



closing the loop on thermal solutions

Industrial Process Thermocouples

THERMOCOUPLE TECHNICAL DATA MATERIAL SELECTION GUIDE FOR THERMOWELL APPLICATIONS

Chemical	Temp. °F	Concentration %	Recommended Material	Chemical	Temp. °F	Concentration %	Recommended Material
Acetic Acid	212	All	Monel, 430 SS	Chloroacetic Acid	212	All	Hastelloy - C
Acetic Anhydride	300	-	Nickel, Monel	Chloroform, Dry	212	-	Monel
Acetone	212	All	304 SS	Chromic Acid	212	50	Hastelloy - C, 316 SS
Acetylene	400	All	304 SS, Monel, Nickel	Cider	212	All	304 SS
Alcohols (Methyl, Ethyl)	212	All	304 SS	Citric Acid	212	All	Hastelloy - C, 316 SS
Aluminum (Potassium or Sodium)	300	All	Hastelloy - C	Coal Tar	212	-	304 SS
Aluminum Acetate	-	Sat.	304 SS	Copper (10) Chloride	212	All	Hastelloy - C
Aluminum Chloride	212	All	Hastelloy - B	Copper (10) Nitrate	300	All	316 SS
Aluminum Sulfate	212	All	316 SS	Copper (10) Sulfate	300	All	316 SS
Ammonia, Dry	212	All	304 SS, 316 SS	Copper Plating Solution (Cyanide)	180	-	304 SS
Ammonium Hydroxide (Ammonia, Aqua)	212	All	304 SS, 316 SS	Copper Plating Solution (Acid)	75	-	304 SS
Ammonium Chloride	300	50	Monel	Corn Oil	300	-	304 SS
Ammonium Nitrate	300	All	304 SS	Cottonseed Oil	300	-	304 SS
Ammonium Sulfate	212	All	316 SS	Creosote, Crude	200	All	304 SS, Monel
Amyl Acetate	300	All	304 SS, Monel	Crude Oil	300	-	Monel
Aniline	75	All	Monel	Ethyl Acetate	300	All	Monel
Asphalt	250	All	304 SS	Ethyl Chloride, Dry	500	-	Steel
Barium Compound	70	All	Hastelloy - C	Ethylene Glycol	212	All	Steel
Beer	70	-	304 SS	Ethylene Oxide	75	-	Steel
Benzene (Benzol)	212	-	Steel (C1018)	Fatty Acids	500	All	316 SS
Benzine	-	-	Steel (C1018)	Ferric Chloride	75	All	Hastelloy - C, Tantalum
Benoic Acid	212	All	316 SS	Ferric Sulfate	70	All	304 SS
Bleaching Powder	70	20	Monel	Formaldehyde	212	All	316 SS
Borax	212	All	Brass	Formic Acid	150	All	316 SS
Bordeaux Mixture	200	-	304 SS	Freon	-	-	Steel
Boric Acid	212	All	316 SS	Fluorine, Anhydrous	100	-	304 SS
Bromine	125	Dry	Monel, Tantalum	Furfural	450	-	316 SS
Butabien	-	All	Brass, 304 SS	Gallic Acid	150	5	Monel
Butane	70	All	Steel, 304 SS	Gasoline	70	-	Steel, 304 SS
Butyl Alcohol	212	All	304 SS	Glucose	300	All	304 SS
Butyric Acid	70	5	Hastelloy - C, 304 SS	Glue pH 6-8	300	All	304 SS
Calcium Bisulphite	75	All	Hastelloy - C, 316 SS	Glycerin	212	All	Brass, 304 SS
Calcium Chloride	212	All	Hastelloy - C, 304 SS	Glycerol	-	-	Brass, 304 SS
Calcium Hydroxide	212	50	Hastelloy - C, 317 SS	Hydrobromic Acid	212	All	Hastelloy - B
Calcium Hypochlorite	70	20	Monel	Hydrochloric Acid (37-38%)	225	All	Hastelloy - B
Carbolic Acid	212	All	316 SS	Hydrogen Chloride, Dry	300	-	304 SS
Carbon Dioxide, Dry	212	All	Brass, Steel (C1018)	Hydrocyanic Acid	212	All	316 SS
Carbonated Water	212	All	304 SS	Hydrofluoric Acid	212	60	Monel, Hastelloy - C
Carbonated Beverages	212	All	304 SS	Hydrogen Fluoride, Dry	175	-	Steel
Carbon Disulfide	200	-	304 SS	Hydrofluogilicic Acid	212	40	Monel
Carbon Tetrachloride	70	All	Monel	Hydrogen Peroxide	212	10-100	316 SS
Chlorine, Dry	-	100	Monel	Iodine	70	All	Tantalum
Chlorine, Moist	212	All	Hastelloy - C	Kerosene	70	-	Steel, 304 SS

Sensors



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Chemical	Temp. °F	Concentration %	Recommended Material
Lacquers & Thinners	300	All	Monel
Lactic Acid	212	All	316 SS, Tantalum
Lime	212	All	316 SS
Linseed Oil	75	-	Steel, 304 SS
Magnesium Chloride	212	50	Nickel
Magnesium Hydroxide	75	All	304 SS
Magnesium Sulfate	212	50	Nickel
Malic Acid	212	All	316 SS
Mercuric Chloride	212	50	Nickel
Mercury	-	-	Steel, 304 SS
Methane	70	All	Steel
Methylene Chloride	212	All	304 SS
Methyl Chloride, Dry	75	-	Steel
Milk, Fresh or Sour	180	-	304 SS, Nickel
Molasses	300	All	304 SS
Natural Gas	70	-	304 SS
Nitric Acid	75	All	304 SS
Nitric Acid	300	All	316 SS, Tantalum
Nitrobenzene	70	-	304 SS
Oxygen	70	All	Steel
Oleic Acid	500	All	316 SS
Oxalic Acid	212	All	Monel
Palmitic Acid	500	All	316 SS
Photographic Bleaching	100	All	304 SS
Phosphoric Acid	212	All	316 SS
Phenol	-	All	316 SS
Potassium Compounds	See Sodium Compounds		
Propane	70	All	Steel
Rosin	700	100	316 SS
Sea Water	212	-	Monel
Soap & Detergents	212	All	304 SS
Sodium Bicarbonate	212	20	316 SS
Sodium Bisulphite	212	20	304 SS
Sodium Bisulfate	212	20	304 SS
Sodium Carbonate	212	40	316 SS
Sodium Chloride	300	30	Monel
Sodium Chromate	212	All	316 SS
Sodium Cyanide	212	All	304 SS
Sodium Hydroxide	212	30	316 SS
Sodium Hypochlorite	75	10	Hastelloy - C
Sodium Nitrate	212	40	304 SS
Sodium Nitrate	75	20	316 SS
Sodium Phosphate	212	10	Steel
Sodium Silicate	212	10	Steel
Sodium Sulfate	212	30	316 SS
Sodium Sulfide	212	10	316 SS
Sodium Sulfite	212	30	304 SS

Chemical	Temp. °F	Concentration %	Recommended Material
Sodium Thiosulfate	212	All	304 SS
Steam	-	-	304 SS
Stearic Acid	500	All	316 SS
Sugar Solutions	300	All	304 SS
Sulfur	500	-	304 SS
Sulfur Chloride, Dry	75	-	316 SS
Sulfur Dioxide, Dry	500	-	316 SS
Sulfur Trioxide, Dye	500	-	316 SS
Sulfuric Acid	212	5	Hastelloy - B
Sulfuric Acid	212	5-100	Hastelloy - B, Hastelloy - D
Sulfuric Acid, Fuming	175	-	Hastelloy - C
Sulfurous Acid	75	20	316 SS
Titanium Tetrachloride	75	All	316 SS
Tannic Acid	75	40	Hastelloy - B
Toluene	75	-	Steel
Trichloroacetic Acid	75	All	Hastelloy - B
Trichlorethylene	-	-	Steel (C1018)
Turpentine	75	All	316 SS
Varnish	150	-	Steel, 304 SS
Vinegar	212	All	Monel, 304 SS
Zinc Chloride	212	All	Hastelloy - B
Zinc Sulfate	212	All	316 SS