

## 2017 Case Study

# Grandview Products Company, Inc.

Intern: Sarif Ullah Patwary  
Major: Apparel & Textiles, M.S.  
School: Kansas State University



### Company Background

Grandview Products Company Inc. (Grandview) manufactures made-to-order kitchen and bathroom cabinets for new construction, repairs, and remodels. The firm was founded in Grandview, Missouri in 1946 and moved to Kansas in 1965. Its operations are currently spread across two facilities in Parsons and one facility in Cherryvale. Together, the three facilities encompass approximately 212,500 square feet of manufacturing space and employ 270 people. Daily output is about 1200 cabinets in a variety of styles and finishes that are sold from coast to coast.

### Project Background

This was Grandview's first summer hosting an intern from Kansas State University's Pollution Prevention Institute. Projects focused on painting processes, compressed air systems, and solid waste streams. Most of the company's product lines use a three-step painting process (stain, seal, finish), and Grandview must track the associated hazardous air pollutant (HAP) and volatile organic chemical (VOC) emissions. All three facilities use compressed air, but regular leak audits are not currently part of the maintenance routine. For solid waste, as a custom wood cabinet manufacturer, changes to product lines or custom orders sometimes generate high volumes of scrap wood.

Additionally, woodcutting and sanding processes in the main Parsons plant generate sawdust that Grandview collects through a central ventilation system and sells to a chicken farm as fuel. However, the current collection system cannot capture all of the sawdust generated and employees must spend time sweeping the remaining dust that settles throughout the plant. Grandview had previously purchased and installed a new blower and cyclone system to achieve better dust collection efficiency, but had not yet connected

the new system to machinery and ductwork in the plant. The intern was tasked with determining if the new system would achieve the expected benefits.

### Incentives to change

Grandview's management trusts in environmental well-being, believing that a corporation cannot flourish sustainably if it does not care for its people and operating environment. They also believe that reducing the environmental burden of inefficient production processes improves the bottom line. In 2007, the Kitchen Cabinet Manufacturers Association, of which Grandview is a certified member, recognized the company's environmental stewardship efforts. Grandview brought on a pollution prevention intern this year as part of its continued commitment to increase environmental sustainability, a goal best accomplished through research and recommendations about available efficiency improvement options.

### Projects reviewed for P2 potential

#### Paint Line Transfer Efficiency

The intern investigated spray transfer efficiency on three paint operations. Based on discussions with the environmental health and safety (EHS) manager and the paint equipment vendor, Grandview's transfer efficiency could be improved by 10% through equipment changes and vendor-provided spray training. This would take their baseline transfer efficiency of 40% to 50% for all three paint operations. The new painting equipment will allow for spray patterns that match the shapes of different products and, with proper employee training, decrease overspray and subsequent paint waste. Achieving the 10% increase in transfer efficiency would save the facility 7,186 gallons of paint, 24,180 pounds of volatile organic chemical emissions (VOCs), 4,854 pounds of hazardous air pollutant emissions (HAPs), and \$129,187 per year.

### Compressed Air Audit

The intern audited compressed air lines for leaks at all three of Grandview's facilities. Using a UE System Ultrasonic Leak Detector, he identified 128 leaks. Fixing these leaks would save Grandview 342,355 kilowatt-hours (kWh) annual electricity consumption, the equivalent of \$46,665 per year.

### Update 2021

A 2019 P2 Intern reevaluated this project and learned the leaks had been repaired shortly following the end of the 2017 internship.

### Recycling of Wood Scrap

The intern observed and documented scrap wood generation in the facility. Based on four days of observation and extrapolation to a full year, 153.7 tons of wood scrap is landfilled and Grandview bears \$10,295 in annual disposal costs. A meeting with the Southeast Kansas Recycling Center, identified options for recycling the scrap into other wood products, such as mulch, but a solution has not yet been determined.

### Dust Collector Evaluation

The intern researched environmental and economic benefits for the new dust collector. Direct benefits from the improved collection system would be decreased employee time spent

sweeping and 47.2 tons sawdust recovered for fuel. Assuming the improved system allows for 100% sawdust collection, the annual savings from wages, hauling costs, and disposal fees would be \$10,389.

### Sweeping Training

The intern also realized employees use the compressed air system to supplement their sweeping efforts. Since compressed air is generated by expending electricity, training the employees not to use compressed air for sweeping could save 315,941 kWh per year, totaling \$36,333 annually; this savings could be realized without implementing the new dust collection system.

### Power Factor Correction

While reviewing the past 18 months of electricity bills for all three facilities, the intern noticed Grandview's facilities all had low power factors. Power factor is a measure of how much electricity a facility is using compared to how much electricity it draws from the grid. Power companies will often penalize companies for low power factors because the extra load artificially increases the needed amount of electricity available on the grid. Installing on-site capacitors at each facility can offset the artificial loading and improve the power factor, saving Grandview an estimated \$50,068 annually.

### *Summary of 2018 P2 intern recommendations for Grandview Products Company, Inc.*

<b>Project description</b>	<b>Annual estimated environmental impact</b>	<b>Annual estimated cost savings</b>	<b>Status</b>
Paint Line Transfer Efficiency	24,180 lbs. VOCs 4,854 lbs. HAPs	\$129,187	Implemented
Compressed Air Audit	342,355 kWh	\$46,665	Implemented
Recycling of Wood Scrap	up to 153.7 tons lumber	up to \$10,295	More research needed
Compressed Air Leak Audit	342,355 kWh	\$46,665	Recommended
Dust Collector Evaluation	up to 47 tons sawdust	up to \$10,389	More research needed
Power Factor Correction	N/A <sup>1</sup>	\$50,068	Recommended
<b>Total savings<sup>2</sup></b>	<b>24,180 lbs. VOCs 4,854 lbs. HAPs 658,296 kWh</b>	<b>\$262,333</b>	
<b>GHG reductions<sup>2, 3</sup></b>	<b>644 metric tons CO<sub>2</sub>e</b>		

<sup>1</sup>No direct environmental impact for the host company

<sup>2</sup>Does not include projects with "more research required"

<sup>3</sup>USEPA May 2014 P2 GHG Calculator with Cost