

WMRC Technology Update

Automotive Plant Reduces Cleaner Usage

Eagle Wings Industries, Inc. (EWI) is an automotive parts original equipment manufacturer located in Rantoul, IL. EWI has a 9-stage metal cleaning process that includes a 950-gallon alkaline spray degreasing tank and a 6,340 gallon alkaline dip degreasing tank. Both tanks operate between 140°-160°F and a pH between 10.9 and 12.6.

EWI discharged more than 26,000 gallons of alkaline waste to its water treatment plant each year, in addition to the loss of 8,000 gallons of concentrated cleaning chemicals. The annual cost of disposal exceeded \$33,000.

EWI opted to use membrane filtration technology to reduce its cleaning process waste. Membrane filtration is a separation technology that removes emulsified oils and grease (O&G), precipitated metals, and total suspended solids (TSS) from process fluids and produces a clean filtrate (called permeate). The filtrate may be sewerred or reused and often contains valuable process chemicals that, when returned to the process bath, can reduce the amount and cost of raw materials usage.

EWI's pilot system of 4-5 foot long ultrafiltration membranes was setup to pull dirty solution from the process' first stage bath and return a clean permeate stream to the second stage bath.

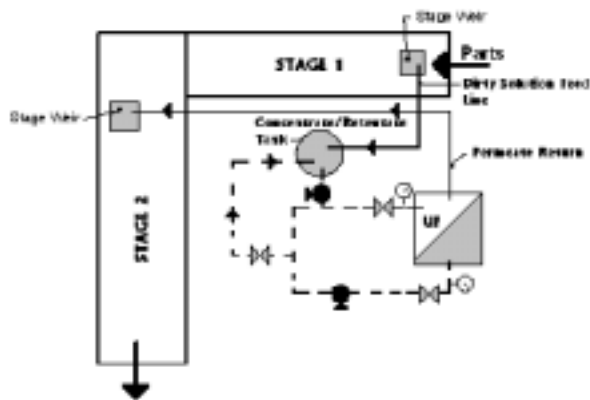


Figure 1. EWI Pilot Ultrafiltration System

The 30-day test began with a two week old bath. Laboratory analysis indicated that the first stage bath was contaminated with 660 parts per million of O&G and 410 ppm of TSS.

As the test progressed, data showed that the ultrafiltration's permeate production held steady after 12 days and the first stage bath's O&G content was reduced by 67% and the TSS was reduced by 80%.

The EWI system also recovered 87% of the cleaning chemical. However, loss of some surfactant properties required the addition of a surfactant package to replace lost chemical components.



Figure 2. EWI Ultrafiltration Unit

Economically, the installation of the ultrafiltration system paid back within one year. Annual chemical savings were \$15,000 for cleaning chemicals and \$3,100 for hydrochloric acid used to clean the two tanks. Additional savings included \$100 in wastewater treatment chemicals. Total savings equaled \$18,200 for the first year of operation.

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