



Toxics Use Reduction Case Study

Low-VOC Coatings for Brownell Boat Stands, Inc.

Summary

In an effort to reduce emissions of volatile organic compounds (VOC) from its coating operations, Brownell Boat Stands, Incorporated switched from low-percent solids paint thinned with toluene to high-solids coatings that could be thinned with acetone, a non-VOC. Brownell also enlarged its manufacturing facility to allow product inventory to be stored inside, and installed an automatic dip coating machine to handle a portion of the company's production line. Thanks to these changes, the company has been able to reduce VOC emissions by half while steadily increasing production.

Background

Brownell Boat Stands is a 45 year-old company which employs 23 people at its headquarters and manufacturing facility in Massapoisett, MA. A pioneer in the market, Brownell has established itself as the world's largest manufacturer of portable, adjustable, reusable dry-dock boat stands for sailboats and motorboats. Brownell produces stands in a variety of configurations. Each stand is welded from steel tubing and angles, and is fitted with a top consisting of a plywood or metal platform fixed to a threaded steel rod.

The stands are painted by dipping the fully welded product into a large tank. About six stands can be dipped at once, depending on the size of the stands. Once the stands have been dipped, they are suspended over the tank to allow excess paint to drip off. They are then moved down the line and left to finish air drying. The stand tops are painted separately.

The entire production line, from the initial cutting and welding of the steel tubing to the packaging of painted stands and tops is now entirely contained within a single building. There is no special temperature or humidity control for the building or the dip coating areas.

Toxic Use Reduction

Product Substitution: Following an inspection and a recommendation from the Massachusetts Department of Environmental Protection (DEP), Brownell Boat Stands contacted OTA for assistance with reducing VOC emissions below the 5 ton/year Limited Plan Application (LPA) threshold. At that time, the viscosity of the coating used in Brownell's dip tanks was maintained with toluene (the coating contained approximately 5 lbs of VOC per gallon as applied). Working with its coatings manufacturer and OTA, the company investigated various low-VOC options, including latex waterborne coatings.

Brownell's products are price competitive, and the company strives to reduce manufacturing costs wherever possible. The additional costs for product cleaning and preparation associated-with several alternative coatings were serious drawbacks.'

The company eventually decided on a high-solids, low-VOC coating (about 3 lbs of VOC per gallon as applied) kept thin with acetone, rather than toluene. This new coating met Brownell's needs with regards to coverage, durability, and rapid drying time, and also allowed the company to conform with LPA requirements. Early in the review process, other technologies that met this criteria, such as powder coatings and UV coatings, were determined to be prohibitively expensive.

After extensive up-front testing with their vendor, Brownell Boat Stands changed the coatings in the dip tank over to the new resin formulation gradually to avoid the need to discard unused old formulation or interrupt production. Evaluations have indicated that the new paint achieves better coverage than the toluene-based paint, and that apart from a slightly longer drying time, there have been no problems with the application or viscosity of the paint with varying temperature and humidity conditions.

Process Changes: Brownell elected to expand their manufacturing facility to house the large inventory generated in preparation for the market's rush season, which runs from August to November. Previously, completed stands were stored outside, and oftentimes had to be touched up or entirely re-coated before they were shipped off for sale. The company also installed a customized dip coating machine for the stand tops. The machine dips the stands into a small tank, spins them over the tank to remove excess paint, and runs them along a conveyor as they air dry. It replaces a more time consuming and labor intensive hand-dipping operation and recovers more of the excess paint from the stand tops.

Results

The new acetone-thinned formulation, combined with the process changes implemented at Brownell's facility, have allowed the company to cut total annual VOC emissions by half to 3.5 tons. These reductions have been achieved even as production volumes have increased by more than 10%.

Facilities with greater air emissions generally must complete a more extensive permit application process and comply with more rigorous control requirements. Reformulation allowed Brownell to submit a Limited Plan Application, thereby saving the company \$5,000 - \$10,000 in engineering costs and, \$800 in permitting fees that would have been incurred under a Comprehensive Plan Application. Under the Limited Plan, Brownell must simply follow standard emissions control measures.

.This case study is one in a series prepared by the Office of Technical Assistance (OTA), a branch Of the Massachusetts Executive Office of Environmental Affairs. OTA's mission is to assist industry in reducing the use of toxic chemicals and/or the generation of toxic manufacturing byproducts. Mention of any particular equipment or proprietary technology does not represent an endorsement of these products by the Commonwealth of Massachusetts. This information is available in alternate formats upon request. OTA's confidential, non-regulatory services are available at no charge to Massachusetts businesses and institutions that use toxics. For further information about this or other case studies, or about OTA's technical assistance services, contact: Office of Technical Assistance, 100 Cambridge Street, Room 2109, Boston, Massachusetts 02202. Phone #(617) 727-3260). Fax #(617) 727-3827. Website: <http://www.magnetstate.ma.us/ota>.