



CLEANER PRODUCTION

> CASE STUDY

COATING AUSTRALIA

COATING
AUSTRALIA PTY LTD

SUMMARY

The installation of new technology has eliminated the use of solvents and thinners in applying stains and lacquers on to wood panels used in furniture production. The new technology has reduced dissipation of solvents and thinners into the atmosphere because of the curtain coater which reduces the consumption of lacquers and stains by 30–40% and the UV roller which reduces solvent usage by approx 80%. The resultant savings in labour are approx 20–25% whilst the savings in materials are approx 40%. The quality of the product is also improved and production efficiency increased. The new technology enables the industry to 'catch up' with emerging overseas competitors and provides opportunity for developing export markets. Total savings: \$30,000 per annum.



Environment Protection Agency
Government of South Australia





COATING AUSTRALIA PTY LTD

Business Profile

Coating Australia Pty. Ltd. was established in 1997 to increase competitiveness and improve business practices in the furniture industry. The business is focussing on assembling and polishing furniture made from solid timber, timber veneer and particle board.

Financial assistance

The EPA's Cleaner Industries Demonstration Scheme provided an interest free loan of \$69,000.

Technology installed

Solventless timber polishing equipment.

Cleaner production motivators

Increased production while minimising manual spraying and thereby labour.
Compete internationally with the demand in South East Asian markets to produce environmentally friendly products.
Reduce the dissipation of hazardous substances into the atmosphere.

TRADITIONAL APPROACH

- The SA furniture industry uses approx 1.2 ML of paint and solvent per annum.
- Traditional polishing errors such as runs, patches missed, consume a lot of paints, solvents and thinners. Final products vary in appearance because the degree of staining varies between different polishers.
- Operators are exposed to chemicals.
- Rate of production of a spraying machine is limited by factors such as finishing features, required quality, shape of the piece, gun movement and number of guns used for spraying. It is a labour intensive process and there are few qualified polishers in SA.
- A polished piece of furniture is very soft and there is a high rework rate between the assembly process and the polishing process.

WASTE MANAGEMENT

Processes generating waste

A team assembled the furniture and prepared it for polishing; then up to five polish applications of lacquer combined with solvent and thinner, and then sprayed on to furniture item. Solvents and thinners dissipated directly into the air via exhaust system. The ratio of lacquer to solvent and thinner on average approx 28:72.

Waste stream description

Solvent and thinner fumes dissipated into environment.

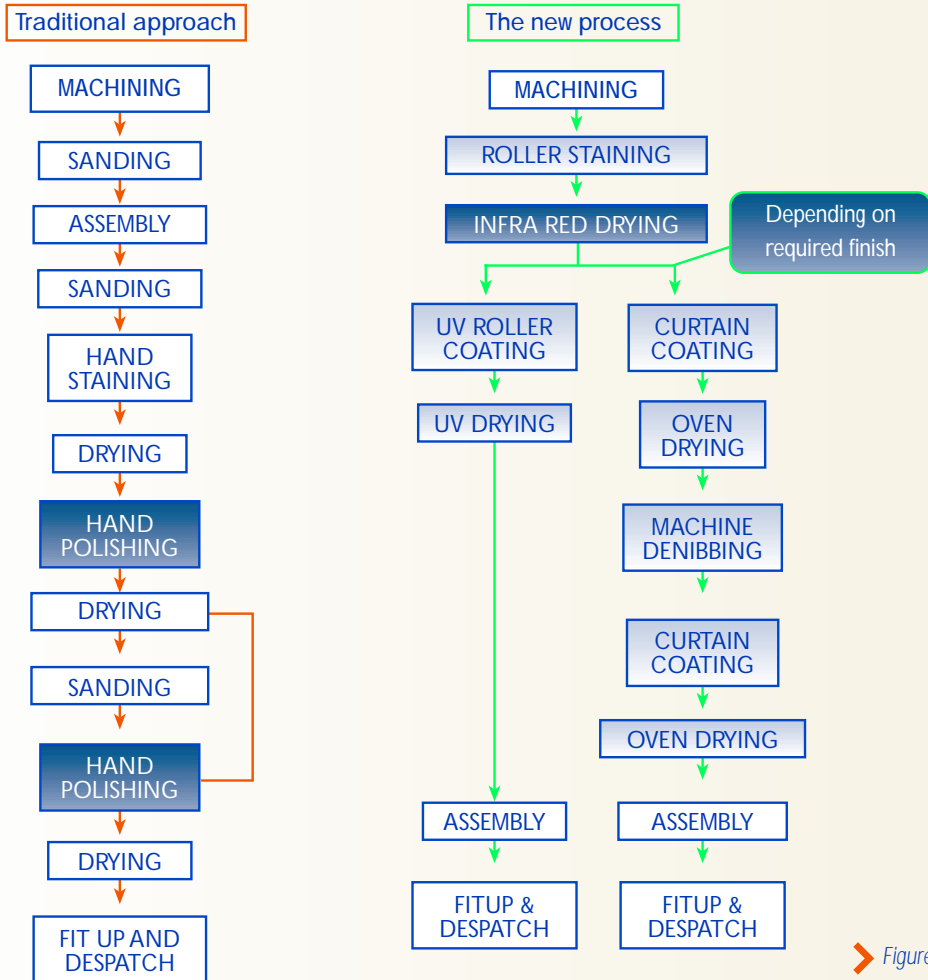


Figure 1 Process flow diagram

CLEANER PRODUCTION INITIATIVES

New polishing techniques

The lacquer line comprises several sections including:

- conveyor
- roller coater
- drying tunnel
- curtain coater
- exhaust system
- drying rack
- drying oven.

The UV rollercoater eliminates the use of solvents and thinners by rolling the lacquer (UV material) directly on to the piece of timber. UV light applied to the timber cures the lacquer within seconds and the timber is ready to be assembled into the piece of furniture. This method is used especially for drying the less visible areas of furniture such as underneath surfaces, and for commercial desks. The drying time is in the range 5–10 seconds.

The airless high output pressure spraying equipment, especially for base coat lacquers, allows more lacquer to be applied within a specific time and very little product bouncing since the sprayed lacquer droplets are larger and not mixed with high pressure air.

BENEFITS RECOMMENDED AND IMPLEMENTED

Solventless timber polishing equipment

ENVIRONMENTAL	
Air quality	<ul style="list-style-type: none"> • Reduced dissipation of solvents, paints and thinners; emissions ventilated into an air exhaust system. • Lacquer oversprays caught by filters located in different places on the machine preventing discharge of solid particles into the atmosphere. • Airless guns reduce overspray and hence fumes within the finishing area.
Storage, usage and handling chemicals	<ul style="list-style-type: none"> • Minimised volume of lacquers and stains used in the process by 30–40%, reduced the explosive hazard and substantially reduced storage of hazardous substances on the premises. • Usage of environmentally friendly substances (water-based stains and paints, UV lacquers). • Optimising the process by using mechanical spraying instead of gun spraying has reduced the amounts of paint used and increased the quality of the product.
ECONOMIC	
Investment	<ul style="list-style-type: none"> • \$150,000 (includes the EPA contribution)
Operational and maintenance costs	<ul style="list-style-type: none"> • Reduced manufacturing costs. • Automatic spraying does not require qualified painters.
Productivity	<ul style="list-style-type: none"> • Reduced production time: much faster process than traditional polishing. • Much improved production efficiency, far better product quality and superior finish. • Greater export opportunities, positive effect on developing potential export markets for Australian furniture manufacturers. • Significantly improved physical and chemical features of finished products, especially mechanical strength; finish much harder than with traditional spray polishing. • More consistency in stain colour. • Less rework, less polishing errors and rejects.
Savings, outcomes	<ul style="list-style-type: none"> • Increased profitability of 5%. • The curtain coater reduces the consumption of lacquers and stains by 30–40%. The UV roller saves approx 80% solvent usage. • The savings in labour approx 20–25%; savings in materials approx 40%. • Total saving in turnover of about 20%.
Payback period	<ul style="list-style-type: none"> • The payback period likely to be less than 5 years.
OHS	<ul style="list-style-type: none"> • Health risks to the operators reduced substantially since no operator required during spraying process. • Skin contact with hazardous chemicals and inhalation of solvents and solids extensively eliminated.

BENEFITS RECOMMENDED AND BEING CONSIDERED

- Ecolabelling of products to educate the community.
- New unconventional printing methods.

WHERE TO FIND ADDITIONAL INFORMATION

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