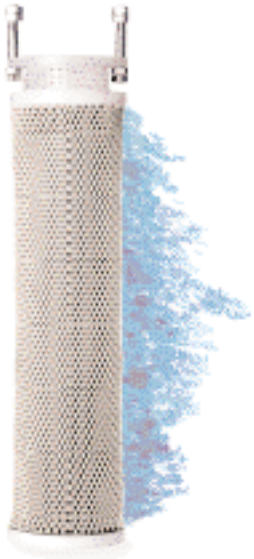
RenoCell



This is it.

World-Class Lineage

RenoCell was developed over the past two years by Renovare International, Inc. and is now available through value-added resellers in North America, Europe, and Asia.

RenoCell is descended from a long line of electrolytic products developed during the past three decades in the United Kingdom by EA Technology Limited (EATL). EATL focuses on electrical and energy-related technologies and is one of the most successful industrial research laboratories of its kind in the world.

1980 *1990* *2000*

RenoCell
1997 License to Renovare

Porocell
- *Metal Recovery*
- *Effluent Streams*
- *Custom Product Manufacture by EA Technology*

DEM Cell
- *General Purpose*
- *Synthesis, Waste Treatment*
- *Product 1984*

Chemelec cell
- *Metal Recovery*
- *Effluent Streams*
- *Product 1981*

The Economic Revolution in Industrial Wastewater Treatment

Revolution is defined as a sudden or momentous change in a situation, and just such a change is shaking the foundations of the industrial wastewater treatment industry. Today, as both the cost of process water and the cost to treat effluent continue to escalate, the issues of waste minimization and water recycling are taking center stage.

The heavy metals that are pervasive in most industrial process operations traditionally have been difficult to treat. This fact, combined with the convergence of economic factors that are driving the revolution, has pushed the worldwide demand for more robust, efficient, and cost-effective wastewater treatment to an all-time high.

Today's global economic and environmental realities are directly addressed by the breakthrough technology and design employed in RenoCell. RenoCell alone sets new standards of operating performance, reliability, and cost-effectiveness that are unmatched for wastewater treatment and metal recovery.

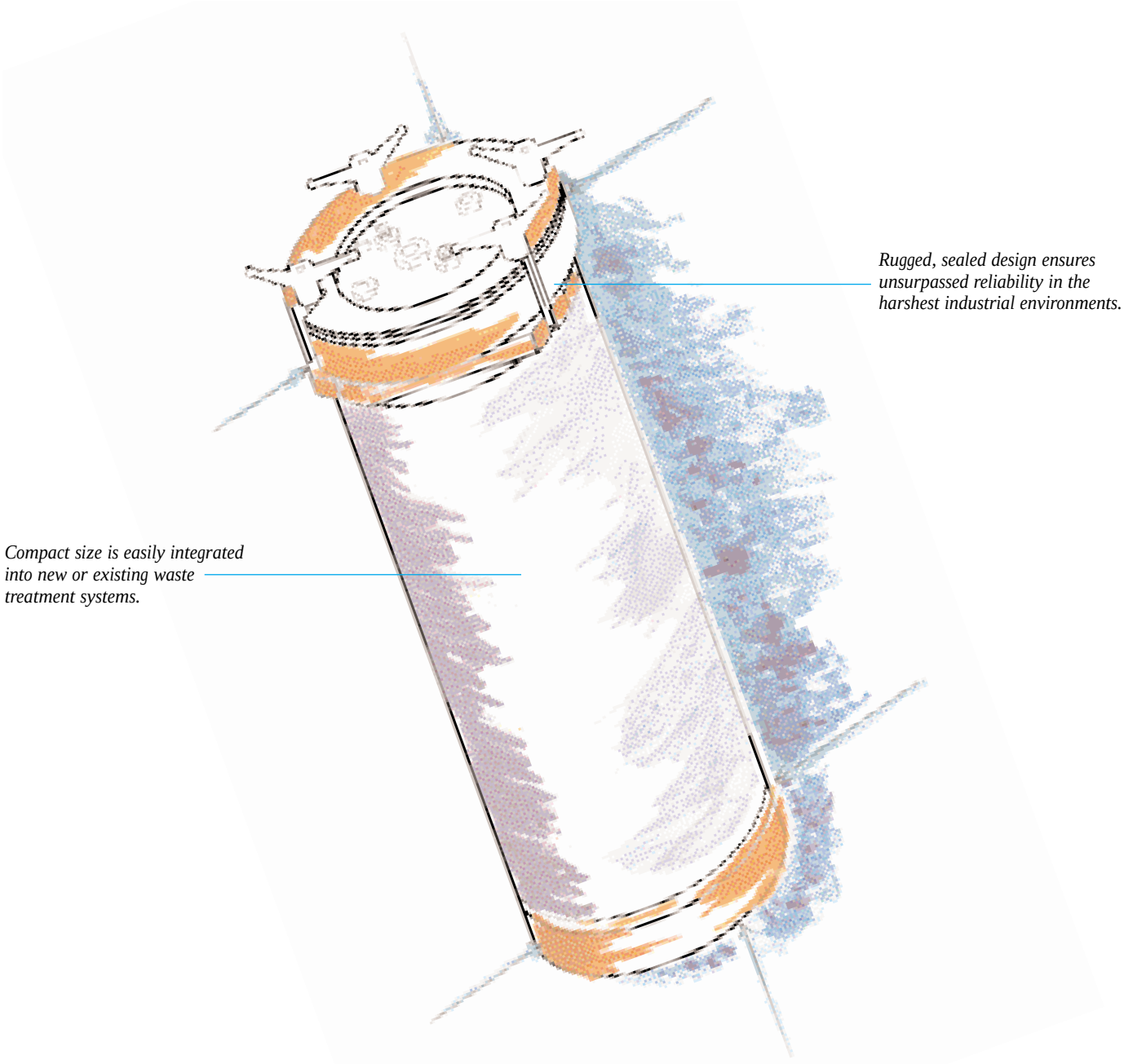
RenoCell currently recovers 20 specific metals and has the potential to recover 6 additional ones.

The Next Generation of Wastewater Treatment and Metal Recovery Products

RenoCell is a new electrochemical cell based on revolutionary, patented technology that employs a three-dimensional, porous carbon element as a component of the cell cathode. This technology is the culmination of three decades of electrochemical cell research and development.

The technology employed in RenoCell gives it an operating range with respect to metal ion concentrations that is two to three orders of magnitude beyond that of conventional electrochemical cells with a greater than 10 times improvement in current efficiency.

RenoCell is equally effective for effluent treatment and metal recovery and is designed to either replace or enhance existing systems.

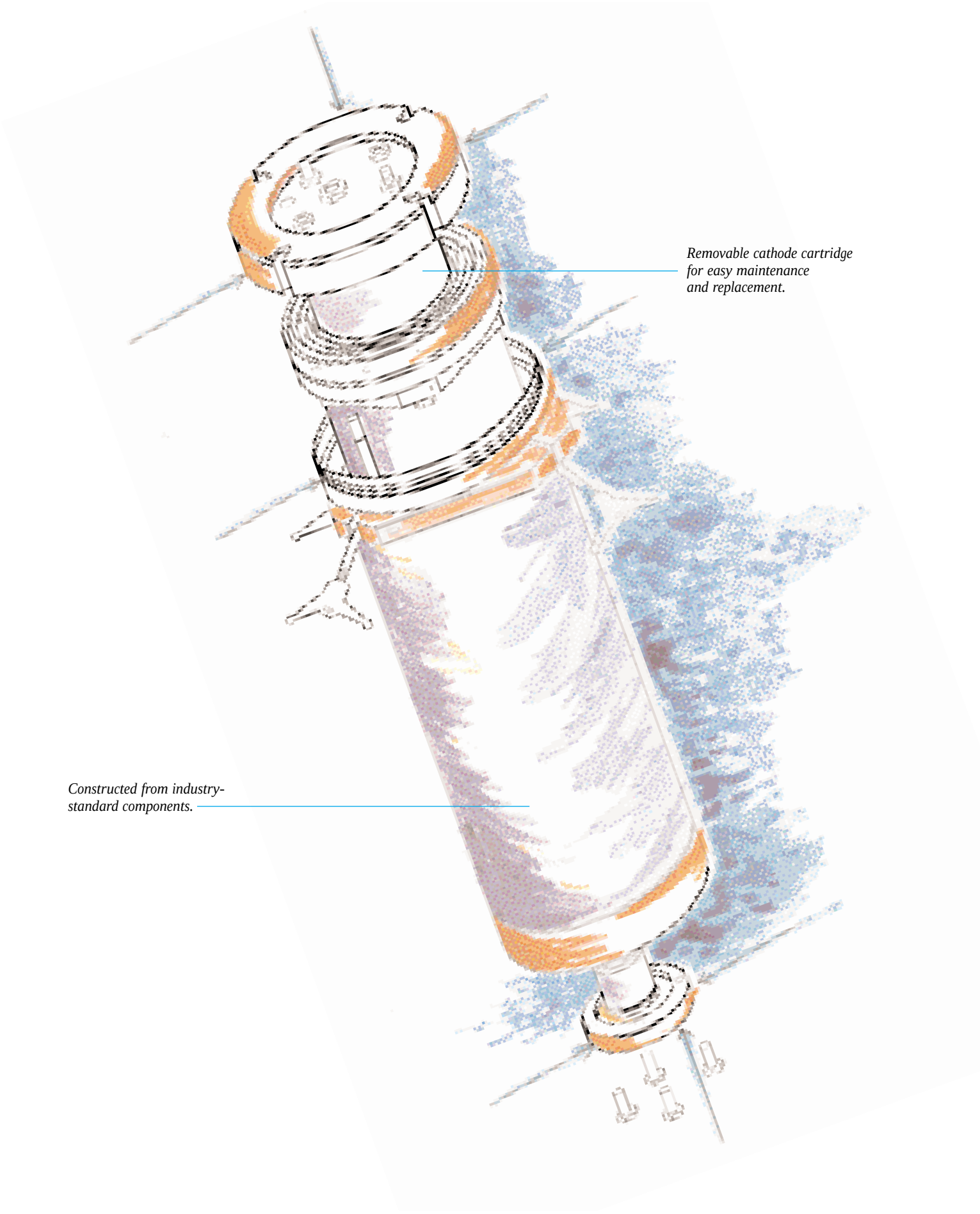


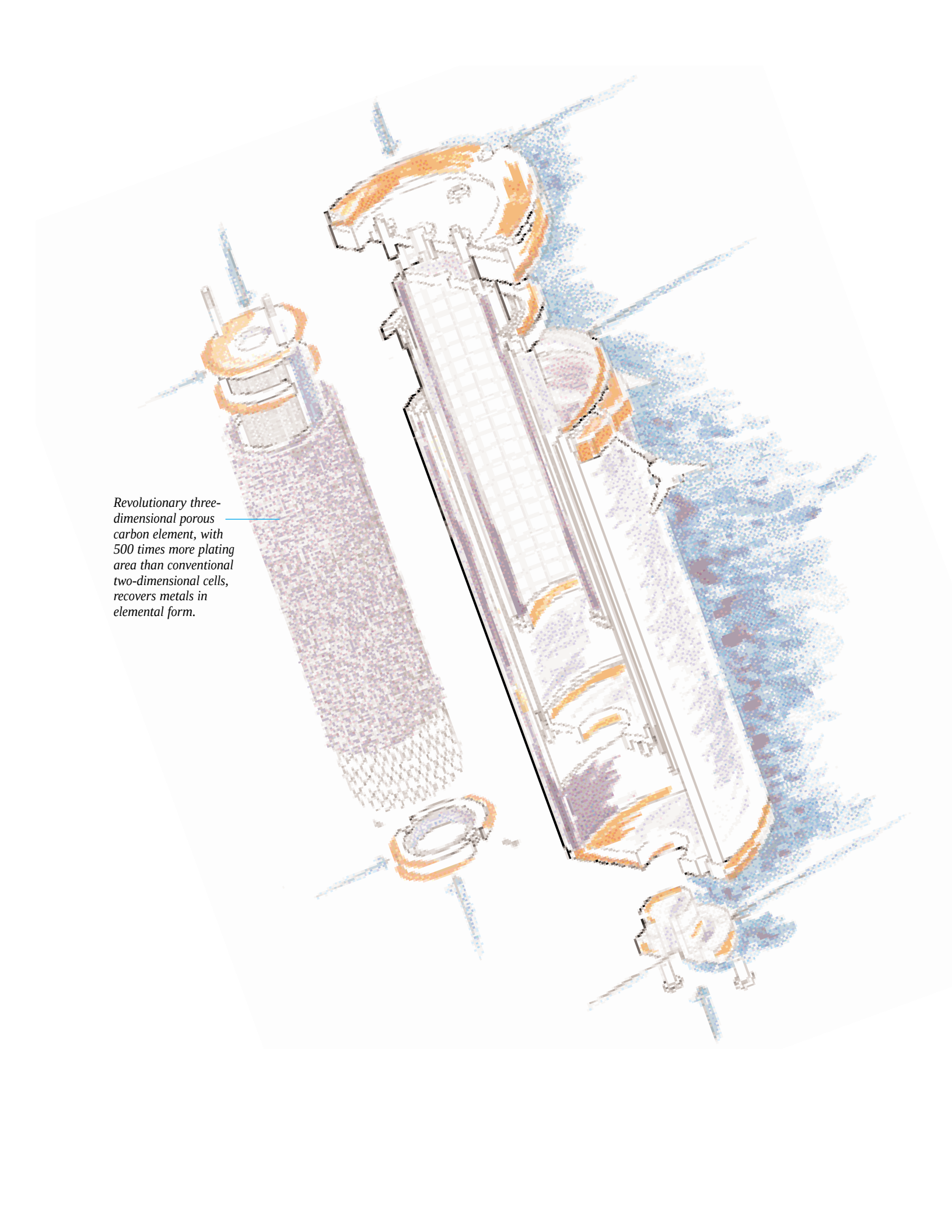
Revolutionary Technology at the Heart of RenoCell Smashes the PPM Barrier

Conventional electro-chemical cells employ technology that, at best, can only be described as primitive. The two-dimensional metal plate or mesh cathodes used in conventional cells limits their ability to achieve metal ion concentrations to the 150-50 parts per million (PPM) range.

RenoCell's revolutionary, three-dimensional, porous carbon element, which is a component of the cell cathode, provides performance that consis-tently pushes metal ion concentrations down to the sub-PPM range.

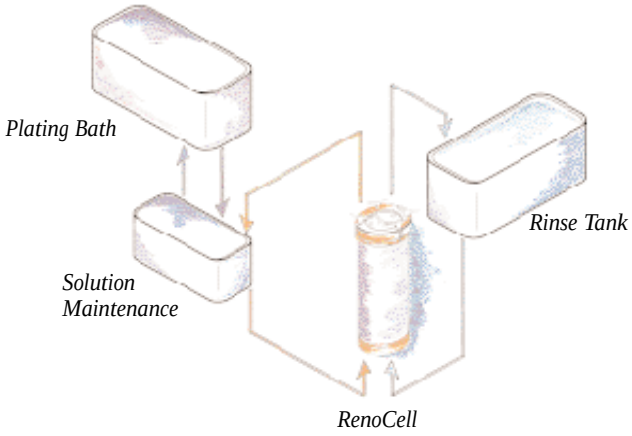
In addition to constantly achieving sub-PPM metal ion concentrations, RenoCell offers more than 10 times greater energy efficiency than conventional cells and it recovers metals in elemental form that are ready for sale or reuse.


Removable cathode cartridge for easy maintenance and replacement.
Constructed from industry-standard components.

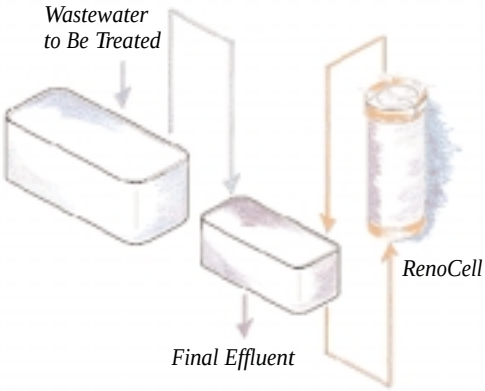


Revolutionary three-dimensional porous carbon element, with 500 times more plating area than conventional two-dimensional cells, recovers metals in elemental form.

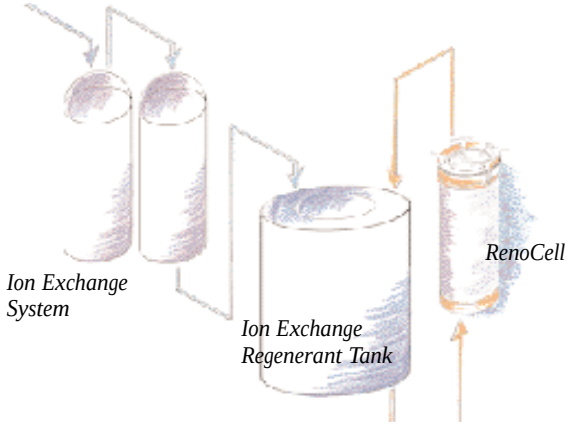
Point Source Treatment of Baths and Drag-out Rinses



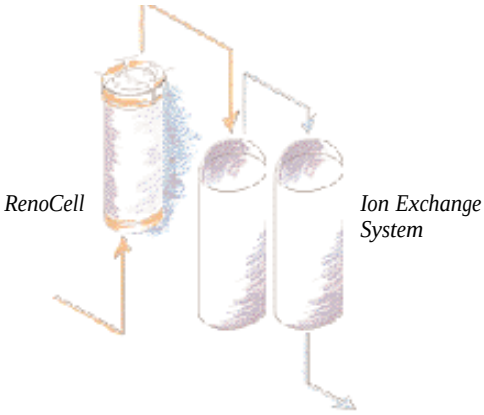
Replace or Enhance Wastewater Treatment



Ion Exchange Pre-treatment



Ion Exchange Regenerant Reuse



Typical RenoCell Applications

The applications for RenoCell in industrial wastewater treatment and metal recovery are fivefold:

- Point source treatment of baths and drag-out rinses
- Replace existing electrowinning and precipitation systems
- Enhance existing membrane systems (e.g., reverse osmosis)
- Enhance ion exchange treatment
- Replace or enhance other metal waste treatment processes

In these applications, RenoCell has the potential to completely change a plant's process flow sheet by simplifying processes, and by reducing floor space, reducing capital equipment, and reducing operating and maintenance costs.

RenoCell is easily integrated into new or existing waste treatment systems.

Compact, Modular Design Adapts to All Industrial Environments

RenoCell is similar in shape to a cartridge filter vessel and pump system. It uses industry-standard components in a modular design that make it compact, robust, and flexible.

The physical properties and operating characteristics of RenoCell make it the ideal complement to industrial-grade wastewater treatment and metal recovery process systems. RenoCell's rugged, sealed design provides unsurpassed reliability in the harshest industrial environments.

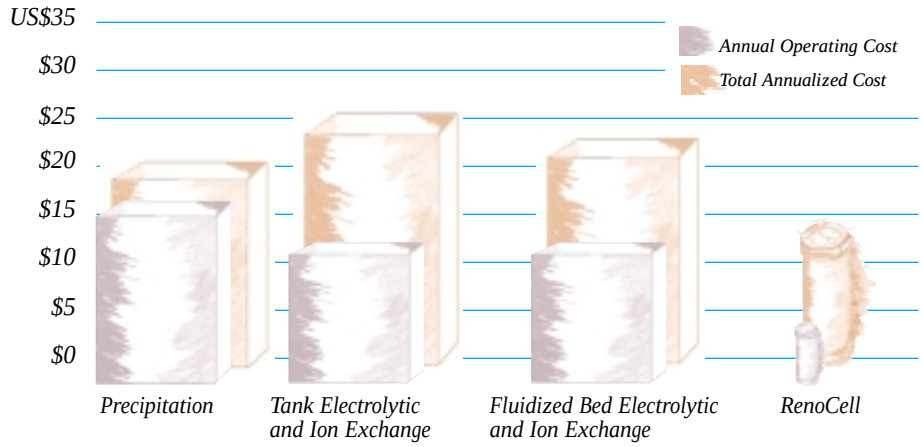
RenoCell easily accommodates the space limitations of any treatment operation. And, if floor space is unavailable, RenoCell is capable of being wall-mounted.

Cost Comparisons and RenoCell's Economic Benefits in Selected Market Segments

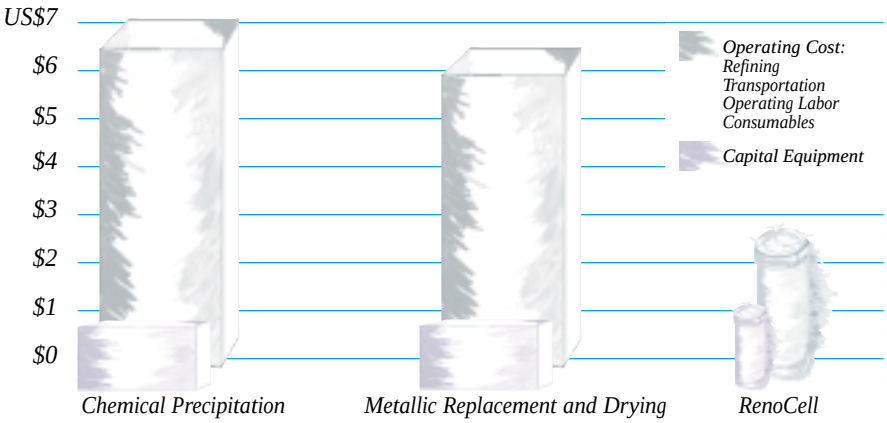
As a point source treatment for a printed circuit board (PCB) operation line, RenoCell reduces annual copper removal operating expenses up to 70 percent by eliminating hazardous sludge and the costs associated with secondary treatment and disposal.

For silver recovery, RenoCell is an on-site treatment that uses no chemicals and minimal consumables to recover valuable silver from photochemical solutions.

Cost per Pound of Copper Recovered in PCB Manufacturing



Cost per Troy Ounce of Silver Recovered in Photochemical Operations



The Bottom Line: RenoCell Saves Money

RenoCell's ability to meet and exceed process and environmental compliance standards faced by printed circuit board and electronics manufacturers and by metal finishers is impressive. Even more impressive, however, is the positive economic impact RenoCell can have on waste treatment operations in these market segments.

For precious metal operations, RenoCell offers the added value of elemental metal recovery in addition to impressive cost savings. For example, the treatment of 300,000 liters of process liquor containing 50 ppm platinum and 55 ppm palladium in a very acidic chloride matrix requires only eight compact Renocells to reduce the metal content to below detectable levels.

In this type of application, a small uncomplicated RenoCell system can plate nearly 1000 troy ounces of elemental platinum and palladium over the course of one month. These recovered precious metals are immediately available for resale, or they can be used to substantially reduce in-process metal inventory.

Ten Compelling Reasons to Consider RenoCell

- Proven world-class technology and design.
- Effective metal ion treatment down to the sub-PPM range surpasses conventional electrodeposition methods by two to three orders of magnitude.
- Three to five times more cost-effectiveness than electrode position systems currently in use.
- Greatly improved electrical efficiencies and life-cycle cost reduction.
- Robust, modular design using industry-standard components.
- Easy metal removal; quick and easy cathode replacement; and low operating and maintenance costs.
- Ability to treat anodically sensitive solutions.
- Regulatory compliance virtual elimination of hazardous sludge by recovering elemental metals ready for sale or reuse.
- Highly reliable operation in harsh industrial environments.
- Compact size, capable of being wall mounted.

Proven world-class RenoCell system design, integration, and support provided by:

RenoCell

Renovare International, Inc. was formed in 1996 to exploit the advantages of a unique electrochemical technology called Porocell. The company now markets that technology in the form of RenoCell products in North America, Europe, and Asia.

RenoCell products are available only through Renovare-authorized, value-added resellers.

Renovare International, Inc.,
Walnut Creek, California, U.S.A.