



closing the loop on thermal solutions

Immersion Heaters

APPLICATION GUIDELINES

The goal is to optimize the heater configuration to ensure the longest life possible, while minimizing overall product and life cycle costs. The general temperature, sheath material and watt density guidelines below can aid in proper heater selection for some common liquids. Contact Durex for further assistance.

Liquid	Maximum Operating Temperature °F (°C)	pH Level and/or Concentration	Recommended Sheath Material	Typical Plug Material	Maximum Watt Density W/in2 (W/cm2)
Clean, Potable Water	212 (100)	Neutral (pH 6 to 8)	Copper	Brass	60 - 90 (9.5 - 14)
Process Water & Weak Solution	212 (100)	pH 5 to 9; 2-3%	Incoloy® or 304SS	Steel or 304SS	48 (7.5)
Demineralized, Deionized Water	212 (100)	Neutral	304SS or 316SS (passivated)	304SS or 316SS	60 (9.5)
Weak (Acidic) Solutions*	210 (100)	Up to 5-6%	Incoloy®, 316SS	Steel	48 (7.5)
Mildly Corrosive (Acidic) Solutions*	180 (80)	5-15%	Incoloy®, 316SS	304SS or 316SS	20 - 23 (3.5)
Severely Corrosive (Acidic) Solutions*	180 (80)	>15%	Incoloy®, titanium, Teflon®	304SS or Other	15 - 16 (2.5)
Caustic Soda 10%	210 (100)	pH 14; 10%	Incoloy®	Steel	20 - 23 (3.5)
Caustic Soda 50%	250 (120)	pH 14; 50%	Incoloy®	Steel	16 (2.5)
Fuel Oil 1 & 2; Kerosene Lube Oil SAE 10 to 30	200-250 (95-120)	-	Steel	Steel	20 - 23 (3.5)
Fuel Oil 4 & 5; Lube Oil SAE 40 to 50	200-250 (95-120)	-	Steel	Steel	15 - 16 (2.5)
Fuel Oil 6 & Bunker C	160 (70)	-	Steel	Steel	6 - 8 (1.2)
Hydraulic Oil	100 (40)	-	Steel	Steel	15 - 16 (2.5)
Ethylene Glycol	300 (150)	-	Steel	Steel	23 - 30 (3.5 - 4.5)
Glycerine	500 (260)	-	Incoloy®	Steel	8 - 10 (1.5)
Molten Salt Bath	800 (425)	-	Steel, 321SS, Monel®	Steel	23 - 30 (3.5 - 4.5)
Paraffin Wax	150 (65)	-	Steel or 304SS	Steel	15 - 16 (2.5)
Molasses	100 (40)	-	304SS or 316SS	304SS	4 - 5 (0.7)

*Sheath material and watt density dependent on type of acid, concentration, temperature, aeration, movement, etc.

Please note that the user accepts full responsibility for validating that a heater is suitable for a given liquid or gas heating application.

Ensure that heater elements are completely covered in liquid AT ALL TIMES. Failure to do so may cause the heater elements to operate in open air and fail prematurely, or worse, lead to ignition of flammable vapor mixtures, causing serious personal injury and equipment damage. Liquid level sensors are highly recommended.

Durex recommends the use of a thermostat or process controller as well as a high limit sensor and FM approved safety controller to prevent unexpected over temperature conditions.