## Putting Conservation Strategies to Work

by Eric Rogers and Ted Molinari

A new board shop incorporates energy-saving techniques.

hen a new bare-board and assembly facility was built in Dallas, OR, Praegitzer Industries had the opportunity to design major energy-conserving components and integrate them into the new building's construction. Working with the contractor, local consultants, and the State Department of Energy, a Praegitzer design team set out to maximize the use of existing technology and aid the company in conserving energy as well as operational dollars.

Oregon has always worked to preserve its natural resources. Its focus on energy conservation was instrumental in the State Legislature approving tax credit programs for energy conservation, recycling, and pollution control. Programs of this type provide incentive for companies like Praegitzer to instigate energy-saving practices.

Oregon's Department of Energy played an important role in the Praegitzer undertaking. It informed the company about a variety of energy conservation programs, assisted in identifying areas that could benefit from conservation techniques, and responded promptly to applications and other documents that were a necessary part of the process. This joint effort between Praegitzer and the State Department of Energy had a simple goal: to maximize the company's production and create an enhanced work environment in a way that would conserve energy and decrease the cost of facility operations.

## TACKLING THE PROJECT

One of the focus areas for the new Praegitzer facility was lighting. Major sections of the plant received energy-saving ballasts and lights. Using parabolic reflectors in key placements reduced the total number of fixtures necessary for good lighting by about 15%. It is estimated that this was a second feature of plant construction that lent itself to innovative energy conservation techniques. A liquid-to-liquid exchange system was incorporated to provide heat for all process circuit board baths that require such heat. The system includes temperature control instrumentation, process piping, and a hot-water boiler



The air to air heat exchanger system is on the roof at Praegitzer's energy-conserving facility.

setup has saved some 300,000 kWh. Don Jose, maintenance supervisor at Praegitzer with an extensive background in industrial electrical applications, was pleased with the results. "The lighting system in the facility is excellent," he said, "and well worth the time and effort we spent in designing an energy-efficient system."

Process heating and heat recovery

that continuously recirculates 235° F water through a closed-loop system.

In addition, heat from wastewater and from water-cooled air compressor discharge is recovered through a 100gpm heat exchanger to preheat incoming domestic water. This process provides makeup water to the boiler, deionization systems, and tempered rinse water (Figure 1). John Powell,



**Figure 1.** Wastewater system preheats incoming domestic water to provide makeup water to the boiler, deionization systems, and tempered rinse water.



Figure 2. HVAC system reclaims exhausting heated air.

another maintenance supervisor, said the new system is a safe, economical, and efficient means of dealing with in-plant liquid heat requirements and does not appear to create any unusual maintenance problems. Energy savings with this system are estimated to be 1.2 million kWh.

Another area of concentration was heating, ventilating, and air conditioning (HVAC). The implemented HVAC system has several features that significantly conserve energy. For example, infrared gas heaters were used instead of gas hanging units. An A pattern heat exchanger reclaims exhausting heated air (Figure 2). Also installed were IIVAC economizers that constantly monitor inside vs. outside air temperatures, resulting in more efficient and more effective in-plant temperature control. High-performance heating and air conditioning equipment achieves constant, more efficient energy use. Finally, a computerized energy management system controls day and night modes, optimizes duty cycles, and provides demand control. The estimated energy conservation from all this equipment is 993,000 kWh.

## **REWARDS FOR HARD WORK**

Substantial effort went into designing the programs at Praegitzer, and this work didn't go unrewarded. In addition to lowering its energy costs and protecting the environment, the company received the Governor's Award for Energy Conservation in 1989 and a similar award from the U.S. Department of Energy. Praegitzer believes it's good public policy to provide incentives to businesses encouraging them to use conservation techniques and that it's good business policy to establish such conservation practices to sustain a healthy business climate without sacrificing natural resources.

Eric Rogers is a facilities manager and Ted Molinari is a vice president at Praegitzer Industries, Dallas, OR.