RULE-OF-THUMB

Wattage for Heating Hydraulic Oil:

1 Watt Will Heat 1 Gallon 1°F in 1 Hour

Example of Use of Chart. Assuming a reservoir with 70 square feet of surface, 525 watts would be needed to keep the oil 10°F above surrounding air temperature, or, 2625 watts to keep it 50°F above air temperature.

ELECTRICAL POWER TO MAINTAIN ELEVATED OIL TEMPERATURE

Figures in the chart are watts required on heating elements.

Sq. Feet Tank Surface ↓	Air/Oil Temperature Difference, Degrees F.									
	10°	20°	30°	40°	50°	60°	70°	80°	90°	100°
10	75	150	225	300	375	450	525	600	675	746
20	150	300	450	600	746	900	1050	1200	1350	1500
30	225	450	675	900	1120	1350	1575	1800	2025	2250
40	300	600	900	1200	1500	1800	2100	2400	2700	3000
50	375	746	1120	1500	1875	2250	2625	3000	3375	3750
60	450	900	1350	1800	2250	2700	3150	3600	4050	4500
70	525	1050	1575	2100	2625	3150	3675	4200	4725	5250
80	600	1200	1800	2400	3000	3600	4200	4800	5400	6000
90	675	1350	2025	2700	3375	4050	4725	5400	6075	6750
100	746	1500	2240	3000	3750	4500	5250	6000	6750	7500
125	935	1865	2800	3750	4675	5600	6550	7475	8400	9350
150	1125	2235	3360	4500	5600	6725	7850	8950	10,100	11,250

HEAT RADIATION FROM METAL SURFACES

For every foot of metal surface with oil on one side and exposed to free air circulation, 135 BTU per hour can be radiated without the oil temperature rising to more than 50 degrees F above surrounding air temperature.

TABLE 6-B. Heat Radiating Ability of Typical Steel Tanks

Typical Tank, Size	Sq. Feet Radiating Surface	Heat Radiation BTU/hr	Heat Radiation Horsepower
6 gals.	4½	550	0.20
12 "	6¾	850	0.34
18 "	8½	1000	0.40
33 "	13¼	1700	0.67
80 "	24	3000	1.18
120 "	30	4000	1.60
250 "	50	6800	2.70

HEAT RADIATION CHART FOR OIL RESERVOIRS - For Sizing Heat Exchangers

Figures in body of chart are radiation figures in BTU per hour that can be radiated at various temperature differences and for tanks of various square foot radiation surfaces.

Sq. Ft. Surface	Temp Difference °F Between Air and Oil								
	10	20	30	40	50	60	80	100	125
10	256	512	767	1025	1280	1530	2048	2560	3200
20	512	1025	1530	2048	2560	3072	4090	5120	6400
30	767	1530	2304	3072	3840	4610	6140	7670	9600
40	1025	2048	3072	4090	5120	6140	8180	10,250	12,800
50	1280	2560	3840	5120	6400	7670	10,250	12,800	16,000
60	1530	3072	4610	6140	7670	9200	12,300	15,300	19,200
70	1792	3580	5375	7160	8950	10,750	14,320	17,920	22,400
80	2048	4090	6140	8180	10,250	12,300	16,380	20,480	25,600
90	2304	4610	6920	9200	11,500	13,800	18,430	23,040	28,800
100	2560	5120	7670	10,250	12,800	15,300	20,480	25,600	32,000
125	3200	6400	9600	12,800	16,000	19,200	25,600	32,000	40,000
150	3940	7670	11,520	15,300	19,200	23,040	30,720	39,400	48,000