

Technology Corner

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Free Cooling is not totally free ...

The downside to “free” cooling is that it relies on efficient transmission of outside air through equipment fin coils to allow fans to work at maximum efficiency with the lowest energy input. A large data center for a major bank, located in the United Kingdom, had four new dry air coolers fitted for the facility. Manufactured and installed by Coolers & Condensers Limited, it soon became evident to them that local environmental conditions were going to cause system problems. Data centers house sensitive computers that require a consistently high level of critical cooling. Minimizing any chance of cooling disruption that impacts uptime and costs associated with cooling is mandatory.



Less than one mile from the data center is a recycling plant, a landfill site and large stretches of woodland or open grassland. Depending on the season, the outside air carries seeds, pollen, dust, leaves and insects into the air intake fin coils. The system becomes repeatedly clogged, creating reduced efficiency and increased energy consumption. Tech Services consultant, Dave Lewis, contacted Richard Betts of RAB Specialist Engineers Limited to submit a proposal for external filter protection of the coils, as well as additional cold weather curtains to prevent added wind chill factors during winter months.

RABSE was able to offer a variety of solutions by using the manufacturing flexibility of Permatron, located near Chicago, and many years of experience in air filter design. PreVent® Model U woven polypropylene filters were custom sized and designed to be mounted with nylon drop tab fasteners secured to the cooler's framework with stainless steel grommets. To create the winter curtain, solid vinyl sheeting was also custom sized and fitted in the same fashion with vinyl edging and stainless steel grommets to match each filter. The air intake filters remain on the equipment year-round for debris protection. During winter, when freezing temperatures create



Installation began by cleaning the coil fins, 64 in total, with a pressure washer and water to remove grime and protect aluminium fins from chemical damage.

system problems, HVAC technicians can react quickly by affixing the solid vinyl curtains before wind conditions generate ice and cause coil pipes to burst. The curtains are used as an alternative to adding glycol anti-freeze to the system, which has been found to reduce cooling efficiency by 30%. While the filter screens were fitted across the fin coils, the weather curtains hang across the outside face of the enclosure. Both filter screens and curtains use nylon snap fittings to combine overlapped edges for a completely smooth and secure finish for oversized air intake applications.



Cleaning all sixty-four coils on a monthly and sometimes weekly basis, at approximately thirty minutes per coil, took about sixteen hours to complete. The PreVent® filter screens are quickly vacuumed, brushed or rinsed clean to maintain free cooling efficiency at the site during normal operational conditions.

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