

AnoPur™ Acid Purification Unit

BENEFITS

- Reduced sulfuric acid purchases
- Less process downtime
- Reduced neutralization and disposal costs
- Lower discharge of dissolved salt
- Improved anodize finish consistency
- Increased productivity
- Lower energy requirements and operating costs

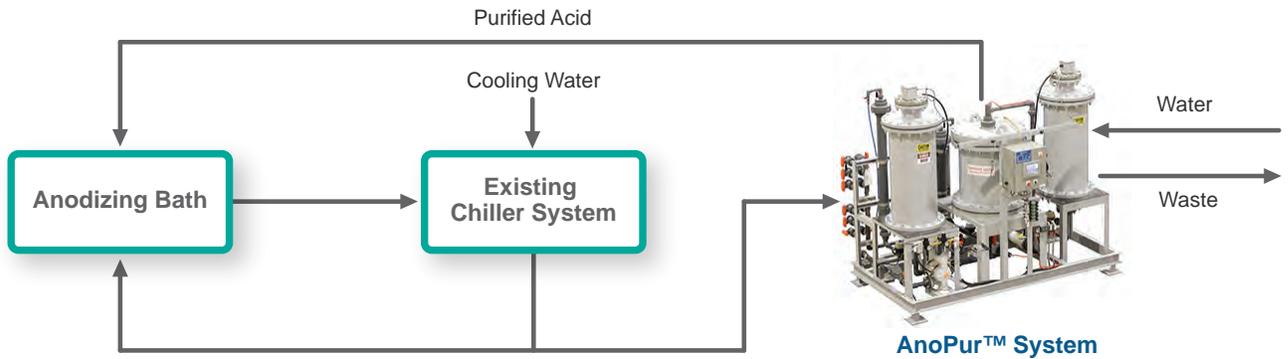


The AnoPur™ unit is a small, skid-mounted device that connects directly to an anodizing tank to continuously remove aluminum as it is dissolved in sulfuric acid. The system relies on Eco-Tec ion exchange resin technology to effectively remove metal contaminants and purify and recycle sulfuric acid.

The system first pumps filtered acid through the resin column to separate the acid and metal salt contaminants, which is followed by a water wash through the column to recover and recycle over 95% of the free acid back to the anodizing bath. This process reduces neutralization costs of the decanted bath solution and eliminates bath dumping. It offers greater safety to the operator by way of less acid usage and handling. Product quality, productivity, and process predictability are enhanced by controlling variable fluctuations in metal concentrations within the bath solution.

The AnoPur unit is available in six standard models and is easily installed. The system includes a control panel with a simple PLC and optional manual valves for both feed and product, as well as mounting hardware. A Mobile Kit is available for select models to make the AnoPur unit portable.

AnoPur™ Unit Typical Process



Typical Unit Capacities

Model	Aluminum Removal (g/h)				Flowrate (L/h)	
	@ 6 g/L	@ 8 g/L	@ 10 g/L	@ 12 g/L	Bath Recirculation	Waste
D10A	595	795	995	1195	410	130
D11A	860	1140	1430	1715	595	190
D13A	1525	2035	2540	3045	1055	335
D15A	2370	3160	3950	4740	1650	525
D8A+	140	180	230	275	110	57
D11A+	305	410	515	615	245	130

Note: Listed flowrates correspond to solution temperatures >10°C. Rates at temperatures between 0° - 10°C are reduced by 25%. Removal rates vary with the aluminum level; The AnoPur system can treat any level between 6 – 20 g/L. Models D8A+ and D11A+ are used where additive recovery is desired. Additives recovered include typical organic acids used to inhibit burning, such as oxalic and glycerin/glycolic acids. For applications where the anodizing solution is operated between 0°C – 4.5°C, a cold temperature adder is required. Temperatures below 0°C cannot be utilized with the AnoPur system.

Unit Process Specifications

Model	Constituent	AnoPur™ Stream		
		Feed (g/L)	Recovered Acid (g/L)	Waste (g/L)
D10A D11A D13A D15A	Sulfuric Acid	160	154	16
		240	232	24
	Aluminum	6.0	4.6	4.6
		8.0	6.1	6.1
		10.0	7.6	7.6
D8+A D11+A	Sulfuric Acid	12.0	9.1	9.1
		160	157	5
	Sulfuric Acid	240	235	8
		6.0	4.7	2.4
	Aluminum	8.0	6.3	3.2
		10.0	7.9	4.0
		Additive	20 – 24	18 – 22



Standard Features

- Frame mounted, dual stage cartridge filters and diaphragm feed pump for feed acid
- 24V control panel with graphics
- Skid-mounted design with all piping and valves on a steel frame
- Operating & maintenance manuals (3)
- Spare parts kit
- Remote start/stop (24V signal required)

Installation

Model	Footprint (L x W x H)	Electricity (110/220, 1, 50/60)	Comp. Air (5.3 bar/80 psig)	Water (2 bar/30 psig)
D8+A	112 cm x 94 cm x 181 cm / 44 in x 37 in x 71 in	5 amps	8.5 m ³ /h (5.0 SCFM)	500 L/h (2.1 SGPM)
D10A			30 m ³ /h (17 SCFM)	995 L/h (4.4 SGPM)
D11A	46 m ³ /h (27 SCFM)		1430 L/h (6.3 SGPM)	
D11+A	229 cm x 135 cm x 193 cm /		34 m ³ /h (20 SCFM)	1100 L/h (4.8 SGPM)
D13A	90 in x 53 in x 76 in		62 m ³ /h (36 SCFM)	2540 L/h (11.2 SGPM)
D15A			84 m ³ /h (49 SCFM)	3970 L/h (17.5 SGPM)

Note: No provision has been made for the removal of oil, grease, or submicron particles from the anodizing bath solution or water fed to the AnoPur™ unit. Air supply must be clean, dry, oil-free and filtered to 40 microns (air filters can be supplied, if required, at additional cost). Water supply should contain <200 mg/L TDS, <135 ppm total hardness, and must be clean (i.e. municipal source filtered to 1 micron).

Typical Sulfuric Acid Savings

Costs	Bath Dumping	AnoPur™ Installed
Acid lost by dumping	62%	7%
Acid used to dissolve aluminum	26%	26%
Acid lost by dragout	12%	12%
AnoPur™ savings	--	55%

Basis: Class II coating (0.4 mil) – 20 minutes @ 129 amps/m² (12 ASF). Dissolving rate = 7 g/m² (1.4 lbs per 1,000 ft²). Dragout rate = 0.1 L/m² (2.5 U.S. gallons per 1,000 ft²). Sulfuric acid at start = 180 g/L Al. Aluminum at time of bath dumping = 12 g/L Al. Aluminum with AnoPur installed = 10 g/L.

Choosing the Best AnoPur Unit

Our team of experts help customers in choosing the most appropriate AnoPur™ unit given their unique process specification. Information collected and examined for this purpose includes:

- Operating hours per week
- Dump volume per week
- Dump aluminum level
- Production output
- Anodize time
- Current density

The aluminum buildup rate is calculated by one of two methods: the bath dump method or the production data method.

Startup, Usage, and Maintenance

A detailed operating manual is included with the shipment of the AnoPur unit. These manuals include easy to understand installation instructions that offer helpful details on locating the unit, piping, and wiring. Installation and startup of an AnoPur unit is simple and straightforward.

- Remove the crate and packing materials.
- Move the AnoPur Unit into position.
- Attach any pipework that has been removed for shipping purposes.
- Connect single phase electrical supply, 5.5 bar (80 psig) air supply and water supply.
- Install piping (1) to and from the anodizing tank, and (2) for the waste line.
- After hookup is complete, the unit can be started. The manual includes checklists and troubleshooting guides.
- No special adjustments are required as the unit is fully tested and calibrated prior to shipment.

Routine monitoring is recommended, and log sheets are provided for this purpose. Preventative maintenance schedules are also included in the manual. Regular maintenance primarily involves filter cartridge replacement. The replacement frequency will vary from plant to plant based on solids levels. The unit is supplied with a replacement parts kit that includes a supply of cartridge filters.

The AnoPur unit also includes free access to 24/7 customer service. Onsite training and assistance are available, and a full stock of replacement parts can normally be shipped within 24 hours.

