eco-Tec
A Kovalus Company

ChromaPur™ Acid Purification System

Comprehensive Solution for the Contaminate Removal in Chromic Acid Plating Solution

A Holistic Ion Exchange Offering

KOVALUS SEPARATION SOLUTIONS™ (KSS) is a global leader in innovative process separation technology. Kovalus has a comprehensive portfolio of advanced separation technologies, including membrane filtration, ion exchange, and thermal separation solutions to address the world's most complex processing challenges, delivering excellence and innovation across many markets.

Eco-Tec, a Kovalus Separation Solutions company, is a leader in the ion exchange industry for over 50 years. With expertise in water treatment, acid recovery and lithium brine purification, Eco-Tec delivers innovative ion exchange solutions across various sectors. Eco-Tec's ion exchange technology is the proprietary Recoflo® column design – a unique short, packed configuration for smaller footprint ion exchange systems with higher operational efficiency and separation performance.

Our capabilities extend beyond ion exchange technology to include:

- **Process Design:**
  With over 60+ years of expertise, we design ion exchange solutions tailored to your specific requirements, ensuring optimal efficiency and performance for your operation
- **Equipment Design and Fabrication:**
  Manufacturing high-quality equipment, built for durability and optimized to handle your demands with precision
- **Equipment Installation:**
  With over 10,000 global installations, we have regionally experienced professionals located throughout the globe to ensure your system is up and running efficiently and on schedule
- **Process Commissioning:**
  Comprehensive testing and commissioning to confirm that your treatment system meets all regulatory standards and operates at peak efficiency from day one

By integrating these services with our ion exchange and membrane technologies, Kovalus provides a holistic solution that ensures regulatory compliance, operational efficiency, and sustainability. From design through installation and beyond, Kovalus delivers innovative, reliable, and cost-effective solutions to tackle the toughest ion exchange challenges.

A Holistic Solution for Removing Contaminant Build-up in Chrome Plating Baths

Benefits

- Reduced chemical and waste treatment costs
- Consistent and predictable performance and product quality
- Elimination of bath dumping
- High recovery of metal salts
- Lower energy requirements

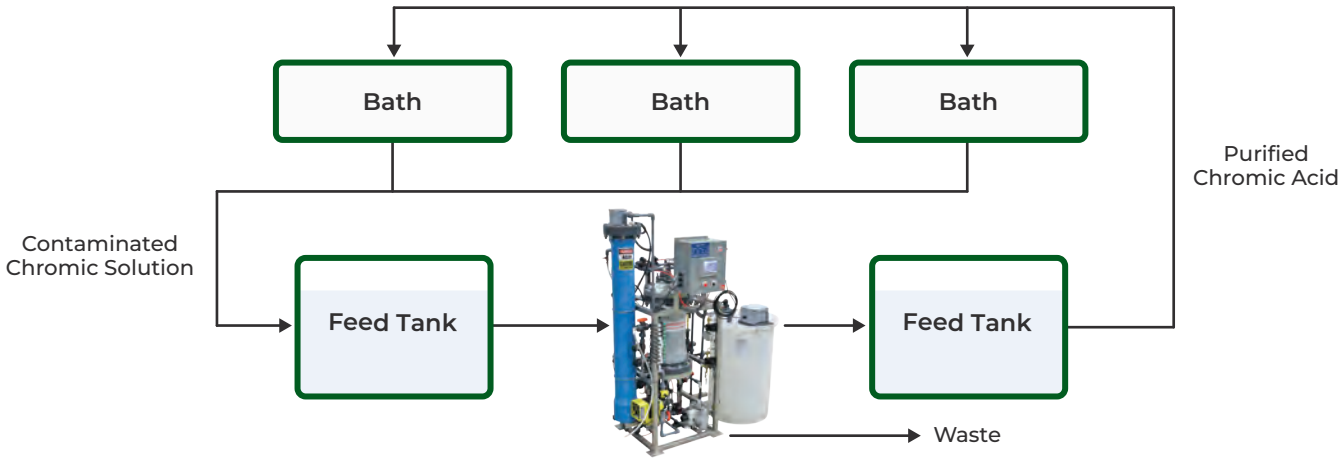
Standard Features

- Dual stage cartridge filter, diaphragm feed pump, and sulfuric metering pump
- Level control modules for purified acid storage tank and regenerant acid drum
- Skid mounted design with all piping and valves on a steel frame
- CPVC/PVC standard piping material
- Stainless steel standard fasteners
- PVC standard valves
- 24V control panel with graphics
- Spare parts kit

The ChromaPur™ unit is a small, skid-mounted device that automatically processes chromic acid plating solution from one or more plating tanks. The ChromaPur unit features Eco-Tec's Recoflo® ion exchange bed which works to remove metallic contaminants while allowing purified chromic acid to pass through for reuse.

In hard chrome plating processes, metal contaminants such as copper, iron, and chromium build up in the plating bath, leading to a decline in performance as measured by longer plating times, higher voltages, and an increase in plating defects such as pitting. Over time, this buildup needs to be removed via bath replacement where fresh chromic acid must be added, and the old solution must be purified or hauled off-site for disposal.

ChromaPur System Typical Process



ChromaPur™ System

The ChromaPur™ process works in cycles, starting with contaminated chrome solution being transferred to a feed tank. From there, the solution flows by gravity to the ChromaPur™ for processing. Purified chromic acid flows into a purified storage tank. Automatic regeneration begins when a preset volume of feed has been treated, using diluted sulfuric acid and a water wash to remove waste and dissolved metal contaminants from the ion exchange bed.

The ChromaPur cycle can be optimized by selecting the most suitable operating range:

- **High Level:** For chrome plating solutions with metal contaminants in the 15 g/L range
- **Low Level:** For chrome plating solutions with metal contaminants in the 5 g/L range

System Performance

Setting	Model Number	Metallic Removal (g/h)	Flowrates (L/h)		
			Feed	Product	Waste
Low (5 g/L)	CP6	105	45	75	80
	CP8	185	85	130	130
	CP10	295	130	215	200
High (15 g/L)	CP6	250	20	35	125
	CP8	450	40	65	220
	CP10	700	65	105	340

Setting	Model Number	Flowrates (L/h)		
		Water	Sulfuric Acid	Product Dilution
Low (5 g/L)	CP6	100	1.5	30
	CP8	180	2.6	55
	CP10	290	4.0	85
High (15 g/L)	CP6	135	2.5	15
	CP8	245	4.0	25
	CP10	380	6.0	40

Typical Stream Compositions with ChromaPur™

Stream	Composition (g/L)			
	Chromic Acid (typical range)	Sulfuric Acid	Dissolved Metals	
			Low Setting	High Setting
Feed	220 – 270	-	5	15
Recovered Acid	130 – 160	-	1.5	1.8
Waste	<1	24 – 26	1.5	2.3

Note: Some chrome plating baths are not compatible with the ChromaPur system, i.e. baths containing strontium-based catalysts or trivalent chrome plating solutions.

Installation

Model Number	Footprint	Electricity	Comp. Air	Water
	(L x W x H)	(110/220, 1, 50/60)	(5.5 bar/80 psig)	(2 bar/30 psig)
CP6	160cm x 90cm x 178cm / 63” x 35” x 70”	5 amps	1.5 m3/h (<1 SCFM)	0.22 m3/h (0.6 GPM)
CP8	165cm x 90cm x 178cm / 65” x 35” x 70”		1.5 m3/h (<1 SCFM)	0.41 m3/h (0.41 GPM)
CP10	175cm x 90cm x 178cm / 69” x 35” x 70”		3.3 m3/h (<1 SCFM)	0.64 m3/h (2.8 GPM)

Note: The temperature of the chromic acid added to the Feed Acid Storage Tank should be <60°C (140°F) to ensure the chromic acid fed to the ChromaPur unit is <32°C (90°F). No provision has been made for the removal of oil, grease, or submicron particles from the chromic acid or water fed to the ChromaPur 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 and must be clean (i.e. municipal source filtered to 1 micron). Sulfuric acid should be 93 – 98% w/w technical grade and free of inhibitors and oxidants.

Tank Specifications

Model Number	Feed Acid Storage Tank		Product Acid Storage Tank	
	Diameter	Height	Diameter	Height
CP6	140 cm (55 in)	158 cm (62 in)	140 cm (55 in)	140 cm (55 in)
CP8	178 cm (70 in)	198 cm (78 in)	163 cm (64 in)	163 cm (64 in)
CP10	178 cm (70 in)	198 cm (78 in)	178 cm (70 in)	178 cm (70 in)

Note: Level control modules are not provided for the Feed Acid Storage Tank.

OpEx Benefits

Costs	Bath Dumping	ChromaPur Installed
Chrome losses	38%	0%
Treatment chemicals	30%	9%
Sludge disposal	32%	4%
ChromaPur™ savings	--	87%

Basis: Chemical treatment with sodium metabisulfite and caustic soda. Removal of waste material as filter cake. Chromic acid at time of bath dumping = 255 g/L. Metals at time of bath dumping = 15 g/L. Chromic acid with ChromaPur unit installed = 240 g/L. Metals with ChromaPur™ unit installed = 5 g/L.

Kovalus Separation Solutions™

We are excited to introduce Kovalus Separation Solutions, formerly Koch Separation Solutions. This evolution marks a pivotal moment for us as we continue our journey of pioneering advancements in separations technology. We're revolutionizing the field of separations through cutting-edge technologies like membrane filtration, ion exchange, evaporation, and drying. With over six decades of expertise, we provide comprehensive solutions for demanding applications in food and beverage, life sciences, and general industry sectors. Our extensive membrane portfolio features a range of pore sizes, enabling us to handle diverse process fluids, water, and wastewaters effectively. Collaborating with clients worldwide, we specialize in recovering high-value products, minimizing waste, reducing environmental footprint, enhancing productivity, and optimizing costs.

Kovalus Customer Support

We've got you covered with Kovalus support

With Kovalus-qualified personnel, we offer tailored expertise throughout the life cycle of your membrane filtration system, ensuring optimal performance, protecting your investment, and maximizing process efficiency. Our KSS ASSIST ™ program provides proactive site visits, remote monitoring, and operator training to keep your system running at peak levels, backed by global service and support. We're dedicated to delivering faster, more efficient solutions, forming lasting partnerships, and exceeding your expectations.

Additionally, we offer

The SepTrac™ Smart System which seamlessly integrates with any KSS system to collect live data, send notifications and alerts, store documentation, and manage influent logs, all while offering easy access to our customer service teams.

REACH US

WWW.KOVALUS.COM

GETINFO@KSS-SEP.COM

KOVALUS Separation Solutions™

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