

AXORA

METALS & MINING AX01230

The technology
marketplace for
heavy industry

Reagent free wastewater treatment system

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REAGENT FREE WASTEWATER TREATMENT SYSTEM

How it works

Water is essential to mining, whether it's mineral processing, dust suppression, mineral extraction or more. At the same time, the industry is under pressure to improve environmental management and stewardship, specifically reducing the water used across the mine and treatment processes.

The water used at mining operations can become contaminated, making it difficult to reuse, release or recycle. Chemical treatment is the default approach and if not treated correctly, wastewater can cause both environmental and operational challenges for mine sites.

This water purification system offers a more sustainable, easier, and cost-effective solution to treating mine wastewater. It cleans industrial waters such as tailing ponds, acid mine drainage, mining process water, and more.

The patented electrocoagulation system removes many of the chemicals typically found in mining wastewater including heavy metals, complex organic compounds, suspended and colloidal solids, fats, and much more.

Electrocoagulation is a proven technique over many decades but has been criticised for sludge build-up and anode corrosion, which can be costly and cause downtime. Sludge would develop in the reactors and fouling of the anodes would cause them to stop working, requiring maintenance every few hours.

This innovative technology has solved these core issues, creating a more efficient approach to wastewater management. The patented rotating electrodes stop anode passivation and sludge build-up. An electrical current from the rotating electrodes dissolves the metal anodes into the water so the pure metal ions bind to the contaminants. This system can run continuously for a month without the need for maintenance.

Key facts

70-100%

reduction in contaminants

100%

reduction in biocide use

30-70%

reduction in sludge

TOP BUSINESS BENEFITS

There are five key businesses benefits of this wastewater treatment system:

- › Removes 70-100% of contaminants
- › Reduce sludge by up to 70%
- › Enables recovery of rare earth minerals
- › Reduce maintenance
- › Reduce costs by a 70-95% reduction in chemical consumption

This sustainable water treatment system provides many benefits allowing operators to achieve multiple objectives with one system. It has proved to remove up to 100% of harmful contaminants in a single-step process. Removing chemicals usually used in water treatment reduces a site's overall chemical and reagent consumption and associated costs. It also decreases potential safety risks from handling hazardous chemicals and onsite storage.

Additionally, the system produces a smaller volume waste (flocculent), but what is produced can be processed to recover valuable minerals. Less waste also leads to a significant reduction in transport and disposal costs, plus it minimises harm to the environment.

The technology is modular, scalable, easy to maintain and offers customisable water treatment. It has a small footprint making it seamless to integrate into all work environments. It requires minimal maintenance, with anodes usually requiring replacement once every thirty days. The process of replacement takes less than an hour and can be completed by two people.

The self-cleaning system offers continuous water treatment improving the efficiency and productivity of your wastewater treatment process.

Top benefits

- › Removes up to 100% of contaminants
- › Reduce sludge by up to 70%
- › Enables recovery of rare earth minerals
- › Reduce maintenance
- › Reduce costs by a 70-95% reduction in chemical consumption



The reactor

CUSTOMER SUCCESS STORIES

Denver mining operation

Customer challenge:

The acid mine water at an operation in the west of Denver flows at 1400 l/ min. The treatment process that was in place raised the pH in the water from pH 2 to 11 and generated 150 litres of sludge daily that would be transported to a local landfill.

Solution:

This system reduced the concentration of over 25 elements like aluminium, cadmium, arsenic, and zinc by 70-100%. It also significantly reduced the amount of sludge produced.

Denver mining operation treatment results			
Element	Raw	Treated	Removed
Al	34825	580.67	98.33%
As	7.57	0.55	92.69%
Cd	71.2	0.11	99.85%
Co	113	0.56	99.51%
Cr	28.0	3.95	85.91%
Cu	2688	7.83	99.71%
Fe	85916	1344	98.44%
Mg	127605	35398	72.26%
Mn	96187	297.66	99.69%
Ni	179	8.54	95.24%
P	37.6	DL	100%
Pb	299	DL	100%
Pd	0.966	DL	100%
Sb	3.72	0.38	89.87%
Se	9.00	1.29	85.73%
Si	23416	759.1	96.76%
Sn	6.98	DL	100%
Ti	6.68	DL	100%
U	35.6	0.48	98.66%
Zn	138771	37.43	99.97%
Measurements in µg/L			

Denver mining operation Rare Earths			
Element	Raw	Treated	Removed
Ce	301	0.07	99.98%
Dy	23.1	DL	100%
Er	11.78	DL	100%
Eu	5.20	DL	100%
Gd	33.3	0.01	99.98%
Ho	4.28	0.02	99.47%
La	97.2	0.02	99.98%
Lu	1.28	DL	100%
Nd	97.5	0.06	99.94%
Pr	29.9	DL	100%
Sc	8.43	DL	100%
Sm	25.52	0.01	99.97%
Tb	4.52	0.03	99.36%
Tm	1.49	DL	100%
Y	118	0.04	99.97%
Yb	8.63	DL	100%
Measurements in µg/L			

Denver mining operations results

CUSTOMER SUCCESS STORIES

Landfill case study

Customer challenge:

A waste sample was treated from a landfill site known for producing some of the worst landfill leachate in the industry. The liquid waste was then analysed and verified by a third-party laboratory.

Solution:

The treated sample removed many contaminants like zinc, ammonia, and vanadium.

West Virginia pilot

Customer challenge:

Produced oil water is one of the largest by-products of oil exploration and production. The solution processed 6000 gallons from a water-holding pond in West Virginia.

Solution:

It successfully removed all metals, such as iron, in all tests, and metals were sequestered in the heavy metal precipitate sludge.

FAQ

Is the system easy to maintain?

This solution removes contaminants in a single-step process creating a more effective way to treat your wastewater. This self-cleaning solution provides 24/7 water treatment until anode dissolution, with the anodes being very easy and quick to replace. It has a small footprint making it not complicated to manage and integrate into most work environments.

What are the maintenance requirements?

There are very few maintenance requirements. The anodes usually need to be replaced once every thirty days. The anodes are easy to replace and do not require skilled labour, with maintenance taking no more than sixty to ninety minutes.

Why should I use electrocoagulation to treat my water?

Electrocoagulation provides a more cost-effective and sustainable approach to wastewater management. The upgraded system was designed and engineered to address the operational challenges of legacy electrocoagulation systems. The technology replaces chemicals used in wastewater treatment and produces less sludge than other wastewater treatments.

About Axora

Your next steps

→ [Email us](#)

Axora is the global technology **marketplace** for heavy industry. We source the best innovative solutions, to solve the biggest industrial problems.

Our service helps industrial companies to discover, evaluate, procure and deploy technology from all over the world.

Entrusted globally by 100s of industrial leaders and innovative solution providers, we help companies take action to hit their safety and sustainability goals.

About the Solution Provider

This innovative water treatment company has developed a more efficient way for companies to treat wastewater. The patented solution treats highly contaminated industrial waters for heavy industry. It uses electrocoagulation technology to reduce up to 100% of all contaminants with few to no chemicals. The upgraded system provides a cost-effective, easier, and more sustainable method for wastewater treatment.

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