ENERGY

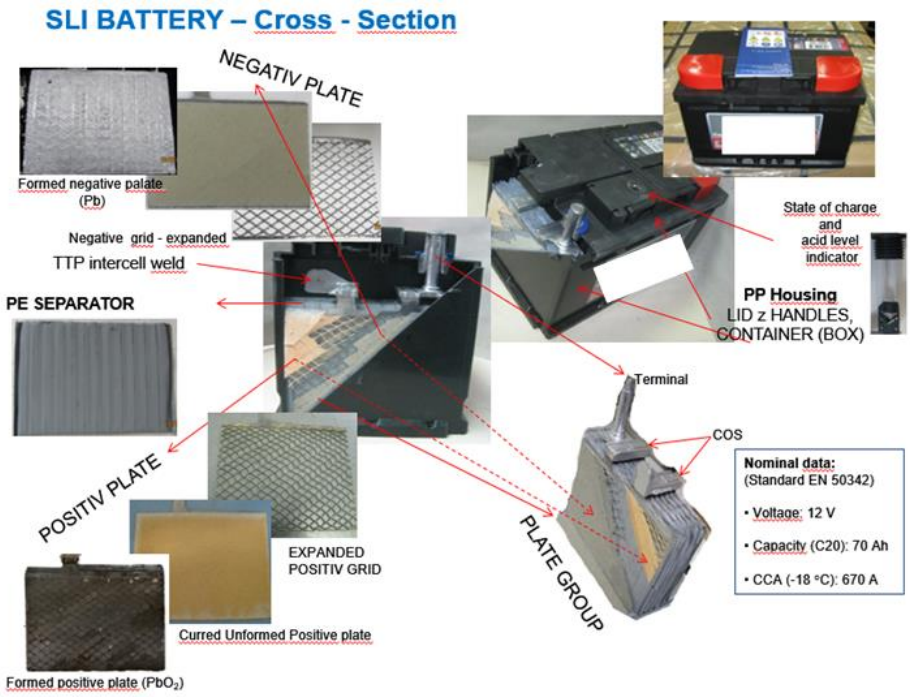
Ceramic Matrix Composites

23_ENER_CMC_LightGRID

Title: Lightweight active grid for replacement of lead alloy grids

Description: Replacement of lead alloy grid with lightweight material with better conductivity and resistant in dilute sulfuric acid. Seeking for lightweight material for active grid with electrical conductivity and resistant in dilute sulfuric acid. Achieving adhesion with active material to collect electrons from chemical reactions in active mass in batteries electrodes.

Figures: top – active grid, bottom – battery components



Objectives:

- Higher energy density (weight reduction)

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 101005435

- Reduce the use of lead
- CO_2 emissions reduction

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46_ENER_CMC_siliconeFIRESTOP

Title: Arc extinguishing material on the melting elements of fuse link

Description: We currently use a special silicone named FIRESTOP with the addition of aluminium trihydrate to limit the electrical arc inside the fuse link during fuse operation on DC voltage (up to 1500V d.c.). Electrical arc made chemical reaction which aluminium trihydrate “change” to water and aluminium oxide. Energy consumption from chemical reaction reduce the temperature of electric arc. Additional material which is added to silicone is SILAN which improved adhesion to the melting element.

Silicone is applied to the melting elements which is a part of fuse link. Using a silicone FIRESTOP reduce the length of fuse link for more than 30% and weight for more than 20% in comparison to other technical solutions.

The process of application of the silicone on the melting element in the production is relatively complicated and time consuming (application on the melting element, drying, curing, control).

The challenge is to find a suitable technical (replacement for FIRESTOP silicone or another additive to quartz sand (like boric acid)) and find technological equivalent to the existing process, which will be simpler and will reduce production costs.

Existing technical solution with FIRESTOP silicon is patented in EU (Pat. Nr.EP 14 835 723.9)

Objectives:

- Finding a technical and technological equivalent for the existing FIRESTOP silicone.
- Significantly reduce costs of material used and production process (for more than 50%).

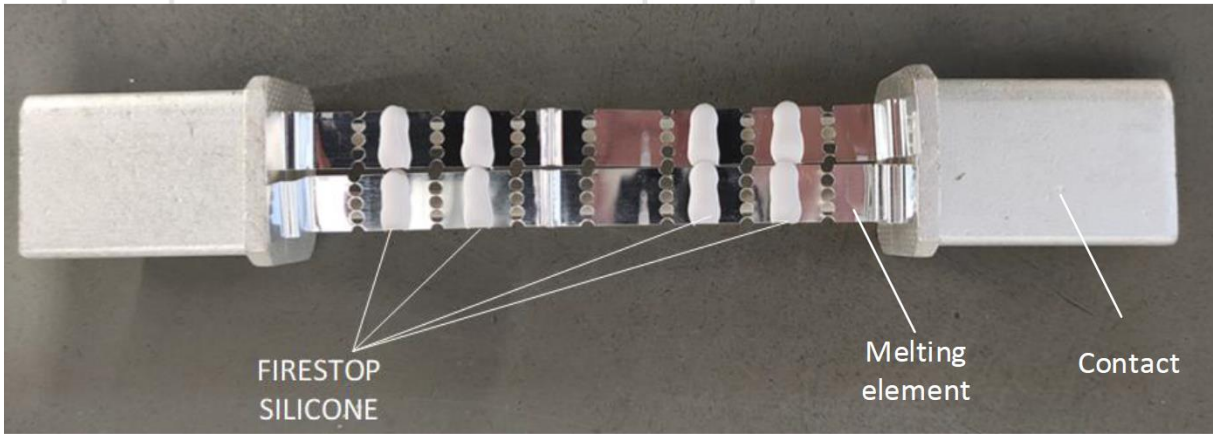

Figure: Example of fuse link

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