

E.I. DUPONT

COMPANY BACKGROUND

E.I. du Pont de Nemours and Company (DuPont) was founded in 1802, originally as a gunpowder mill. Over the years DuPont transformed into a science based chemical company aimed at providing better, safer, healthier lives for people everywhere. With operations in over 70 countries, today DuPont offers products and services in agriculture, nutrition, electronics, communications, safety and protection, home and construction, transportation, and apparel. The Fort Madison plant specializes in ink-jet inks and performance polymers.

FORT
MADISON



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PROJECT BACKGROUND

One of DuPont's sustainability goals is to reduce overall energy usage, focusing on boiler and air compressor efficiency. These process improvements are

necessary to reduce the company's environmental footprint.

INCENTIVES TO CHANGE

As a world leader in science based chemical production, DuPont also prides itself on being a leader in finding better ways to protect the environment. The company is constantly creating new sustainability goals. These goals include reducing energy usage and using new forms of renewable energy that are inexpensive and clean burning, such as solar or wind energy. DuPont also continuously strives to further reduce carbon gas emissions, air carcinogen emissions and water consumption.

RESULTS

Steam Trap Maintenance Program: There are 326 total steam traps in the Fort Madison plant, with only about 250 currently in service. The failure rate for the facility was 8.5%, which is commendable. However, a few of the traps are relatively old models and need to be replaced in order to meet the standards of the rest of the plant's steam trap system. Setting up and maintaining a steam trap database is recommended for use in future steam trap surveys in order to keep records up-to date. With rising energy costs, implementing an annual steam trap survey program would help reduce lost energy due to insufficient or failed steam traps and would cut back on natural gas consumption.

Insulate Steam/Condensate Return Lines: Steam is a big energy consumer at the Fort Madison plant. DuPont uses steam for heating in its production of ink and polymers, and for space heating the plant itself in the fall and winter months. Hot condensate, or steam that has been condensed into liquid water form, is then returned back to the boilers to be reused. Bare, non-insulated pipe loses

heat and energy to the atmosphere through convection and radiation. After analyzing the plant's steam and condensate return piping, 995 ft. of non-insulated steam pipe and 3,597 ft. of non-insulated condensate pipe were found. Using the U.S. Department of Energy's 3E Plus software, the intern was able to identify the best types of insulation for reducing energy loss and maximizing savings.

Compressed Air Leaks: Compressed air is regularly used throughout the plant and accounted for 25 percent of total electrical use for the last calendar year. The Fort

Madison plant has two different systems for compressed air: process air and breathing air. Process air is used for general purposes throughout the facility, while breathing air is used to provide positive pressure in protective safety suits. After conducting a compressed air survey of the plant, a total of 211 leaks were found, amounting for 475 cubic feet of lost air per minute. Approximately 95 percent of the lost air was from the process air system, with the remaining 5 percent coming from the breathing air. Undertaking a continuous program of searching, identifying, and repairing compressed air leaks can save DuPont large amounts of electrical energy annually.

PROJECT	ANNUAL COST SAVINGS	ENVIRONMENTAL RESULTS	STATUS
STEAM TRAP MAINTENANCE PROGRAM	\$62,862	89,555 THERMS	RECOMMENDED
INSULATE STEAM/CONDENSATE RETURN LINES	\$24,102	35,665 THERMS	RECOMMENDED
FIX COMPRESSED AIR LEAKS	\$31,504	552,694 KWH	IN PROGRESS
COMPRESSED AIR LEAK MAINTENANCE PROGRAM	\$23,550	413,159 KWH	RECOMMENDED



Air Pollutants Diverted in Tons

	Total for all sectors
SO2	7.72
CO	1.02
NOX	3.72
VOC	—
PM	—

Green House Gases Diverted in Tons (CO2 Equivalent)

	Total for all sectors
CO2	1458.32
CH4	—
N2O	—
CFCS	—