

## Pilot Systems

Mech-Chem designs, fabricates, and assembles PLC automated modular pilot systems for developing, testing, and validating various processes, operations, and applications that need to safely handle and use hazardous acid and chemicals.

### Process Development Applications Include:

- ◆ Metal Dissolving Processing
- ◆ Metal Extraction Purification
- ◆ Carbon Processing Systems
- ◆ Acid Etching Milling
- ◆ Alkaline Cleaning Etching
- ◆ Acid Recovery Purification
- ◆ Waste/Wastewater Treatment



The picture above shows a modular AP-60 Acid Purification System which can process 60 gal/day of used, spent or waste acid.

Acid Purification Systems utilize an easy-to-use, dependable, and economical purification membrane technology known as Diffusion Dialysis.

Diffusion Dialysis is a very effective technology for the recovery and purification of used, spent, or waste acid solutions that contain low levels of dissolved metals and still contain a large fraction of the acids.

The system pictured on the left is a self-contained reactor unit with sliding cover. The reactor system is used for carbon processing operations and metal dissolving, extraction and purification applications.

The pilot system features chemical feed pumps with controllers, containment for acid and chemicals, and fume extraction and ventilation. Materials of construction are welded polypropylene or PVDF with PP, PFA and PVDF piping and shielding.

The pictures to the right and below show a complete automated modular pilot system for the dissolving, processing and purification of various rare earth and precious metals. The pilot system has the following features:

- ◆ PVDF Reactor with Support Stand
- ◆ Agitator with Variable Frequency Drive
- ◆ Automated Acid Feed Piping Systems
- ◆ Automated Waste Piping System
- ◆ Control Panel with PLC
- ◆ Framed Modular Enclosure
- ◆ Polypropylene Containment Tray
- ◆ Clear Plastic Splash Curtains
- ◆ Fume Ventilation System



The picture below shows a pilot acid distillation system. The materials of construction are glass components with tantalum heat exchangers assembled with PTFE gaskets. This 10 gallon per hour automated system can be used for the concentration and distillation of various spent or waste acid solutions.



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