



Graver Technologies

ECOSORB® MULTI-FUNCTIONAL PURIFICATION MEDIA

ECOSORB® Metal Finishing Wastewater Case Study

The Problem:

A metal finishing plant was finding it difficult to keep rinse bath discharge consistently in compliance. Despite a multi-stage waste treatment system, variations in effluent feed, bath mixtures, and flow rates often resulted in discharge upsets. As in many plants, the use of electroless copper, finishers, and brighteners added to treatment difficulties. Additional monitors and a closer watch on the system helped, but offered no long-term fix.

The company had no wish to replace their existing treatment plant. They hoped to find a solution that would augment their current process, without a significant capital investment.

Discussion:

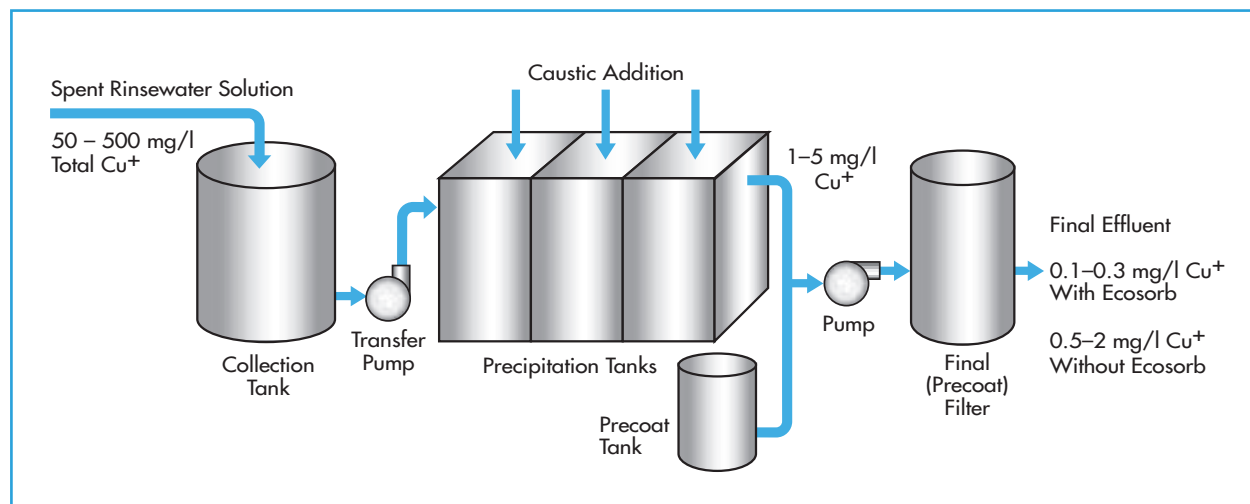
It's a common problem. As discharge regulations have become more stringent — in many municipalities heavy metal discharge is limited to 0.1–0.5 ppm - additional pressure is placed on waste treatment operations.

Conventional multi-step precipitation, even with final filtration, often can't meet the new requirements.

Several factors contribute to the problem. First, treatment processes designed for targets of 1–2 ppm may achieve better results under ideal conditions, but cannot cope with even minor process imbalances. Extra dragout, for example, can put the already stressed system "over the edge." Or, the abrupt introduction of a bailout load can lead to a complete process upset.

In addition, the chelating agents used to keep plating metals in solution and to increase the efficiency of plating processes actively work to prevent recovery of the metals by precipitation, especially at ppb levels. Colloidal particles as well as undissolved metals also contribute to higher discharge levels, and may not be removed by conventional filtration media.

New waste treatment equipment is one answer. But, for most plating and finishing operations, the capital outlay would be prohibitive.



Typical rinse water recovery treatment system. Rinse water feed containing 50–500 mg/L total metal (in this case, copper) is collected in a holding tank. A measured flow of untreated feed is introduced into a series of clarifying tanks, where progressive precipitation steps are used to remove soluble metals.

A cloth matrix filter, precoated with diatomaceous earth, removes suspended solids. Depending on feed concentration and other process conditions, this type of system is typically capable of producing a treated waste stream in the 0.5 to 2 ppm range with conventional DE filtration.

ECOSORB offers an easy, economical solution

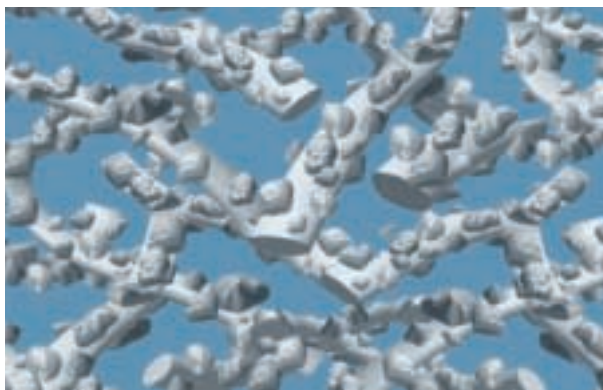
The treatment scheme shown on the previous page can reduce discharge levels to <0.5 ppm, and also widen the window of treatment operations when ECOSORB is added to the final filter. Carbon has been shown to effectively adsorb chelated copper complexes; but carbon is messy and difficult to use. Large flow rates and changing conditions require rapid adsorption and low pressure drop. ECOSORB W-714 offers the perfect solution. This semi-moist, low pressure drop, rapid adsorption filtration adsorption media is clean and easy to use. Simply substitute Ecosorb filter media for most of the diatomaceous earth precoat used in the final filtration step. In the case above, this single, economical change reduced copper discharge levels to 0.1–0.2 ppm, and improved process consistency as well. And ECOSORB W-791, an all purpose product containing activated carbon, zeolite and anionic exchange resin, is capable of removing a wide range of soluble and insoluble contaminants from water (free metals, chelated or complexed metals, residual carbamates, cyanides and chromates).

ECOSORB is a patented adsorptive medium that removes both particulate and soluble materials. The adsorbent in ECOSORB is immobilized onto a fiber filter aid producing a very low pressure drop adsorption filtration medium. This creates a large increase in adsorption efficiency and the ability to polish to low levels. When used for polishing heavy metal wastewater, ECOSORB effectively removes soluble, colloidal and chelated metals, as well as other unprecipitated solids that can add an additional burden to the discharge stream.

ECOSORB products are available in formulations to meet a wide range of process needs. Zeolite-based ECOSORB W-761 has broad applications for treatment of heavy metal streams. Carbon-based ECOSORB W-714 material is ideal for removal of chelated metal complexes and toxic organic compounds, and, as illustrated in this application brief, has been especially effective in the removal of chelated copper.

Custom formulations

Graver Technologies has developed numerous custom formulations of ECOSORB to meet the needs of specialized pretreatment and wastewater polishing applications. ECOSORB products can be tailored to provide specific performance characteristics of adsorption, filtration, and settling using a variety of active surfaces.



ECOSORB products are used by precoating onto industrial filters that allow for the formation of a filter cake.

Additional ECOSORB Literature

- GD-101 ECOSORB Products for Pharmaceutical Processing
- GD-103 ECOSORB Products for Wastewater Treatment
- GD-105 ECOSORB Product Selection Guide - Aqueous Applications
- GD-106 ECOSORB W-714 Adsorbents
- GTX-133 ECOSORB Sugar Bulletin
- GTX-134 ECOSORB Laboratory Evaluation Guide

For more information

To request a standard or custom sample or to discuss your application with a technical representative, please contact Graver Technologies at **1-800-249-1990** or e-mail us at info@gravertech.com our website: www.gravertech.com

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