

Client Success Story: Recycle Fluid Technologies, Inc.

Company profile

Application: Recycle Fluid Technologies, Inc., of Richland Michigan recovers ethylene glycol of higher purity and greater volumetric yield. The recovered product must meet stringent General Motors and ASTM Standards.

Waste Description: The used ethylene glycol contains inhibitor salts, ash, dissolved metals, organic acids, motor oils and other variable adulterants.

Waste Disposal Goals: The client's goal is to minimize the volume of waste resulting from the process and increase the recovery of resalable ethylene glycol.



Wastewater treatment challenge

Former Process: The client was using an out dated physical chemical process combined with membrane technology to recover ethylene glycol (E.G.) from waste automobile coolants. The recovered ethylene glycol was usable but only 50-60% pure. A large volume of unusable glycol contaminated waste was generated with the old process.

CASTion solution

CASTion installed a CAST 3000 GPD Flash Distillation System constructed of 304 and 316 stainless steel. The system is capable of processing 3,000 gallons per day (input) of mixed water and ethylene glycol. The expected volumetric ratio is 55% water to 45% ethylene glycol.

The client uses a fleet of vacuum trucks to recover used ethylene glycol from automotive shops, dealers and radiator repair facilities. The collected product is transferred to a large equilibration tank and then treated with precipitating agents. Organic acids are removed via a rotary drum. The desalted influent is then transferred to the CAST distillation system. Heat is supplied by a high temperature thermal boiler and cooling is achieved using a standard cooling tower.

Pre-treatment consists of conventional precipitation using coagulants and flocculants to precipitate the dissolved phosphates and nitrates. Granular activated carbon is used to remove dissolved organic acids.

The water phase of the mixture has the lowest boiling point and is removed in the first distillation step. Water is transferred into a storage tank and will be used for diluting the pure ethylene glycol generated in step two of the distillation process.

Pure ethylene glycol is recovered in the high temperature phase of the process (second distillation step). Glycol exceeding 99% purity is transferred into a storage tank and will be blended with corrosion inhibitors and diluted to ASTM and GM specifications for resale.

The concentrate from the CAST system is hauled off as waste and typically contains only 5-6% ethylene glycol. The remainder of the still bottoms contain water and concentrated dissolved salts.

	1st Distillation	2nd Distillation
Ethylene Glycol	45%	>99%
Water	55%	<1%
Ash	10-250 PPM	< 5 PPM
Chloride	>1000 PPM	< 5 PPM
Silicon	>150 PPM	<5 PPM
Phosphorous	>5000 PPM	< 5 PPM
Boron	> 500 PPM	< 5 PPM
Organic Acids	> 50 PPM	< 0.5 PPM
Metals	> 300 PPM	ND

The estimated cost to treat one gallon of waste glycol is \$0.15. The distillation process results in a higher product yield and a higher purity of ethylene glycol. Conventional precipitation followed by membrane processes are far more inefficient, produce more waste products, have lower actual E.G. yield and have much higher maintenance costs.

Contact CASTion

With the CASTion solution, Recycle Fluid Technologies, Inc. met their recovery and discharge goals, gaining a purer resalable product and lowering their operating and waste disposal costs. Contact CASTion today to learn how we can help your company achieve its waste disposal and recovery objectives