



ON-SITE TECHNICAL ASSISTANCE PROGRAM FOR MANUFACTURERS

» Pollution Prevention Case Study

Industrial Paints and Coatings

COMPANY OVERVIEW

The following describes a 40-person manufacturer of a wide range of high quality colour paints and industrial coatings, located in Ontario, Canada. There are six main processes at the facility: plastisol production, backer and thinner production, quality assurance/quality control (QA/QC), cleaning, ancillary processes and waste management.

P2/TR/E2 ASSESSMENT PROCESS

Through The Bloom Centre for Sustainability (BLOOM), this manufacturer retained the services of a pollution prevention consultant, Enviro-Stewards, to complete an integrated pollution prevention, toxics reduction and energy efficiency (P2/TR/E2) assessment of its facility. The key driver for participation was Ontario's *Toxics Reduction Act, 2009* (TRA), which requires accounting, reporting, and planning to reduce the use and creation of toxic substances. Company management is also very invested in continuous improvement and keen to integrate environmental sustainability principles into the facility's operations.

The assessment process involved an on-site training seminar for facility staff, in-plant study work, and an engineering assessment of alternatives. The consultant provided the company with a detailed assessment report, which summarized the findings of the assessment along with recommendations on P2/E2 options for key processes.

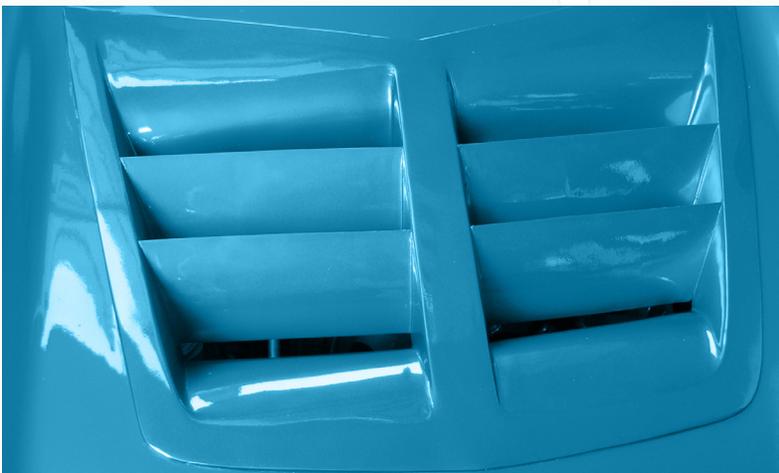
SUMMARY OF FINDINGS

At the time of the assessment, backer process equipment was cleaned using wash solvent, which contains the TRA and CEPA toxic substance methyl ethyl ketone (MEK), among others. Polyester backer contains a solvent as an ingredient, which can be used to clean the process equipment after the backer is made. This solvent/paint mixture can then be used as an ingredient in the next appropriate batch of backer. This option reduces MEK use by 5,000 kilograms, hazardous waste by 24 tonnes, and saves \$20,000 annually. The facility is implementing a similar approach for cleaning the plastisol process tanks, which further reduces MEK use by 3,600 kilograms, hazardous waste by 25 tonnes, and saves \$20,000 annually.

In the plastisol production process, heat is generated when ingredients are mixed in tanks. In order to maintain an internal tank temperature at or below 35°C, tanks are equipped with external jackets through which city water runs continuously and the used city water is discharged to the drain. Based on empirical observation by facility staff, temperatures of water entering and leaving the jackets were approximately the same, which suggests that an excessive quantity of water is used for this purpose, since very little heat is being transferred to the cooling water. Installation of temperature regulating valves for mixing tanks to regulate the flow of water entering the process will significantly reduce cooling water consumption, almost 5,000 tonnes annually, while reducing greenhouse gas emissions by 1 tonne and costs by \$10,000 annually.

In QA/QC, implementation of standard operating procedures to ensure that all paint or coating samples are returned to the batch, can reduce use of heavy metals (lead – TRA and CEPA toxic) by 1 kilogram, hazardous waste by 1 tonne, and save \$4,000 annually.

Many additional recommendations to further reduce toxics, hazardous waste, volatile organic compounds (VOCs), energy consumption and costs were provided in the assessment report, selections of which are highlighted in the table on the following page.



P2/TR/E2 Solutions, Environmental Results and Related Cost Savings

The table below summarizes P2/E2 projects being undertaken by the paint and coatings manufacturer from the list of recommendations outlined in the assessment report. When implementation is complete, the P2/E2 measures are projected to reduce annually:

- 9 tonnes toxics
- 1 kg heavy metals
- 83,000 m³ natural gas
- 4,970 tonnes water
- 0.6 tonnes VOCs
- 51 tonnes hazardous wastes
- 162 tonnes greenhouse gases

Total quantified annual savings of **\$75,000** and an overall payback of **< 2 years**.

PROCESS	P2/TR/E2 SOLUTIONS	ENVIRONMENTAL REDUCTIONS	COST SAVINGS & PAYBACK
PLASTISOL PRODUCTION Targeted Pollutants/Waste: Water, GHGs	Install temperature regulating valves for mixing tanks on outlet side and pressure reduction on inlet for water system	4,970 tonnes/yr water 1 tonne/yr GHGs	➔ \$10 K annual savings Payback of 9 months
BACKER AND THINNER PRODUCTION Targeted Pollutants/Waste: Toxics (TRA, CEPA), VOCs, GHGs	Install covers on portable in-process tanks	27 kilograms/yr VOCs 27 kilograms/yr MEK 0.1 tonnes/yr GHGs	➔ \$80 annual savings Payback of 9 months
QA/QC Targeted Pollutants/Waste: Heavy Metals, Toxics, Hazardous Waste	Standard Operating Procedures (SOPs) to ensure that all QA/QC samples go back into batch	1 kilogram/yr heavy metals (lead) 1 kilogram/yr toxics (TRA, CEPA) 1 tonne/yr hazardous waste (211H)	➔ \$4 K annual savings Payback immediate
CLEANING Targeted Pollutants/Waste: VOCs, Toxics (TRA, CEPA), Hazardous Waste, GHGs	Wash backer process equipment with product solvent for reuse in subsequent batches	5,130 kilograms/yr MEK 24 tonnes/yr hazardous waste (211H)	➔ \$20 K annual savings Payback immediate
	Wash plastisol process tanks with plastisol solvent for reuse in subsequent batches	3,570 kilograms/yr MEK 25 tonnes/yr hazardous waste (211H)	➔ \$20 K annual savings Payback immediate
	Install tank covers on portable cleaning vessels (tanks, cans, buckets)	0.5 tonnes/yr VOCs 166 kilograms/yr MEK 2 tonnes/yr GHGs	➔ \$170 annual savings Payback of 2 months
	Cover lab equipment cleaning containers when not in use	78 kilograms/yr VOCs 39 kilograms/yr MEK 0.3 tonnes/yr GHGs	➔ \$200 annual savings Payback immediate
ANCILLARY PROCESSES Targeted Pollutants/Waste: Natural Gas, GHGs	Install air-to-air heat recovery system	41,200 m ³ /yr natural gas 80 tonnes/yr GHGs	➔ \$10 K annual savings Payback of 8 years
	Install condensing stack economizer	32,600 m ³ /yr natural gas 63 tonnes/yr GHGs	➔ \$8 K annual savings Payback of 5 years
	Install boiler controller	9,240 m ³ /yr natural gas 18 tonnes/yr GHGs	➔ \$2 K annual savings Payback of 2.5 years

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