VT Industries

CASE SUMMARY 26

VT INDUSTRIES

Holstein, Iowa
Ida County

Intern: Amir Shadlu
Major: Mechanical Engineering
School: Iowa State University

The Company

VT Industries is an industry leader in fine laminate countertops with seven facilities spread across the United States and Canada. At VT corporate headquarters in Holstein, Iowa, a full range of architectural wood doors are manufactured. The 365,000 square foot facility lies on 60 acres and employs about 350 people. The multi-million dollar privately held company manufactures approximately 9,000 doors a week.

Project Background

The main objective for this project is to improve system and environmental performance, maximize resource efficiency, reduce energy use, and reduce costs. The compressed air system, the dust collection system, and material handling equipment are three opportunities for improvement.

Incentives to Change

VT is implementing lean manufacturing and is striving for continuous improvement. Improving the efficiency of its processes will increase product quality and reduce waste and utility costs.

Results

Reduce compressed air leaks: $13,371

Four rotary screw compressors have a compressed air capacity of 1,600 cfm. Air leaks constitute 19.6 percent of the total compressor outputs and are wasting 315 cfm of compressed air. This leak load can be reduced to 10 percent of the total compressor outputs (156 cfm) resulting in a $13,371 annual cost savings. It is recommended that a leak detection program be integrated into the system; an ultrasonic leak detector can be used to take a proactive approach in leak detection.

Change operation schedule of dust collection system: $10,000

The different blowers on the dust collectors cost from $1 to $4 per hour to run and only 1 to 6 cents to start. The opportunity cost for turning off the blowers is great. Turning the blowers off when not needed will reduce VT's utility use and conventional pollutants generated from the electrical services. There are two viable options to reduce 285 MWh of electricity annually, resulting in $10,000 annual cost savings.

Reduce vacuum leakage: $42,000

Many doors are dropped as a result of leakage in the vacuum cups. This leakage will greatly reduce the performance of the vacuum pumps and will cause the lifter to fail. Installing flow valves and replacing vacuum cups with pads will reduce the vacuum leak load in the system. The annual cost savings is estimated to be $42,000.

Resize regenerative blowers: $8,600

After installing valves in the vacuum cups, high flow regenerative blowers will no longer be needed to perform the

function effectively. These vacuum pumps will be oversized for their application and will waste as much as 8KW of electricity. One option is to centralize the regenerative blower to supply the vacuum to two lifting portals. Another option is to replace the regenerative blower with two rotary vane pumps. These viable options will result in $8,600 annual energy cost savings.

Venturi style vacuum pumps: $4,493
The Venturi style vacuum generator on the self-operated vacuum lifters consumes between 3 to 6 cfm of compressed air. Operators seldom turn off the valves on these lifters, resulting in $4,493 in energy costs annually. This wasted energy can be saved by modifying the existing lifters to allow the vacuum to be generated only when the suction pad is in contact with the door.

Project Summary Table

Project Description	Environmental Impact	Economic Cost Savings	Status
Reduce compressed air leaks	275 MWh	$13,371	In Progress
Change operation schedule of dust collection system	285 MWh	$10,000	In Progress
Reduce vacuum leakage		$42,000	Recommended
Resize regenerative blowers	196 MWh	$7,592	Recommended
Venturi style vacuum pumps	143 MWh	$6,938	In Progress
Total	~900 MWh	~$80,000	