



## Automotive Interior Components Plant: Manufacturer of Automotive Interior Components Implements Big Energy Savings Recommendations

### Summary

Johnson Controls, a producer of automotive interior components, was able to realize a significant reduction in energy consumption and costs with the assistance of the Department of Energy's Industrial Assessment Center located at the University of Alabama. Johnson Controls implemented three of the eight suggested assessment recommendations resulting in reductions in both natural gas and electricity usage. Johnson Controls implemented three of the eight assessment recommendations made by the team, and savings realized resulted in reductions of both natural gas and electricity usage. Through recommended actions of improving lighting, closing dock doors, and reducing air leaks, Johnson Controls was able to save approximately \$84,600. The overall average payback realized was 1.45 years. Savings realized from the implemented recommendations resulted in significant energy savings, which qualifies the plant for DOE Energy Saver recognition.

### Company Background

Johnson Controls manufactures completely assembled seating and interior system for automobiles, and provides "just-in-time" deliveries based on a continuous broadcast transmission procedure. The interior systems include center consoles, overhead (headliners) and door panels, as well as individual seat assemblies. Individual seat assemblies are produced by attaching seat legs to the back frame then adding and trimming the foam, trimming, and exterior seat material. The seat exterior material is steamed for wrinkles prior to audit testing. In parallel, interior systems are produced by adhering laminate carpet to plastic shell. The plastic shells are assembled on to the interior panel followed by sonic welding, inspection, and shipping. The facility consists of one 360,000 square foot building, and annual utility bills for the facility totaled approximately \$720,000.

### Assessment Approach

A team of three faculty and five students from the University of Alabama's Industrial Assessment Center performed the assessment in the Fall of 2007. The team spent one day on-site gathering information and making measurements regarding energy usage. Lighting levels and air infiltration were measured throughout the plant.

**Assessment Date:** August 28, 2007

### Benefits:

- Initially implemented three of the eight assessment recommendations
- Recommendations will save approximately \$84,600 of the total energy bill
- Recognized as an energy saver by the Department of Energy

### Applications:

The Johnson Controls 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 three different energy expending components of the facility.



## Energy Conservation Awareness

### Improved Lighting, Closing Doors, and Repairing Air Leaks

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

- Some of the dock doors at the facility during the assessment were left open or had existing cracks allowing large amounts of conditioned air to be lost in the summer and heated air to be lost in the winter. Keeping the doors closed will save 31,065 kWh/yr in cooling and 5,443 ccf/yr in heating, corresponding to a cost savings of \$11,046 per year.
- The IAC identified several compressed air leaks caused by leaky valves and fittings in the distribution system. A program to repair the leaks and regularly check the air distribution components to detect leaks was implemented by the facility resulting in a yearly cost savings of \$5,894 and a payback period of approximately 0.12 years.
- During the visit, the IAC team observed the usage of 515-400W metal halide lamps to light a majority of the production area. The metal halide lamps consumed approximately 1,758,482 kWh/yr; replacing the metal halide lamps with fluorescent T5HO fixtures resulted in an energy savings of approximately 942,870 corresponding to a yearly cost savings of \$67,625 with a simple payback period of 1.8 years.

## Results

Table 1 shows the annual cost savings that Johnson Controls 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 5,443 ccf each year, of electricity by 1,064,889 kWh/yr, thereby saving the facility \$84,565 per year. The total estimated implementation cost of these recommendations is \$122,755 yielding an overall simple payback of 1.45 years.

## Projects Identified

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

Table 1. Opportunities at Johnson Controls				
Recommended Action	Annual Resource Savings	Annual Cost Savings (\$)	Implementation Costs (\$)	Payback (years)
<i>Close Dock Doors</i>	31,065 kWh/yr and 5,443 ccf/yr	\$11,046	\$0	0.00
<i>Repair Air Leaks</i>	90,954 kWh/yr	\$5,894	\$700	0.12
<i>T5Ho Lights</i>	942,870 kWh/yr	\$67,625	\$122,055	1.80
<b>Totals</b>	<b>1,064,889 kWh/yr and 5,443 ccf/yr</b>	<b>\$84,565</b>	<b>\$122,755</b>	<b>1.45</b>

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