Seeo’s solid polymer battery

Conventional Li Ion

Cu Current Collector
Porous Graphite Anode Composite
Porous Separator
Porous Cathode Composite
Al Current Collector

Seeo Battery

Li Foil Anode
Dry Solid Separator
Dry Polymer Cathode Composite
Al Current Collector

<table>
<thead>
<tr>
<th>Element</th>
<th>Li Ion</th>
<th>Seeo</th>
<th>Seeo Benefits</th>
</tr>
</thead>
<tbody>
<tr>
<td>Electrolyte</td>
<td>Liquid</td>
<td>Solid</td>
<td><strong>Safety:</strong> Non-reactive and non-flammable</td>
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<tr>
<td>Anode</td>
<td>Porous</td>
<td>Solid</td>
<td><strong>Energy:</strong> Superior specific energy (Wh/kg)</td>
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<tr>
<td>Cathode</td>
<td>Porous</td>
<td>Solid</td>
<td><strong>Reliability:</strong> High temp stability, minimal fade</td>
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Objective: Build and evaluate battery pack

Seeo Cells

Seeo Module
Polymer optimization and scale-up

Polymer development

Polymer collection & centrifuge

Polymer vacuum drying

Final polymer bagged
Pilot production process flow: Cells

- Standard Equipment & Process
- Standard Equipment, Distinct Process

**Electrode Fabrication**
- Cathode Mix
- Cathode Coating
- Cathode Calendar
- Polymer Coating
- Drying

**Cell Assembly**
- Winding
- Laminate
- Stack Bundles
- Press Stack
- Tab Weld
- Pouch Seal

Commercially available cell manufacturing equipment

Conventional process flow with electrolyte coating vs. fill
Safety testing example: Crush tests

X-Axis

Y-Axis

Z-Axis
Crush test example: Y-axis

Most aggressive crust test: along axis with terminals

Li-ion: $\Delta T = 60$ to $100^\circ C$ or enter thermal runaway

Seeo:
Max $\Delta T = 23^\circ$

No venting, smoke or flames observed for any nail & crush
Scalable Module

- Capable of meeting various voltage and current requirements
- Integrated BMS for solid polymer cells
- Fully sealed

Battery Pack

- Flexible orientation to fit in required space
- System-level BMS functions
- Efficient thermal management
Q&A