

Effect of Scale on Evaporative Condenser Performance

Even minimal amounts of scale on the condensing coil surface will affect the performance of evaporative condensers. Figure 1 illustrates the impact of scale build-up on condenser performance. With only 1/32" thick scale, the evaporative condenser performance is robbed of 27% of its heat transfer capability. As scale thickness increases, capacity losses increase significantly.

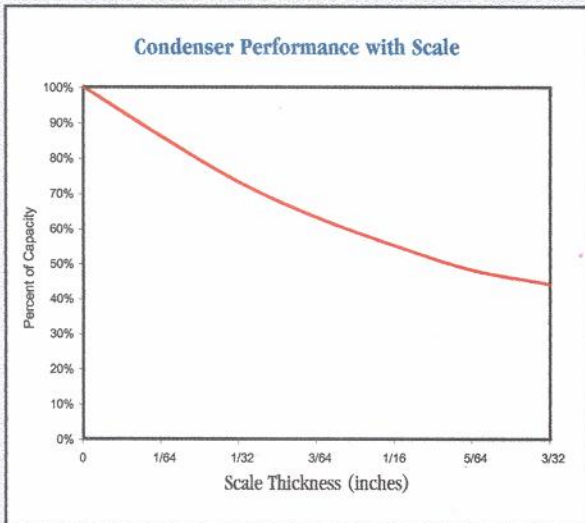


Figure 1

The Cost of Scale

Although the formation of scale is not always noticed by the system operator, an evaporative condenser with a scaled-up coil forces other system components to work harder to make up for its shortcomings. In a refrigeration system, the burden is placed on the compressor. With scale build-up on the condenser coil, the compressors will work against higher head pressures, and

therefore consume greater energy and reduce output. This will increase system-operating costs year-round, although it may go unnoticed until the system operates on the hottest days.

With just 1/32" thick scale, the compressor power will increase 7% and the compressor tonnage will decrease 1%. This reduces maximum plant throughput and associated revenue by a similar percentage. Figure 2 illustrates further penalties as scale increases.

In addition to lost throughput, the energy costs for 1/32" of scale on the coil are significant. For example, consider a 1,000 TR freezer application with 0° F suction and 95° F condensing. **The additional energy costs** associated with 1/32" thick scale amount to 25% of the cost of a new condenser each and every year.**

**Based on 50% annual usage, \$10/kWh per month demand charge, and \$0.05/kWh electric rate.

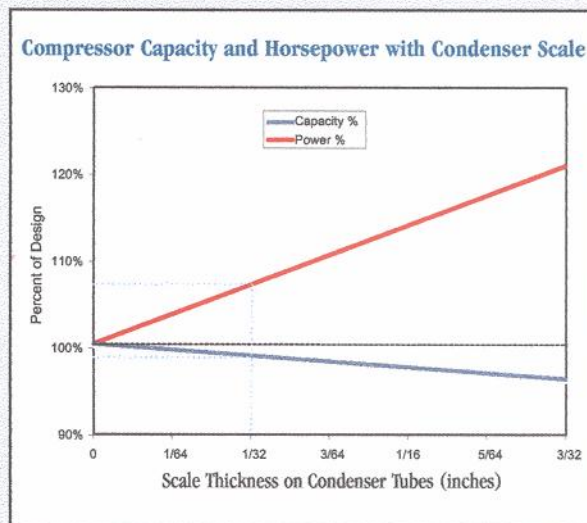


Figure 2

The CXV Evaporative Condenser minimizes scale potential to ensure sustained performance and maximized coil life. For more information on the CXV or the benefits of advanced coil technology, please contact your local B.A.C. Representative or visit our website at <http://www.BaltimoreAircoil.com>.



For more information...contact

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