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Li Lithium-Ion Batteries

Filtration in Li-Ion Battery Cell Coating

How liquid filtration helps ensure high-quality battery cells

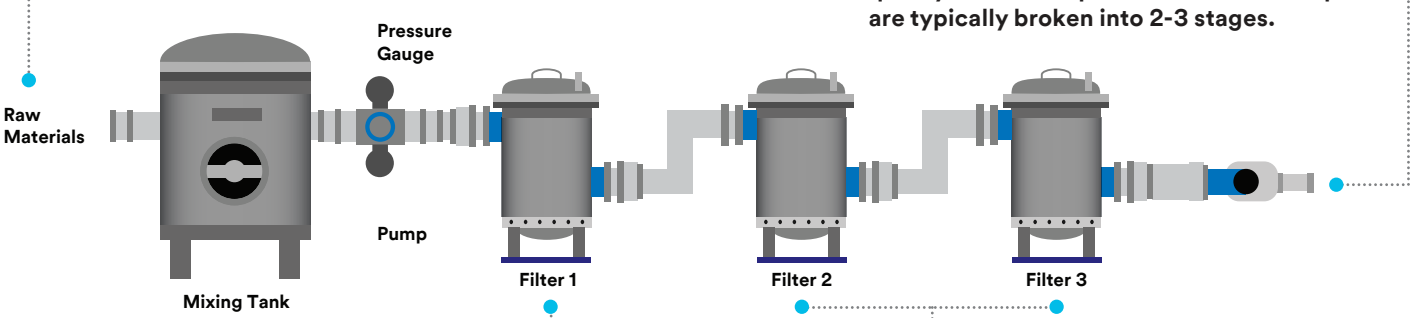
Manufacturing high-quality Li-Ion battery cells requires several key steps, including the critical coating process. Filtration plays a crucial role in this step, helping to remove undesirable large particles and ensures uniformity of the electrode slurries after it's mixed.

1. Slurry Mixing

The first step in Li-Ion battery cell manufacturing, where active materials are blended with a binder to create a slurry.

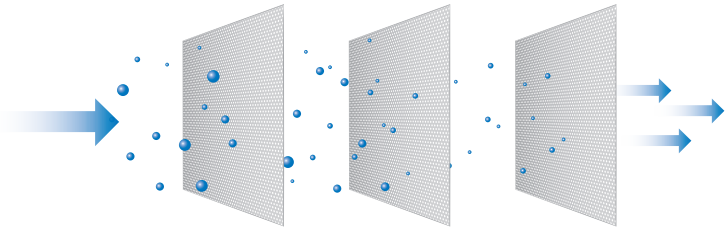
2. Coating

In this step, the slurry is spread onto a metal foil to form a thin, and uniform layer. Filtration of slurry is critical to ensure the quality of the final product and these steps are typically broken into 2-3 stages.



Stage 1 filtration:

A reusable metal mesh is used to help remove larger particles and prevent clogs in the subsequent filters.



Stage 2 and 3 filtration:

Non-woven depth filters are used to remove larger particles and ensure a high-quality coating.

Because they're easy to replace, capsules are often used at this point to reduce the cycle time associated with filter change out and cleaning time, thereby minimizing disruptions.

Using high-quality filters can help ensure the performance and reliability of battery cells, which is critical for many applications:

- Electric vehicles
- Portable devices
- Renewable energy storage

Without adequate filtration, defects can include:

- Craters
- Gel agglomeration
- Scratches
- Blisters
- Coating pits

Filtration can help:

- Improve consistency
- Increase yield
- Protect equipment
- Reduce defects
- Lower overall manufacturing cost of ownership

Learn more or talk to a 3M expert at 3M.co.uk/microelectronics.

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