

# Fansteel Wellman

CASE  
SUMMARY

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## FANSTEEL WELLMAN DYNAMICS

Creston, Iowa  
Union County

Intern: Andrew Hirsh  
Major: Chemical Engineering  
School: University of Iowa



### The Company

Fansteel Wellman Dynamics is a prominent manufacturer of premium magnesium and aluminum sand castings. The castings are meticulously inspected to stringent tolerances to ensure quality. After 40 years of supplying the aerospace industry with integral parts, Fansteel continues to meet and exceed its customer's expectations.

### Project Background

Fansteel Wellman Dynamics has numerous opportunities for improvement and optimization of their processes. The environmental engineering department at Fansteel has requested that the Iowa Department of Natural Resources lend their assistance with pollution prevention by way of a pollution prevention engineering intern.

### Incentives to Change

Fansteel Wellman Dynamics understands the strong correlation between pollution prevention and reduced manufacturing costs. In this spirit, Fansteel desires to improve their air compressor leak detection system, retrofit their lighting system, recycle their foundry sand, reduce their water consumption and eliminate the use of hexavalent chrome.

### Results

#### 1. Air Compressor System

Fansteel's compressed air system was thoroughly evaluated for possible improvements. Through implementing a leak tagging system and a temporary hose system Fansteel can significantly reduce their energy use. To ensure the success of these two programs, the employees of Fansteel were given educational training about the importance of air compressor diligence.



#### 2. Lighting

Fansteel currently uses T12 bulbs and magnetic ballasts to light the office areas. However, T12's are being phased out of the industry in favor of more energy efficient T8 light bulbs and electric



ballasts. It is recommended that Fansteel weigh the financial and implementation options recommended by the intern and choose the most reasonable avenue to retrofit the lighting system. Converting the lighting system to T8 light bulbs will save the company \$5,693 annually.

### 3. Foundry Sand

Fansteel has an onsite landfill to dispose of non-hazardous waste. Certain types of sand cannot be reused by Fansteel and are sent to the onsite landfill. To extend the life of the landfill and to reduce solid waste produced by Fansteel, the sand has been diverted for use as cover for the Union County Landfill. It is projected that 3,000 tons of sand will be diverted from Fansteel's onsite landfill. The process could still be improved if a vendor was found to recycle the sand.

### 4. Water Chiller

To protect the bearings of one of Fansteel's heat treatment machines, cooling water flows around a jacket on the bearing. Originally, the process included once through cooling where the water would go from the heat treatment oven to the sewer. However, if a chiller is installed, the cooling water can be used in a closed system. This closed system will annually save 2.5 million gallons of water.

### 4. Leachate

Leachate water is not used in Fansteel's production process at the moment. However, since the resource is available, the leachate provides cost and resource saving opportunities. If the leachate water is pumped from the landfill to a magnesium dross process 313,600 gallons of water and \$1,653 can be saved annually.

Project Summary Table

Project Description	Environmental Impact	Economic Cost Savings	Status
Air Compressor	616,000kWh	\$30,500/year	Implementation in Progress
Lighting	115,000kWh	\$5,693/year	Implementation in Progress
Foundry Sand	3,000 tons	\$98,667/year	Implemented
Water Chiller	2.5 million gal	\$10,764/year	Recommended
Leachate	313,600 gal	\$1,653/year	Recommended