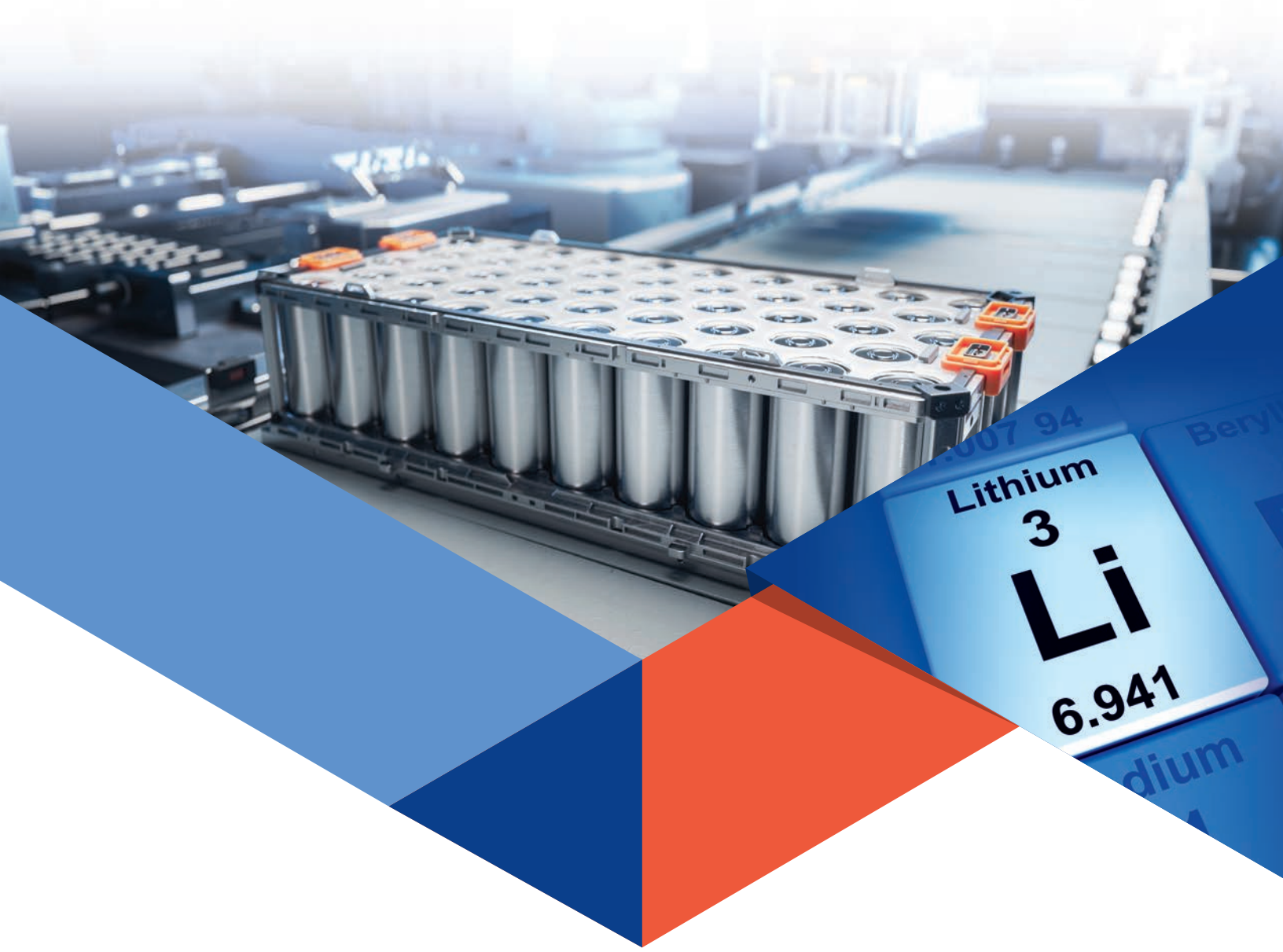
eco-Tec
A Kovalus Company




# Lithium Purification Capabilities

Comprehensive Solutions for the Lithium Industry

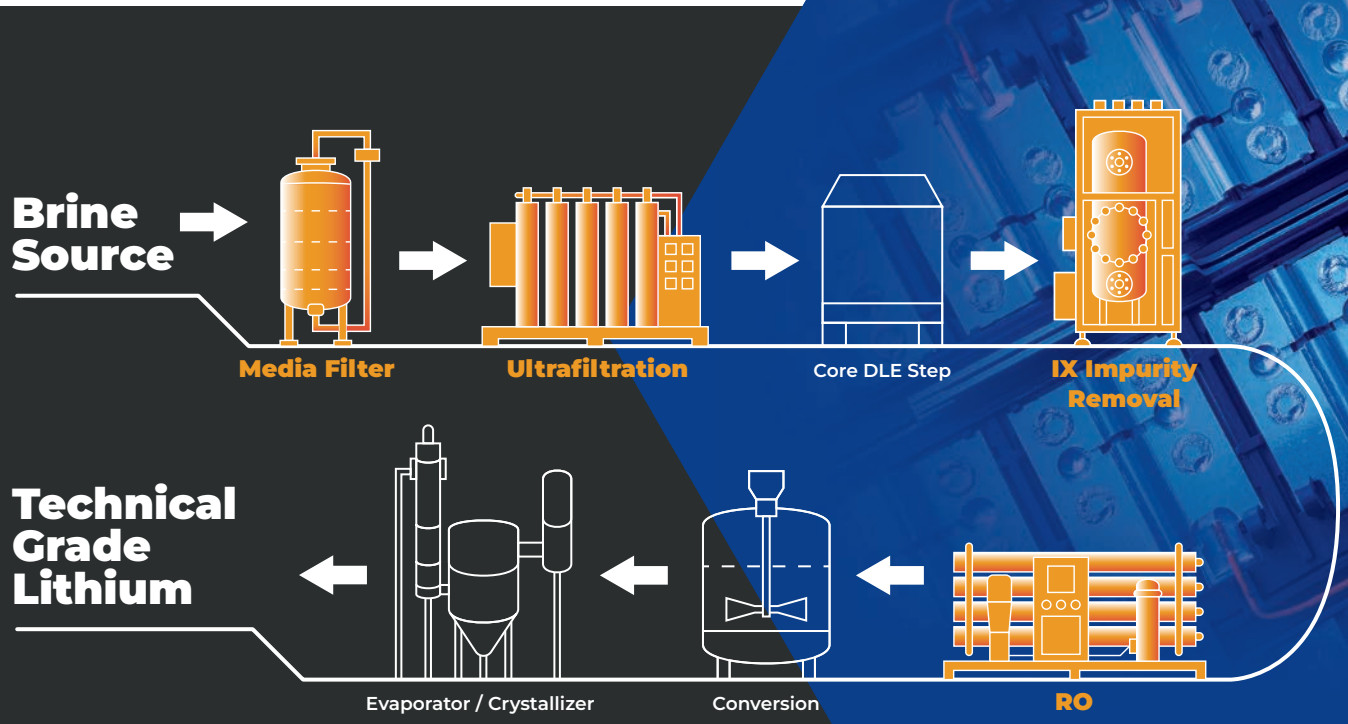
# Cutting-edge Ion Exchange Technology

KOVALUS SEPARATION SOLUTIONS™ (KSS) formerly Koch Separation Solutions, brings decades of innovation and expertise to industrial separations. Our advanced membrane technologies play a critical role in the lithium industry, enabling efficient, selective extraction and purification processes. By improving water recovery, minimizing waste, and protecting downstream systems, our solutions help lithium producers meet growing global demand while optimizing operational sustainability and performance.

Eco-Tec, a Kovalus Separation Solutions company, is a leader in the ion exchange industry with over 50 years of experience. 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.

## Industry-Leading Innovations for the Demands of the Lithium Industry

Together, Eco-Tec and Kovalus offers a smarter approach to lithium brine treatment — one that delivers performance, reliability, and sustainability where it counts most. From managing high solids and hardness to maximizing water recovery and minimizing chemical use, our advanced treatment systems are engineered for the unique demands of Direct Lithium Extraction (DLE). Leveraging proven ultrafiltration, reverse osmosis, and proprietary ion exchange technologies, we help operators produce cleaner brine, reduce fouling and scaling, and streamline downstream processing.



# Lithium Brine Treatment




We are at the forefront of addressing the challenges of lithium brine treatment with a suite of innovative, high-performance technologies. Global demand for lithium continues to surge driven by the rise of electric vehicles, renewable energy storage, and portable electronics. We are pioneering solutions to optimize lithium recovery while reducing environmental impact. Through advanced process engineering and a commitment to sustainability, we are helping reshape the future of lithium extraction for a cleaner, more efficient energy landscape.

## Ultrafiltration (UF) PURON® MP

### Lithium Brine Clarification

- Positive barrier ultrafiltration
- Single header hollow fiber cartridge

## Reverse Osmosis (RO) Membrane Systems

### Lithium Chloride Concentration

- 80% recovery rate
- High-water recovery

## Recoflo® Softener

### Lithium Brine Softening

- Achieve 5 ppm hardness with less than 3% lithium loss
- Integration with existing DLE process

## Salt Separation Unit (SSU™)

### Chloride Removal from Crystallizer Bleed Streams

- 90% chloride removal
- Water-eluted resin-based process

## Pilot Testing and Demonstration

Pilot-scale systems are available for validating our solutions. Our pilot services help optimize system design and confirm process performance based on real-world brine chemistries.

# The Kovalus Advantage

## Advanced Ultrafiltration for Lithium Brine Pre-Treatment

We offer specialized ultrafiltration solutions tailored for Direct Lithium Extraction (DLE) applications.

### **PURON® MP** – Handles Complex Brine and Wastewater Streams

- 0.03-micron ultrafiltration barrier ensures consistent removal of suspended solids, delivering crystal-clear brine
- Exclusive single-header cartridge design reduces fiber clogging and fouling, ensuring long-term efficiency
- Stable membrane performance with minimal chemical cleaning — saving time and reducing maintenance costs
- Robust construction guarantees system durability without introducing new contaminants into the process

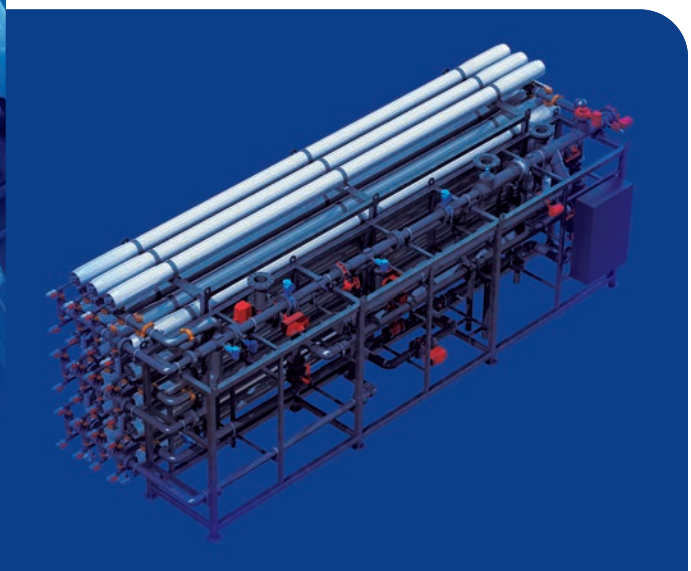


### System Benefits:

- Protects downstream processes like RO systems and evaporators by delivering solids-free brine
- Lowers capital and operating expenses with compact, skid-mounted design optimized for lithium brine applications
- Performs reliably under fluctuating feed conditions, making it ideal for dynamic lithium production environments

### **Reverse Osmosis (RO)** – Designed to Concentrate Lithium Chloride Solutions while Supporting Operational Efficiency and Sustainability

- High-efficiency spiral membranes achieve typical recoveries of 80%
- Produces high-concentration lithium brine, optimizing yield in downstream processes
- Recovers high-quality water for internal recycling, reducing freshwater demand and enhancing sustainability
- Compact, modular design ideal for space-limited installations



### System Benefits:

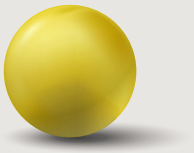
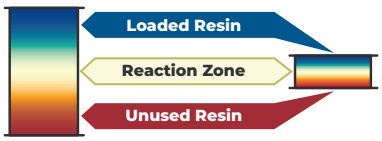
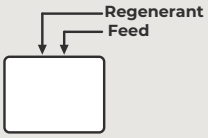
- Maximized lithium output with high brine concentration and water recovery
- Tailored configurations to suit a wide range of brine chemistries and operating conditions
- Lower downstream processing costs as a result of reduced equipment requirements
- Reliable and user-friendly, with straightforward operation and minimal maintenance needs

## **Recoflo® Softener** – Advanced Brine Softening for DLE

- Regenerates with standard NaCl brine, eliminating the need for harsh chemicals like NaOH or HCl — reducing both cost and environmental impact
- Delivers treated brine with <5 ppm hardness, ensuring downstream process integrity with <3% lithium loss
- Small-diameter resin beads provide high surface area and packing density, boosting performance in a compact footprint
- High flux rates and short bed depths reduce space requirements and capital costs

## Sustainability & Efficiency Benefits:

- Seamlessly integrates into existing DLE operations using internal regenerant sources
- Minimizes energy and chemical consumption, supporting greener operations
- Lowers both CAPEX and OPEX compared to traditional softening systems

| | Conventional Ion Exchange | Recoflo Ion Exchange | Features of Recoflo Technology |
|---|---|---|---|
| **Resin** |  |  | **Recoflo:** Fine mesh resin beads<br>**Conventional:** 4X larger diameter resin beads |
| **Column** |  | | **Recoflo:** Compressed shallow resin bed<br>**Conventional:** Fluidized resin bed with large freeboard |
| **Regeneration** |  |  | **Recoflo:** Short cycles (minutes) of counter-current regeneration<br>**Conventional:** Long cycles of regeneration, same direction as process flow |



## SSU™ – Chloride Removal from Crystallizer Bleed

- Achieves over 90% chloride removal, enhancing the stability of downstream crystallization systems
- Recovers more than 90% of sulfate or carbonate salts, supporting circular resource use
- Selective water-eluted ion exchange process ensures efficient, chemical-minimized separation

## System Benefits:

- Provides chloride control to protect costly process equipment from premature corrosion
- High salt recovery to minimize loss of valuable lithium
- Low OPEX and simple operation

# 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™

eco-Tec A Kovalus Company

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