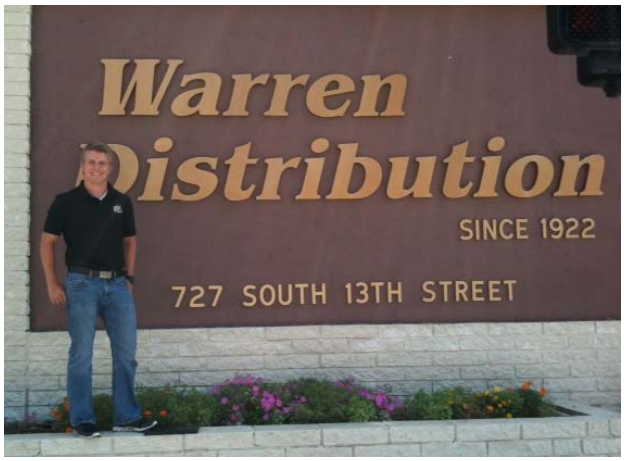
PROJECT OVERVIEW



Industrial Placement Intern: Caleb Peterson
Major: Civil Engineering
School: University of Nebraska - Lincoln

Company Background
Warren Distribution (WD) was founded in 1922, and is a privately owned manufacturer, marketer, and distributor of automotive aftermarket products. The products sold by the company fall into three categories: lubricants and chemicals, accessories, and repair parts. WD consists of three main facilities in the Omaha, NE metro area which are the head offices WD, Warren Performance Packaging (WPP), and PACE Transportation. The latter two are located in Council Bluffs, IA along the Missouri River. Packaging plants are also located in Alabama and West Virginia. Production runs 24 hours a day, 7 days a week, and products are shipped worldwide.

Project Description
The primary focus of this project was to evaluate the compressed air system at WPP. This included developing a comprehensive map of the plant airlines, identifying more efficient system controls and air usage methods, as well as determining the total CFM required for plant operations. From this, pollution prevention (P2) opportunities were identified that could reduce costs, lower energy and gas consumption, and improve the environment. Additionally, a reassessment of a past intern's work for WD was completed.

Potential Pollution Prevention Benefits and Results
The potential pollution prevention benefits and results of the project are summarized in Table 1 below:

Table 1 – Summary of Potential Pollution Prevention Recommendations, Benefits and Savings

P2 Suggestion	Potential P2 Benefit(s)	Potential Financial Savings	Initial Investment
Repair Air Leaks	Conserve 200,000 kWh/yr of energy	$10,000/yr	$0
Implement Leak Management System	Conserve 20,000 kWh/yr of energy	$1,000/yr	$960
Train Employees In Proper Air Usage	Reduce energy consumption from random uses	N/A	$0
Reduce Airline Pressure	Conserve 200,000 kWh/yr of energy	$10,000/yr	$0
Increase Tank Storage	Possibility of removing spare compressor	N/A	$1,000-$8,000
Renovate Airline System	Conserve 180,000 kWh/yr of energy	$9,000/yr	$100,000
Add Heat and Water Recovery Systems	Conserve 50,000 therms/yr of natural gas consumption	$33,000/yr	$15,000
Purchase Pulsair Blenders	Conserve 300,000 kWh/yr of energy	$15,000/yr	$20,000-$30,000
Total Savings	**900,000 kWh/yr 50,000 therms/yr**	**$78,000/yr**	**$154,000 (max)**

Additional indirect or intangible benefits include:

- Longer life for the compressor
- Increased efficiency for compressor and pneumatic machines
- Reduced need for heat in cold months (from recovery system implementation)
- Reduced need for air pressure regulators
- Reduced noise in plant
- Less machine maintenance required
- Increased safety for employees
- Reduction of greenhouse gas (GHG) emissions by **1,121** metric tons of carbon dioxide equivalents ($MTCO_2e$/yr)