

BUSINESS UPDATE

**POWER
BATTERY**

Pioneers in scalable
energy solutions

Recycling re-use **easy to use**
battery packs



IN THIS UPDATE

As the world increasingly shifts towards sustainable practices, the demand for eco-friendly solutions has never been greater. At Power Battery, we are committed to leading this charge by engineering battery packs that not only deliver exceptional performance but also adhere to the highest standards of environmental responsibility.

Welcome to Power Battery

We are known for pioneering in cooling and heating technologies, specifically tailored for battery packs. Ensuring optimal performance, longevity, and safety while maintaining a lightweight design. With a relentless commitment to research and development, Power Battery has emerged as a leader in the field of battery cooling solutions.

Our team of engineers and experts harnesses cutting-edge technologies and advanced methodologies to design and deliver cooling systems that exceed expectations.

The beauty of our cooling technology

While our primary focus with this cooling technology is on delivering top-notch performance, a significant bonus is an unaffected lifespan of the cells utilized in these packs, even under demanding conditions.

Each module boasts an impressive capability, delivering up to 360Amps and capable of complete discharge within a mere 10 minutes, all without the risk of overheating. Even at peak usage, cell temperatures remain comfortably within the manufacturer's specified range, with a maximum temperature of just 55 degrees Celsius when discharging at room temperature.

Optimizing cooling

The true beauty of our cooling technology lies in its ability to significantly reduce chemical cell degradation and the formation of dendrites.

By optimizing cooling, we ensure that the cells maintain their integrity over time, ultimately extending their lifespan and maximizing years of reliable use.

Holistic approach

When it comes to LiBs, the environmental toll of their production and disposal cannot be overlooked. Extracting one tonne of lithium demands a significant resource input—either 250 tonnes of spodumene or 750 tonnes of mineral-rich brine [1].

Yet, despite this intensive process and technical advancements in prolonging longevity (like the remarkable achievement with our cooling technology), LiBs typically face disposal after just 1 to 3 years of use, posing grave environmental risks and safety risks when mishandled. And shockingly; only about 5% of LiBs are currently recycled [1], leaving a staggering 95% as pure waste.

Our mission

At Power Battery, we refuse to accept the status quo of short use of cells. While others may focus solely on increasing recycling rates, we recognize the urgent need to adopt a more holistic approach.

Our mission goes beyond merely boosting the percentage of recycled LiBs; instead, we strive to elevate the standards of waste management altogether. Our vision entails ascending the hierarchy of waste management by championing the re-use of lithium-ion cells.

By embracing the re-use of LiB cells, we not only mitigate the environmental impact of battery production but also prolong the lifespan of valuable resources.

Prolong the lifespan of valuable resources

Power Battery possess expertise in repurposing and recycling battery packs sourced from a previous project. However, re-using battery cells still poses a formidable challenge, primarily due to the uncertainty surrounding their condition.

Evaluating the exact state of a battery cell is a complex undertaking, as its initial capacity frequently varies among cells and experiences a swift decline during the initial discharge and charge cycles. After this initial drop, capacity tends to stabilize before gradually decreasing further until the battery approaches its end-of-life (EOL) phase.

Through our innovative data inquiring technique we are able to gain full 100% entry control of all our battery packs. With Safion equipment, we can measure 32 data points per second, enabling us to continuously track and graph the lifespan and residual value of a battery pack. In the Netherlands, it's not uncommon to come across descriptions on used car websites like: *"It belonged to an old lady, the car has always been parked inside"*, suggesting minimal wear and tear. However, with our advanced data inquiry technique, we can truly verify whether such claims hold true.

Prolong the lifespan of valuable resources

With this knowledge our high performance battery cells can get a second life in less demanding operations. The re-used battery cells can be used for energy storage to solve net congestion and provide local electricity supply for companies. It will do so in an economically and environmentally responsible way.

We will put our high performance full re-useable battery cells in a recyclable battery pack to show that maximum performance can come with minimum waste, but only at Power Battery.

Naturally, the battery cells are easily dismantlable too. Look forward to their release in early 2025.

That is one of the reasons that we have developed our proprietary cooling technology for Li-Ion battery packs. This cooling technology is aimed at high performance in the first place. But a very nice side effect is that the lifespan of the cells used in the pack is not affected when used in demanding applications. A single module can deliver 360Amps and can be fully discharged in 10 minutes without overheating. Cell temperatures stay well within the temperature range of the manufacturer. Maximum temperature when discharging at room temperature is 55 degrees celsius.

The greatest benefit is that chemical cell degradation, and the forming of dendrites, is reduced due to the optimized cooling. Thus beneficiary for the lifespan and years of use of the cell.

References [1]

B. R. Y. S. K. Rahul Rautela, "A review on technologies for recovery of metals from waste lithium-ion batteries,"Power sources, 2023.