



Earthwise Environmental Case Study: Energy Savings at a Commercial Office Building

BENSENVILLE, Ill. – A commercial office building at 225 W. Wacker Drive in Chicago provides the opportunity to evaluate efficiencies of changing from the use of ethylene glycol-based antifreeze to a formate-based product – namely Earthwise Environmental’s *eGuard F* (Formate).

This low-viscous, biodegradable glycol alternative is engineered to provide freeze protection in HVAC chilled water systems while reducing corrosion, minimizing pumping requirements, improving water usage, prolonging equipment life and providing energy savings.

Situation:

The commercial facility’s HVAC chilled water system utilized 30-percent ethylene glycol to prevent AHU chilled water coils from freezing in winter. HVAC chilled water systems typically use either ethylene or propylene glycols to prevent coils from freezing. The percent of glycol used varies with system design, but is generally 30- to 40-percent glycol in the system. This is common practice in the Midwest as draining the coils will not remove all the water due to coil sag. With large temperature changes, systems must be ready to operate within hours.

There are known efficiency losses due to both pumping and heat transfer when using glycols. Pumping losses are due to both density of the product and change in viscosities over using water only. These losses can amount to an increase in pumping hp and size. Normal increases in hp (energy) needed for a 30-percent solution of glycol-based products is about 12.1 percent for ethylene glycol and 19.9 percent for propylene glycol. With using Earthwise *eGuard F*, the increase is 8 percent for a savings of 4.1 percent for ethylene glycol and 11.9 percent for propylene glycol.

Heat transfer losses are due to differences in thermo conductivity of fluids. Because of this, more chiller tonnage or gpm is needed for a set load, or a decrease in load will be utilized in the system. Energy losses with 30-percent glycols are 23.19 percent with ethylene glycol and 24.4 percent with propylene glycol.

Favorable Outcomes:

There is an increase in heat transfer using eGuard F over water of 2.86 percent. Thus, the savings from thermo efficiency using eGuard F is 26.05 percent for ethylene glycol and 27.26 for propylene glycol.

When gpm needed for heat transfer is included, the net savings using eGuard F is 17.6 percent for ethylene glycol and 14.86 percent for propylene glycol.

Facility Benefits:

- Conversion to eGuard F will save this commercial facility \$28,856 per year in chiller and pump energy costs.
- Product and engineering costs are \$39,970, with a ROI of 16 months.
- Incentive rate savings are \$8,988

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Earthwise Environmental Inc.TM provides environmentally-sound water management options to clients including hospitals, schools, hotels, food processing plants, light industrial and commercial buildings. The company offers proactive programs designed to reduce water consumption while helping clients understand the real energy impact of poorly managed water programs and the potential for energy savings. Earthwise also provides programs that manage and prevent waterborne diseases and is an established leader in the field of proactive control and education to prevent Legionnaires' disease created by the waterborne Legionella organism. Earthwise recommendations for Legionnaires' disease prevention exceed new industry standards set by ASHRAE. Chicago-area clients include Northwestern Memorial Hospitals, University of Chicago Hospitals, Soldier Field Stadium and Hamilton Partners' entire portfolio of commercial office buildings. For more about Earthwise Environmental, visit the company's newly redesigned website at www.EarthwiseEnvironmental.com.