

Solid state sulfide Based LI-Metal batteries for EV applications

D5.4 – 10Ah cell prototypes manufacturing

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Publishable summary

The purpose of this deliverable is to showcase the prototype production of the SUBLIME solid-state multilayer pouch cells. This final output comes out of the joint development involving Saft and Fraunhofer/IST-TUB, built in the “battery cell design, pre-industrial scale up and manufacturing” workpackage. The cell manufacturing was successfully carried out by Fraunhofer/IST-TUB, after which the cells were distributed to partners for electrochemical performance, lifespan, and safety tests.

Leveraging the feedback from the experimental processing and assembly of small-scale monolayer cells, Saft and Fraunhofer/IST-TUB have developed a 1 Ah prototype cell in a pre-industrial format, complete with its assembly process flow chart. Following the scaling up of the sulfide-based components, the necessary components for cell manufacturing were prepared at Fraunhofer/IST-TUB:

- Lithium / Copper anode (20/10 μm): Material was outsourced, and a protective layer (Aluminium oxide) was deposited by TNO.
- All solid-state cathode (2 mAh/cm²) was manufactured by Fraunhofer/IST-TUB using lithium
- nickel manganese cobalt oxide (NMC811) sourced from UMICORE, and Sulfide electrolyte powder supplied by SYENSQO.
- Sulfidic solid electrolyte membrane (thickness 200 μm) was manufactured by Fraunhofer/ISTTUB using Sulfide electrolyte powder supplied by SYENSQO.

The experimental conditions for cell assembly were optimized for the manufacturing of the prototype pouch cells. The challenges and issues resolved during the manufacturing process flow have provided valuable insights, enabling a more comprehensive assessment of the production chain for sulfide-based all solid-state batteries.