



Assessment Date: June 27, 2003

#### Benefits:

- Saves nearly \$4,600 per year initially
- Should save an additional \$19,000 or more per year with new HVAC system
- Has payback periods ranging from immediate to nearly 4 years

#### Applications:

Opportunities were identified that would decrease energy usage and costs while increasing productivity, improve product quality, and enhance corporate competitiveness.

## Moraine Molded Plastics, Inc.: Industrial Energy Assessment Finds Opportunities to Save \$24,000 in Annual Operating Costs

### Summary

The University of Dayton's Industrial Assessment Center (IAC) performed an energy audit of Moraine Molded Plastics, Inc., in Cincinnati, Ohio, that should save the company approximately \$24,000 per year in operating costs. The IAC, sponsored by the U.S. Department of Energy (DOE) Industrial Technologies Program (ITP), is one of 26 across the nation in which faculty and students provide eligible small- and medium-sized manufacturers with no-cost energy assessments. This assessment project was sponsored by ITP and The Society of the Plastics Industry, Inc. (SPI), a DOE Allied Partner.

Some energy-saving opportunities identified by the assessment team and implemented at the plant included replacing inefficient lighting and reducing the temperature of the barrel heater on the injection molding machines when the machines were not being used. The company also decided to improve the efficiency of the plant's heating, ventilating, and air-conditioning (HVAC) system to reduce defects, increase productivity, and reduce operators' fatigue by air-conditioning the plant.

### Company Background

Moraine Molded Plastics specializes in providing injection-molded component parts manufactured to extremely tight specifications for a variety of original equipment manufacturers. The plant facility measures 35,000 square feet, and its total energy budget is close to \$119,000 per year, the majority of which is electricity costs.

### Assessment Approach

A team of three students and one staff member from the University of Dayton IAC assessed this facility on June 27, 2003. The assessment was led by IAC Assistant Director Rebecca P. Blust.

### Recommendations

**Energy Conservation Awareness.** The assessment team identified some energy conservation awareness practices for the employees at Moraine Molded Plastics as cost-effective ways to significantly reduce energy consumption. Employees will be encouraged to turn off or shut down idle processing equipment, lights, fans, air compressors, and other types of energy-consuming components when they are not being used.



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**Air-Conditioning for the Manufacturing Area.** At the time of the assessment, the air temperature in the manufacturing areas of the plant was not being controlled. Managers said that the resulting inconsistent air temperatures had been adversely affecting the plant's performance and workers' productivity during summer months. They believe that if the temperature can be controlled better, production levels will increase while equipment downtime and the number of defective products both decrease. Greater productivity at a custom-made products plant means that less equipment and labor are needed to meet production levels. Although this recommendation actually increases energy use, the operation savings more than compensate for the additional cost. The assessment team therefore recommended installing new HVAC equipment to control the temperature in the plant.

**Lighting.** The plant production area is lit by 170 F96T12 fixtures, each containing two 60-W lamps. The average lighting level is about 35 foot-candles (fc) under the plant's skylights and about 20 fc in the rest of the plant. High-bay fluorescent lights are available that provide more light, improve the overall quality of the lighting, and use less energy than the T12 lights. The assessment team therefore recommended replacing the 170 F96T12 fixtures in the production area with 52 six-lamp, high-bay fluorescent fixtures.

## Results

Moraine implemented three of the team's six recommendations. The table below describes these projects and shows that the company expects to save \$24,070 in annual costs, in addition to energy savings and productivity gains.

### Implemented Recommendations for the Moraine Molded Plastics Plant in Cincinnati, OH

Project Category/ Recommendation	Annual Resource Savings	Annual Cost Savings	Implementation Cost	Payback Period
<b>Productivity</b> Air condition manufacturing area	77,850 pieces; 226 hours	\$19,485	\$50,000	2.6 years
<b>Lighting</b> Replace 2-lamp F96T12 lights with bay fluorescent lights	40,000 kWh; 9.6 kW	\$3,360	\$11,700	3.5 years
<b>Controls</b> Reduce the temperature of the barrel heater when not in use	37,065 kWh	\$1,225	\$0	Immediate
<b>Total</b>	<b>77,850 pieces 226 labor hours; 77,065 kWh/yr; 9.6 kW/yr</b>	<b>\$24,070</b>	<b>\$61,700</b>	

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### Project Partners:

Moraine Molded Plastics, Inc.  
Cincinnati, OH

The Society of the Plastics Industry, Inc.  
Washington, DC

### For Additional Information:

Industrial Technologies Program  
Energy Efficiency and Renewable Energy  
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