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Office of Technical Assistance
Executive Office of Environmental Affairs
Commonwealth of Massachusetts



Toxics Use Reduction Case Study

ZINC DISCHARGE REDUCTION AT THE LOWELL CORPORATION

SUMMARY

The Lowell Corporation added a dead-water rinse tank, drip boards and a drain rack to its zinc phosphating line in order to minimize its losses of zinc while permitting some reuse of phosphating solution. The production line change -- which was carried out at a nominal cost in time and labor -- cut zinc discharges by two thirds, bringing the firm into line with local sewer authority discharge limits. This environmentally beneficial change effectively saved the Lowell Corporation approximately \$26,000 per year.

BACKGROUND

The Lowell Corporation is a 28-employee machine tool shop which manufactures specialty ratchets from cast iron blanks. The firm was based in Worcester until June of 1991, but has since relocated to West Boylston. As part of the production process, pieces of iron are treated with zinc phosphate to improve corrosion resistance. Before it began to explore Toxics Use Reduction (TUR) opportunities, the Lowell Corporation used a zinc phosphating line with two phosphating tanks, each followed by a running-water rinse tank. (See Figure 1)

The regional sewer authority, known as the Upper Blackstone Pollution Abatement District (UBWPAD), measured zinc concentrations in Lowell's wastewaters at 4.47 ppm -- considerably above the 2.61 ppm zinc limit specified in the company's discharge permit. UBWPAD instructed Lowell to bring its zinc discharges into line or eliminate its zinc phosphating processes and contract out the phosphating work. After determining that out-of-house phosphating would add \$26,000 per year to its operating costs, Lowell officials decided to investigate process modifications that would remove zinc from its wastewater.

OTA CONSULTATION

The UBWPAD referred Lowell Plant Manager Richard Gion to the Massachusetts Office of Technical Assistance (OTA) for help in reducing zinc discharges. OTA proposed the installation of a dead-water rinse tank after the second phosphating tank in Lowell's phosphating line. (See Figure 1) OTA's past experience with similar changes indicated that this technique would decrease zinc drag-out by approximately 50%. Additionally, OTA suggested drip boards and drain racks on all rinse tanks to further reduce zinc drag-out. (See Figure 2).

TOXICS USE REDUCTION MODIFICATIONS

The Lowell Corporation chose to install the dead-water drag-out tank. The change was hardly complex - the new tank carried a modest price tag and took only ten minutes to install.