

Condenser System Scale vs. Energy Cost

Calcium Carbonate Scale Thickness (mm)	Common Items with similar thickness	% Energy Increase in Chiller	Annual Energy Cost Increase per every 100 Tons
0.00 mm	-	0%	\$0
0.25 mm	Aluminum Foil	9%	\$1,968
0.50 mm	Fingernail	18%	\$3,936
0.75 mm	Credit Card	28%	\$6,123
1.00 mm	Paper clip	37%	\$8,091
1.25 mm	Dime	46%	\$10,060
1.50 mm	Penny	55%	\$12,029

- Annual Energy Costs based on 100 Ton HVAC Water Cooled Tower System, operating 18 hours/day, 6 months/year.
- Rate of Energy cost estimated at \$0.09 per kWh, requiring 0.75 kW/(h Ton) of refrigeration for compressor operation.

Example Calculation:

For a 500 Ton Tower, operating 18 hour/day, 6 months/year with 0.75 mm calcium carbonate scale, the annual increase in energy cost is 5 x \$6,123 = **\$30,615 per year**