



## ELECTROLESS NICKEL TREATMENT SYSTEM



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# ELECTROLESS NICKEL TREATMENT SYSTEM

- Renovare International, Inc. has completed a development program to demonstrate the feasibility and efficiency of dissolved nickel removal from aqueous electroless nickel (EN) waste streams using its RenoCell<sup>®</sup> advanced electrowinning technology. The development program significantly reduced the operating cost of nickel metal removal, meeting effluent discharge criteria, allowing for nickel recovery and reducing environmental risks from current practices.
- The major driving force for this development program was the reduction of high and increasing chemical costs associated with nickel removal by precipitation (VenMet, DTC) technologies. Total operating costs are also increasing when labor, waste sludge disposal, and indirect cost elements are included.

## RENOCELL DEMONSTRATION RESULTS

- The major objective of the RenoCell program was to determine the current efficiency(s) of ionic nickel removal at various conditions of pH, temperature, and ORP, and to determine the process variable values at which the process current efficiency is maximized. The EN waste stream is a high nickel concentration relatively low volume waste stream. Thirty (30) tests were performed and covered the entire EN range of 6,000 mg/L to a few mg/L of nickel. The spent EN chemistry bath treated was from a major US disk substrate plating operation.
- Commonly used nickel treatment technology is chemical precipitation and sedimentation. Based upon the RenoCell test results, a number of alternatives with RenoCell and or RenoCell in combination with existing or other processes, provide practical and cost effective treatment to meet existing and future requirements. Renovare prepared a cost analysis on a per unit basis with enough detail to allow actual EN treatment cost information to be analyzed.

## RENOCELL COST SAVINGS

The use of a RenoCell Nickel Treatment System has a significant operating cost advantage (\$8.88/kg Ni) versus precipitation (\$45.15 to \$55.05/kg Ni).

# TYPICAL RENOCELL TREATMENT SYSTEM

