



## Rubber Plant: Manufacturer of Rubber Products Implements Big Energy Savings Recommendations

### Summary

Through the Department of Energy's Industrial Assessment Center located at the University of Alabama at Tuscaloosa, Specification rubber, a rubber product maker, was able to save a significant amount of money from reductions in energy consumption. Specification Rubber implemented two of the six assessment recommendations. All of the savings were from a result in reduction of natural gas. Through recommended actions in reducing steam leaks and insulating bare steam equipment Specification Rubber was able to save approximately \$37,000. The overall average payback realized was four months. Savings realized from the implemented recommendations resulted in a 7.61% energy savings, which qualifies the plant for DOE Energy Saver recognition.

### Company Background

Specification Rubber Products manufactures rubber gaskets that are used by cast iron, hydrant, and valve producers in the water piping industry. Products are created through curing of rubber. The smaller products go through an injection molding process whereas the larger products go through a compression molding process. After final inspection the products are placed onto pallets and sent to the customers. The facility consists of one 85,000 square foot building, and annual utility bills for the facility totaled \$780,000.

### Assessment Approach

A team of faculty and students from the University of Alabama's Industrial Assessment Center performed an Industrial Assessment in the spring of 2007. The assessment was led by Center Director, Dr. Keith Woodbury, Associate Director, and Dr. Robert Taylor, both Professors in the Department of Mechanical Engineering, and Assistant Director, Dr. Gary Moynihan, a Professor in the Department of Industrial Engineering at the University of Alabama. A group of three students also participated in the assessment.

### Energy Conservation Awareness

Prior to the visit Specification Rubber was practicing energy monitoring. The company had replaced most of their fluorescent lighting and some metal halide lighting with more efficient bulbs. Also, they used high efficiency boilers to power their steam system.

**Assessment Date:** JANUARY 9, 2007

### Benefits:

- Implemented two of the six assessment recommendations
- Recommendations will save approximately 7.61% of the total energy bill
- Recognized as a energy saver by the Department of Energy

### Applications:

The Specification Rubber assessment team discovered opportunities to decrease energy usage thereby increasing capacity, improving product quality, and enhancing corporate competitiveness. In order to decrease energy usage, the assessment team identified potential energy savings on the steam distribution system. The results at Specification Rubber will guide IAC assessments that deal with facilities that primarily use steam in their processes, where the savings can be replicated.



## Steam System

Steam systems require significant amounts of energy to operate, subsequently resulting in high costs. The University of Alabama Industrial Assessment team recommended the following measures, both of which were implemented by the company. These assessment recommendations are designed to ensure reduced energy usage and more efficient operations:

- The IAC team identified several pressure steam leaks caused by leaky valves and fittings in the distribution system. A program to repair the leaks and regularly check the steam distribution components to detect leaks was implemented by the facility resulting in a yearly cost savings of \$35,628 and a payback period of 2 months.
- During the assessment, IAC personnel made note of almost 700 feet of un-insulated steam pipes located around various process equipment. The DOE software tool 3E-Plus was used to analyze these un-insulated surfaces. The resulting loss of energy (heat) to the surrounding unconditioned space causes hotter, more uncomfortable working conditions for the facility personnel and an increase in natural gas expenses to run the boiler. This loss of energy was calculated to be roughly 976 MMBtu per year with a yearly cost of \$11,078. The facility hired a contractor to install the insulation. The implementation cost quoted by the contractor was higher than what was estimated by IAC, but still resulted in a payback of 15 months.

## Results

Table 1 shows the annual cost savings that Specification Rubber obtained by implementing these energy conservation opportunities identified by the IAC team during the assessment. Based on these results, the facility can reduce energy consumption of natural gas by 4,115 MMBtu each year and save the facility \$46,706 in per year. The total estimated implementation cost of both recommendations is \$14,191 yielding an overall simple payback of 4 months.

## Projects Identified

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

Table 1. Opportunities at Specification Rubber				
Recommended Action	Annual Resource Savings	Annual Cost Savings (\$)	Implementation Costs (\$)	Payback (months)
<i>Steam Distribution System</i>				
Repair Steam Leaks	3,139 MMBtu/yr	\$35,628	\$600	2
Insulate Steam Pipes	976 MMBtu/yr	\$11,078	\$13,591	15
<b>Totals</b>	<b>4,115 MMBtu/yr</b>	<b>\$46,706</b>	<b>\$14,191</b>	<b>4</b>

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