



## CASE STUDY

Customer: A large aluminum rolling mill  
Site: United States  
Coolant: Magiesol 47 with an alcohol package

## CRS Delivers Coolant Recovery Rate Greater than 98% with \$108,000 Savings

### CHALLENGE

In order to maintain high product quality in terms of visual appearance of the rolled aluminum sheet, a large aluminum rolling mill processing plant located in the US has to remove oil contamination from its process coolant and its finishing solvent.

The plant processes approximately 90,000 gallons per month, of which 75,000 gallons are process coolant and 15,000 gallons are finishing solvent. The process coolant is a combination of Magiesol 47, with an alcohol package, while the finishing cleaning fluid is a typical solvent.

The challenge is to remove oil contaminants and recover the base oil and expensive additives back to the process feed tank. Additionally, they want to eliminate the practice of taking 14,000 gallons off-site for reprocessing as this is expensive, has a potential environmental impact and does not produce consistent results in terms of residue control.

### SOLUTION

The Aluminum Rolling Mill facility began with the evaluation of the supplier alternatives available on the market. After a thorough evaluation process, the aluminum rolling mill decided that CRS has the appropriate solution based on a strong business case and the on-site turnkey service technology that incorporates contract guarantees associated with meeting stringent coolant and solvent specifications (namely cleanliness and level of residue), recovery rates and capacity.

CRS worked closely with this aluminum rolling mill to understand the level of cleanliness of the process coolant and the level of residue required by gathering the entire current chemical and process fluid variables to develop a custom solution. CRS developed a custom process flow with the appropriate temperatures and pressures to operate the custom designed thin film vacuum distillation unit ("VDU") that would process 150,000 gallons of process fluid on a monthly basis.

The actual system serves as a kidney loop operation and is capable of treating both process coolant and solvent between strict back wash procedures. The thin film VDU process operates under reduced atmospheric pressure which lowers the boiling point of the coolant and the solvent. The higher the vacuum pressures the lower the coolant and solvent boiling temperature.

This process and methodology ensures that we are able to operate at a lower temperature and reduces the possibility of overcooking the coolant or the solvent. Additionally, this process lowers the overall energy cost to reprocess the coolant and solvent because the vaporization is lower.



CRS installed this VDU on the aluminum rolling mill grounds to eliminate the need to transport the 14,000 gallons off-site. The building constructed only occupies an area of approximately 100 feet by 60 feet. The CRS trained technician operates the still 24/7 to ensure that the level of cleanliness and residue is achieved. A weekly report is generated and submitted to the Aluminum plant management team regarding the volume reprocessed, all specifications and recovery including the level of residue and H<sub>2</sub>O level in the reprocessed fluid.

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## RESULTS

The thin film VDU provides the level of cleanliness and residue removal that the customer requires. The customer is achieving the following in the reprocessed fluid that is returned to the system:

- Typical coolant recovery rate is 98%+
- Improved the residue level from 3% to 0.25%
- Remove H<sub>2</sub>O to only traceable amounts
- Appearance of water is crystal clear
- Elimination of the offsite transportation cost for 14,000 gallons every month which is \$9000 per month
- Lower virgin feed stock oil and solvent cost added back to the system

The Aluminum plant is extremely happy with the results that the CRS process has achieved since initiating the program in June 2002. It elected to renew the agreement for two successive three year terms and for HSE purposes had CRS install an integral piping system for the solvent that will allow the contaminated and reprocessed fluid to flow directly to/from the CRS VDU without the need of tank truck.