WATER TREATMENT NEWS

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Keep Your Coils Clean for Energy Savings

Facilities engineers have long understood the importance of cleaning and maintaining the waterside surfaces of their chillers and boilers. Keeping waterside surfaces clean and free of scale, corrosion byproduct buildup and microbiological growth extends the useful life of the equipment and saves energy by optimizing heat transfer.

Industry spends billions of dollars each year on water treatment programs designed to keep boiler and cooling systems clean and operating efficiently. This is money well spent, as the cost of a well-conceived water treatment program is returned many times over in reduced maintenance and operating costs. However, engineers who do an excellent job of maintaining their boilers and chillers often fail to apply similar maintenance programs to air-cooled coils in air handling units (AHUs) and roof-top units.

Dust, dirt and other airborne debris collects on coils as dirty air passes through AHUs and roof-top units. As these contaminants build up on the coil surface, air flow is restricted and heat transfer through the coil is reduced, making fan motors and compressors work harder to provide cooling and causing increased electrical usage. This translates to premature equipment failure and higher operational costs.

A study conducted in the summer of 2005 on a 1.2 million square foot, 34-story New York City office building proved that cleaning dirty coils provides substantial energy savings. The building has four large air handlers that service the air conditioned and heated space in the facility. The study focused on two of the air handlers, and determined, based on meticulous data collection before and after cleaning one of the AHU coils, that the energy savings from cleaning that single coil totaled more than $40,000 per year! The study also found that the pressure drop across the coils decreased by 14%, with a corresponding increase in air flow through the coil and a commensurate decrease in load on the fan motor. This obviously translates into lengthened fan motor service life. An added benefit was increased dehumidification of the cooled air during air conditioning, resulting in improved building occupant comfort.

While studies have not been conducted on the effects of cleaning roof-top units and other air-cooled condensers, it is reasonable to assume that a similar percentage gain in efficiency will be realized by cleaning these types of coils. Since this type of air-cooled condenser is directly exposed to the outdoor environment, many quickly become extremely fouled with dust, dirt and organic debris like cottonwood seeds, leaves and grass clippings. Regular cleaning with a good coil cleaner will result in substantial energy savings for the owner.

Coil cleaning involves the use of one of three different types of chemicals: acidic, alkaline or neutral. Selection of the correct chemical is determined by the type of coil and the contaminant to be removed from the coil. Alkaline cleaners are effective at removing greasy or oily deposits; deposits that have a high mineral content like silica (sand) or calcium and are tightly adherent to the coil are most effectively removed with an acidic cleaner.

Both the alkaline and acidic cleaners work by reacting with the aluminum in the coil fin to produce a dense foam. As the foam expands, it lifts the dirt and other contaminants off the coil; rinsing with water removes the contaminants. Extreme care must be taken when using either alkaline or acidic cleaners to *completely* rinse the chemical from the coil when the cleaning is complete. Failure to thoroughly rinse can result in severe damage to the coil and fins.

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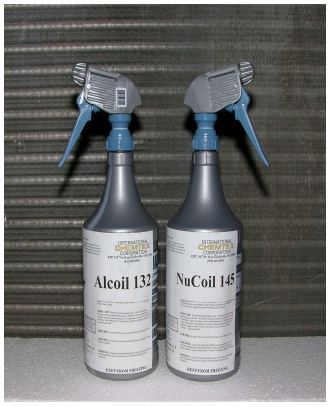

Alcoil 132 & NuCoil 145— alkaline and neutral coil cleaners produced by International Chemtex Corporation.

This Newsletter courtesy of:

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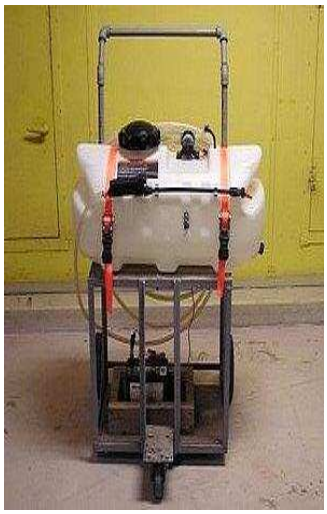

The cart-mounted spray system makes cleaning AHU coils easy

Keep your coils clean and save big bucks in energy costs -- ask your Chemtex representative about their line of coil cleaners today!

Neutral coil cleaners have been developed that essentially eliminate the danger of coil damage during cleaning. Neutral cleaners rely on surfactants for cleaning contaminants from the coil surface. Surfactants are chemicals that make the fins and coil surfaces slippery, causing contaminants to be released from the metal surface, allowing them to be easily rinsed away with water. The neutral chemical does not react with the aluminum in the coil or fin, eliminating the danger of excessive etching or corrosion during cleaning.

Neutral cleaners are also effective at cleaning evaporator coils. Since the neutral products do not attack the aluminum, they can be allowed to remain on the coil until condensate that forms during dehumidification rinses the cleaner and the accumulated dirt from the coil.

The coil cleaning process is simple—a dilute solution of the coil cleaning chemical is sprayed on the coil. After allowing the chemical a minute or two to lift or release the contaminants from the coil surface, the cleaner is rinsed from the coil along with the removed dirt. For roof-top units and other small air-cooled condensers the coil cleaner solution can be applied to the coil using a spray bottle or a small pump-up pressure sprayer. A typical unit can be cleaned in 15-30 minutes using this type of hand-held sprayer.

Large AHU coils require a different approach—the time required to apply cleaner to a 200 square foot coil surface using a hand-help sprayer would be prohibitive. Engineers at a large corporate office building in Minneapolis came up with an innovative solution to this problem.

While visiting a tool and equipment store in the twin cities area, one of the building engineers found an ATV-mounted spray system for applying weed killers and pesticides. They bought the unit, which includes a 16 gallon polyethylene solution tank, a 40 psi pump to maintain sprayer pressure, an adjustable spray wand and 20 foot hose for under $100.00. A thirty five dollar 12 volt lawn tractor battery supplies power for the pump. The engineer mounted the spray system on a pushcart, making for easy transport to each of the facility's 27 AHU coils.

Whether your facility has small air-cooled condensers or large air-handling units, keeping the coils clean will return big dividends to your company in decreased energy costs and extended equipment life. Using a good neutral coil cleaner and getting the right equipment for applying the cleaning solution makes the job quick and easy.

Condenser coil fouled with dust, dirt and vehicle exhaust particles. This caused increased electrical consumption in the air-conditioning system.

Same coil after one cleaning with NuCoil 145, a neutral coil cleaner produced by International Chemtex Corporation. System is now operating efficiently and has no difficulty in meeting cooling demand. Savings were estimated at 15 to 20%;