

Tubular Immersion Heater Selection Guide

The corrosion guide represents a compilation of available data and application experience on the relative compatibility of heater sheath materials and corrosive environments. It may be valuable in the initial selection of a heater sheath material to firstly check with the corrosion data. However, final selection should be made based on the specific exposure conditions, recommendations from the corrosive agents, manufacturer and preliminary testing.

CORRODANT	SHEATH MATERIALS									
	IRON AND STEEL	CAST IRON NI RESIST	300 SERIES STAINLESS	MONEL	INCONEL INCOLOY	COPPER	LEAD	ALUMINIUM	NICKEL	
Acetic Acid, Crude	X	C	F	F	C	F	X	F	F	
Pure		X		A	C	F	F	A	F	
Vapours		X		F	C	F	X	C	F	
150 PSI; 400°F.				F	C	F	X	C	F	
Acetone	C	F	A							
Alboloy Process	A									
Alodine 200°F.			A-347 A-316							
Aluminium Sulphate	X	C	F	F		F	A	C	C	
Ammonia Gas, Cold	A	A	A	A		C	A	A		
Hot	C	C	C	C		X	X			
Ammonia and Oil	A									
Ammonium Chloride	C	A	F	F		X	A	X	F	
Ammonium Hydroxide	A	A	A	C	A	X	A	F		
Ammonium Nitrate	A	C	A	C		X	X	F		
Ammonium Sulphate	A	A	A	A	F	A				
Amyl Alcohol				A	A					
Anhydrous Ammonia	A					X				
Aniline, Aniline Oil	A		A	A		X		X		
Aniline, Dyes			A	A						
Anodizing Solutions 10% Chromic Acid 96°F.	C		A							
Sulphuric Acid 70°F.								A		
Sodium Hydroxide Alkaline	A									
Nigrosine Black Dye				A					F	
Nickel Acetate				A			C		F	
Barium Chloride			F-304 X-316					X	A	
Barium Hydroxide			A			X	X	X	A	
Barium Sulphide			A	A		X	A			
Bleaching Solution 1½ lb. Oxalic Acid per Gallon of H ₂ O at 212°F.				A					F	
Bonderizing	C	F	A							
Cadmium Plating					A					
Carbolic Acid, Phenol	C	C	A	A	A	X	A	A		
Carbon Dioxide, Dry	A	A	A	A	A	A	A	A		
Wet	F	C	A	A	A	F	X	F		
Carbon Tetrachloride	C	C	C	A	A	C	F	C		
Castor Oil	A		A	A	A			A		
Chloroacetic Acid	X		X			X	X	X	F	
Chlorine, Dry	A	A	A	A		A	A	A		
Chlorine, Dry	A	A	A	A		A	A	A		

MATERIALS BEING HEATED	SHEATH MATERIALS									
	IRON AND STEEL	CAST IRON NI RESIST	300 SERIES STAINLESS	MONEL	INCONEL INCOLOY	COPPER	LEAD	ALUMINIUM	NICKEL	
Copper Sulphate	X	C	A	A	A	C	A	X		
Creosote	A	A	A	A		A		A		
Deoxidine			A							
Deoxylyle			A							
Diphenyl 300° - 350°	A									
Di Sodium Phosphate 25% 180°F.	A									
Diversey No. 99	A									
Dowtherm	A									
Ethers	A			A	A	A	A	A		
Ethyl Chloride	A		A	A		A			A	
Ethylene Glycol 300°F.			A	A					A	
Ferric Chloride	X	X	X	X	X	X	X	X	X	
Ferric Sulphate	X	X	F-304 A-316	X	C	X	A	X	X	
Formaldehyde	F	F	A	A	A	F	X	F		
Formic Acid	X		F	C	C	F	X	X	C	
Freon	C	A	C	A		A	A	A		
Fuel Oil	A		A	A		A	A			
Fuel Oil, Acid	C		C	A		C	A			
Gasoline, Sour	C	C	A	A	A	C	A	C		
Gasoline, Refined	A	A	A	A	A	A	A	A		
Glycerin, Glycerol	A	A	A	A		F	A	A		
Holdens 310A Tempering Bath										A
Houghtons Mar Tempering Salt	C									C
Hydrochloric Acid <150°F.	X	X	X	C		X	F	X	C	
>150°F.	X		X	C		X	X	X	C	
Hydrofluoric Acid, Cold <65%	X	X	X	F		C	F	X	X	
>65%	F		X	A		F	C	X		
Hot <65%	X		X	C		X	X	X	X	
>65%	C		X	A		F	X	X		
Hydrogen Peroxide	X	X	A	F	A	X	F	A	F	
Iridite 1-Part and 5-Parts, Water 200°F.								A		
Isopropanol	C			A		F				
Kerosene	A		A	A	A	A	A			
Kolene										A
Lacquer Solvents	C	A	A	A		C			A	
Lard	F									
Linseed Oil	A		A	A	A	A	A	A		
Magnesium Chloride	F	F	F	F		F	X	X	F	
Magnesium Hydroxide	A	A	A	A		X		X	A	
Magnesium Sulphate	A	A	A	A		A		C		

Corrosion Resistance Ratings: A=Good F=Fair C=Depends on conditions X=Unsuitable.