

Completed Return on Investment Project Case Study

United States Department of Energy
Office of Environmental Management
Fact Sheet

Nitric Acid Recovery

Los Alamos National Laboratory

Original Problem

The metal plating and electroforming laboratory in MST-7 generated a great deal of copper-contaminated nitric acid from the electroforming operations. Disposing of the spent nitric acid and buying virgin replacement nitric acid cost approximately \$10,000 a year. Other equipment in the plating lab recovers wash water, hydrochloric acid, and sulfuric acid for reuse, so Mike Brooks was anxious to find a method to reuse the nitric acid solution as well.

The Project Solution

Mike Brooks purchased a cold vaporization acid recovery unit to separate the aqueous nitric acid solution from the residual copper compounds. The recovered nitric acid solution can be directly reused in the electroforming dissolution bath. Although some virgin nitric acid must be added to maintain the proper concentration, over 90% of the nitric acid solution is recycled for reuse.

Value of Improvement

The success of the cold vaporization acid recovery unit means that less spent nitric acid is produced and less virgin nitric acid is purchased. The acid recovery unit saves approximately \$10,000 per year in disposal and acquisition costs, and an estimated 428 kg of nitric acid solution waste is avoided each year.

Lifecycle Waste Reduction	
Lifecycle Waste Reduction	4280 kg HAZ
Commencement Date	1999
Project Useful Life (Years)	10



DOE Monetary Benefits

Total Project Cost	\$19,280
Lifecycle Savings	\$81,720
Return on Investment	28%

Benefits At-A-Glance

- Reduces the amount of copper-contaminated nitric acid solution waste produced.
- Reduces the amount of virgin nitric acid that must be purchased.
- Saves approximately \$10,000 per year in acquisition and disposal costs.

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	Summary Data
Priority Area:	Waste Minimization Projects
Project Type:	Source Reduction
Total Project Cost:	\$19,280
Lifecycle Savings:	\$81,720
Implementing Group:	MST-7
Benefiting Group:	MST-7
Useful Life Years:	10
Return on Investment:	28%
Lifecycle Waste Reduction:	4280 kg of hazardous waste over 10 years
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