Treating the hard to treat

Case Study: Aquapure

Looking Upstream to Cut Heavy Metals in Wastewater

The Challenge

A manufacturer of stainless steel and nickel alloy bar and wire was registering extremely high amounts of nickel, zinc, and other metals in their wastewater. They needed to pretreat and co-mingle into their main discharge. When they could not find solutions from their existing supplier, the manufacturer called on Hubbard-Hall to come in and assess the situation to find solutions so they could meet effluent guidelines for their wastewater system.

The Approach

Instead of immediately recommending that the manufacturer apply new chemicals and processes to the wastewater treatment operation, the Hubbard-Hall team first took a look upstream at their cleaning process which was causing the high metal levels in their system. The manufacturer had been using two types of cleaning processes in their operation: citric-based and phosphate-based. Knowing that a lot of operations have trouble with citric cleaners and the after-effects of their uses, the Hubbard-Hall team recommended a different type of cleaner in hopes of reducing the amount of metals in the waste. The same recommendation was made in changing the phosphate cleaner to a Hubbard-Hall product that allowed fewer heavy metals in the wastewater.

Executive Summary

A manufacturer of stainless steel and nickel alloy bar was failing heavy metal discharge limits

- Analysis of cleaning process lead to upstream evaluation
- **Aquapure Cal 45** and **Aquapure Cal 50** used to cut heavy metal discharge.
- Metal reductions:
  Chrome: -99.3%
  Nickel: -99.8%
  Zinc: -96.1%
  Copper: -99.7%

The Outcome

By focusing on the upstream process instead of just treating the wastewater system as they were asked originally, Hubbard-Hall was able to significantly reduce the amount of nickel, zinc, and other metals that were making their way into the main discharge line.

Previously, the plant was discharging 3315 mg/L of nickel into the wastewater with a limit of 3.78 mg/L. By changing the citric cleaning process to use Hubbard-Hall's **Aquapure SLA 3000** and **Aquapure Cal 40** and adjusting the pH to 9, the team was able to get the discharge of nickel to 3.46 mg/L, well below the threshold. Likewise, chrome was reduced from 462 mg/L to just 2.48 mg/L; zinc was cut from 9 mg/L to 0.351 mg/L; and copper was reduced from 345 mg/L to barely 0.985 mg/L, far below all levels allowed. Similarly, the phosphate line was switched to Hubbard-Hall's **Aquapure Cal 50 Plus**, and the pH adjusted to 7.5.

"The expertise Hubbard-Hall has in upstream cleaning processes helped pinpoint the wastewater issue. We definitely lucked out."

Wastewater Treatment Operator

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