



# Advance Corporation



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## Company Background

Located in Cottage Grove, Advance Corporation is a braille signage and custom awards company that employs 60 people. Founded in 1941, Advance Corp began as a flexographic products manufacturer, which led the company to develop a wide variety of engraving and etching capabilities closely aligned with the printing industry. In 1990, the company formed its Braille-Tac™ division and began producing wayfinding sign systems and ADA-compliant signage. Both the Award line and the Braille-Tac™ divisions feature products fashioned in an impressive array of materials, styles, and design specifications. While Advance Corp's processes and products have evolved, its commitment to quality and customer satisfaction has remained the same since its establishment over 80 years ago.



ADVANCE CORPORATION

*"Over the summer, I gained an abundance of knowledge and was able to explore projects that allowed me to think creatively. The most rewarding part is the impact that my projects will have, and I am thankful for the opportunity that I was given." ~MD*

## Project Background

A major part of Advance Corp's longstanding success is the company's ability to maintain a high standard for its products despite changes in the industry. As part of its new green initiative to combat wastes of all forms, the company made the decision in 2022 to discontinue its magnesium die product line. In addition, the company began working with Environmental Initiative to explore the opportunity for reducing air emissions from its painting and finishing operations. These changes led to interest in a MnTAP intern to determine the waste saving potential of discontinuing the magnesium etching process as well as switching to a lower emission paint system.

Volatile organic compounds (VOCs) contained within the paints applied to signage are a risk to worker health. Advance Corp had made efforts in the past to explore lower VOC options but had not found satisfactory products available from their paint supplier. Another challenge was the additional equipment costs for spray equipment compatible with water-based finishes. Grant funding available through Ramsey/Washington Recycling & Energy meant that Advance Corp had the opportunity to offset costs.

## SOLUTIONS

### Incentives to Change

Although nitric etching had long been a core operation at Advance Corp, it became clear that eliminating this process would offer substantial benefits from both business and environmental standpoints. The process generated significant amounts of wastewater, resulting in high labor and chemical expenses and elevated regulatory compliance requirements. Removing production from this line would help the company reduce its non-value added processes and waste profile, saving labor, material costs, waste disposal fees, and productivity.

### Switch to Low VOC Paints

A majority of the VOCs emitted come from the paints used for metallic substrates. The intern assessed performance of several alternative paints containing fewer VOCs to identify an optimal paint system and determined that making the switch would save 1,570 lbs of VOC emissions. A significant benefit was that the paint supplier provides color-matching software to reduce time spent matching colors manually. VOC emissions can be reduced by 1,570 lbs from this change, enabling a savings of \$18,000 in labor costs.

# Solutions

## Switch to a Water-based Wood Finishing System

An analysis of the VOC outputs by product found that Advance Corp's wood finish was the highest generator of emissions. An alternative wood finish was identified that would result in an overall decrease of 20%–840 pounds—in VOC emissions, with a cost savings of \$1,800.

## Optimize Sprinkler System

Irrigation consumes over 60% of Advance Corp's water usage. It was found that a 5-minute reduction of each irrigation cycle could save 97,000 gallons of water and \$640. Additional improvements to the system included replacement or repair of several damaged or leaking rotors, adjustment of rotor positioning to increase watering coverage, and shutoff of a native prairie grass zone that did not require irrigation.

*"Madeline was given several goals to examine and recommend changes to our operation. Goals were met and, due to her outstanding performance and dedication, her efforts have far exceeded expectations. She established processes to reduce our exposures by hundreds of thousands of dollars per year and above all caused a reduction of VOCs, wastewater and hazardous waste in our company."*

*~Glen Lorenz, CEO  
Advance Corporation*

## Reduce Wastewater by Removing Nitric Etching Process

Advance Corporation is transitioning to CNC machining as a means of replacing production from their legacy nitric etch line. The shutdown of the nitric etch line means a significant portion of wastewater will be eliminated, allowing Advance Corp to haul the remainder for off-site treatment. Anticipated wastewater generation from the remaining process equipment was estimated at under 10% of the current waste volume, helping to save \$132,000 in combined labor, chemical, and hazardous waste costs.



Recommendation	Annual Reduction	Annual Savings	Status
Switch to Low VOC Paints	1,570 lbs VOC emissions	\$18,000	Recommended
Switch to Water-based Wood Finishing System	840 lbs VOC emissions	\$1,800	Needs Further Investigation
Optimize Sprinkler System	97,000 gal water	\$640	Implemented
Reduce Wastewater by Removing Nitric Etching Process	96,000 gal water 107,000 lbs of hazardous waste	\$132,000	Planned

MnTAP Advisor: Daniel Chang, Associate Engineer