Diamond Vogel Paint

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COMPANY BACKGROUND

Diamond Vogel Paint is a family owned, Midwest-based coatings manufacturer and retailer headquartered in Orange City, Iowa. Since 1926, Diamond Vogel Paint has produced industrial and architectural coating solutions. Today, the company has a diversified market, manufacturing paints, wood stains, powder coatings and traffic paint. Diamond Vogel Paint also distributes and retails its products, with more than 80 retail stores in 14 states. The company has a workforce of 800 employees. Annual sales in 2008 topped $150 million.

PROJECT BACKGROUND

After a site visit from Pollution Prevention Services' engineers, Diamond Vogel Paint recognized the potential to improve its compressed air system and the benefits of a solid waste audit. The Pollution Prevention intern used a systematic approach to evaluate the effectiveness of the system and to recommend possible improvements. A secondary project assessed efficiency of the hot water bath stage in the production process.

INCENTIVES TO CHANGE

Diamond Vogel Paint is partnering with the Pollution Prevention Intern Program in its pursuit of ISO 14000 certification. The company objectives in obtaining certification are to:

- Identify and control the environmental impacts of its products;
- Continually improve its environmental performance; and
- Implement a systematic approach to setting environmental goals with measurable results, achieving these results, and verifying the impacts.

RESULTS

Repair Compressed Air Leaks and Leak Detection Program: The intern conducted a compressed air leak audit and found 33 leaks. These leaks comprised 23 percent of the compressed air system's capacity. By repairing the leaks identified and implementing an aggressive leak detection program, Diamond Vogel Paint can reduce its system capacity lost to leaks to less than 10 percent.

Lower Compressed Air System Pressure: By documenting the pressure requirements of compressed air end uses, it was discovered that the system pressure in the liquid production facility was higher than necessary. If the system pressure were lowered, the electricity consumed by the compressor could be reduced by 15 percent.

Heat Recovery: During the colder months of the year, it is possible for Diamond Vogel Paint to use the hot exhaust air from three of its air-cooled compressors for space heating. These compressors are located very close to production areas that are currently heated by a boiler system. If the hot exhaust air were recovered for 24 weeks each year, these three compressors would provide almost 540 million BTUs of heat to offset the use of the boiler system.

Modify Compressors Air Intake Location: The largest compressor, which is 75 horse power (HP), currently draws outside air for its air intake. Two smaller compressors, 40 HP and 20 HP, have air intake directly attached to each compressor. The air surrounding the compressors is in excess of 100° F. By piping each air intake vertically 6 feet through the roof, the air intake temperature would be greatly reduced. Cooler air requires less energy to compress, and the electrical consumption of the 40 HP and 20 HP compressors would be lowered by 11.5 percent.

Install Electric Control on Water Pump: As part of the aerosol production line, spray paint cans must be tested for defects before they are packaged and distributed. Once the cans are filled with paint and charged with natural gas, they are immersed in a hot water bath at 130° F. Aerosol production runs 12-hour shifts four days per week. When production is not operating, the hot water bath is not needed. The intern recommended a seven-day electric timer as a viable option to reduce the natural gas consumed by turning the system off during non-production hours.

Modify Tank Volume: When the aerosol hot water bath was initially chosen, it was purchased with the capacity for a second process line in case of production expansion. A second process line is not planned, and the current tank is 67 percent larger than necessary. By reducing the volume of the tank to the minimum required, the total system volume would be reduced by 164 gallons. This change would reduce the time required to warm up the hot water bath each morning as well as the amount of heat lost during production.

Insulate Piping and Tank: In the aerosol production line, 71 feet of steel piping and 110 square feet of the hot water bath are not insulated. By insulating these areas, the heat lost to the surroundings would be reduced, and the working conditions for employees would be improved. This reduction in heat loss would allow the thermostat for the water heater to be set to a lower temperature.

Increase Solid Waste Recycling: In the liquid and aerosol production facilities, some cardboard recycling occurs. By expanding the recycling program to include more cardboard materials and plastics, 167 tons of waste can be diverted from the landfill. To do this, Diamond Vogel Paint would need to educate employees on the types of materials recycled and where to deposit the materials.

AIR POLLUTANTS DIVERTED IN TONS

Total for all sectors	
SO2	1.05
CO	0.20
NOx	0.53
VOC	0.13
PM	0.03

GREEN HOUSE GASES DIVERTED IN TONS
(CO2 Equivalent)

Total for all sectors	
CO2	203.50
CH4	36.96
N2O	0.17
CFC	2.50

PROJECT	ANNUAL COST SAVINGS	ENVIRONMENTAL RESULTS	STATUS
REPAIR COMPRESSED AIR LEAKS	$9,540	127,000 KWH	IMPLEMENTED
LEAK DETECTION PROGRAM	$4,580	61,000 KWH	RECOMMENDED
LOWER COMPRESSED AIR SYSTEM PRESSURE	$1,230	16,290 KWH	RECOMMENDED
HEAT RECOVERY	$5,340	5,390 THERMS	RECOMMENDED
MODIFY COMPRESSOR AIR INTAKE LOCATION	$1,440	19,170 KWH	RECOMMENDED
INSTALL ELECTRIC CONTROL ON WATER PUMP [NATURAL GAS]	$12,400	12,510 THERMS	RECOMMENDED
MODIFY TANK VOLUME	$1,575	1,590 THERMS	RECOMMENDED
INSULATE PIPING AND TANK	$470	474 THERMS	RECOMMENDED
INCREASE SOLID WASTE RECYCLING	$14,810	167 TONS	RECOMMENDED