Enpower's Lithium Metal Battery Outperforms Lithium Ion Batteries in Nail-Penetration Testing

June 8, 2022

Enpower's lithium metal battery (LMB) has passed the nail-penetration test, which is a very challenging safety test for lithium-ion batteries. Enpower also obtained the UN38.3 transport safety certification from an accredited third-party tester. This breakthrough follows Enpower's successful verification of ultra-high energy density levels of 450 Wh/kg and 520 Wh/kg in 2021. The performance tradeoff between energy density and safety has long been a standing dilemma. Enpower uses a proprietary lithium interface technology and a novel electrolyte/separator solution to solve the dilemma, while maintaining a competitive cycle life. It is a big milestone towards commercialization for Enpower's LMB.

Enpower's LMB has registered more than 500 charge and discharge cycles while maintaining 450Wh/kg energy density. The same battery passed a complete suite of safety tests including height simulation, thermal, vibration, shock, (high temperature) external short circuit, impact/crush, and forced discharge, all conducted by an accredited third-party testing organization. These make up the UN38.3 safety certification for shipping by air, sea, rail, or roadways.

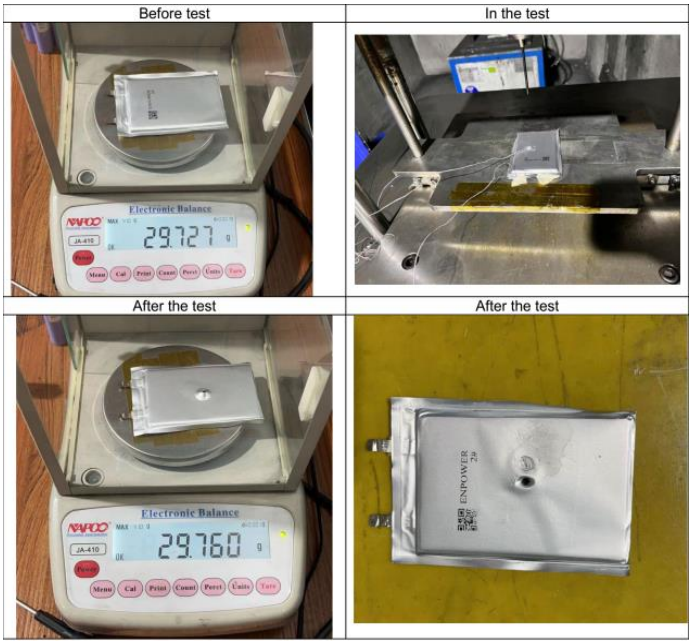
In the nail penetration test, conducted by the same third-party, Enpower's battery sample passed on the first trial with no combustion and no explosion. The company has also conducted internal tests comparing the safety of commercially available lithium-ion batteries, comprising the chemistries of LFP/graphite, NCM/graphite and NCM/Silicon-Carbon, and Enpower LMBs outperformed them all and have been demonstrated to be safer.

At present, Enpower is collaborating closely with Softbank on their HAPSMobile project, which is developing solar-powered stratospheric drones to enhance global telecommunications. It also cooperates, both commercially and in R&D, with eVTOL and auto companies to enhance the performance and cost competitiveness of Enpower batteries. Enpower is committed to the early commercialization of LMB in drones and electric vehicles. A 10-100MWh pilot line is currently under construction, and 11Ah and 100Ah sample cells for UAV/eVTOL and EV applications will be launched in the third quarter of this year. Enpower will reach a 100MWh production capacity by 2023 to start suppling to early customers. A GWh production line will be constructed by 2024.

Enpower is a solid-state battery company dedicated to the commercialization of the next-gen batteries including the lithium metal batteries and all-solid-state batteries, and along with their key materials. Enpower has operations in China, Japan, and the United States, drawing from the top talent

and regional advantages of all three to execute on breakthrough innovations. Enpower works closely with Nobel Laureate Dr. John Goodenough, one of the inventors of the lithium-ion battery, and his lab at the University of Texas at Austin, as well as Dr. Ryoji Kanno, the inventor of the super-ionic conductor, with Tokyo Institute of Technology. Enpower also maintained strategic partnerships with more than 30 established companies up and down the supply chain. Enpower's mission is to realize a carbon neutral future through the promotion of next-generation batteries such as lithium metal and all-solid-state batteries.

Screenshot of Enpower's nail penetration test
The two pictures above are Enpower lithium metal batteries,
and the two pictures below are commercially available lithium-ion batteries.



A diagram of the third-party test institute's report
(before and after the nail penetration of cells)

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