

CURRIES DIVISION OF AADG, INC.



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COMPANY PROFILE

CURRIES Division of AADG, INC., located in Mason City, Iowa, is a leading manufacturer of non-residential steel and Fiberglass Reinforced Polyester (FRP) doors and steel and aluminum frames. Currently, CURRIES has 650 employees and operates door production 2 shifts per day, 5 days per week, with an average annual operation of 4,043 hours. Frame production operates 3 shifts per day, 5 days per week plus a weekend shift, with an average annual operation of 4,885 hours.

PROJECT BACKGROUND

CURRIES desires to reduce municipal water use and potentially reuse water from the rinse stages of the washer systems to eliminate water discharge. The purpose of the 2015 intern project is to pinpoint source reduction opportunities for water use and evaluate reuse opportunities in the wash stages of the production process to help meet environmental performance goals.

INCENTIVES TO CHANGE

CURRIES' parent company, ASSA ABLOY of Stockholm, Sweden, is committed to sustainable business practices such as minimizing waste generation and utilizing resources effectively. CURRIES' ISO 14001 certification reinforces the company's focus on continuous improvement. They have received the Governor's Iowa Environmental Excellence Awards three times for their high level of environmental performance. The 2015 intern project will provide framework to help Curries achieve a goal of reducing wastewater generation by 10 percent by the year 2020. Recommendations also offer opportunities to meet corporate goals to reduce water and energy usage.

RESULTS

Re-Plumbing of Frame Washer: Curries utilizes multi-stage parts washers to clean and phosphatize components used in door and frame construction. Opportunities exist to reuse water from the rinse stages of this process as make-up water in the wash tanks. Reuse of the rinse water could reduce water use at Curries by approximately 970,123 gallons and save \$6,121 annually.

Install Oil Separator on Frame Washer: Oil removal from wash tanks is a cost effective method to increase the efficiency of cleaning the frame components. Improving the efficiency of the wash process could prevent re-contamination of the parts, extend fluid life, and reduce chemical purchasing costs. The intern researched oil separators and provided a recommendation based on small footprint, application of gravity flow, and minimal required maintenance. By installing an oil separator CURRIES could achieve an annual savings of \$31,007 and a chemical reduction of 1,834 gallons.

Reverse Osmosis (RO) System: Based on analysis of current water usage, CURRIES annually uptakes and discharges roughly 12 million gallons of water for the frame and door parts washing processes. RO is ideal for treatment of wastewater from the parts washing process as it allows for both water and chemical reuse. Implementation of an RO recycling system could save 5,681,163 gallons of water and associated purchasing and disposal costs of both water and chemicals.



PROJECT	ANNUAL COST SAVINGS	ENVIRONMENTAL RESULTS	STATUS
RE-PLUMBING OF FRAME WASHER	\$6,121	970,123 GALLONS	IN PROGRESS
INSTALL OIL SEPARATOR ON FRAME WASHER	\$31,007	1,834 GALLONS OF CLEANER	IN PROGRESS
REVERSE OSMOSIS (RO) SYSTEM	\$59,063	5,681,163 GALLONS	RECOMMENDED
VFDS AND PRESSURE SENSOR CONTROLS ON PUMP MOTORS	\$25,151	320,615 KWH	IN PROGRESS
VFD ON AIR KNIFE SYSTEM	\$6,037	77,008 KWH	IN PROGRESS



Variable Frequency Drives (VFDs) and Pressure Sensor Controls on Pump Motors: CURRIES utilizes motors that operate on a fixed speed drive to pump and pressurize water in stages of the Frame and Door Skin washer. Operational benefits of VFD application could result in a reduction of required maintenance, improved motor performance, and increased life-span of the pump motors. Installing VFDs and pressure sensors on the pump motors could result in an annual savings of \$25,151 and 320,615 kWh.

VFD on Air Knife System: CURRIES utilizes a 50 hp motor for the air knife system on the Door Skin washer. The current motor operates at a fixed speed and at 100 percent capacity regardless of production rates. A VFD could be used as a soft starter to reduce shock from inrush of current, and to reduce electrical demand by decreasing starting motor current. Installing a VFD on the air knife system could result in an annual savings of \$6,037 and 77,008 kWh.

ESTIMATED CONVENTIONAL AIR POLLUTANTS DIVERTED IN METRIC TONS

For Implemented and In Progress Recommendations

TOTAL FOR ALL SECTORS						
CO ₂	NH ₃	NO _x	PM ₁₀	PM _{2.5}	SO ₂	VOC
303.13	0.00	0.58	0.09	0.06	1.17	0.04

ESTIMATED GREENHOUSE GASES DIVERTED IN METRIC TONS

TOTAL FOR ALL SECTORS			
MTCO ₂ e	CH ₄	N ₂ O	CFC
376.18	14.49	2.41	1.81

ESTIMATED CONVENTIONAL AIR POLLUTANTS DIVERTED IN METRIC TONS

For Recommendations in Recommended Status

TOTAL FOR ALL SECTORS						
CO ₂	NH ₃	NO _x	PM ₁₀	PM _{2.5}	SO ₂	VOC
105.13	0.00	0.16	0.05	0.02	0.19	0.17

ESTIMATED GREENHOUSE GASES DIVERTED IN METRIC TONS

TOTAL FOR ALL SECTORS			
MTCO ₂ e	CH ₄	N ₂ O	CFC
461.88	35.67	5.97	0.54

