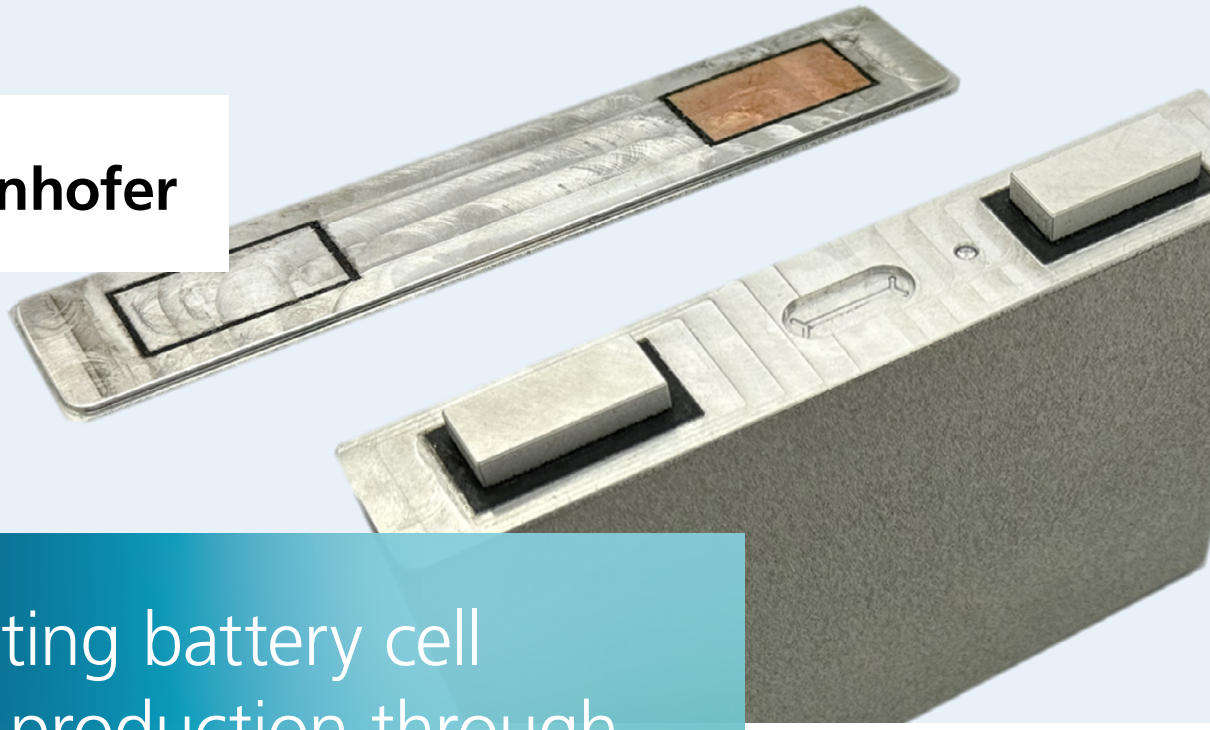

Accelerating battery cell housing production through Additive Manufacturing

Fraunhofer IGCV offers geometrically flexible, time-efficient additive solutions

Battery cells undergo development phases from prototypes to industrial production. In early stages, small quantities of cell housings are needed, where conventional manufacturing reaches its limits. Methods like deep drawing or impact extrusion are costly and time-consuming, while machining or bending and welding also pose challenges.

Additive manufacturing based on PBF techniques enables rapid design iterations without tooling costs, making it ideal for early cell development phases where speed and flexibility are crucial.

The Fraunhofer Institute for Casting, Composite, and Processing Technology IGCV has qualified pure aluminum for additive manufacturing of battery cell cans. Optimized exposure strategies and vertical supports enable thin-walled housings with high accuracy and minimal warpage. Helium leak tests at 0.8 mm wall thickness confirmed suitability for prototypes, while vibratory grinding reduces surface roughness below 5 µm (Ra).

Building on this, additive manufacturing also allows the production of cell caps.

The multi-material PBF-LB process combines aluminum, copper, and ceramic in a single build, enabling complex geometries and high design flexibility. Integrating multiple materials simplifies the production chain, removes processing steps, and reduces assembly effort.

The method is ideal for small production runs and rapid prototyping, supporting faster design adaptation. Ceramics can also be processed alongside conductive metals as electrical insulators, achieving high density and structural integrity. Despite longer build times and some post-processing, the flexibility and precision of this approach offer a strong alternative to conventional methods and open new possibilities for efficient, customizable energy storage solutions.

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exhibit overview