



Dickten & Masch: Energy Assessment Finds Potential Savings for Plastics Manufacturer

ASSESSMENT DATE: JULY 10, 2003

BENEFITS:

- 66% of recommendations were implemented in the first 12 months
- Implemented recommendations will result in savings of \$34,743
- Paybacks range from 2 to 29 month

APPLICATIONS:

The Dickten & Masch Manufacturing Co. assessment team discovered opportunities to decrease energy usage and increase productivity, thereby increasing capacity, improving product quality, and enhancing corporate competitiveness. In order to decrease energy usage and increase productivity, the assessment team focused primarily on the manufacturing process as well as: lighting, heating, compressed air, and waste management. The results at Dickten & Masch will guide energy assessments at similar facilities where the savings can be replicated

Summary

The assistance of the University of Wisconsin – Milwaukee’s Industrial Assessment Center was solicited to perform an energy audit of the Dickten & Masch Manufacturing Co. Nashotah production facility. Opportunities for saving electricity were identified through the installation of energy efficient lighting, variable frequency drives on motors and better control of the compressed air system as well as the use of outside air. The assessment team also found that better scheduling of forklift charging would reduce overall demand. An opportunity for gas savings through implementing a temperature setback in the facility was also identified. Further results from this assessment are highlighted throughout the case study.

Company Background

The Dickten & Masch Manufacturing Co. is a custom manufacturer of thermal-set and injection-molded plastics. The Nashotah facility annually generates approximately \$50 Million in sales and processes approximately 15 million pounds of a variety of plastics. The facility assessed was 144,000 square feet in size with production covering 108,000 square feet. At the time of assessment, annual energy bills totaled \$708,760.

Assessment Approach

A team consisting of students and director from the University of Wisconsin - Milwaukee Industrial Assessment Center performed an assessment of this facility in the summer of 2003. After arriving onsite, the team met with plant personnel, toured the facility and collected data. Once the team had reviewed possible energy-saving opportunities, they presented their findings to plant managers. The assessment was led by UWM-IAC assistant director: Dr. Vjekoslav Pavelic.

Energy Conservation Awareness

The assessment team identified energy conservation awareness practices utilized by employees at the Dickten & Masch facility as a cost-effective way to significantly reduce energy consumption. Management encourages employees to turn off or shut down idle processing equipment, lights, fans, air compressors, and other energy-consuming components when not in use. The Audit team discovered that the facility also had automated part removal from machines and an efficient automated feed system. These systems reduced spillage and scrap as well as increased accuracy and productivity. This facility also had dock seals installed on shipping doors to reduce heated and conditioned air loss through doors



Lighting

With most plant lighting (metal halide, high pressure sodium, etc.) a large portion of light is wasted because it cannot be directed efficiently to the ground. Energy efficient fluorescent lights with super reflective casing are available that send 99.9 percent of the light to usable areas. One of the requirements of such lighting is that ceiling height must exceed sixteen feet. By replacing current lighting with energy efficient lighting the number of watts on a fixture can be greatly reduced with no appreciable reduction in lumens. At this facility, the team found that replacing 400 watt metal halide lamps with energy efficient fluorescent lamps would save 562,170 kWh per year for a corresponding cost savings of \$26,308.

Reducing Demand

Peak electrical demand was found to be a large portion of the facility's electric costs. The assessment team recommended that timers be installed on each charging unit for its forklift truck batteries so that recharging would only be done during off-peak hours. Significant annual cost savings of \$4,115 would be seen, with a simple payback of only 2 months.

Results

Dickten & Masch Manufacturing Co. implemented four of the six recommendations provided by the UWM-IAC. These recommendations will realize a \$34,243 annual savings. Table 1 shows the annual cost savings that will accrue at the Dickten & Masch Manufacturing Co. Nashotah facility due to implemented recommendations. Energy conservation opportunities identified in the assessment that were implemented will reduce electrical usage by over 632,000 KWH, subsequently reducing electrical demand by approximately 1,528 KW-mo per year. Annual natural gas usage will also be reduced by 210 MMBtu.

Projects Identified

Opportunities for reducing energy consumption that were identified during the assessment are described in the following table:

Table 1. Opportunities at Dickten & Masch's Nashotah Facility

Recommended Action	Annual Resource Savings	Annual Cost Savings (\$)	Implementation Cost (\$)	Payback (months)
<i>Facility</i>				
Install Energy Efficient Lighting	562,170 kWh/yr 1,124.3 kW-mo/yr	\$26,308	\$61,875	28
<i>Demand</i>				
Charge Forklift Trucks During Off-Peak Hours	255.2 kW-mo/yr	\$4,115	\$400	1
<i>Process Supply</i>				
Use Outside Air for Compressor	61,683 kWh/yr 148.3 kW-mo/yr	\$3,128	\$1,980	8
<i>Heating</i>				
Implement Temperature Setback in Facility	210.6 MMBtu/yr	\$1,192	\$1,600	16
Totals	632,853 kWh/yr 1,527.8 kW-mo/yr 210.6 MMBtu/yr	\$34,743	\$65,855	23

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