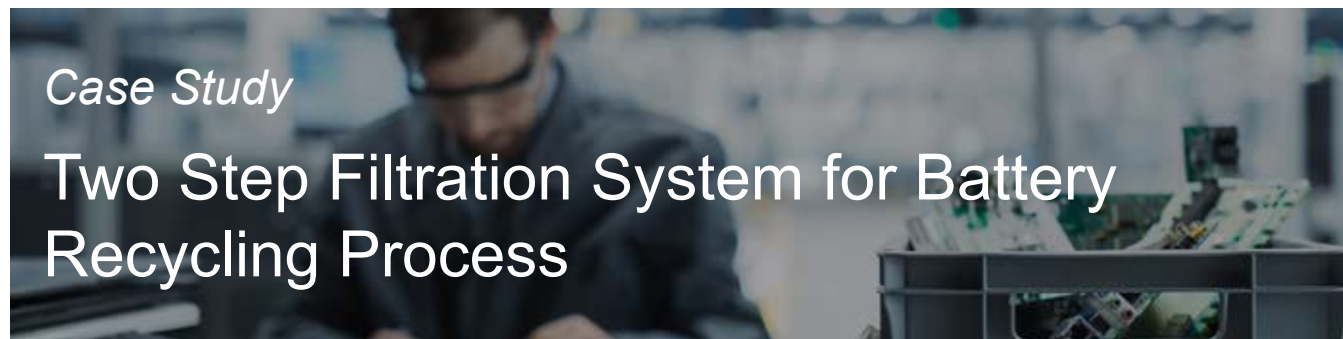




Case Study

Two Step Filtration System for Battery Recycling Process

Customer Issue

A full service provider of systems engineering, integration, and fabrication services based in Pennsylvania was engaged by a leading battery recycling firm in 2023 to develop a separation and filtration system for use in the recovery of lithium battery chemistry components.

This specific situation posed a unique design challenge. It required the careful selection of filters that would be able to withstand and function in an environment that had caustic and corrosive elements.

Early in the design stage, the design firm came to realize that many conventional filtration solutions providers were unfamiliar, and often uncomfortable, working with battery chemistries, particularly in the recycle and recapture process.

Ultimately, the design firm was put in touch with Filter Products Company who worked closely with the Process Filtration division at Donaldson to validate materials of construction for filter elements and filter housings.

Filter Products Company Solution

The design firm knew that they needed a two stage filtration system but were not sure what construction material to use for each stage, or what micron rating was required.

Collaborating with Donaldson Filters, the manufacturers of the housings and filters, FPC proposed the following set-up, which integrated into the larger system that was being developed for battery component recapture and recycling.

A two-step filtration system consisting of two large-format filter housings and associated filters.

The first filter housing utilized 21 304 stainless steel metal mesh filters of 1-micron rating for bulk material removal. Two complete sets of these filters were delivered with the housing because these elements are engineered to be cleaned in an ultrasonic bath and returned to service.

Following cleaning, each element can be tested to ensure performance and the results for each element are stored and compared to results of subsequent testing. This process ensures optimal filtration performance; provides filter lifecycle analysis, and catches any filter that can no longer be cleaned or has sustained mechanical damage and must be removed from service.

The second housing utilized 21 polypropylene progressive density melt blown filter cartridges (0.45-micron rating) with a double open end (DOE) configuration. These low-cost filters are consumable items in the process.

Customer Result

The filtration system was integrated into the battery recycling process and has performed as anticipated since commissioning. The original metallic filter elements are still in service. The client coordinates with Filter Products Company to have one set of these elements cleaned after the other set is installed during planned maintenance. Both sets have been through multiple cleaning cycles.

The disposable filters have proven to last longer than planned because of the performance of the metallic mesh elements and process improvements to the system after commissioning.

Please contact Filter Products Company for help with your next project.

Services Used

Consulting Services, Metallic filter element cleaning

Products Used

Donaldson Purification Products