Immersion

Screw Plug Immersion Heaters

Selection Guidelines

Selecting a Screw Plug Heater

The selection of the proper screw plug immersion heater requires critical engineering judgement. After determining the heat requirement (see the Technical section of this catalog), the proper selection of the screw plug material, heating element sheath material and correct watt density is critical for long life of the heater. The following table may be used as a guide to this selection, along with the Technical Information at the back of this catalog. Ultimate choice is determined by the knowledge of the process and engineering acumen of the plant engineer.

Application Factors

Heater application is influenced by the following parameters.

- 1 The heated media, viscosity, specific heat, density and corrosive properties.
- (2) Contaminants or pH present in the media.
- The corrosion resistant properties of heater sheath material.
- 4 Watt density of the heating element—the heat output per square inch.
- (5) Screw plug material.

Typical Applications

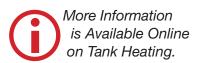
See screw plug immersion heater selection guide below for your application.

- · Hot Water Storage Tanks
- Warming Equipment
- · Preheating all Grades of Oil
- · Food Processing Equipment
- Cleaning and Rinsing Tanks
- Heat Transfer Systems
- · Process Air Equipment
- Boiler Equipment
- Freeze Protection of Any Fluid

Screw Plug Immersion Heaters — Selection Guidelines

	1	2	3	4	5	
Application	Solution or Heater Type	Alkaline or Acid Content (Est. % by Volume)	Sheath Material	Watt Density (W/In²)	Screw Plug Material	
Water & Very	Clean Water pH6 to pH8 Neutral Co	Copper	45	Brass		
Mild Solutions	Process Water or Very Weak Solutions	pH5 to pH9 2-3%	Stainless Steel ¹	45	Stainless Steel	
	Weak Solutions	5-6%	INCOLOY®	45	Stainless Steel	
	Demineralized, Deionized water	_	INCOLOY® Stainless Steel ¹	45	Stainless Steel Stainless Steel	
Corrosive & High Viscous Solutions	Mild Corrosive Solution	5-15%	INCOLOY® or Stainless Steel1	23	Stainless Steel	
	Severe Corrosive Solution	16% or more	INCOLOY®, Stainless Steel or Titanium	15	Stainless Steel	
Oil Heating	Low Viscosity Oil Medium Viscosity Oil High Viscosity Oil	_ _ _	Steel Steel Steel	23 15 6	Steel Steel Steel	
Specialty Heaters	Small Tanks Process Water Demineralized Water Low Viscosity Oil Pipe Insert Commercial Equipment	pH5 to pH9 — — — — Clean Water	Stainless Steel ¹ Stainless Steel ¹ Stainless Steel INCOLOY [®] Copper	45 45 23 12 60	Brass Stainless Steel Steel Steel Brass	

Note — Liquid level controls are suggested for all immersion heating applications. See Controls section in this catalog.



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Screw Plug Immersion Heaters Application Guidelines

Application Element — Guidelines

Application	Screw Plug Size (In.)	Sheath Material	Screw Plug Material	Heater Model	Integral Thermostat	Page
Clean Water	1 1-1/4 2 2 2 2 2 2-1/2 2-1/2	Copper Copper Copper Copper Copper INCOLOY® Copper Copper	Brass Brass Brass Brass Brass Brass Brass Brass	ARTM MT-1 EMT-3 ARMT-2 MT-2 CH-SD ARMT-3 MT-3	Yes No No Yes No Vo Yes No	B-7 B-10 B-15 B-11 B-13 B-16 B-17 B-21
Process Water	1 2 2 2 2 2-1/2 2-1/2	SS SS SS SS SS SS	SS SS SS SS SS SS	ARTMS ARMTS-2 MTS-2 AREMTS-3 EMTS-3 ARMTS-3 MTS-3	Yes Yes No Yes No Yes No	B-23 B-27 B-29 B-31 B-32 B-34 B-36
Solution Water	2 2 2 2 2-1/2 2-1/2	INCOLOY® INCOLOY® INCOLOY® INCOLOY® INCOLOY® INCOLOY® INCOLOY®	SS SS SS SS SS	ARMTI-2 MTI-2 AREMTI-3 EMTI-3 ARMTI-3 MTI-3	Yes No Yes No Yes No	B-38 B-40 B-41 B-42 B-43 B-45
Corrosive Solutions	2 2 2 2	SS SS INCOLOY® INCOLOY®	SS SS SS SS	AREMTS-3 EMTS-3 AREMTI-3 EMTI-3	Yes No Yes No	B-46 B-47 B-48 B-49
Severely Corrosive Solutions	2 2 2 2	SS SS INCOLOY® INCOLOY®	SS SS SS SS	AREMTS-3 EMTS-3 AREMTI-3 EMTI-3	Yes No Yes No	B-50 B-51 B-52 B-53
Light Weight Oil	1 1-1/4 2 2 2 2 2 2-1/2 2-1/2	Steel	Steel Steel Steel Steel Steel Steel Steel Steel	ARTMO-1 MTO-1 ARMTO-2 MTO-2 AREMTO-3 EMTO-3 ARMTO-3 MTO-3	Yes No Yes No Yes No Yes No	B-54 B-57 B-58 B-60 B-61 B-62 B-63 B-65
Medium Weight Oil	2 2 2 2 2-1/2 2-1/2	Steel Steel Steel Steel Steel Steel	Steel Steel Steel Steel Steel Steel	ARMTO-2 MTO-2 AREMTO-3 EMTO-3 ARMTO-3	Yes No Yes No Yes No	B-67 B-68 B-69 B-70 B-71 B-72
Heavy Weight Oil	2 2 2 2 2-1/2 2-1/2	Steel Steel Steel Steel Steel Steel	Steel Steel Steel Steel Steel Steel	ARMTO-2 MTO-2 AREMTO-3 EMTO-3 ARMTO-3 MTO-3	Yes No Yes No Yes No	B-73 B-74 B-73 B-74 B-75 B-75
Specialty Heaters — Water, Oil & Corrosive Fluids	1/2 1/2 1/2 1/2 1/2 3/4 3/4 1 1 1 1 1-1/4 2	INCOLOY® SS INCOLOY® SS SS INCOLOY® SS Copper Copper Copper SS Steel Copper INCOLOY® INCOLOY®	Steel Steel Brass Brass SS Brass Brass Brass Steel SS Steel Brass Brass Steel Brass	RI RIO RIN RINO RIS RIN RINO TMW-1 TM-1 TMWS-1 TMO-1 TMW-2 DWH-MR	No N	B-79 B-79 B-80 B-80 B-80 B-80 B-76 B-76 B-78 B-77 B-81 B-81

Note — SS denotes 304 Stainless Steel.