A	B	A	A	
Bleaching Powder wet	B			C		B	D	A	D	D	B	B	A	C	C	A	C	A	A	A
Blood (Meat Juices)	B		D	A	A	A	B		B	A	B	B	B	A	A	A	A	A	A	
Borax (Sodium Borate)	D	C	C	A		A	A		B	A	A	A	B		B	A	A	A	A	A
Bordeaux Mixture				A		A				A				A	A	A	A	A	A	
Borax Liquors	A	C	C	B		A	A	B		A	A	A	C	B	B	A	B	A	A	
Boric Acid	C	D	D	B		B	B	A	B	A	B	A	B	C	B	A	B	A	A	A
Brake Fluid	B		B	B	A		B		D	B	B	D	C	A	B	A	B	A	A	A
Brines, saturated	B	D	C	B		B	B	A	A	A	A	A	B	A	B	A	B	A	A	A
Bromine, dry	B	D	D	D		B	A	A	D	D	D	B	D	A	D	B	D	A	C	
Bunker Oils (Fuel)	B	B	B	A		A	A		B	A		A	B	A	A	A	A	A	A	D
Butadiene	C	B	B	A		A	C	B	C	C	C	B	C	A	D	A	A	D	A	D
Butane	A	B	B	A		A	B	A	B	A	D	A	B	A	A	A	A	A	A	A
Butter				A		A			B	A			B	A	A	A	A	A	A	A
Buttermilk	D	D	D	A		A	D		A	A	B	A	A	A	A	A	A	A	A	B
Butyl Acetate	B		B	B		A	B	B	D	B	D	D	D	A	B	A	B	A	A	D

Ratings: A—Excellent B—Good C—Poor D—Do not use Blank—No information

Corrosion Data

Chemicals	Brass	Carbon Steel	Ductile Iron/Cast Iron	316 Stainless Steel	17-4PH	Alloy 20	Monel	Hastelloy C	Buna N (Nitrile)	Delrin/Lubetal	EPDM/EPR	Viton	Neoprene	Celazole	Metal "A"	Grafoil	Metal "G"	TFE/TFM - Reinforced	High-per Fill	UHMWPE
Butylene	A	A	A	A		A	A		D	A	D	D	D	A	A	A	A	A	A	
Butyric Acid	C	D	D	B		B	B	A	C	A	C	C	C	A	B	A	B	A	A	D
Calcium Bisulfite	C	D	D	B		B	D	B	A	D	D	A	A	A	B	A	B	A	A	
Calcium Carbonate	C	D	D	B		B	B	B	A	A	B	A	A	A	B	A	B	A	A	A
Calcium Chlorate	D		C	B		B	B	B	B	D	B	B	B	A	B	B	B	A	A	A
Calcium Chloride	B	C	C	B	B	B	B	A	A	A	B	A	A	A	B	A	B	A	A	A
Calcium Hydroxide	C	C	C	B		B	A	A	A	A	A	A	B	A	B	A	B	A	A	A
Calcium Nitrate				B		B			B	C	B		B	A	B	B	B	A	A	A
Calcium Phosphate	C		C	B		B			B	B	B	B	B	A	B	A	B	A	A	A
Calcium Silicate	C		C	B		B			B	A	B	B	B	A	B	A	B	A	A	
Calcium Sulfate	C	C	C	B	B	B	B	B	A	A	B	A	A	A	B	A	B	A	A	A
Caliche Liquor		B		A		A			B	A			B	A	A	A	A	A	A	
Camphor	C		C	B		C	C		B	A	B	B	B	A	B	A	B	A	A	D
Cane Sugar Liquors	B		B	A		A	B		B	A	B	B	B	A	A	A	A	A	A	
Carbonated Beverages	B	D	B	B	B	B	C		B	A	B	B	B	A	B	A	B	A	A	
Carbonated Water	B	B	A	A	B	A	B	A	A	A	A	A	A	A	A	A	A	A	A	A
Carbon Disulfide	C	B	B	B		B	B	A	D	A	D	A	D	A	B	A	B	A	A	D
Carbon Dioxide, Dry	A	A	B	A	A	A	A	A	C	A	B	B	B	A	A	A	A	A	A	A
Carbolic Acid	D	D	D	B	B	A	B	A	B	A	B	A	B	B	B	A	B	A	A	
Carbon Monoxide	A		B	A	A	A	A	A	B	A	B	B	D	A	A			A	A	A
Carbon Tetrachloride, dry	C	B	C	A	A	A	A	A	D	A	D	B	D	A	A	A	A	A	A	D
Carbon Tetrachloride, wet	D	D	D	B		B	B	B	D	B	D	B	D	A	B	A	B	A	A	D
Casein	C		C	B		B	C		B	A	B	B	B	A	B	A	B	A	A	
Castor Oil	A	B	B	A		A	C	A	A	A	B	A	B	A	A	A	A	A	A	A
Caustic Potash				A		A	B		B	D			B	A	A	A	A	A	C	
Caustic Soda		B	B	A		A	A		C	D	B	B		C	A	A	A	A	C	
Cellulose Acetate	B		B	B			B	B	D	C	B	D	D	A	B	A	B	A	A	
China Wood Oil (Tung)	C	C	C	A		A	A	A	A	A	D	A	B	A	A	A	A	A	A	
Chlorinated Solvents	C	C	C	A		A	B		D	A	D	C	D	A	A	A	A	A	A	
Chlorinated Water				C	D	A	D	D	B	D		A	A	A	C	A	C	A	D	C
Chlorine Gas, dry	C	B	B	B	C	A	A	A	C	D	D	B	D	A	A	A	B	A	A	D
Chlorobenzene, dry	B	B	B	A		A	B	B	D	B	D	A	D	A	A	A	A	A	A	D
Chloroform, dry	B	B	C	A	B	A	A	B	D	A	D	B	D	A	A	A	A	A	A	
Chlorophyll, dry	B		B	B		A	B		B		B	B	B	A	A	A	B	A	A	
Chlorosulfonic Acid, dry	C	B	B	B		B	B	A	D	D	D	D	D	D				A	D	D
Chrome Alum	C	B	C	A		A	B		B	B	B	B	B	A	A	A	A	A	A	A
Chromic Acid < 50%	D	D	D	C	C	B	C	B	D	D	C	C	D	B	C	A	D	A	A	A
Chromic Acid > 50%	D	D	C	C	D	B	D	B	D	D	C	C	D	D	C	A	D	A	D	
Chromium Sulfate	C		D	B		C	B	C	B	C	B	B	B	A	B	A	D	A	A	
Cider				A		B	A			A				A	A	A	A	A	A	A
Citric Acid	C	D	D	B	C	A	B	A	B	A	B	A	A	A	B	A	B	A	A	A
Citrus Juices	B	D	D	B		A	A		A	A		A	A	A	B	A	B	A	A	
Coca-Cola Syrup				A		A			B	A		B	B	A	A	A	A	A	A	A
Coconut Oil	B	C	C	B		A	B		A	A	A	A	C	A	B	A	B	A	A	A
Coffee	A		D	A		A	B		A	A	A	A	A	A	B	A	A	B	A	A
Coffee Extracts, hot	B	C	C	A		A	A		A					A	A	A	C	A	A	
Coke Oven Gas	C	B	B	A		A	B	A	C	D	D	B	D	A	A	A	B	A	A	
Cooking Oil	B	B	B	A		A	A		A	A	D	A	B	A	A	A	B	A	A	
Copper Acetate	D	D	D	A		A	C	B	C	D	B	D	C	A	A	A	D	A	A	
Copper Carbonate				A		A				A					A	A	A	A	A	A

Ratings: A—Excellent B—Good C—Poor D—Do not use Blank—No information

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Copper Cyanide	D		D	A		A	C	A	A	A	B	B	A	A	A	A	A	A	A	A
Copper Nitrate	D	D	D	B		B	D		A	A	B	A	A	A	B	B	B	A	A	A
Copper Sulfate	D	D	D	B	B	B	C	A	A	A	A	A	A	A	B	A	B	A	A	A
Corn Oil	B	C	C	B		B	B		A	A	C	A	C	A	B	A	B	A	A	A
Cottonseed Oil	B	C	C	B		B	B	A	A	A	C	B	B	A	B	A	B	A	A	A
Cresol				B		B			D	D	D	D	D	A	B	A	B	A	A	D
Creosote Oil	B	B	B	B	B	A	B	B	C	D	D	A	D	A	B	A	B	A	A	D
Cresylic Acid	C	C	D	B		B	B	A	D	D	D	B	D	A	B	A	B	A	A	A
Crude Oil, sour	C	B	C	A		A	B	A	A	A	D	A	B	A	A	A	A	A	A	A
Crude Oil, sweet	B	B	B	A		A	A	A	A	A		A	B	A	A	A	A	A	A	A
Cupric Nitrate				A		A	D	B		D				A	A	B	B	A	A	
Cutting Oils, Water Emulsions	A	B	B	A		A			A	A		A	B	A	A	A	A	A	A	
Cyanide Plating Solution	D		D	B		B	D		B	D	B	B	B	A	B			A	A	
Cyclohexane	A	A	A	A		A	B	B	C	A	D	A	D	A	A	A	A	A	A	C
Cyclohexanone	B			A		A	B	B	D	A			D	A	A	A	A	A	A	D
Detergents, synthetic	B		B	B		A	B		B	A	B	A	B	A	B	A	B	A	A	A
Dextrin	B		B	B		B	B		B	A	B	B	B	A	B	A	B	A	A	A
Dichloroethane	B		B	B		B	B	B	D	D	D	D	D	A	B			A	A	
Dichloroethyl Ether	B		B	B		B			D	D	D	D	D	A	B			A	A	
Diesel Oil Fuels	A	A	A	A		A	A		A	A	D	A	C	A	A	A	A	A	A	
Diethylamine	B	A	B	A		A	B		B	A	C	D	C	A	A	A	A	A	A	
Diethyl Benzene				B		B			D	C	D		D	A	B	A	B	A	A	
Diethylene Glycol	B		A	A		A	B		A	A	A	B	A	A	A	A	A	A	A	A
Diethyl Sulfate	B		B	B		B	B	A	C	A	C	B	C	A	B	A	B	A	A	A
Dimethyl Formamide	B		B	A		A	B		B	A	D	D	D	A	A	A	A	A	A	
Dimethyl Phthalate				D					B	C		D	B	A	D	A	D	A	A	
Dioxane	B		B	B		B	B		D	C	C	D	D	A	B	A	B	A	A	
Dipentane (Pinene)	A		A	A		A			B	A	D	B	D	A	A	A	A	A	A	
Disodium Phosphate				B		B	C		B	A		B	B	A	B	A	B	A	A	A
Dowtherm	A	B	B	A		A	A		D	A	D	A	D	A	A	A	A	A	A	A
Drilling Mud	B	B	B	A		A	B		A	A	A	A	C	A	A	A	A	A	A	
Dry Cleaning Fluids	C	B	B	A		A	B		D	A		B	D	A	A	A	A	A	A	
Drying Oil	C	C	B	B		B	B		A	A			B	A	B	A	B	A	A	
Enamel	A			A					B	A	D		B	A	A	A	A	A	A	
Epsom Salts (MgSo4)	B	C	C	B		B	B		A	A		A	A	A	B	A	B	A	A	
Ethane	B	C	C	B		B	B	A	A	A	D	A	B	A	B	A	B	A	A	
Ethers	B	A	B	A	B	A	B	A	D	C	C	C	D	A	A	A	A	A	A	D
Ethyl Acetate	C	B	C	B	A	B	B	B	D	C	C	D	D	A	B	A	B	A	A	C
Ethyl Acrylate	B	C	C	A		A	B	A	D	B	C	D	D	A	A	A	A	A	A	
Ethyl Benzene				B		A		A	C	A	D		D	A	B	A	B	A	A	
Ethyl Bromide	A		B	B		C	B		B	A	B	B	B	A	B	A	B	A	A	
Ethyl Chloride, dry	B	B	B	A	A	A	B	B	C	A	C	B	C	A	B	A	A	B	A	D
Ethyl Chloride, wet	C	D	D	B		B	B	B	C	A	B	B	C	A	B	A	B	A	A	D
Ethylene Chloride				A		A	B	B	D	A		D	A	A	A	A	A	A	A	
Ethylene Dichloride				B		A	B	D	D	C	D	D	D	A	B	A	B	A	A	D
Ethylene Glycol	B	B	B	B	A	A	B	A	A	A	A	A	B	A	B	A	B	A	A	A
Ethylene Oxide	C	B	B	B		B	B	A	D	A	D	D	D	A	B	A	B	A	A	C
Ethyl Ether	B		C	A		A	A	B	D	A	D	D	D	A	A	A	A	A	A	
Ethyl Silicate	B		B	B		B	B		B	A	B	B	C	A	B	A	B	A	A	
Ethyl Sulfate				B		B			B	A	C	A	B	A	B	A	B	A	A	

Ratings: A—Excellent B—Good C—Poor D—Do not use Blank—No information

Corrosion Data

Chemicals	Brass	Carbon Steel	Ductile Iron/Cast Iron	316 Stainless Steel	17-4PH	Alloy 20	Monel	Hastelloy C	Buna N (Nitrile)	Delrin/Lubetal	EPDM/EPR	Viton	Neoprene	Celazole	Metal "A"	Grafoil	Metal "G"	TFE/TFM - Reinforced	High-per Fill	UHMWPE
Fatty Acids	C	D	D	A		A	B	A	B	A	D	A	B	A	A	A	A	A	A	A
Ferric Hydroxide				A		A	A		B	A				A	A	A	A	A	A	
Ferric Nitrate	D	D	D	C	B	A	D	B	A	A	A	A	A	A	C	B	C	A	A	A
Ferric Sulfate	D	D	D	B	B	A	D	A	A	A	A	A	A	A	B	A	B	A	A	A
Ferrous Ammonium Citrate				B		B				A				A	B	A	B	A	A	A
Ferrous Chloride	B	D	D	D		D	D	D	A	A	A	A	A	A	D	A	D	A	A	A
Ferrous Sulfate	B	D	D	B		B	B	B	A	A	A	A	A	A	B	A	B	A	A	A
Ferrous Sulfate, Saturated	C	C	C	A		A	B	B	C	A	B	B	C	A	A	A	A	A	A	A
Fertilizer Solutions	C	B	B	B		B	B	A	B				B	A	B	A	B	A	A	A
Fish Oils	B	B	B	A		A	A		A	A	D	A	B	A	A	A	A	A	A	A
Flourine Gas, dry				B		A	A	A						A				A	A	
Flue Gases	B		B	A		A	B	A	C	C	D	C	C	A	A	A	A	A	A	
Fluoboric Acid				B		A		A	A	D			B	A	B			A	D	A
Fluorosilicic Acid	B	D	D	B		B	A	B	C	C	C	C	C	A	B			A	D	A
Formaldehyde, cold	A	A	B	A	A	A	A	B	B	A	B	D	C	A	A	A	A	A	A	A
Formaldehyde, hot	B	D	D	C		B	B	B	B	A			B	A	C	A	C	A	A	A
Formic Acid, cold	B	D	D	B	B	A	B	A	D	D		B	B	D	B	A	B	A	A	A
Formic Acid, hot	B	D	D	B	D	B	B	B	D	D		A	A	C	B	A	B	A	A	A
Freon Gas, dry	B	B	B	A	A	A	B	B	C	A	C	C	C	A	A	A	A	A	A	A
Freon 11, MF, 112, BF	B		C	A		A	B	B	C	A	C	D	C	A	A	A	A	A	A	A
Freon 12, 13, 32, 114, 115	A		B	A		A	B	B	B	A	A	D	A	A	A	A	A	A	A	A
Freon 21, 31	B		C	A		A	B	B	D	A	D	D	D	A	A	A	A	A	A	
Freon 22	A		B	A		A		B	D	A	D	D	B	A	A	A	A	A	A	A
Freon 113, TF	B		C	A		A	B	B	B	A	C	C	C	A	A	A	A	A	A	A
Freon, wet	D		D	C	B	B	B	B	B	A	B	D	B	A	C	A	C	A	A	A
Fruit Juices	B	D	D	A		A	B		A	A	A	A	A	A	A			A	A	A
Fuel Oil	B	B	B	A		A	B		A	A	D	A	C	A	A	A	A	A	A	D
Fumaric Acid						A			B	A			B	B				A	A	
Furfural	A	A	B	A	B	A	B	B	D	A	C	D	C	A	A	A	A	A	A	D
Gallic Acid 5%	C	D	D	B		B	B	B	B	A	C	A	B	A	B			A	A	A
Gas, Manufactured	B	B	B	B		B	A		A	A		A	A	A	B	A	B	A	A	
Gas, Natural	B	B	B	A		B	A	A	A	A	D	A	A	A	A	A	A	A	A	
Gas, Odorizers	A	B	B	B		A	B		B	A		A	B	A	B	A	B	A	A	
Gasoline, Aviation	A	A	B	A		A	A	A	C	A		A	D	A	A	A	A	A	A	D
Gasoline, Leaded	A	A	A	A		A	B	A	C	A		A	D	A	A	A	A	A	A	D
Gasoline, Motor	A	A	B	A	A	A	A	A	C	A	D	A	D	A	A	A	A	A	A	D
Gasoline, Refined	B	B	B	A		A	B	A	C	A	D	A	C	A	A	A	A	A	A	D
Gasoline, Sour	B	B	B	A		A	C	A	C	A	D	A	D	A	A	A	A	A	A	D
Gasoline, Unleaded	A	A	B	A		A	A	A	C	A		A	D	A	A	A	A	A	A	D
Gelatin	A	D	D	A		A	B		A	A	A	A	A	A	A	A	A	A	A	A
Glucose	A	B	B	A		A	A	A	A	A	A	A	A	A	A	A	A	A	A	A
Glue	B	A	B	B		A	B	A	A	A	B	A	A	A	B	A	B	A	A	A
Glycerine (Glycerol)	B	C	B	A	A	A	A	A	C	A	A	B	D	A	A	A	A	A	A	A
Glycol Amine	D		B	B	A			D	A	C	D	D		A	A	A	B		A	A
Glycol	B	C	B	B		A	B		B	C	A	A	A	A	B	A	B	A	A	A
Graphite	B		C	B		A	B		B	A	B	B	B	A	B	A	B	A	A	
Grease	C	A	A	A		A	B		A	A	D	A	B	A	A	A	A	A	A	
Helium Gas	B		B	A		A	B	A	B	A	B	B	B	A	A	A	A	A	A	A
Heptane	A	B	B	A		A	B	A	A	A	D	A	B	A	A	A	A	A	A	C
Hexane	B	B	B	A		A	B	A	A	A	D	A	C	A	A	A	A	A	A	D
Hexanol, Tertiary	A	A	A	A		A	A	A	A	A	D	B	C	A	A	A	A	A	A	A

Ratings: A—Excellent B—Good C—Poor D—Do not use Blank—No information

Corrosion Data

Chemicals	Brass	Carbon Steel	Ductile Iron/Cast Iron	316 Stainless Steel	17-4PH	Alloy 20	Monel	Hastelloy C	Buna N (Nitrile)	Delrin/Lubetal	EPDM/EPR	Viton	Neoprene	Celazole	Metal "A"	Grafoil	Metal "G"	TFE/TFM - Reinforced	High-per Fill	UHMWPE
Hydraulic Oil, Petroleum Base	B	A	B	A		A	A		A	A	D	A	B	A	A	A	A	A	A	
Hydrazine	D		D	B		B	D		C	D	B	D	C	A	B			A	A	
Hydrocyanic Acid	D	D	C	A		A	C	B	B	D	B	A	B	A	A			A	A	A
Hydrofluosilicic Acid	A	D	D	C		B	B	B	B	A	B	A	B	C	C	A	C	A	D	
Hydrogen Gas, cold	B	B	B	A		A	A	A	B	A	B	A	B	A	A	A	A	A	A	A
Hydrogen Gas, hot		B		B		A		A	B	A	B		B	A	B	A	B	A	A	A
Hydrogen Peroxide, Concentrated	D	D	D	B		B	D	D	D	D	B	B	D	A	B	D	D	A	A	C
Hydrogen Peroxide, Dilute	C	D	D	B		B	D	D	A	D	B	A	B	A	B	C	C	A	A	A
Hydrogen Sulfide, Dry	C	B	B	A	B	B	B	B	C	C	A	A	A	A	A	A	A	A	A	A
Hydrogen Sulfide, Wet	D	C	D	B		B	C	D	C	C	B	A	B	A	B	A	B	A	A	A
Hypo (Sodium Thiosulfate)	C	D	C	B		B	B	A	A	A	A	A	A	A	B	A	B	A	A	
Illuminating Gas	A	A	A	A		A	A		C	A	D	A	C	A	A	A	A	A	A	
Ink-Newsprint	C	D	D	A		A	B		A	A	B	A	B	A	A	A	A	A	A	A
Iodoform	C	B	C	A		A	C		A	A	D			A	A			A	A	
Iso-Butane				B		B			B	A	D		D	A	B	A	B	A	A	
Iso-Octane	A	A	B	A		A	A		A	A	D	A	C	A	A	A	A	A	A	
Isopropyl Acetate				B		A			D	A	D		D	A	B	A	B	A	A	
Isopropyl Ether	A	A	B	A		A	B	A	C	A	D	D	C	A	A	A	A	A	A	
J P-4 Fuel	A	A	B	A		A	A	A	A	A		A	C	A	A	A	A	A	A	
J P-5 Fuel	A	A	A	A		A	A	A	B	A		A	C	A	A	A	A	A	A	
J P-6 Fuel	A	A	A	A		A	A	A	A	A		A	C	A	A	A	A	A	A	
Kerosene	A	B	B	A		A	A	A	A	A	D	A	C	A	A	A	A	A	A	C
Ketchup	D	D	D	A		A	B		A	A		A	A	A	A	A	A	A	A	
Ketones	A	A	A	A		A	A		D	A	D	D	D	A	A	A	A	A	A	C
Laquer (and Solvent)	A	C	C	A		A	A		D	A	D	D	D	A	A	A	A	A	A	
Lactic Acid Concentrated cold	D	D	D	A	D	A	D	A	B	D	B	A	A	A	A	A	A	A	A	A
Lactic Acid Concentrated hot	D	D	D	B	D	A	D	B	C	D	B	B	C	B	B	A	B	A	A	A
Lactic Acid Dilute cold	D	D	D	A	B	A	C	A	B	D	B	A	A	A	A	A	A	A	A	A
Lactic Acid Dilute hot	D	D	D	A	D	A	D	B	C	D		D	D	B	A	A	A	A	A	A
Lactose	B		C	B		B	B		B	A	B	B	C	A	B	A	B	A	A	
Lard	B		A	A		A			B	A	C		C	A	A	A	A	A	A	A
Lard Oil	B	C	C	B		A	B		A	A	B	A	B	A	B	A	B	A	A	A
Lead Acetate	C	D	D	B		B	B		A	A	B	B	B	A	B	A	B	A	A	A
Lead Sulfate	C		D	B		B	B		B	A	B	B	B	A	B	A	B	A	A	
Lecithin	C		C	B		B	B		D	A	D	B	D	A	B			A	A	
Linoleic Acid	B	B	B	A		A	B		B	A	D	B	B	A	A	A	A	A	A	
Linseed Oil	B	A	A	A		A	B		A	A	D	A	C	A	A	A	A	A	A	A
Lithium Chloride	B		B	B		A	B		B	A	B	B	B	A	B	A	B	A	A	
LPG	A	B	B	B		B	B		A	A	D	A	B	A	B	A	B	A	A	
Lubricating Oil Petroleum Base	B	A	A	A		A	B		A	A	D	A	B	A	A	A	A	A	A	C
Ludox	D		B	B		B	B		B	B	B	B	B	A	B			A	A	
Magnesium Bisulfate	B	B	B	A		A	B		B	A	B	B	B	A	A	A	A	A	A	
Magnesium Bisulfide	D		D	B		B	B		B	A	B	B	B	A	B	A	B	A	A	
Magnesium Carbonate	B		B	A		A	B	B	B	A	B	B	B	A	A	A	A	A	A	A
Magnesium Chloride	B	C	D	B	C	B	B	A	A	A	A	A	A	A	B	A	B	A	A	A
Magnesium Hydroxide	B	B	B	A	A	A	B	B	A	A	A	A	A	A	A	A	A	A	A	A
Magnesium Hydroxide Hot	D	B	B	A	A	A	A	B	B	A		A	B	A	A	A	A	A	A	A
Magnesium Nitrate				A		A	B		B	A		B	A	A	A	B	B	A	A	A
Magnesium Sulfate	B	B	B	A	A	A	B	A	A	A	A	A	A	A	A	A	A	A	A	A
Maleic Acid	B	B	C	B		B	B	A	B	A	D	A	B	A	B	A	B	A	A	A

Ratings: A—Excellent B—Good C—Poor D—Do not use Blank—No information

Corrosion Data

Chemicals	Brass	Carbon Steel	Ductile Iron/Cast Iron	316 Stainless Steel	17-4PH	Alloy 20	Monel	Hastelloy C	Buna N (Nitrile)	Delrin/Lubetal	EPDM/EPR	Viton	Neoprene	Celazole	Metal "A"	Grafoil	Metal "G"	TFE/TFM - Reinforced	High-per Fill	UHMWPE
Maleic Anhydride	B		B	B		B	B	B	D	C	D	B	D	A	B	A	B	A	A	
Malic Acid	B	D	D	B		B	B		A	A		A	B	A	B	A	B	A	A	
Malt Beverages				A		B	A		A	A	B	A	A	A	A	A	A	A	A	
Manganese Carbonate				B		A			B	A				A	B	A	B	A	A	
Manganese Sulfate	B		D	A		A	B		B	A	B	B	B	A	A	A	A	A	A	
Mayonnaise	D	D	D	A		A	B		A	A		A	A	A	A	A	A	A	A	
Meat Juices	D			A		A			B	A			B	A	A	A	A	A	A	A
Melamine Resins			D	C		C			B	A			B	A	C	A	C	A	A	
Mercuric Chloride	D	D	D	B		B	D	B	A	A	A	A	B	A	B	A	B	A	A	A
Mercuric Cyanide	D	D	D	A		A	C	B	A	A	A	A	B	A	A	A	A	A	A	A
Mercurous Nitrate	D			A		A	D		A			B		A	A	B	B	A	A	A
Mercury	D	A	A	A		A	B	B	A	A	A	A	A	A	A	A	A	A	A	A
Methane	A	B	B	A		A	B	A	A	A		A	B	A	A	A	A	A	A	
Methyl Acetate	A	B	B	A		A	B	A	D	B	B	D	D	A	A	A	A	A	A	
Methyl Acetone	A	A	A	A		A	A		D	B	A	D	D	A	A	A	A	A	C	
Methylamine	D	B	B	A		A	C	B	D	A	B	D	D	A	A	A	A	A	A	
Methyl Bromide 100%	C		D	B		A	B		B	A	D	B	D	A	B	A	B	A	A	D
Methyl Cellosolve	A	B	B	A		A	B	B	C	A	B	D	D	B	A	A	A	A	A	
Methyl Cellulose				A		A		B	D	A			D	A	A	A	A	A	A	
Methyl Chloride	B	B	B	A		A	B	A	D	A	D	B	D	B	A	A	A	A	A	D
Methyl Ethyl Ketone	A	A	A	A		A	A	B	D	A	B	D	D	A	A	A	A	A	C	D
Methylene Chloride	A	B	B	A		A	B	B	D	A	D	C	D	A	A	A	A	A	A	D
Methyl Formate	A	C	C	B		A	B	B	D	A	B	D	B	A	B	A	B	A	A	
Methyl Isobutyle Ketone				A		A			D	A				D	A	A	A	A	C	
Milk & Milk Products	B	D	D	A		A	B	A	A	A	A	A	A	A	A	A	A	A	A	B
Mineral Oils	B	B	B	A		A	A		A	A	D	A	B	A	A	A	A	A	A	D
Mineral Spirits	B	B	B	B		B	B		A	A		A	C	A	B	A	B	A	A	D
Mixed Acids (cold)	D	C	C	B		B	C		D	D	D	B	D	A	B			A	A	
Molasses, crude	A	A	A	A		A	A		A	A		A	A	A	A	A	A	A	A	B
Molasses, Edible	A	C	C	A		A	A		A	A		A	A	A	A	A	A	A	A	B
Molybdic Acid				A		A		B		A				B	A	A	A	A	A	
Monochloro Benzene Dry				B		B	B		D	C			D	A	B	A	B	A	A	
Morpholine	B		B	A		A	B	D	D	A	B	D	D	A	A	A	A	A	A	
Mustard	A	B	B	A		A	A		A	A		A	A	A	A	A	A	A	A	
Naptha	B	B	B	B		B	B	A	B	A	D	A	C	A	B	A	B	A	A	D
Napthalene	B	B	B	B		B	B	B	D	A	D	A	D	A	B	A	B	A	A	D
Natural Gas, Sour	B	B	B	A		A	D	A	A	A	D	A	A	A	A	A	A	A	A	A
Nickel Ammonium Sulfate	D	D	D	A		A	C		A	C	B	D	B	A	A	A	A	A	A	
Nickel Chloride	D	D	D	B		A	B	A	A	D	B	A	A	A	B	A	B	A	A	A
Nickel Nitrate	D	D	D	B		A	B	B	A	C	A	A	A	A	B	B	B	A	A	A
Nickel Sulfate	D	D	D	B		A	B	B	A	C	B	A	A	A	B	A	B	A	A	A
Nicotinic Acid	A	B	C	A		A	A		D	C	D	B	D	A	A	A	A	A	A	A
Nitric Acid 10%	D	D	D	A	A	A	D	B	C	D		A	B	C	A	A	D	A	A	A
Nitric Acid 30%	D	D	D	A	D	A	D		C	D	B	A	C	C	A	B	D	A	A	A
Nitric Acid 80%	D	D	D	C	D	B	D		D	D	D	B	D	C	C	C	D	A	D	D
Nitric Acid 100%	D	D	D	A	D	A	D		D	D	D	B	D	C	A	D	D	A	D	D
Nitric Acid Anhydrous	D	D	C	A	D	A	D		D	D	D	A	D	B	A	D	D	A	D	
Nitrobenzene	D	B	B	A		A	B	B	D	B	C	C	D	A	A	A	A	A	A	D
Nitrogen	A	A	A	A		A	A	A	A	A	B	A	A	A	A	A	A	A	A	A
Nitrous Acid 10%	D	D	D	B		B	D		C	B		A	A	C	B	A	B	A	A	

Ratings: A—Excellent B—Good C—Poor D—Do not use Blank—No information

Corrosion Data

Chemicals	Brass	Carbon Steel	Ductile Iron/Cast Iron	316 Stainless Steel	17-4PH	Alloy 20	Monel	Hastelloy C	Buna N (Nitrile)	Delrin/Lubetal	EPDM/EPR	Viton	Neoprene	Celazole	Metal "A"	Grafoil	Metal "G"	TFE/TFM - Reinforced	High-per Fill	UHMWPE
Nitrous Gases	D	B	C	A		A	D		B					A	A	A	A	A	A	
Nitrous Oxide	B	B	C	B		B	D	B	B	A		A	B	A	B	A	B	A	A	A
Oils & Fats				A		A			B	A	D			A	A	A	A	A	A	
Oils, Animal	A	A	A	A		A	B	A	A	A	B	B	B	A	A	A	A	A	A	A
Oils, Petroleum Refined	B	A	A	A		A	A	A	A	A	D	A	B	A	A	A	A	A	A	A
Oils, Petroleum Sour	C	B	C	A		A	A	A	B	A	D	A	B	A	A	A	A	A	A	A
Oils, Water Mixture	A	B	B	A		A		A	A	A		A	B	A	A	A	A	A	A	A
Olaic Acid				B		B	A		D	C		C	D	A	B	A	B	A	A	
Oleic Acid	B	C	C	B		A	B	B	B	C	D	A	C	A	B	A	B	A	A	C
Oleum	C	B	D	B		B	C	B	D	D	D	C	D	A	B			A*	D	D
Oleum Spirits	D		D	B		B	D		C	D	D	A	D	A	B			A	D	
Olive Oil	C	B	B	A		A	A		A	A	B	A	B	A	A	A	A	A	A	A
Oxalic Acid	B	D	D	B	D	B	B	B	C	C	B	A	B	A	B	A	B	A	A	A
Oxygen	A	B	B	A	A	A	A	A	B	D	A	A	B	A	A		A**	A	D	D
Ozone, Dry	A	A	A	A		A	A	A	D	C	A	B	D	A	A	A		A	A	C
Ozone, Wet	B	C	C	A		A	A	A	D	C	B	B	D	A	A			A	A	C
Paints & Solvents	A	A	A	A		A	A		D	A	D	B	D	A	A	A	A	A	A	
Palmitic Acid	B	C	C	B		B	B		B	A	B	A	B	A	B	A	B	A	A	
Palm Oil	B	C	C	B		A	A		B	A	D	A	B	A	B	A	B	A	A	A
Paper Pulp	B		B	A		A	B	A	B	A	B	B	B	A	A	A	A	A	A	A
Paraffin	A	B	B	A		A	A	A	A	A	D	A	C	A	A	A	A	A	A	C
Paraformaldehyde	B	B	B	B		B	B		B	A	D		B	A	B	A	B	A	A	
Paraldehyde				B		B			B	A	D		B	A	B	A	B	A	A	
Pentane	A	B	B	A		A	B		A	A	D	A	B	A	B	A	A	A	A	
Perchloroethylene, dry	C	B	B	A		A	B	B	D	B	D	A	D	A	A	A	A	A	A	
Petrolatum (Vaseline Petroleum Jelly)	B	C	C	B		A	A		A	A		A	B	A	B	A	B	A	A	A
Phenol	B	D	D	A	B	A	A	A	D	C	D	B	D	A	A	A	A	A	A	D
Phosphate Ester	D	A	A	A		A	A		D	A	A			A	A	A	A	A	A	
Phosphoric Acid 10%	D	D	D	D	B	B	D	A	B	D	B	A	A	B	D	A	D	A	A	A
Phosphoric Acid 50% Cold	D	D	D	B	B	B	C	B	B	D	B	A	B	B	B	A	B	A	A	A
Phosphoric Acid 50% Hot	D	D	D	D	D	B	C	D	B	D	B	A	B	D	D	A	D	A	A	A
Phosphoric Acid 85% Cold	D	B	B	A	C	B	A	B	B	C	D		C	C	A	A	A	A	B	A
Phosphoric Acid 85% Hot	D	C	C	B	D	B		D	C	D			C	D	B	A	B	A	B	A
Phosphoric Anhydride				A		A			D	B		B	D	B	A	A	A	A	A	
Phosphorous Trichloride		B	C	A		A			D	D	B	B	D	A	A	A	A	A	A	A
Phthalic Acid	B	C	C	B		B	A	B	C	B		A	C	A	B	A	B	A	A	
Phthalic Anhydride	B	C	C	B		B	A	A	C	A		A	C	A	B	A	B	A	A	A
Picric Acid	C	D	D	B	C	B	D	B	C	D	B	B	A	A	B			A	A	A
Pineapple Juice	C	C	C	A		A	A		A	A		A	A	A	A	A	A	A	A	
Pine Oil	B	B	B	A		A	B		A	A	D	A	D	A	A	A	A	A	A	D
Pitch (Bitumen)				A		A			C	A	D		C	A	A	A	A	A	A	
Polysulfide Liquor	D		B	B		A	B		B	D	B	B	B	A	B	A	B	A	A	
Polyvinyl Acetate	B		B	B		B	B			A	B		C	A	B	A	B	A	A	
Polyvinyl Chloride	B		B	B		B	B			A	B		C	A	B	A	B	A	A	
Potassium Bicarbonate				A		A	B		B	A				A	A	A	A	A	A	A
Potassium Bichromate				A		A	A		B	B		B	B	A	A	A	A	A	A	
Potassium Bisulfate				A		A	B		B	A		A	B	A	A	A	A	A	A	
Potassium Bisulfide	C	D	D	B		B	D	A	A	A	B	A	A	A	B	A	B	A	A	
Potassium Bromide	C	D	D	A	C	B	B	A	A	A	B	A	A	A	A	A	A	A	A	A
Potassium Carbonate	B	B	B	B	A	B	B	B	A	A	B	A	A	A	B	A	B	A	A	A

Ratings: A—Excellent B—Good C—Poor D—Do not use Blank—No information

* Not with Reinforced or Polyfill
 ** Do not exceed 800°F

Corrosion Data

Chemicals	Brass	Carbon Steel	Ductile Iron/Cast Iron	316 Stainless Steel	17-4PH	Alloy 20	Monel	Hastelloy C	Buna N (Nitrile)	Delrin/Lubetal	EPDM/EPR	Viton	Neoprene	Celazole	Metal "A"	Grafoil	Metal "G"	TFE/TFM - Reinforced	High-per Fill	UHMWPE
Potassium Chlorate	B	B	B	B	B	B	C		A	A	B	A	A	A	B	C	C	A	A	A
Potassium Chloride	C	C	B	B	B	A	B	B	A	A	A	A	A	A	B	A	B	A	A	A
Potassium Chromate	B		B	B		B	B	A	B	A	B	B	A	A	B			A	A	A
Potassium Cyanide	D	B	B	B		B	B	B	A	A	A	A	A	A	B	A	B	A	A	A
Potassium Dichromate	D	C	C	B		A	B	B	A	A	B	A	A	A	B			A	A	A
Potassium Ferricyanide	D	C	C	A	B	B	B		A	A	B	A	A	A	A	A	A	A	A	A
Potassium Ferrocyanide	B	C	C	B		B	A		A	A		A	A	A	B	A	B	A	A	A
Potassium Hydroxide Dilute Cold	D	A	A	B	B	B	A	A	A	D		D	B	A	B	A	B	A*	A	A
Potassium Hydroxide To 70% Cold	D	B	B	B	C	B	A	B	B	D	B	D	B	A	B	A	B	A*	A	A
Potassium Hydroxide Dilute Hot	D	B	B	B	C	B	A	B	B	D			B	C	B	A	B	A*	A	A
Potassium Hydroxide To 70% Hot	D	A	B	B	D	B	A	B	C	D	A		B	C	B	A	B	A*	A	A
Potassium Iodide	D	C	C	B	B	B	C	A	A	A	B	A	A	A	B	A	B	A	A	
Potassium Nitrate	B	B	B	B	B	B	B	B	A	A	B	A	A	A	B	B	B	A	A	A
Potassium Oxalate				A		A				A				A	A	A	A	A	A	
Potassium Permanganate	B	B	B	B	B	B	B	B	A	A	B	A	A	A	B			A	A	A
Potassium Phosphate	C		C	B		B	B	B	A	A	A	A	A	A	B	A	B	A	A	
Potassium Phosphate Di-basic	B	A	A	A		A	B	B	A	A	B	A	A	A	A	A	A	A	A	
Potassium Phosphate Tri-basic		A	A	B		B	B		B		B		B	A	B	A	B	A	A	
Potassium Sulfate	B	B	C	A	A	A	B	B	A	A	A	A	A	A	A	A	A	A	A	A
Potassium Sulfide	B	B	B	A		A	C	A	A	A	B	B	B	A	A	A	A	A	A	A
Potassium Sulfite	B	B	B	A		A	C	B	B	A	A	B	B	A	A	A	A	A	A	A
Producer Gas	B	B	B	B	A	B	A		A	A	D	A	B	A	B	A	B	A	A	
Propane Gas	A	B	B	B	A	A	B	A	A	A	D	A	B	A	B	A	B	A	A	A
Propyl Bromide	B		B	B		A	B		B	A	B	B	B	A	B	A	B	A	A	
Propylene Glycol	B	B	B	B		B	B		A	C	B	A	A	A	B	A	B	A	A	A
Pyridene			B	B		A		B	D	D		D	D	A	B	A	B	A	A	
Pyroglacial Acid	B	B	B	B	B	A	B	B	A	A		A	A	A	B			A	A	
Quench Oil	B	B	B	A		A			A	A		A	B	A	A	A	A	A	A	
Quinine, Sulfate, dry				A	B	A	B			A				A	A	A	A	A	A	
Refrigerant 123	A	A	A	A	A	A	A	A	C	B	A	A	C		A	A		A**	A	D
Refrigerant 134A	A	A	A	A	A	A	A	A	D	A	D	D	D		A	A	A	A	A	
Resins & Rosins	A	C	C	A	B	A	A	A	C	A		A	C	A	A	A	A	A	A	
Resorcinol				B		B								A	B	A	B	A	A	A
Road Tar	A	A	A	A		A	A		B	A	D	A	C	A	A	A	A	A	A	
Roof Pitch	A	A	A	A		A	A		B	A		A	C	A	A	A	A	A	A	
Rosin Emulsion	B	C	C	A		A	A		D	A		B	C	A	A	A	A	A	A	
R P-1 Fuel	A	A	A	A		A	A		B	A		A	C	A	A	A	A	A	A	
Rubber Latex Emulsions	A	B	B	A		A			A	A		A		A	A	A	A	A	A	
Rubber Solvents	A	A	A	A		A	A		D	C		D	C	A	A	A	A	A	A	
Salad Oil	B	C	C	B		A	B		A	A	B	A	A	A	B	A	B	A	A	
Salicylic Acid	C	D	D	A		B	B	A	A	A	B	A	A	A	A	A	A	A	A	A
Salt (NaCl)	B	C	C	B		A	A	A	A	A		A	A	A	B	A	B	A	A	A
Salt Brine	B		D	B		B	B	A	A	A	B	B	D	A	B	A	B	A	A	A
Sauerkraut Arine				B		B				C				A	B	A	B	A	A	
Sea Water	C	D	D	B		B	A	A	A	A	A	A	A	A	B	A	B	A	A	A
Sewage	C	C	D	B	A	B	B	A	A	B	B	B	C	A	B	A	B	A	A	A
Shellac	A	A	B	A		A	A		A	A			A	A	A	A	A	A	A	
Silicone Fluids	B		B	B		B			B	A		B	B	A	B	A	B	A	A	C
Silver Bromide				A	C	A	B			D				A	A	A	A	A	A	
Silver Cyanide	D		D	A		A	B		B	D		B	B	B	A	A	A	A	A	A
Silver Nitrate	D	D	D	A		A	D	A	C	A	A	A	C	A	A	B	B	A	A	A

Ratings: A—Excellent B—Good C—Poor D—Do not use Blank—No information

* Not with Reinforced or Polyfill
** Seat Only

Corrosion Data

Chemicals	Brass	Carbon Steel	Ductile Iron/Cast Iron	316 Stainless Steel	17-4PH	Alloy 20	Monel	Hastelloy C	Buna N (Nitrile)	Delrin/Lubetal	EPDM/EPR	Viton	Neoprene	Celazole	Metal "A"	Grafoil	Metal "G"	TFE/TFM - Reinforced	High-per Fill	UHMWPE
Silver Plating Sol.				A		A				D			B	A	A			A	A	
Soap Solutions (Stearates)	A	A	B	A		A	A		A	A	A	A	B	A	A	A	A	A	A	
Sodium Acetate	B	C	C	B		B	B	B	B	A	B	A	B	A	B	A	B	A	A	A
Sodium Aluminate	B	C	C	A		B	B	B	A	A	B	A	A	A	A	A	A	A	A	
Sodium Benzoate				B		B	B			B				A	B	A	B	A	A	A
Sodium Bicarbonate	B	C	C	B		A	B	B	A	B	A	A	A	A	B	A	B	A	A	A
Sodium Bichromate				B		B		B	D	A				A	B			A	A	A
Sodium Bisulfate 10%	B	D	D	A		A	B		A	D	B	A	A	A	A	A	A	A	A	A
Sodium Bisulfite 10%	B	D	D	A		B	B	B	A	D	B	A	A	A	A	A	A	A	A	A
Sodium Borate	B	C	C	B		B	B		A	A	B	A	A	A	B	A	B	A	A	A
Sodium Bromide 10%	B	C	D	B		B	B	B	A	A	B	A	A	A	B	A	B	A	A	A
Sodium Carbonate (Soda Ash)	B	B	B	A		A	B	B	A	A	B	A	A	A	A	A	A	A	A	A
Sodium Chlorate	B	C	C	B		B	C	B	A	A	B	A	A	A	B	B	B	A	A	A
Sodium Chloride	B	C	C	B		A	A	B	A	A	B	A	A	A	B	A	B	A	A	A
Sodium Chromate	C	B	B	A		B	B	A	A	A	B	A	A	A	A			A	A	
Sodium Citrate				B		B				A				A	B	A	B	A	A	
Sodium Cyanide	D	B	B	A	B	A	B		A	A	B	A	A	A	A	A	A	A	A	
Sodium Ferricyanide				A		A	B			A				A	A	A	A	A	A	A
Sodium Fluoride	C	D	D	B	B	A	B		A	A	B	A	A	A	B	A	B	A	A	A
Sodium Hydroxide 20% Cold	A	A	A	A	A	B	A	A	A	D	B	B	A	A	A	A	A	A*	B	A
Sodium Hydroxide 20% Hot	A	B	B	A	C	A	A	B	B	D	B	C	B	C	A	A	A	A*	C	A
Sodium Hydroxide 50% Cold	A	A	B	A	B	A	A	A	A	D	B	C	A	A	A	A	A	A*	B	A
Sodium Hydroxide 50% Hot	A	B	B	A	C	A	B		B	D	C	B	C	C	A	A	A	A*	C	A
Sodium Hydroxide 70% Cold	A	A	A	B	B	A			B	D	B	C	C	A	A	A	A	A*	B	A
Sodium Hydroxide 70% Hot	B	B	B	A	C	B	B		D	D	B	C	D	C	A	A	A	A*	C	A
Sodium Hypochlorite (Bleach)	D	D	D	D	D	C	D	A		D		A		C	D	A	D	A	A	A
Sodium Hyposulfite				B		B	B	B		A				A	B	A	B	A	A	
Sodium Lactate				A		A	B			A				A	A	A	A	A	A	
Sodium Metaphosphate	C	B	C	B	B	B		A	A	B	B		A	A	B	A	B	A	A	
Sodium Metasilicate Cold	B	C	C	A		A	A		B	A		B	A	A	A	A	A	A	A	
Sodium Metasilicate Hot	B	D	D	A		A	A	A		A				A	A	A	A	A	A	
Sodium Nitrate	B	B	B	A	B	A	B	B	C	A	B	A	B	A	A			A	A	A
Sodium Nitrite				B		B	C	B	C	B	A	B	D	A	B	B	B	A	A	A
Sodium Perborate	B	B	B	B	B	B	B	B	C	A	A	A	B	A	B	A	B	A	A	
Sodium Peroxide	D	C	C	B	B	B	B	B	C	A	A	A	B	A	B	A	B	A	A	
Sodium Phosphate	C	C	C	B	B	B	B	B	B	B	A	A	C	A	B	A	B	A	A	A
Sodium Phosphate Di-basic	C	C	C	B		B	B	B	A	A	A	A	A	A	B	A	B	A	A	
Sodium Phosphate Tri-basic	C	C	C	B		B	B	B	B	A	A	A	B	A	B	A	B	A	A	
Sodium Polyphosphate				B		B	B	B	B		A		B	A	B	A	B	A	A	
Sodium Salicylate				A		A				A				A	A	A	A	A	A	
Sodium Silicate	B	B	B	B		B	B		A	A	B	A	A	A	B	A	B	A	A	A
Sodium Silicate, hot	C	C	C	B		B	B		A	A	B			A	B	A	B	A	A	A
Sodium Sulfate	B	B	B	A	B	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A
Sodium Sulfide	D	B	B	B	A	B	B	A	A	A	B	A	A	A	B	A	B	A	A	A
Sodium Sulfite	C		A	A	A	A	B	B	A	A	B	B	A	A	A	A	A	A	A	A
Sodium Tetraborate			A	A		A			A	A	B		A	A	A	A	A	A	A	
Sodium Thiosulfate	C	B	C	B	A	B	B	A	A	A	A	A	A	A	B	A	B	A	A	
Soybean Oil	B	C	C	A		A	A	A	A	B	B	A	B	A	A	A	A	A	A	A
Starch	B	C	C	B		A	A	A	A	C	A	A	A	A	B	A	B	A	A	A
Steam (212° F)	A	A	A	A	A	A	B	A	D	D	B	C	D	B	A	A	A	A	A	A

Ratings: A—Excellent B—Good C—Poor D—Do not use Blank—No information

Corrosion Data

Chemicals	Brass	Carbon Steel	Ductile Iron/Cast Iron	316 Stainless Steel	17-4PH	Alloy 20	Monel	Hastelloy C	Buna N (Nitrile)	Delrin/Lubetal	EPDM/EPR	Viton	Neoprene	Celazole	Metal "A"	Grafoil	Metal "G"	TFE/TFM - Reinforced	High-per Fill	UHMWPE
Stearic Acid	C	C	C	B		B	B	A	A	A	B	A	C	A	B	A	B	A	A	A
Styrene	A	A	B	A		A	B	A	D	A	D	B	D	A	A	A	A	A	A	A
Sugar Liquids	A	B	B	A		A	A	A	A	A	B	A	A	A	A	A	A	A	A	A
Sugar, Syrups & Jam Sulfate, Black Liquor	B		C	A	A	A		A		A			B	A	A	A	A	A	A	A
	C	C	C	B	A	B	B		C	C	B	C	B	A	B	A	B	A	A	A
Sulfate, Green Liquor	C	C	C	B	A	B	B		C	A		C	B	A	B	A	B	A	A	A
Sulfate, White Liquor	C	C	C	B	B	D	C		C	D		C	B	A	B	A	B	A	A	A
Sulfur	D	C	C	B		A	B	B	D	A	B	B	C	A	B	A	B	A	A	A
Sulfur Chlorides	B	D	D	D		A	B		D	A	C	A	D	A	D	A	D	A	A	A
Sulfur Dioxide, dry	B	B	B	A	A	B	B	A	D	A	A	A	D	A	A	A	A	A	A	A
Sulfur Dioxide, wet	D	C		B	B	B	C	A	D	D	B		D	A	A	A	A	A	A	A
Sulfur Hexafluoride	B			A		A				A			B	A	A	A	A	A	A	A
Sulfur, Molten	D	C	B	B		A	D	B	D	D	B	B	C	D	B	A	B	A	D	D
Sulfur Trioxide	B	B	B	B	B	B		B	D	D		B	D	A	B	D	D	A	A	A
Sulfur Trioxide, dry	B	B	B	B	B	B	B	B	D	A	B	A	D	D	B	D	D	A	A	A
Sulfuric Acid 0 to 77%	C	D	D	C		B	B	B	B	D		A	B	C	C	A	D	A	A	B
Sulfuric Acid 100%	C	C	B	A	B	A	D	A	D	D	C	B	D	D	A	D	D	A	D	D
Sulfurous Acid	D	D	D	B		B	D	B	C	C	C	A	C	C	B	A	B	A	A	A
Tall Oil	B	B	B	B		B	B	A	B	A	D	A	B	A	B	A	B	A	A	A
Tannic Acid (Tannin)	B	C	C	B	B	B	B	B	B	A	B	A	B	A	B	A	B	A	A	A
Tanning Liquors					B			A	B	D			D	A	B			A	A	
Tar & Tar Oils	A	A	A	A	A	A	A	A	C	A	D	A	D	A	A	A	A	A	A	A
Tartaric Acid	B	D	D	A	A	A	B	B	C	A	B	A	B	A	A	A	A	A	A	A
Tetraethyl Lead	B	C	C	B		B	A		A	A				A	A	B	A	B	A	A
Toluol (Toluene)	A	A	A	A		A	A	A	D	C	D	B	D	A	A	A	A	A	A	D
Tomato Juice	C	C	C	A		A	B		A	A		A	A	A	A	A	A	A	A	
Transformer Oil	B	A	B	A		A	A		A	A		A	B	A	A	A	A	A	A	C
Tributyl Phosphate	A	A	A	A		A	A		D	A	B	D	D	D	A	A	A	A	A	A
Trichlorethylene	B	B	C	B	A	B	B	A	D	A	D	B	D	A	B	A	B	A	A	D
Trichloroacetic Acid	B		D	D		B	B	A	C	D		D	D	A	D			A	A	C
Triethanolamine				B		B	B	A	C	A	B		B	A	B	A	B	A	A	C
Triethylamine	B			B		B		A	B	C			B	A	B			A	A	
Trisodium Phosphate				B		B		A	A	A	B	B	A	A	B	A	B	A	A	A
Tung Oil	B	B	B	A		A	C	A	A	A	D	A	B	A	A	A	A	A	A	A
Turpentine	B	B	B	B	A	B	B	A	B	A	D	A	D	A	B	A	B	A	A	D
Urea	B	C	C	B		B	B	A	C	A	B	D	B	A	B	A	B	A	A	A
Uric Acid				A		A		A		B				A	A	A	A	A	A	
Varnish	A	C	C	A		A	A	A	C	A	D	B	B	A	A	A	A	A	A	
Vegetable Oils	B	B	B	A		A	B	A	A	A	D	A	B	A	A	A	A	A	A	
Vinegar	B	D	D	A		A	B	A	D	B	A	D	D	A	A	A	A	A	A	A
Vinyl Acetate	B		B	B		B	B	A		D	A		B	A	B	A	B	A	A	
Water, Distilled	A	D	D	A	A	A	A	A	C	A	B	A	B	A	A	A	A	A	A	A
Water, Fresh	A	C	C	A	A	A	A	A	C	A	B	A	B	A	A	A	A	A	A	A
Water, Acid Mine	D	D	D	B	B		D	C	B	A	A	D	A	A	B	A	B	A	A	A
Waxes	A	A	A	A		A	A	A	A	A	C	A	B	A	A	A	A	A	A	
Whiskey & Wines	B	D	D	A		A	A	A	B	A	A	A	B	A	A	A	A	A	A	A
Xylene (Xylol), Dry	A	B	B	A		A	A	A	D	A	D	B	D	A	A	A	A	A	A	D
Zinc Bromide	B		D	B		B	B	A	B	A	B	B	B	A	B	A	B	A	A	
Zinc Hydrosulfite	C	A	B	A		A	B	A	A	A	A	A	A	A	A			A	A	
Zinc Sulfate	B	D	D	B		A	B	A	A	A	A	A	A	A	B	A	B	A	A	A

Ratings: **A**—Excellent **B**—Good **C**—Poor **D**—Do not use **Blank**—No information