

Project:

Energy Conservation Study
E-Coat Line

Client:

DaimlerChrysler Canada Inc.
Assembly Plant
Windsor, Ontario



Description:

Priming van bodies by means of electro-deposition (E-coating) requires significant amounts of energy at Chrysler's Windsor Assembly Plant. Much of this energy is input to the E-coat bath, a very large tank containing suspended paint solids that are deposited on the van bodies as they move through it.

The bath tends to heat up unless the temperature is carefully monitored and controlled. Chrysler had been cooling the bath using a 200 Ton chiller and two large plate type heat exchangers. The heat was rejected to a rooftop mounted cooling tower.

Byrne Engineering Inc. undertook a study to determine if the bath temperature could be maintained if the chiller was removed and only cooling tower water was used. The study was prompted by a desire on Chrysler's part to not only reduce energy costs, but to eliminate the ozone depleting CFC-11 used in the chiller.

Several options were examined in terms of equipment layout and pumping arrangements. In addition, alternatives for providing back-up cooling received careful scrutiny.

Possibilities included:

- Screw compressors employing HFC's
- Absorption units
- Connecting to a central chilled water system

Each of the alternatives was evaluated for technical feasibility, annual operating costs, reliability and capital cost.

It was determined that the bath temperature could be maintained on cooling tower water, even in mid-summer, as long as the heat exchangers were kept in a reasonably clean condition. Byrne Engineering Inc. recommended a piping/pumping configuration that minimized energy use and that back-up be provided by connecting to the central water system since this was the least cost and most reliable standby option.

Implementation of this scheme will save Chrysler about \$65,000 in electrical energy costs annually, reduce electrical demand by 188 kW and eliminate the need to meet costly future guidelines.