

# CORROSIVE SERVICE GUIDE TO MATERIALS

CHEMICAL	CONDITION	MATERIAL
Acetic Acid	to 50% to 212 F to 75% to 300 F to 99% to 250 F All conc. to B.P. All conc. to B.P.	316 Stainless Steel Titanium Hastelloy C Monel 400
Acetic Anhydride		304 SS, Aluminum
Acetone		304 SS, Aluminum
Acetylene	70 F-212 F	304 Stainless Steel
Alcohol, Ethyl	to 25% and 212 F	304 Stainless Steel
Aluminum Sulphate	to 50% and 212 F All concentrations	316 Stainless Steel 304 Stainless Steel
Ammonia gas or liquid		
Ammonium Hydroxide		1100-1114 Aluminum
Ammonium Phosphate	to 25% and 212 F	304 Stainless Steel
Ammonium Nitrate	All conc. to 212 F	316 Stainless Steel
Ammonium Sulphate	All conc. to B.P. to 45% and 212 F	316 Stainless Steel Monel 400 304 Stainless Steel
Amylacetate		
Aniline	All concentrations	
Barium Chloride	25% to B.P.	Hastelloy C
Barium Hydroxide	to 50% 212 F	C1018 Steel Alloy 556
Black Liquor		
Boric Acid		Hastelloy C
Brines	All conc. to B.P.	Monel 400, Hastelloy C
Bromine Dry	to 212 F	Monel 400
Butane	to 250 F	316 Stainless Steel
Butylacetate	to 212 F	Monel 400
Butyl Alcohol		Copper, Aluminum
Calcium Chlorate	to 30% and 212 F	304 Stainless Steel
Calcium Hydroxide	to 50% and 212 F	Hastelloy C or Titanium
Carbonic Acid	All conc. to 300 F	316 Stainless Steel
Carbon Dioxide	to 1300 F	304 Stainless Steel
Chlorine Gas	Moist to 212 F	Hastelloy C or Titanium
Chromic Acid	10% at 150 F	Hastelloy C
Citric Acid	to 50% 212 F All conc. to B.P.	316 Stainless Steel Hastelloy C
Copper Nitrate	All conc. to 212 F	304 Stainless Steel
Copper Sulphate	All conc. to B.P.	316 Stainless Steel
Cyanogen Gas	to 212 F	304 Stainless Steel
Dowtherm		C1018 Steel
Ether		304 Stainless Steel
Ethyl Acetate	to 150 F	Monel 400
Ferric Chloride	to 50% & B.P.	Tantalum
Ferric Sulphate	to 30% & B.P.	Hastelloy C
Ferrous Sulphate	All conc. to B.P.	Hastelloy C
Formaldehyde	All conc. to 150 F	304 Stainless Steel
Formic Acid	All conc. to 212 F	304 Stainless Steel
Freon		316 Stainless Steel
Gallic Acid	to 212 F	Monel 400
Gasoline or Petroleum		304 Stainless Steel
Glucose	70 F	304 Stainless Steel
Glycerine		304 Stainless Steel
Glycerol		304 Stainless Steel
Hydrobromic Acid	40% to 65 F 48% to 212 F	Titanium
Hydrochloric Acid	to 37% and 150 F	Hastelloy B
Hydrofluoric Acid	All conc. to B.P.	Hastelloy B Hastelloy C
Hydrogen Peroxide	to 212 F	316 Stainless Steel
Hydrogen Sulphide	Dry to 1000 F	316 Stainless Steel
Iodine	to 70 F to B.P.	Tantalum Aluminum, 316 SS
Ketones		304 Stainless Steel
Kerosene		304 Stainless Steel
Lactic Acid	to 212 F	Tantalum
Magnesium Chloride	to 40% of 212 F	Monel 400
Magnesium Sulphate	to 50% 212 F	Monel 400
Muriatic Acid	to 37% and 150 F	Hastelloy B
Naphtha	70 F	304 Stainless Steel
Natural Gas	to 800 F	304 Stainless Steel
Nickel Chloride	to 80% and 200 F	Hastelloy C
Nickel Sulphate	25% and 125 F	304 Stainless Steel
Nitric Acid	to 40% and 180 F All conc. to 370 F	304 Stainless Steel Tantalum

CHEMICAL	CONDITION	MATERIAL
Nitrobenzene	to 212 F	Carpenter 20CB3
Oleic Acid	to 212 F	316 Stainless Steel
Oleum	to 70 F	316 Stainless Steel
Oxalic Acid	All conc. to 212 F	Monel 400
Oxygen	70 F Liquid Oxygen Elevated Temps. 100% at 439 F	C1018 Steel 304 Stainless Steel 304 Stainless Steel 316 Stainless Steel 304 Stainless Steel 316 Stainless Steel 316 Stainless Steel
Palmitic Acid		
Pentane		
Phenol	to 700 F	316 Stainless Steel
Phosphoric Acid	10% & 70 F to 90% and 215 F to 212 F	316 Stainless Steel Hastelloy B 316 Stainless Steel
Picric Acid		Hastelloy C
Potassium Bromide	75% to 180 F	304 Stainless Steel
Potassium Carbonate	to 50% and 212 F All conc. to B.P.	304 Stainless Steel Hastelloy C
Potassium Chlorate	to 25% and 212 F	316 Stainless Steel
Potassium Hydroxide	to 50% and B.P.	316 Stainless Steel
Potassium Nitrate	to 80% and 212 F	304 Stainless Steel
Potassium Permanganate	to 50% and 75 F	Hastelloy C or Titanium
Potassium Sulphate	to 20% and 212 F	304 Stainless Steel
Pyrogallic Acid	All conc. to B.P.	304 Stainless Steel
Quinine Bisulphate	Dry	316 Stainless Steel
Quinine Sulphate	Dry	316 Stainless Steel
Sea Water		Monel 400
Salicylic Acid	to 250 F	Nickel
Sodium Bicarbonate	to 20% and 212 F	304 Stainless Steel
Sodium Carbonate	to 25% and 212 F	304 Stainless Steel
Sodium Chloride	Saturated to 212 F	316 Stainless Steel Alloy 556
Sodium Fluoride	10% - 70 F	Monel 400
Sodium Hydroxide		304 Stainless Steel
Sodium Nitrate	Fused	316 Stainless Steel
Sodium Peroxide		304 Stainless Steel
Sodium Sulphate	to 25% and 212 F	304 Stainless Steel
Sodium Sulphide	to 25% and 212 F	304 Stainless Steel
Sodium Sulphite	5% to 212 F	304 Stainless Steel
Sulphur Dioxide	to 800 F	316 Stainless Steel
Sulphur	to 850 F to 1600 F	316 Stainless Steel Alloy 556
Sulphuric Acid	1-60%, 75-100%, 176 F to 60% & B.P. All conc. to 370 F to 212 F	Carpenter 20CB3 Hastelloy B Tantalum 304 Stainless Steel
Tannic Acid		304 Stainless Steel
Tartaric Acid	All conc. to 212 F	304 Stainless Steel
Toluene	to 250 F	304 Stainless Steel
Turpentine		304 Stainless Steel
Whiskey and Wine		316 Stainless Steel
Xylene		Copper
Zinc Chloride	to 25% and 130 F All conc. to B.P.	Carpenter 20CB3 Monel 400
Zinc Sulphate	to 25% to 212 F to 40% to B. P.	316 Stainless Steel Hastelloy C

## Hot Condition

310SS up to 2000°F Inconel and 446SS up to 2150°F

In recommending the above materials, consideration has been given to providing good service life without undue cost. Where two or more materials are satisfactory, the least expensive is listed. Consult the factory for information on materials or services not given.