

Sheath Material Selection Guide

CORROSION POLICY

TEMPCO cannot warrant any electric immersion heater against failure by sheath corrosion if such failure is the result of operating conditions beyond the control of the heater manufacturer. The facts and recommendations appearing in the TEMPCO catalog or any other literature published by TEMPCO are based on our own research and the research of others, and are believed to be accurate. We cannot anticipate all conditions under which this information and our products, or the products of other manufacturers in combination with our products, may be used.

We accept NO responsibility for results obtained by the application of this information or the safety and suitability of our products, either alone or in combination with other products. It is the responsibility of the Purchaser to make the ultimate choice of sheath material based on his/her knowledge of the chemical composition of the corrosive solution, character of materials entering the solution, and controls, which he/she maintains, on the process.

Examples of process variables that can affect heater sheath selection

- * Solution chemistry
- * Solution contamination
- * Temperature
- * Flow rate (velocity) past heater
- * Heater watt density
- * Heating cycle (time-on, time-off)
- * Galvanic behavior
- * Degree of aeration

Key to Notes in Sheath Material Selection Guide:

1. This solution contains a mixture of various chemical compounds whose identity and proportions are unknown or subject to change. Check with chemical supplier to confirm suitability of sheath material chosen.
2. Caution—flammable material.
3. Chemical composition varies widely. Check supplier for specific recommendations.
4. Direct immersion heaters not practical. Use clamp-on heaters on outside surface of cast iron pot.
5. Element surface loading should not exceed 20 watts per square inch.
6. For concentrations greater than 15%, element surface loading should not exceed 20 watts per square inch.
7. See suggested watt density chart.
8. Remove crusts at liquid level.
9. Clean often.
10. Passivate stainless steel, Inconel® and Incoloy®.



Maximum Recommended Watt Densities for Various Materials

Material Being Heated	Maximum Operating Temperature °F	Maximum Watt Density W/in ²
Acid Solutions	180	40
Alkaline Solutions, Oakite	212	40
Ammonia Pltg. Solution	50	25
Asphalt, Tar or Heavy Compounds	200-500	4-10
Caustic Soda 2%	210	45
10%	210	25
75%	180	25
Degreasing Solution Vapor	275	20
Electroplating Solution	180	40
Ethylene Glycol	300	30
Fatty Acids	150	20
Fuel Oils		25-30 circ.
Light Grade	180	8
Heavy (Bunker C)	160	23
Gasoline	300	10
Glycerine	500	

Material Being Heated	Maximum Operating Temperature °F	Maximum Watt Density W/in ²
Machine Oil SAE 30	250	15-20 non-circ.
Metal Melting Pot	500-900	20-27
Mineral Oil	400	16
Molasses	100	4-5
Molten Tin	600	20
Oil Draw Bath	600	20
Paraffin or Wax	150	16
Potassium Hydroxide	160	25
Propylene Glycol	150	20
Steel Tubing Cast Into Aluminum	500-750	50
Steel Tubing Cast Into Iron	750-1000	55
Trichlorethylene	150	20
Water (Process)	35-150	100-125 circ.
	212	75-100 non-circ.
		75 circ.
		50 non-circ.