

EAGLE WINDOW AND DOOR



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COMPANY BACKGROUND

Eagle Window & Door, an Andersen Corporation company, is a manufacturer of a complete line of high-quality, aluminum-clad windows and doors. Located in Dubuque, Iowa, the company focuses exclusively on high-end residential (new and remodel) and commercial construction. Eagle is housed in a 390,000-square-foot manufacturing facility with a workforce of 531 employees. The company has been handcrafting premium windows and doors for more than 30 years and is a proud member of the WDMA and many other fenestration associations.

PROJECT BACKGROUND

Eagle Window & Door consumes large amounts of solvent in the paint purging and cleaning processes and accordingly generates quantities of hazardous waste. The intern analyzed the processes and investigated opportunities to use solvent more efficiently and to improve the effectiveness of the solvent recycling process in an effort to reduce solvent usage, hazardous waste generation, and associated purchasing and disposal costs.

INCENTIVES TO CHANGE

Eagle Window & Door is committed to ECO 3 environmental policy by continuously striving to minimize waste, recycle materials and improve processes to minimize adverse environmental effects. Reducing solvent usage in paint purging and cleaning processes will decrease air emissions, hazardous waste and costs. The company's ultimate goal is to implement sustainable processes that can be shared with other facilities within the corporation.



RESULTS

New Recycling Unit: The operating time of the plant's recycling unit is inconsistent mainly because it utilizes an air-cooled condenser and a high ambient temperature interferes with the machine operation. Accordingly, only half of the solvent wastes generated in the plant can be recycled every two weeks, which indicates capacity issues. In addition, the current unit generates liquids as still bottoms instead of solids.

A new recycling unit is proposed to meet the current needs of the plant. The proposed unit utilizes a water-cooled condenser and a quick-cool coil for optional rapid cooling of the still for successive runs. A chiller option is recommended so that the water can be used repeatedly. Installing the new unit is expected to reduce solvent purchases by 11,220 gallons and solvent waste by 11,440 gallons, saving \$71,446 annually.

Solvent Reduction: Solvent used for cleaning the pumps in the paint booths is highly susceptible to evaporation. Decreasing the volume of solvent in use at one time could reduce the amount of solvent lost to evaporation and still maintain efficiency of the process. Reducing solvent in use by approximately 30 percent is expected to reduce evaporation by 919 gallons, saving \$5,332 annually.

Paint Flushing Program: The parameters are pre-set for the amount of solvent needed to clean the lines when a color change takes place in the paint process. To ensure proper cleaning the parameters are set at the maximum needed for a color change. Installing a program with the capability to set the parameters based on paint colors would allow less solvent to be used with some color changes. Installing the new program could decrease the amount of solvent used in the paint purging process by 2,860 gallons per year. The amount of solvent waste would also decrease by 4,290 gallons per year. This program could save the company \$22,984 annually.



CONVENTIONAL AIR POLLUTANTS AND GREENHOUSE GASES DIVERTED IN STANDARD TONS

Total for all sectors						
CO ₂	SO ₂	CH ₄	N ₂ O	CFC	PM-10	VOC
106.79	0.25	13.47	6.80	3.02	0.08	0.32

PROJECT	ANNUAL COST SAVINGS	ENVIRONMENTAL RESULTS	STATUS
NEW RECYCLING UNIT	\$65,076	11,220 GALLONS OF SOLVENT PURCHASED*	RECOMMENDED
	\$6,370	11,440 GALLONS OF SOLVENT DISPOSED**	
SOLVENT REDUCTION	\$5,332	919 GALLONS OF SOLVENT PURCHASED*	IMPLEMENTED
PAINT FLUSHING PROGRAM	\$16,588	2,860 GALLONS OF SOLVENT PURCHASED*	RECOMMENDED
	\$6,396	4,290 GALLONS OF SOLVENT DISPOSED**	

*REPRESENTS THE AMOUNT OF PURCHASED SOLVENT THAT COULD BE AVOIDED.
** REPRESENTS AVOIDANCE OF SOLVENT DISPOSAL.

