

TITAN HEATERS INC. 805-483-1101

CHEMICAL RECOMMENDATION CHART

**CAUTION !**

Because of the different chemical compositions from various manufacturers and each company's process specifications, this chart is to be used **ONLY** as an aid in the proper sheath selection.

It is the responsibility of the individual company to conduct laboratory tests relating to their particular processes and heater sheath compatibility.

***CHECK THIS LIST PRIOR TO INSTALLING YOUR HEATER !!!***

BY CHEMICAL NAME		BY SHEATH MATERIAL	
Acetic Acid	Quartz	Brown Oxide (PC Boards)	Titanium (D)
Acid Sulfate	Quartz,Teflon	Grey Nickel	Titanium (D)
Actane 70	Teflon	Black Oxide (PC boards)	Titanium (D)
Actane 80	Teflon	Cobalt Nickel	Titanium (D)
Actane Salt	Teflon	Bright Nickel	Titanium (D)
Alodine	316SS	Nickel Plating	Titanium,Quartz (D)
Alco Bright Dip R5	304SS	Sodium Chlorate	Titanium,Quartz
Alcohol	316SS	Copper Acid	Titanium Quartz
Alcorite	Quartz,Teflon	Chromic Acid(no fluorides)	Titanium,Quartz
Alkaline Soak Cleaner	304SS	Chromium	Titanium,Quartz
Aluminum Cleaner(silicated)	304SS	Sulfurous Acid	Titanium,Quartz
Aluminum Bright Dip	Quartz,Teflon SS guard	Zinc Ammonium Chloride	Titanium,Quartz
Aluminum Chloride	Quartz,Teflon	Sodium Carbonate	Titanium,316SS
Aluminum Sulfate	304SS	Sodium Bisulfate	Titanium,316SS
Ammonia	304SS	Tannic Acid	Titanium,316SS
Ammonium Persulfate	316SS	Sodium Sulfide	Titanium,316SS
Ammonium Bi-fluoride	Teflon	Benzenesulfonic Acid	Titanium
Ammonium Chloride	Titanium	Barium Chloride	Titanium
Ammonium Hydroxide	Titanium	Chlorosulfonic Acid	Titanium
Ammonium Nitrate	316SS	Ferric Nitrate	Titanium
Ammonium Sulfate	Titanium	Ammonium Chloride	Titanium
Ammonium Sulfite	TANTALUM	Boric Acid	Titanium
Aniline	316SS	Barium Sulfate	Titanium
Anodizing(sulfuric)	Quartz	Ferric Chloride	Titanium
ARP 80-Blacking Salts	Quartz,Teflon	Benzaldehyde	Titanium
ARP 28	Teflon	Sodium Cyanide	Titanium
Asphalt (liquid)	304SS (DDD)	Benzene	Titanium
Barium Chloride	Titanium	Magnesium Nitrate	Titanium
Barium Hydroxide	316SS	Citric Acid	Titanium
Barium Sulfate	Titanium	Silver Nitrate	Titanium
Benzaldehyde	Titanium	Benzoic Acid	Titanium
Benzene	Titanium	Ammonium Sulfate	Titanium
Benzenesulfonic Acid	Titanium	Mercuric Chloride	Titanium
Benzoic Acid	Titanium	Calcium Chloride	Titanium
Black Nickel	Quartz,(D)	Butyric Acid	Titanium
Black Oxide (290 F)	304SS w/ All SS JBox(DD)	Ammonium Hydroxide	Titanium
Black Oxide (PC boards)	Titanium (D)	Sodium Nitrate	Titanium
Bonderizing	316SS(D)	Calcium Hypochlorite	Titanium
Boric Acid	Titanium	Sulfur	Titanium
Brass Cyanide	304SS	Sulfamate Nickel	Titanium(D)
Bright Nickel	Titanium (D)	Sodium Hydroxide	Teflon,HAS C
Bright Copper Cyanide	304SS	Diversey 514	Teflon

**(D)=DERATED FROM 40 WSI TO 20 WSI**  
**(DD)=DERATED FROM 40 WSI TO 10 WSI**

**(DDD)=DERATED FROM 40 WSI TO 5 WSI**

<b>BY CHEMICAL NAME</b>		<b>BY SHEATH MATERIAL</b>	
Bronze Cyanide	304SS	ARP 28	Teflon
Brown Oxide (PC Boards)	Titanium (D)	Actane 70	Teflon
Butyl Amine	316SS	Ammonium Bi-fluoride	Teflon
Butyric Acid	Titanium	Isoprep 191 Acid Salts	Teflon
Cadmium,Black	Quartz	Enthone Acid 80	Teflon
Cadmium,(alkaline)	304SS	Sodium Dichromate	Teflon
Cadmium,Floborate	Teflon	Salt(actine)	Teflon
Calcium Chlorate	316SS	Iron Fluoborate	Teflon
Calcium Chloride	Titanium	McDermid 629	Teflon
Calcium Bisulfite	316SS	Hydrofluoric Acid	Teflon
Calcium Hypochlorite	Titanium	Potassium Hydroxide	Teflon
Carbon Disulfide	316SS	Tin Nickel	Teflon
Carbonic Acid	316SS	Methyl Bromide	Teflon
Caustic	304SS(D)	Fluoborate	Teflon
Cellosolve	316SS	Cadmium,Floborate	Teflon
Chlorine (WET)	Quartz	Actane 80	Teflon
Chloride	Quartz	Actane Salt	Teflon
Chlorobenzene	316SS	Ammonium Sulfite	TANTALUM
Chlorosulfonic Acid	Titanium	Phosphoric Acid	Quartz(D)
Chromic Acid Anodizing	Quartz	Black Nickel	Quartz,(D)
Chromic Acetate	Quartz	Reynolds Brightner	Quartz/lead guard
Chromic Nickel	Quartz	Aluminum Bright Dip	Quartz,Teflon SS gua
Chromic Acid(no fluorides)	Titanium,Quartz	Alcorite	Quartz,Teflon
Chromium	Titanium,Quartz	Aluminum Chloride	Quartz,Teflon
Citric Acid	Titanium	ARP 80-Blacking Salts	Quartz,Teflon
Clear Chromate	316SS	Acid Sulfate	Quartz,Teflon
Cobalt Nickel	Titanium (D)	Hydrochloric Acid	Quartz
Cobalt plating	Quartz	Nitric Hydrochloric	Quartz
Copper Acid	Titanium Quartz	Gold Acid	Quartz
Copper ,Bright Acid	Quartz	Chromic Nickel	Quartz
Copper Cyanide	304SS	Nitric Acid	Quartz
Copper Strike	304SS	Chromic Acetate	Quartz
Copper Sulfate	304SS	Sodium Salicyate	Quartz
Cyanide	316SS	Muriatic Acid	Quartz
D.I. Water	316SS(electropolished)	Chlorine (WET)	Quartz
Diethylene Glycol	304SS	Zinc Acid	Quartz
Deoxidizer Ph>5	Quartz	Tin Plating, Acid	Quartz
Dichromic Hot Seal	316SS	Wood's Nickel Strike	Quartz
Diversey DS9333	Quartz	Unichrome SRHS	Quartz
Diversey 511	Quartz	Deoxidizer Ph>5	Quartz
Diversey 514	Teflon	Sulphamic Acid	Quartz
Dow Therm A	316SS (D)	Diversey DS9333	Quartz
Dye Solutions,Hot	316SS	Sulfur Chloride	Quartz
Electroless Nickel	316SS(D)	Chromic Acid Anodizing	Quartz
Electroless Tin (acid)	Quartz	Sulfuric Acid	Quartz
Electroless Tin (alkaline)	316SS	Oleic Acid	Quartz
Electro cleaner	304SS	Iridite 4P-4,4-80, 4L-1	Quartz
Electropolishing	Quartz	Cobalt plating	Quartz
Ethanol	316SS	Oxalic Acid	Quartz
Enthone Acid 80	Teflon	Copper ,Bright Acid	Quartz
Ethylene Glycol	316SS (D)	Electropolishing	Quartz
Ferric Nitrate	Titanium	Iridite 5P-1,8,7,7-P8P	Quartz
Ferric Sulfate	316SS	Trioxide	Quartz
Ferric Ammonium Oxide	316SS	Sodium Phosphate	Quartz
Ferric Chloride	Titanium	Chloride	Quartz
Fluoborate	Teflon	Sodium Hypochlorite	Quartz
Formic Acid	316SS	Iridite 8-2,12-P, 17P,	Quartz
Freon	304SS	Acetic Acid	Quartz
Immersion Gold	304SS	Unichrome CR-110	Quartz

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**BY CHEMICAL NAME**

Gold Acid	Quartz
Gold Cyanide	304SS
Grey Nickel	Titanium (D)
Glycerol	304SS
Hot Seal Dichromate	316SS
Hydrochloric Acid	Quartz
Hydrofluoric Acid	Teflon
Indium	Quartz
Iron Fluoborate	Teflon
Iron Phosphate	316SS(D)
Iridite ,#4-75,4-73,14,	316SS
Iridite 14-2, 14-9, 18-P	316SS
Iridite #1,2,3,4-C,4PC&S	Quartz
Iridite 4P-4,4-80, 4L-1	Quartz
Iridite 4-2,4-2A, 4-2P	Quartz
Iridite 5P-1,8,7,7-P8P	Quartz
Iridite 8-2,12-P, 17P,	Quartz
Iridite 15,18-P,	Quartz
Iridite Dyes	Quartz
Isoprep,187,188 Deox	316SS
Isoprep,cleaner #186	316SS
Isoprep 191 Acid Salts	Teflon
Jetal	304SS
Lead Acetate	316SS
Lead Acid Salts	304SS
Linseed Oil	304SS
Lime saturated Water	316SS
Magnesium Hydroxide	304SS
Magnesium Nitrate	Titanium
Magnesium Sulfate	304SS
McDermid 629	Teflon
Mercuric Chloride	Titanium
Methane chloride	Titanium
Methanesulfonic Acid	
Methyl Bromide	Teflon
Muriatic Acid	Quartz
Naphtha	316SS
Nickel Plating	Titanium,Quartz (D)
Nickel Acetate Seal	316SS
Niklad	304SS
Nitric Acid	Quartz
Nitric 6% /Phosphoric	316SS (D)
Nitric Hydrochloric	Quartz
Nitric Sodium Chromate	qtz,316,tef
Oil (30 wt)	304 (DD)
Oleic Acid	Quartz
Oakite #67	304SS
Oxalic Acid	Quartz
Paint Stripper Ph>6	304SS(D)
Paint Stripper (solvent)	316SS(D)
Perchlorethylene	316SS(D)
Phosphoric Acid	Quartz(D)
Phosphate Cleaner	304SS (D)
Phosphate	316SS(D)
Phosphate, Iron	316SS(D)
Phosphatizing	316SS(D)
Potassium Acid Sulfate	Quartz
Potassium Cyanide	304SS
Potassium Hydroxide	Teflon
Potassium Hydrochloric	Quartz
Reynolds Brightner	Quartz w/ lead guard

**BY SHEATH MATERIAL**

Anodizing(sulfuric)	Quartz
Cadmium,Black	Quartz
Indium	Quartz
Potassium Acid Sulfate	Quartz
Sodium Citrate	Quartz
Rhodium	Quartz
Iridite 15,18-P,	Quartz
Iridite 4-2,4-2A, 4-2P	Quartz
Sodium Bromide	Quartz
Electroless Tin (acid)	Quartz
Ruthenium	Quartz
Iridite Dyes	Quartz
Potassium Hydrochloric	Quartz
Diversey 511	Quartz
Iridite #1,2,3,4-C,4PC&S	Quartz
Nitric Sodium Chromate	QTZ,316,TEF
D.I. Water	316SS(electropolisher
Zinc Cyanide	316SS(D),Titanium
Zinc Phosphate	316SS(D) electropolish
Phosphate	316SS (D)
Iron Phosphate	316SS (D)
Perchlorethylene	316SS (D)
Phosphate, Iron	316SS (D)
Paint Stripper (solvent)	316SS (D)
Trichlorethylene	316SS (D)
Electroless Nickel	316SS (D)
Turco Ultra Sonic Solution	316SS (D)
Phosphatizing	316SS (D)
Bonderizing	316SS (D)
Ethylene Glycol	316SS (D)
Turco 4181	316SS (D)
Nitric 6% /Phosphoric	316SS (D)
Turco 4338	316SS (D)
Dow Therm A	316SS (D)
Stearic Acid	316SS,QTZ
Tranrite H-11	316SS electropolisher
Turco 4008	316SS electropolisher
Clear Chromate	316SS
Formic Acid	316SS
Silver Lume	316SS
Alodine	316SS
Calcium Bisulfite	316SS
Naphtha	316SS
Isoprep,cleaner #186	316SS
Yellow Dichromate	316SS
Isoprep, 187, 188 Deox	316SS
Dichromic Hot Seal	316SS
Silver Cyanide	316SS
Calcium Chlorate	316SS
Iridite 14-2, 14-9, 18-P	316SS
Ethanol	316SS
Silver Bromide	316SS
Chlorobenzene	316SS
Barium Hydroxide	316SS
Ferric Ammonium Oxide	316SS
Iridite ,#4-75,4-73,14,	316SS
Lead Acetate	316SS
Ammonium Persulfate	316SS
Nickel Acetate Seal	316SS

**(D)=DERATED FROM 40 WSI TO 20 WSI****(DD)=DERATED FROM 40 WSI TO 10 WSI**

**(DDD)=DERATED FROM 40 WSI TO 5 WSI**

<b>BY CHEMICAL NAME</b>		<b>BY SHEATH MATERIAL</b>	
Rhodium	Quartz	Sodium Sulfate	316SS
Rochelle Salts Cyanide	304SS	Butyl Amine	316SS
Ruthenium	Quartz	Sodium Chloride	316SS
Salt(actine)	Teflon	Dye Solutions,Hot	316SS
Sodium Bisulfate	Titanium,316SS	Carbon Disulfide	316SS
Sodium Bromide	Quartz	Lime saturated Water	316SS
Sodium Carbonate	Titanium,316SS	Carbonic Acid	316SS
Sodium Chlorate	Titanium,Quartz	Cellosolve	316SS
Sodium Chloride	316SS	Anline	316SS
Sodium Citrate	Quartz	Xylene	316SS
Sodium Cyanide	Titanium	Ammonium Nitrate	316SS
Sodium Dichromate	Teflon	Electroless Tin (alkaline)	316SS
Sodium Hydroxide	Teflon,HAS C	Hot Seal Dichromate	316SS
Sodium Hypochlorite	Quartz	Alcohol	316SS
Sodium Nitrate	Titanium	Ferric Sulfate	316SS
Sodium Phosphate	Quartz	Cyanide	316SS
Sodium Salicyate	Quartz	Sodium Silicate	316SS
Sodium Silicate	316SS	Caustic	304SS (D)
Sodium Sulfate	316SS	Paint Stripper Ph>6	304SS (D)
Sodium Sulfide	Titanium,316SS	Phosphate Cleaner	304SS (D)
Silver Bromide	316SS	Asphalt (liquid)	304SS (DDD)
Silver Cyanide	316SS	Black Oxide (290 F)	304SS w/ SS JBox(DI
Silver Lume	316SS	Tin Plating, alkaline	304SS
Silver Nitrate	Titanium	Bright Copper Cyanide	304SS
Stannate	304SS	Rochelle Salts Cyanide	304SS
Stearic Acid	316SS,qtz	Magnesium Hydroxide	304SS
Sulfamate Nickel	Titainum(D)	Ammonia	304SS
Sulfur	Titanium	Electro cleaner	304SS
Sulfuric Acid	Quartz	Gold Cyanide	304SS
Sulfur Chloride	Quartz	Aluminum Sulfate	304SS
Sulfurous Acid	Titanium,qtz	Aluminum Cleaner(silicated	304SS
Sulphamic Acid	Quartz	Immersion Gold	304SS
Tannic Acid	Titanium,316SS	Oakite #67	304SS
Tin Nickel	Teflon	Alkaline Soak Cleaner	304SS
Tin Plating, Acid	Quartz	Magnesium Sulfate	304SS
Tin Plating ,Alkaline	304SS	Jetal	304SS
Tranrite H-11	316SS electropolished	Diethylene Glycol	304SS
Trichlorethylene	316SS(D)	Lead Acid Salts	304SS
Trioxide	Quartz	Water	304SS
Turco 4181	316SS (D)	Linseed Oil	304SS
Turco 4008	316SS electropolished	Zeline	304SS
Turco 4338	316SS (D)	Brass Cyanide	304SS
Turco Ultra Sonic Solution	316SS(D)	Stannate	304SS
Unichrome CR-110	Quartz	Cadmium,(alkaline)	304SS
Unichrome SRHS	Quartz	Freon	304SS
Water	304SS	Bronze Cyanide	304SS
Wood's Nickel Strike	Quartz	Alco Bright Dip R5	304SS
Yellow Dichromate	316SS	Copper Sulfate	304SS
Xylene	316SS	Copper Cyanide	304SS
Zinc Acid	Quartz	Niklad	304SS
Zinc Ammonium Chloride	Titanium,qtz	Potassium Cyanide	304SS
Zincate	304SS	Zincate	304SS
Zeline	304SS	Glycerol	304SS
		Copper Strike	304SS
Specialty BLACK BKA	Titanium	Oil (30 wt)	304SS (DD)

**(D)=DERATED FROM 40 WSI TO 20 WSI**

**(DD)=DERATED FROM 40 WSI TO 10 WSI**

**(DDD)=DERATED FROM 40 WSI TO 5 WSI**

**In California 805-483-1101 , In the Continental U.S.A. 800-423-4195**

**FAX -805-487-5047**

