

BLOOM ON-SITE TECHNICAL ASSISTANCE PROGRAM FOR MANUFACTURERS



Metal Finishing » Pollution Prevention Case Study

West-Tech Finishing Inc.

COMPANY OVERVIEW

West-Tech Finishing is a 23-person anodizing facility specializing in applying finishes to aluminum parts, located in Brampton, Ontario. The main processes at the facility are hard anodizing, sulphuric anodizing and chromate coating.

P2 ASSESSMENT PROCESS

Through The Bloom Centre for Sustainability (BLOOM), West-Tech retained the services of a pollution prevention consultant, Enviro-Stewards, to complete an integrated pollution prevention and energy efficiency (P2/E2) assessment of its facility. The key driver for participation was to reduce the facility's aluminum concentration in its wastewater effluent. Additional participation drivers were Ontario's *Toxics Reduction Act, 2009* (TRA) requirements, and desire on the part of West-Tech management to be the most modern and efficient anodizer in Ontario.

The assessment process involved an onsite training seminar for facility staff, in-plant study work, and an engineering assessment of alternatives. Enviro-Stewards 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

West-Tech provides several types of finishes, including sulphuric anodizing as well as chromate conversion coating. In general, anodizing is an electrochemical process that converts the aluminum surface into a decorative durable corrosion resistant anodic oxide finish. The anodic coating is achieved by passing a direct current through an electrolytic solution, in this case, sulphuric acid. Sulphuric acid is the most widely used solution in anodizing; however it is toxic, and thus any opportunity to reduce its use and associated waste must be explored. Enviro-Stewards recommended installation of an on-site acid purification system to remove impurities from the sulphuric acid, which can then be reused in the aluminum anodizing process instead of being disposed of as hazardous waste. This implementation will reduce sulphuric acid raw material use by 14 tonnes, hazardous waste by

52 tonnes and save West-Tech \$15,000 annually. This estimated reduction in sulphuric acid usage is expected to reduce quantities to below National Pollutant Release Inventory (NPRI) reporting thresholds, thereby avoiding the associated costs with reporting to the NPRI and the TRA. Furthermore, this practice could also potentially help West-Tech satisfy applicable municipal wastewater discharge standards.

The largest estimated water consuming process at West-Tech is the anodize rinse, followed by the chrome, soap, dye, and etch rinses. It was observed during the assessment that spent water from soap rinse (alkaline) and etch rinse (acidic) is discarded. If these waste streams are collected in a tank to be neutralized and reused, West-Tech can reduce water consumption by 2,000 tonnes and save \$4,000 annually.

As the racks of aluminum parts are removed from the anodizing tanks, chemical solution drips from them, referred to as "drag-out". Since drag-out is wasted raw material, and of toxic constituency, it is beneficial to reduce it as much as possible. Increasing the amount of time the racks are held over certain baths lets more of the solution drip from the parts back into the tank, meaning less is lost during transfer, or carried along with the parts into the next solution or rinse tank. Implementing this practice could potentially reduce drag-out volume by up to 50 percent and hazardous waste load by 46 kilograms annually.

Enviro-Stewards also recommended solutions to reduce energy consumption, greenhouse gases and costs, which are highlighted in the table on the following page.

"For West-Tech to be the most modern and efficient anodizer requires that we constantly rethink, change and adapt. The BLOOM program gave us an opportunity to be pro-active with our approach to the *Toxics Reduction Act* requirements, and Enviro-Stewards' clear business and environmental analyses are critical for us to make smart business decisions moving forward, and our long-term sustainability."

Bob Ford, General Manager, West-Tech Finishing Inc.



On-site acid purification system reduces toxics by 14 tonnes, hazardous wastes by 52 tonnes, and saves West-Tech \$15,000 annually.

P2/E2 Solutions, Environmental Results and Related Cost Savings

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

- 14 tonnes toxics**
- 24,000 KWh electricity**
- 1,780 tonnes water**
- 52 tonnes hazardous waste**
- 5 tonnes greenhouse gases**

Total quantified annual savings of **\$26,000** and an overall payback of **< 3 years**.

PROCESS	P2/E2 SOLUTIONS	ENVIRONMENTAL REDUCTIONS	COST SAVINGS & PAYBACK
Anodizing and Chromate Coating Targeted Pollutants/Waste: Toxics, Hazardous Wastes, Water, VOCs	Install onsite acid purification system	0.02 kilograms/yr VOCs 14 tonnes/yr sulphuric acid (TRA and CEPA toxic) 52 tonnes/yr hazardous wastes (212C)	➔ \$15 K annual savings Payback of 4 years
	Neutralize and reuse soap and etch rinse water	2,000 tonnes/yr water consumption	➔ \$4 K annual savings Payback of 1 year
	Reduce drag-out / increase drainage time over plating tanks	46 kilograms/yr hazardous waste (212 C)	➔ \$20 annual savings Payback immediate

Building Services Targeted Pollutants/Waste: Electrical Consumption, GHGs	Lighting retrofit in plant area (T5s)	24,000 KWh/yr electricity 5 tonnes/yr GHGs	➔ \$2 K annual savings Payback of 3 years
	Power factor correction unit	No environmental or energy performance improvements	➔ \$5 K annual savings Payback of 1.5 years

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