

Mark Richey Woodworking, Inc. Toxic Use and Waste Reduction

Summary

Mark Richey Woodworking (MRW) of Newburyport, MA has built a reputation as company of superior craftsmen of high-end architectural millwork products. Its wind turbine is highly visible to the surrounding community and those interested in energy efficient manufacturing have heard of the company's other initiatives like the rooftop solar array and biomass boiler. The company has extensive experience on LEED certified projects and helps clients navigate green building requirements. Behind the scenes, MRW also takes steps to reduce its use of toxic chemicals, reduce waste, and improve worker safety. Since 2008, the company has purchased a solvent recycling unit, an ultrasonic spray gun cleaner, a robotic spray line, and prioritized the use of water based coatings to minimize the use and release to the environment of solvents and volatile organic compounds (VOCs). The company has also implemented an aggressive program to reduce all types of waste from the facility.

Summary of Results

Annual Reductions in Toxics Use and Emissions:

- ✓ 120 fewer gallons of new lacquer thinner, acetone, and VM&P Naptha purchased (about a 25% reduction)
- ✓ 1,200 fewer gallons of denatured alcohol purchased (about a 50% reduction)
- ✓ 12 tons fewer VOCs used in coatings

Total Annual Cost Savings: \$16,435

- ✓ \$3,235 savings by avoiding Large Quantity Generator status for hazardous waste
- ✓ \$1,200 savings due to reductions in purchases of new lacquer thinner, acetone, and VM&P Naptha
- ✓ \$12,000 savings due to reductions in purchases of denatured alcohol

Other Results:

- ✓ 73 percent reduction in solid and universal waste generation despite significant growth in facility manufacturing space, hiring, and production
- ✓ Decreased worker exposures to toxic solvents

Solvent Recycling

The finishing department began using a solvent recycling unit in 2010 to reduce the quantity of new solvent purchases. Jim Richey, finishing department manager and brother of owner, Mark Richey, has developed an organizational system to separate the types of spent solvent that feed into the recycling unit. The recovered solvent is then used for cleaning spray lines after solvent based coatings are sprayed. Jim estimates that the recycling unit has resulted in a reduction of 120 gallons per year of lacquer thinner, acetone, and VM&P Naptha purchased and a comparable reduction in the generation and disposal of

hazardous waste. Overall, the company has experienced savings of 25% (or \$1,200 annually) in the quantity of solvent purchased for line cleaning.

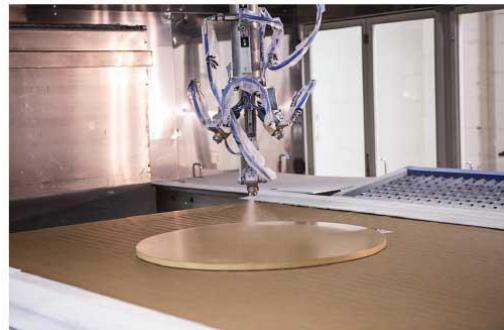
The recycling unit also recovers denatured alcohol. As a result, MRW has saved approximately 50% on purchases of denatured alcohol annually (about 1,200 fewer gallons), resulting in cost savings of about \$12,000 per year. Another significant benefit of installing the solvent recycling unit is that MRW is able to maintain a small quantity generator status, avoiding the need to register with MassDEP as a LQG of hazardous waste. Before installing the recycling unit, solvent was shipped off as hazardous waste. LQGs are subject to increased compliance requirements including training, contingency and emergency planning, air emissions controls, waste minimization planning, reporting, and annual compliance fees of \$3,880 instead of \$645. The cost of the solvent recycling unit was \$2,500 and Jim estimates that the pay-back period for the solvent recycling unit has been two years.

Spray Gun Cleaning

Prior to installing an ultrasonic gun cleaner in 2013, the finishing department used solvents to clean the spray guns. That method was labor intensive and resulted in worker exposures to acetone and various lacquer thinning chemicals. Now, with the enclosed ultrasonic cleaner, workers place the spray gun parts in the cleaner with a solution of Simple Green and water. The cleaning process requires no additional labor or worker exposures and takes about 30 minutes to complete. According to Jim, usually one cycle is all that's necessary. The ultrasonic cleaner works for both water based and solvent based coatings as no coatings used at MRW contain nitrous cellulose.

Robotic Spray Line

In 2012, MRW installed an enclosed robotic spray line by Superfici for large flat panels. The machine sprays a consistent coat and can be programmed to spray only the area required. There is usually some overspray, so the operators use paper to line the conveyor belt, therefore, solvent is not required to clean the belt. "The robot," as the machine is fondly called, has increased the through-put capacity by at least 100% when in full use while improving the quality and consistency of the coating and reducing the amount of wasted paint. The company has hired additional workers to operate the machine and manage the work load that has resulted from incorporating this state of the art technology into the company's repertoire. The cost for the equipment was \$1.2 million and, because of the increased efficiency and capacity, the pay-back period for the robot was five years.



Robotic Spray Line at MRW

Water Based Coatings

In 2016 the company began implementing a new process to prioritize the use of water based coatings on new jobs. When seeking approval from a new client for a coating formulation and appearance, the company's finishing department now prioritizes sending a sample using water based coating. If the sample

is approved, the order is filled using water based paint. Lower sheens and lighter colors usually produce greater success for client approval and product quality with water based coatings. This practice of prioritizing water based coatings has resulted in an estimated reduction of 12 tons of VOCs per year. Some jobs require solvent based coatings including those with opaque finishes or dark, higher gloss stains. However, in 2017 and into the foreseeable future, MRW is filling product orders with approximately 75% water based coatings despite significant increases in production.

Additional Initiatives

MRW's leadership is interested in investing in efficient technologies and creating programs to reduce the facility's waste from all departments. MRW's spray booths are lined with peelable booth coating. This practice saves time and makes the spray booth cleaning process more efficient.

The company also has an aggressive program to divert its waste stream from the landfill. In addition to recycling or reusing 85% of its wood waste, MRW has significantly reduced the quantity of outgoing trash by recycling or selecting recovery programs for all plastics, all metals, paper and cardboard, ion and lithium batteries, light bulbs, and electronics. The company used to produce 30 yards of trash per week with 25% of the facility space and 33% of the personnel that now produce about eight yards of trash per week.

"It takes a commitment from every person in the finishing department to keep our waste and air emissions at manageable levels."

Jim Richey, Manager, Finishing Department, Mark Richey Woodworking

This case study was prepared by the Office of Technical Assistance and Technology (OTA), a branch of the Massachusetts Executive Office of Energy and Environmental Affairs. The OTA helps businesses and other organizations improve their environmental performance by helping them comply with relevant regulations, reduce their use of toxic chemicals, and save money through energy, water, and material resource conservation. OTA's **non-regulatory** and confidential services are available at **no charge** to Massachusetts businesses and institutions.

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