



Lithium battery recycling machine

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The Lithium-ion Battery market is growing rapidly. Much of that demand is coming from electric car manufacturers like Tesla. Since cobalt and lithium are needed in the manufacturing of lithium-ion batteries, they are becoming much more expensive. With the increased demand for these metals, the lithium-ion battery recycling market is becoming more feasible.

Met-Chem manufactures much of the equipment needed to recycle lithium-ion batteries. While there are other methods to recycle batteries, the method outlined below is a low-cost and environmentally friendly way to recycle lithium-ion batteries.

Met-Chem Filter Presses captures solid particles from ground up lithium-ion batteries between the filter plates while the liquid passes through the filter media. The filter press provides a safe and easy to use method to extract solids from liquids.

The Evaporation System is ideally suited for dewatering and concentrating the brine solutions. The temperature-controlled heated tank system allows for Poly Products Evaporator to evaporate at a constant temperature. This is helpful, because there may be various volatile chemicals in the brine. It is recommended that Met-Chem conduct a feasibility test for evaporation.

Lithium-ion Batteries are shredded and broken down into small pieces with a shredder and a hammer mill. The ground-up batteries are transferred to the shaker table. The table will separate mixed plastics and metals according to their weight and size. The slurry from the shaker table contains granular solids known as "black mass". The slurry is then transferred and collected in the filter tank where it will eventually be processed by the Filter Press.

The Filter Press uses pressure filtration to separate the "black mass" from the lithium brine solution. The slurry is pumped into the filter press where the black mass is captured between the filter plates. The filtered water/lithium brine is transferred and pumped over to the Evaporation System.

A Met-Chem Filter Press is custom engineered and designed to fit your specific needs and application. Filter presses come in a variety of sizes ranging from 470mm to 1500mm, or 1 to 300 cubic foot capacity. The manifold and piping can be constructed using CPVC or Stainless Steel. Ask Met-Chem about additional filter press options and features.

After the slurry is processed by the Filter Press, the remaining liquid or lithium brine is transferred to the temperature-controlled evaporation system. In this process, the Evaporator will evaporate excess water and concentrate the brine to a specified level. The concentrated lithium brine is then pumped to the mixing tank.



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The Poly Products Evaporator and Heated Tank System has also been used to dewater and concentrate NMP (N-Methyl-2-pyrrolidone), which is a common solvent when recycling lithium-ion batteries.

After the lithium brine solution is concentrated to the specifications you desire, it is transferred to the mixing tank. Soda ash is added to lithium brine in order to precipitate lithium carbonate (Li_2CO_3). The solution is processed by the Filter Press where the lithium carbonate is captured between the plates, and the remaining liquid is discharged. Depending on your exact chemistry, the filtrate can be returned to the heated tank system for evaporation, thus creating a Closed-loop Zero Liquid Discharge System.

Met-Chem can offer start-up and installation as an additional option. We can provide full support as you get your system up and running. We have installation technicians and technical representatives that we can send to your facility to make sure the system is running as it should.

All units and systems are complete with manuals and telephone support. However, if you need someone to come to your facility, we will be happy to quote you on that as well.

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