



# Waterbased Substitutes for Wood Finishing Lacquers

<b>Company</b>	Aaron Carlson Company Minneapolis, Minnesota
<b>Results</b>	A list of suppliers of waterbased lacquers was assembled by the intern. Criteria for judging the quality of the finish were established and tests to compare lacquers were developed and demonstrated.

Aaron Carlson Company produces high quality custom interior woodwork. Cabinets, doors, desks, and other products are stained and sprayed with a solvent-based catalyzed nitrocellulose wood finishing top coat. In order to meet customer specifications, a wide range of sheens or glosses must be available to use for this lacquer finish coat. The lacquer currently in use contains over five pounds per gallon of volatile organic compounds (VOCs) and accounts for releases to the environment of more than 20,000 pounds per year. Approximately 55 gallons per year of lacquer waste is accumulated due to the expired pot life of the catalyzed lacquer.

### Incentive for Change

Aaron Carlson Company was interested in reducing its VOC emissions by finding a waterbased lacquer that could be substituted for the solvent-based lacquer. Current Minnesota regulations do not mandate VOC reductions, but the Clean Air Act and several California laws indicate that future reduction requirements are imminent. Coatings that are not catalyzed also remain usable for a longer period of time than catalyzed coatings. This would result in generating less waste lacquer and would reduce waste disposal costs.

### Intern Activities

The intern contacted lacquer suppliers to determine the availability of waterbased lacquers and to obtain samples for testing. Tests were designed to evaluate and compare the lacquers. Criteria were developed based on customer requirements and process constraints. Key criteria include:

- Gloss variances
- Drying time
- Mar or scratch resistance
- Solvent resistance
- Compatibility with stains
- Requirements for temperature and humidity controls
- Costs: labor, new equipment, cost per gallon, coverage and application rate.

Potential costs and other economic data were also gathered by the intern.

### Results

A list of suppliers of waterbased lacquers was assembled by the intern. Criteria for judging the quality of the finish were established and tests to compare lacquers were developed and demonstrated.

Twelve lacquers were tested against the established criteria, and two waterbased lacquers were identified as possible substitutes. A decision was not made during the project period to change over to a waterbased lacquer. However, after the project was completed, one of the lacquers was chosen for trials on small jobs. Bidding for small jobs is currently being done with waterbased lacquer finished samples. The finish can be applied during small runs with a cup gun adaptor on the spray equipment, thus delaying the large capital expenditure for a new spray line for applying the waterbased lacquer.

Because water in the lacquer will cause rust, in conventional spray equipment Aaron Carlson Company will need to replace some equipment with non-ferrous equipment. Other equipment will need to be reconditioned to prevent residual catalyzed lacquer from causing the waterbased lacquer to gel.

The payback period for the equipment reconditioning and replacement is at least seven years, as economic savings may only come from reducing the amount of liquid waste generated, subsequently reducing waste disposal costs.

A list of companies that manufacture waterbased lacquer, "Suppliers of Low-VOC, Low HAP and Waterborne Wood Finishes [#7]" is available from MnTAP. If you have questions about this intern

project or if you would like assistance with your waste reduction efforts, call MnTAP at 612/624-1300 or 800/247-0015 in greater Minnesota.

### **For More Information**

MnTAP has a variety of technical assistance services available to help Minnesota businesses implement industry-tailored solutions that maximize resource efficiency, prevent pollution and reduce costs. Our information resources are available online at [mntap.umn.edu](http://mntap.umn.edu). Or, call MnTAP at 612/624-1300 or 800/247-0015 from greater Minnesota for personal assistance.

*This project was conducted in 1991 by MnTAP intern, Ted Kussow a mechanical engineering student at the University of Minnesota.*