ChemTRAC Pollution Prevention Case Study

➢ *Commercial Screen Printer*

Company Overview

This facility manufactures identification labels, signs, nameplates, identification tags and labels, using a wide range of materials that include aluminum, stainless steel, brass, foil, Mylar, vinyl, Lexan and Lamicoid. Currently 21 people are employed at the facility.

Pollution Prevention Assessment Process

The principle motivators for the company in considering a P2 Plan for their facility were regulatory compliance and the desire to be more environmentally responsible. The facility's P2 Plan focuses on opportunities for reducing the priority substances volatile organic compounds (VOCs).

Through the ChemTRAC Program they retained a pollution prevention consultant to complete a pollution prevention plan. This involved:

- assessment of priority substances
- tracking and quantification of priority substances
- assessment of P2 options
- development of an implementation plan

A detailed final report provided the findings and outlined opportunities recommended for implementation.

Summary of Findings

The facility's P2 Plan focuses VOCs. Due to the nature of the business and customer specifications and requirements, the facility must use inks, dyes and paints that contain the VOCs that are then released into the environment. The use of thinners and solvents and the products for cleaning the printing screens also release VOCs.

Production at the facility typically has multiple stages. Aluminum anodizing, brass and stainless steel etching processes are used to create the required images on metal plates. Labels are then hand filled with paints, and baked, which releases VOCs as the paints are cured and dried. After baking, a final cleaning step is needed. As part of this cleaning, identification labels are soaked in mineral spirits overnight. Commercial sand papers and manual cleaning with mineral spirits are used for the final cleaning of products. Some losses of mineral spirits occur with the disposal of mineral spirits moistened clothes.

The P2 Plan made several recommendations:

- Disposal of solvent rags used for the process through a hazardous waste service. This would reduce total VOCs from rags by an estimated 90%, or 90 kg per year.

- Switching to low VOC or VOC free cleaner. While significant product savings are not anticipated, this is expected to reduce VOCs releases from cleaners by 25%, or 150 kg per year.

- Investigating the use of an automated conveyor belt washer for cleaning screens. The estimated cost of this change is $30,000 and would lead to a 50% reduction in labour used in cleaning screens, resulting in $20,000 of yearly labour savings. A 25% reduction in cleaner use, for a reduction of 129 kg of VOCs per year and product savings of $1,325, along with additional savings from the potential of reduced water use could also be expected from this change.

- Developing protocols and implementing a staff training program for Best Operating Practices in the use of cleaners. An in-house training would have an estimated cost of $2,060. Potential annual savings would be $2,110 and a reduction of VOCs by 80 kg per year.

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Pollution Prevention Solutions, Environmental Results and Related Cost Savings

The Table below summarizes select pollution prevention projects outlined in the facility's report. When implementation is complete, the pollution prevention measures are

- ✓ **Projected to reduce 449kg of VOCs annually.**
- ✓ **Offer a total annual savings of $23,435 and an overall payback of 16 months**

Opportunity	P2 Solution	Environmental Benefits	Cost Savings and Payback
Reduction of mineral spirit on-site releases	Waste Management Change: Dispose solvent laden rags through special service	Reduces VOCs by 90 kg/yr.	Implementation costs = $5,436. Annual savings = $0 **Payback = None (additional cost).** **Effort: Minimal**
Chemical substitution with alternative plate cleaners	Replace existing cleaners with low VOC cleaners	Reduces VOCs by 150 kg/yr.	Implementation costs = Little or none. Annual savings = $0 **Payback =Not Applicable.** **Effort: Minimal**
Equipment change with cleaners	Install automated commercial sized conveyor belt washer	Reduces VOCs by 129 kg/yr.	Implementation costs = $30,000. Annual savings = $21,325. **Payback =17 months.** **Effort: Significant**
Staff training	Provide annual refresher training on Best Operating Practices	Reduces VOCs by 80 kg/yr.	Implementation costs = $2,060. Annual savings = $2,110. **Payback = 12 months.** **Effort: Moderate**