



LITHIUM MINING

Process Solutions

Specialized Solutions for EV Metal Mining & Battery Grade Production



EXPERIENCE
RELIABILITY



OPTIMIZED PROCESS SOLUTION IS THE
LIFEBLOOD OF ANY MINING OPERATION

Aquatech's ICD Process Technologies Capability for Lithium Producers

Lithium has become essential in our current global economy and the demand for this valuable resource is growing rapidly. The global lithium market is projected to reach USD 5.88 billion by 2025, more than double of 2017, powering everything from toys and watches to cars and industrial battery reserves. In addition to energy, lithium is continuing to find uses in everything from air treatment systems to ceramics and glass.

Extracting lithium and processing lithium bearing brines has specialized requirements and unique challenges due to the presence of other mineral salts. Understanding those challenges and being able to tailor a solution that is both reliable as well as cost efficient is paramount to any lithium mining operation. Solutions are needed which provide regulatory compliance, and achieve sustainability goals by reducing environmental footprint.

Aquatech's ICD Process Technologies has been supplying systems for product purification, resource recovery, evaporation and crystallization for over 40 years. With in-house research and development capabilities and a proven track record for innovation, Aquatech is positioned to provide in depth analysis and precise process design solutions. Our process specialists are available to assist with process development studies and test work, as well as commercial process development. Our focus on project management – from the earliest stages of the project, through to the plant coming on stream, on schedule – means stakeholders are aligned to meet all key performance indicators (KPIs).

Our commitment does not stop after the plant begins operation. A comprehensive service and upgrade program is available to guarantee both the performance and the longevity of the facility.

OVER
2,000
Installations in
60 countries



Founded
in **1981**

Leading Edge
Laboratory, Piloting
and R&D



**Global
Workforce**
> 650 Employees



Engineering Solutions for Sources of Energy

Aquatech provides its customers with an unrivalled combination of process expertise that covers the full spectrum of lithium production, from brine concentration to high-purity salts. Beginning with the concentration of lithium chloride (from brine) or lithium sulfate (from extraction of spodumene), Aquatech provides end to end process technology solutions to produce technical and battery grades of lithium carbonate and lithium hydroxide.

Aquatech ICD Process Technologies Portfolio Includes

- Lithium brine concentration
- Lithium salt purification by re-crystallization
- Impurity removal (precipitation, membrane filtration and IX)
- Lithium salt crystallization
- By-product recovery from lithium processing

Lithium Salts Crystallization:

- Lithium Chloride (LiCl)
- Lithium Carbonate (Li₂CO₃)
- Lithium Hydroxide anhydrous & monohydrate (LiOH)
- Lithium Sulfate anhydrous & monohydrate (Li₂SO₄)
- Lithium Bromide (LiBr)
- Lithium Phosphate (Li₃PO₄)

Other Salts Recovered with Li Salts:

- Potassium Chloride (KCl)
- Sodium Sulfate (Na₂SO₄)
- Sodium Chloride (NaCl)
- Potassium Sulfate (K₂SO₄)
- Boric Acid (H₃BO₃)

Process Equipment for Li Salts

Evaporator Technologies:

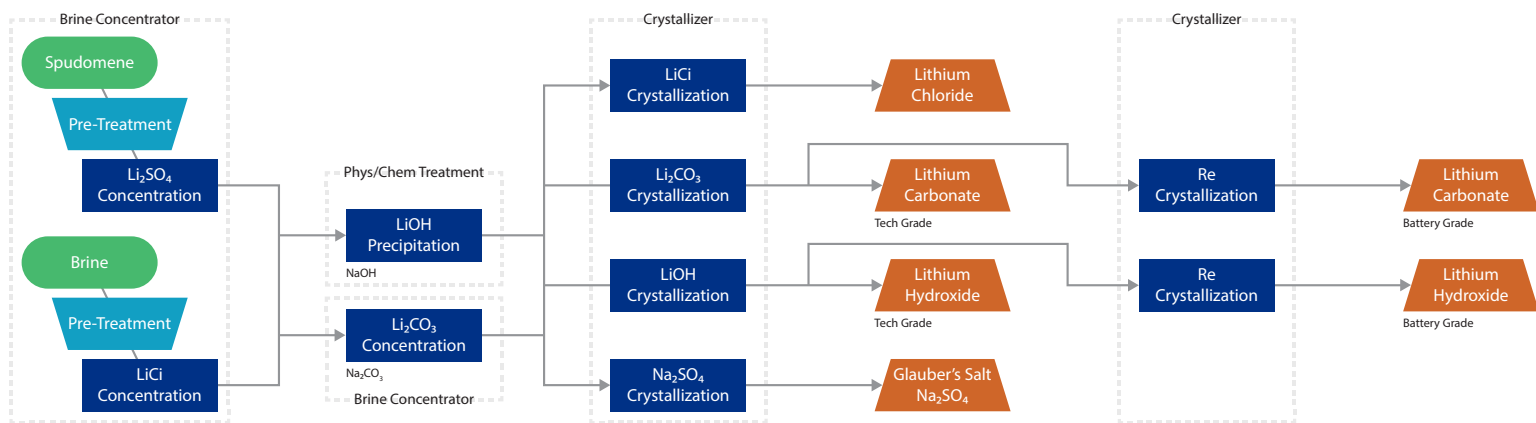
- Thermal Vapor Recompression Evaporator
- Mechanical Vapor Recompression Evaporator
- Multiple Effect Evaporator
- Forced Circulation Evaporator
- Vertical Tube Falling Film Evaporator
- Horizontal Tube Spray Film™ Evaporator

Crystallizer Technologies:

- Draft Tube Crystallizer
- Vacuum Crystallizer
- Forced Circulation Crystallizer
- Cooling Crystallizer
- Integrated Reaction Crystallizer

Other Project Capabilities:

- Aquatech Water technologies including Reverse Osmosis, Ion Exchange, Precipitation systems for purification
- Optimization of Life Cycle Cost (LCC) with system supply and modularization to minimize site work
- **Aquios:** Design, Build, Operate, Maintain (DBOM) project execution models
- **IWS:** Aftermarket, O&M and technical support services



Decades of Experience

ICD Process Technologies has supplied several process systems for inorganic salt crystallization and has performed analytical, bench and pilot-scale testing for our global customers.

Research & Development

Aquatech's research and development is essential for the development of process designs for challenging evaporation and crystallization technologies. In operation for over 40 years, the Applied Development and Test (AD&T) facility includes a laboratory for bench top studies and analytical analysis, as well as pilot evaporators. The AD&T facility is focused on development of new process technology solutions and continuous improvements of existing technologies. The chemistry lab, with its standard and in-house developed test methods, is a key part of the test facility and this helps in continuous development and optimization of solutions for our customers during both the proposal stage and after equipment installation for continuous improvement.



WE'RE HERE TO HELP

Aquatech International

One Four Coins Drive

Canonsburg, Pennsylvania 15317 U.S.A.

+1-724-746-5300

lithium@aquatech.com

www.aquatech.com



Quality
ISO 9001

 SAI GLOBAL