

MAXIMUM RECOMMENDED SHEATH WATT DENSITIES FOR VARIOUS MATERIALS

THE MAXIMUM SHEATH WATT DENSITY VALUES LISTED BELOW ARE INTENDED AS A GENERAL GUIDE. SAFE VALUES VARY WITH OPERATING TEMPERATURES, FLOW VELOCITY, AND HEAT TRANSFER RATE THROUGH THE MATERIAL. IN GENERAL, THE HIGHER THE MATERIAL TEMPERATURE, THE LOWER THE SHEATH WATT DENSITY SHOULD BE.

MATERIAL BEING HEATED	SUGGESTED SHEATH MATERIAL	MAX. OPERATING TEMP.		RECOMMENDED MAX.	
		°F	°C	WATTS/SQ. INCH	WATTS/SQ. CM
Acid Solution — Low percentages by volume	316 St. Steel	180°	82°	20	3.1
Mild Alkali & Cleaning Solutions — Oakite, etc.	Steel St. Steel	212°	100°	40	6.2
Asphalt, Tar & Similar Products	Steel	200°	93°	10 for circ. 5 for non-circ	1.6 0.8
		400°-500°	204°-260°	6 for circ. 3 for non-circ.	0.9 0.5
Caustic-Soda — less than 5% 5-20% above 20%	St. Steel	210°	99°	45	7.0
		210°	99°	25	3.9
		200°-180°	93°-82°	20 and down	3.1
Dowtherm A	Steel	600°	316°	20 and down	3.1
Dowtherm E	Steel	400°	204°	12	1.9
Ethylene Glycol	Steel	300°	149°	20-30	3.1-4.7
Freon	Steel	300°	149°	2-3	0.3-0.5
Fuel Oil — light grade	Steel	160°-180°	71°-82°	25-30 circ. 15-20 non-circ.	3.9-4.7 2.3-3.1
				heavy — Bunker C	Steel
Gasoline and Kerosene	Steel	300°	149°	2-5	0.3-0.8
Heat Transfer Oils	Steel	500°-600°	206°-316°	20-15	3.1-2.3
Lead-stereotype Pot	Cast Iron Steel	600°	316°	35 (casting)	5.4
Linseed Oil	Steel	150°	66°	50	7.8
Machine Oil	Steel	250°	121°	20-25 circ. 15-20 non-circ.	3.1-3.9 2.3-3.1
Metal Melting Pot	Steel-St. Stl.	500°-900°	260°-482°	25-20	3.9-3.1
Molasses	Steel	100°	38°	3-5	0.5-0.8
Paraffin or Wax	Steel	150°	66°	15	2.3
Salt Bath — Molten	St. Steel	800°-950°	427°-510°	30-25	4.7-3.9
Steel tubing cast in aluminum		750°	399°	50	7.8
Steel tubing cast in cast iron		1000°	538°	55	8.5
Tin — Molten	Steel	600°	316°	20	3.1
Trichlorethylene	Steel	150°	66°	20	3.1
Vapor Degreasing Solutions	Steel	275°	135°	20	3.1
Vegetable Oil, Shortening in liquid state	Steel-St. Stl.	400°	204°	30-40 Circulating 15-25 non-circulating	4.7-6.2 2.3-3.9
				Shortening below 100 F	Steel
Water	Copper Incoloy	35°-150°	2°-66°	100-125 Circulating 75-100 non-circulating	15.5-19.4 11.6-15.5
		212°	100°	75 Circulating 50 non-circulating	11.6 7.8
		300°	149°	Low flow volume 10 High flow volume 25-30	1.6 3.9-4.7
Steam	St. Steel Incoloy	500°	260°	Low flow 5-10 High flow 20-25	0.8-1.6 3.1-3.9
		700°	371°	Low flow 5 High flow 15-20	0.8 2.3-3.1