

## Flanged Immersion Heaters

### Application & Selection Guidelines

#### Selection Guidelines

The selection of the proper Flanged Immersion Heater requires critical engineering judgement. After determining the heat requirement (see the applications section of this catalog), the proper selection of the flange material, heating element sheath material and correct watt density is critical for long life of a 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.

Heater application is influenced by the following parameters.

- ① The heated medium viscosity, specific heat density and corrosive properties.
- ② Contaminants present in the medium.
- ③ The heater sheath material corrosion resistant properties.
- ④ Watt density of the heating element — the heat output per square inch.
- ⑤ Maximum sheath temperature — this is the recommended maximum sheath temperature of the element material. It is not the operating temperature of the heated medium (sheath temperature is dependent on items 1 thru 4).

#### Applications

See Selection Guidelines 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

#### Application Selection — Guidelines

Application	①	②	③	④	⑤
	Solution or Heater Type	Alkaline or Acid Content (Est. % by Volume)	Sheath Material	Watt Density (W/in <sup>2</sup> )	Max. Recommended Sheath Temp. (°F)
Water & Very Mild Solutions	Clean Water	pH6 to pH8 Neutral	Copper	45	350
	Process Water	pH5 to pH9	Stainless Steel <sup>1</sup>	45	1200
	Very Weak solutions	2 - 3%	INCOLOY®	45	1600
	Weak Solutions	5 - 6%	INCOLOY®	45	1600
Corrosive & High Viscous Solutions	Demineralized, De-ionized or pure water	—	INCOLOY® w/ Stainless Flange	45	1600
	Mild Corrosive Solution	5 - 15%	Stainless Steel <sup>1</sup>	23	1200
	More Severe Corrosive Solution	10 - 25%	INCOLOY®	23	1200
Specialty Water	Severe Corrosive Solution	30 - 60%	INCOLOY® w/ Stainless Flange	15	1600
	Steam Boilers	Treated	INCOLOY®, Copper	—	1600
Oil	Low Viscosity Oil	—	Steel	23	750
	Medium Viscosity Oil	—	Steel	15	750
	High Viscosity Oil	—	Steel	6.5	750
Oil Reservoir	Lubrication Oil	—	Steel	15	750
Air, Gases & Steam	Low Temperature		Stainless Steel	23	1200
	High Temperature		INCOLOY®	23	1600

1. Passivated stainless steel recommended for water.

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Application	Flange Size (In.)	Sheath Material	Flange Material	Heater Type	Page
Clean Water	3	Copper	Steel	TM	B-95
	5	Copper	Steel	TM	B-95
	6	Copper	Steel	TM	B-96
	8	Copper	Steel	TM	B-96
	10	Copper	Steel	TM	B-96
	12	Copper	Steel	TM	B-96
Process Water	14	Copper	Steel	TM	B-96
	3	SS	Steel	TMS	B-97
	5	SS	Steel	TMS	B-98
	6	SS	Steel	TMS	B-98
Solution Water	8	SS	Steel	TMS	B-98
	3	INCOLOY®	Steel	TMI	B-99
	5	INCOLOY®	Steel	TMI	B-100
	6	INCOLOY®	Steel	TMI	B-100
Mildly Corrosive Solution	8	INCOLOY®	Steel	TMI	B-100
	3	SS	Steel	TMS	B-101
	5	SS	Steel	TMS	B-102
	6	SS	Steel	TMS	B-102
Corrosive Solution & Gas	8	SS	Steel	TMS	B-102
	3	INCOLOY®	Steel	TMI	B-103
	5	INCOLOY®	Steel	TMI	B-104
	6	INCOLOY®	Steel	TMI	B-104
	8	INCOLOY®	Steel	TMI	B-104
	10	INCOLOY®	Steel	TMI	B-104
Severely Corrosive Solution	12	INCOLOY®	Steel	TMI	B-104
	14	INCOLOY®	Steel	TMI	B-104
	3	INCOLOY®	SS	TMIS	B-105
	5	INCOLOY®	SS	TMIS	B-105
Demineralized or De-ionized Water	6	INCOLOY®	SS	TMIS	B-105
	3	INCOLOY®	SS	TMIS	B-106
Light Weight Oil	5	INCOLOY®	SS	TMIS	B-106
	3	Steel	Steel	TMO	B-107
	5	Steel	Steel	TMO	B-107
	6	Steel	Steel	TMO	B-108
	8	Steel	Steel	TMO	B-108
	10	Steel	Steel	TMO	B-108
	12	Steel	Steel	TMO	B-108
14	Steel	Steel	TMO	B-108	
Medium Weight Oil	3	Steel	Steel	TMO	B-109
	5	Steel	Steel	TMO	B-109
	6	Steel	Steel	TMO	B-109
Heavy Weight Oil	3	Steel	Steel	TMO	B-111
	5	Steel	Steel	TMO	B-111
Boiler & Water	2-1/2 Sq.	Copper	Brass	TTSF	B-112
	2-1/2 Sq.	INCOLOY®	Steel	TTSF	B-112
	4-1/2 Sq.	Copper	Steel	WCSF	B-112
Food Equipment	3-1/4 Dia.	Copper	Brass	TTUH	B-113
		Copper	Brass	TTUH-CO	B-114