



INTERN PROJECT SUMMARY

Intern Project Date: Summer 1991

Intern: Ted Kusow

Company: Aaron Carlson Company, Minneapolis, Minnesota

Project Supervisor: Paul Pagel, MnTAP Engineer

Process Background

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 (lacquer). In order to meet customer specifications, a wide range of sheens or glosses must be available to use for the 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 their VOC emissions by finding a water-based 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 water-based 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 & 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.

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Results

A list of suppliers of water-based 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 water-based lacquers were identified as possible substitutes. A decision was not made during the project period to change over to a water-based 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 water-based 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 water-based lacquer.

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

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

Additional Information

A list of companies that manufacture water-based lacquer 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 612/627-4646 or 800/247-0015 in greater Minnesota.