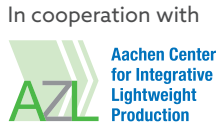


Find more information
on our website



About AZL

As a one stop shop for market and technology know how, the senior staff of AZL brings together experts and decision makers from academia and industry to support business and technology development for the lightweight industry. We support you, regardless of your position in the value chain, in the development, benchmarking and improvement of your design methodologies, manufacturing techniques and products.

AZL Battery Casing Products & Services

- Application Relevant Fire Test Procedure for Battery Pack Protection
- Application Relevant Bottom Impact Protection Procedure for Battery Casings
- Concept Study and Development of Cell-to-Pack Battery Casings
- EV Battery Casings Consultancy

Industrial Companies Working with AZL Battery Experts



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Excellence in Lightweight Production



Excellence in Lightweight Production

AZL Engineering Service EV Battery Casings Consultancy

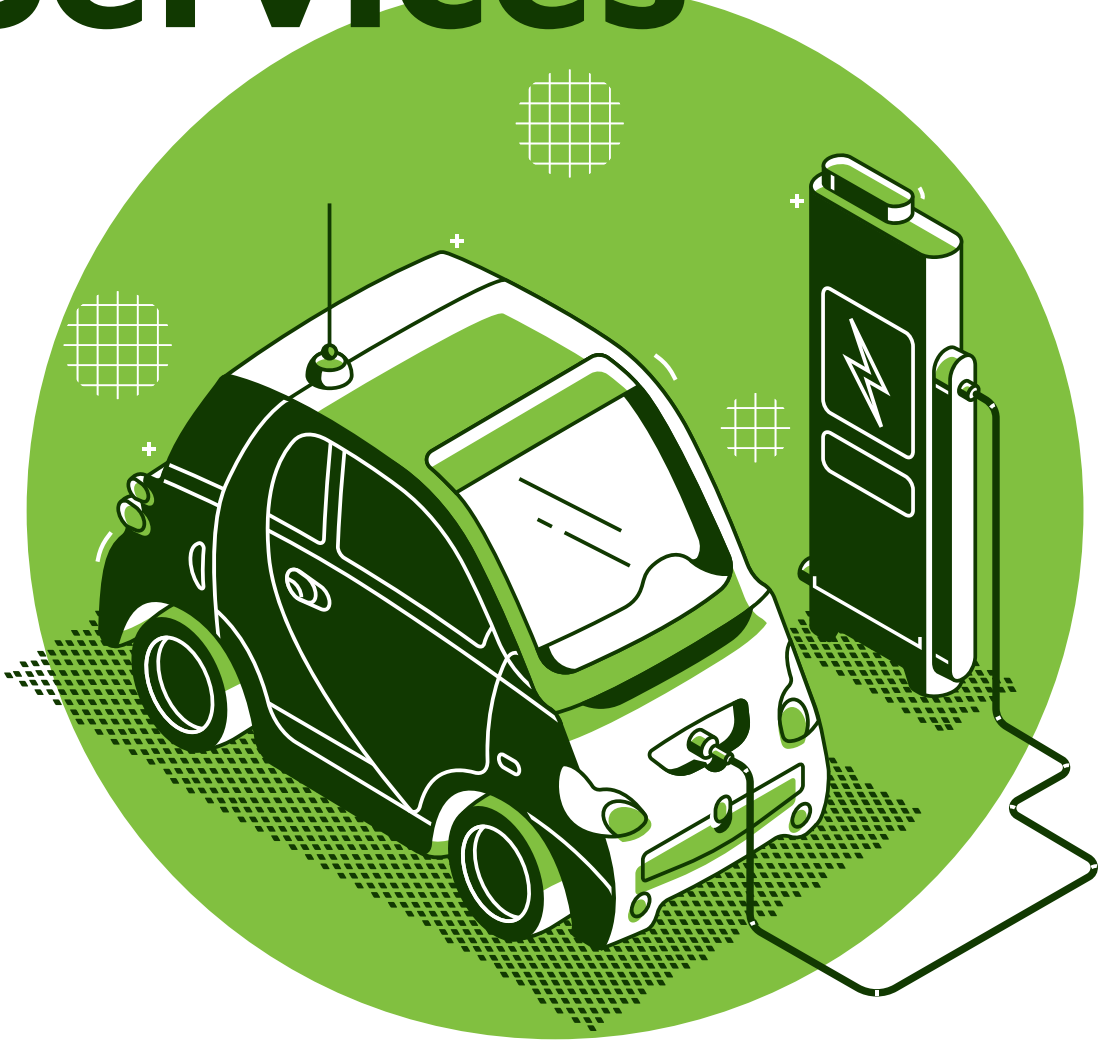
Together we analyse the fast-growing market for EV battery casings and identify opportunities for your materials, products and technologies considering cost, weight and environmental impact.

Our Assets related to Battery Casings

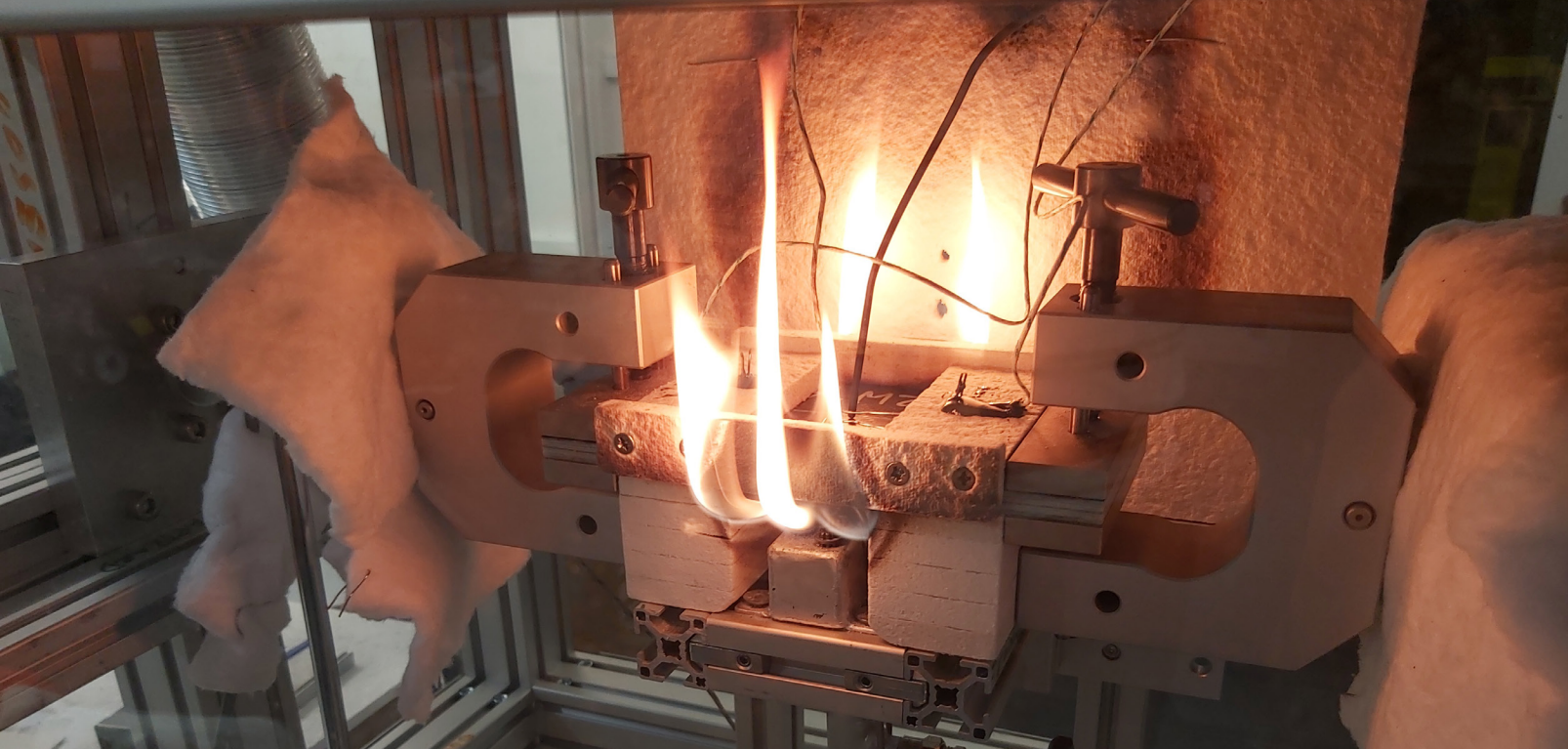
AZL conducted several projects with 76 industrial companies along the complete value chain, investigating:

- Worldwide standards, regulations and specifications
- 60+ state of the art casings and future concepts
- About 30 different multi-material design concepts, including:
 - Alternative cell-packing and cooling options for future cell-to-pack designs
 - Analysis of alternative materials to mitigate thermal runaway propagation
 - Analysis of and design for recycling
- CAE analysis and optimisation to crash and intrusion load cases
- Modelling production chains and benchmarking analysis of weight, cost and CO₂ footprint, and volumetric efficiency

With our market and technology know-how, simulation methods, cost and CO₂ footprint analysis and testing capacities, we provide consulting and development for your materials, products and technologies



Battery Casing Products & Services



AZL Engineering Service

Application Relevant Fire Test Procedure for Battery Pack Protection

Material Strength Test

- 3 different temperatures: 800 °C, 1000 °C, 1200 °C
- During exposure to fire: tensile force of 0.5 kN over 10 minutes
- If no failure, increase force up to 5 kN

Particle Blast Test

- Equal damage effect of thermal runaway with real battery cell
- Exposure to 1.200 °C for 80 seconds
- Afterwards 10 seconds blast duration, filling mass 450 g

Test specimen size for both tests is 200 mm x 100 mm, flame exposure along the full specimen width
Approx. 10 test specimens required, 2 for each tests and temperature

AZL's Expertise

- Setup of test procedure and test bench with 3 different temperatures measuring the material strength under fire load
- 60+ materials tested and compared
- Impact on performance, weight and cost

AZL Joint Partner Project

Concept Study & Development of Cell-to-Pack Battery Casings

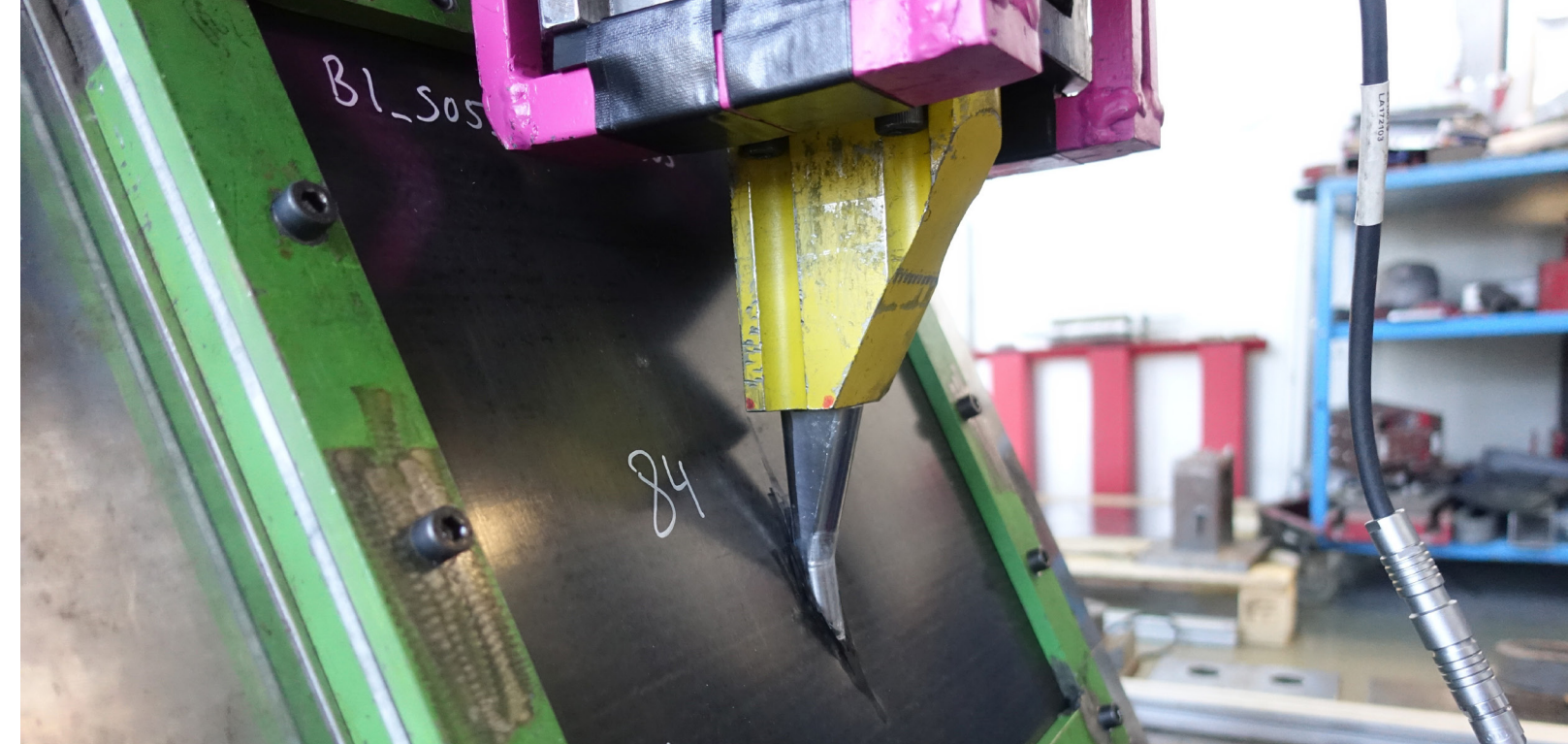
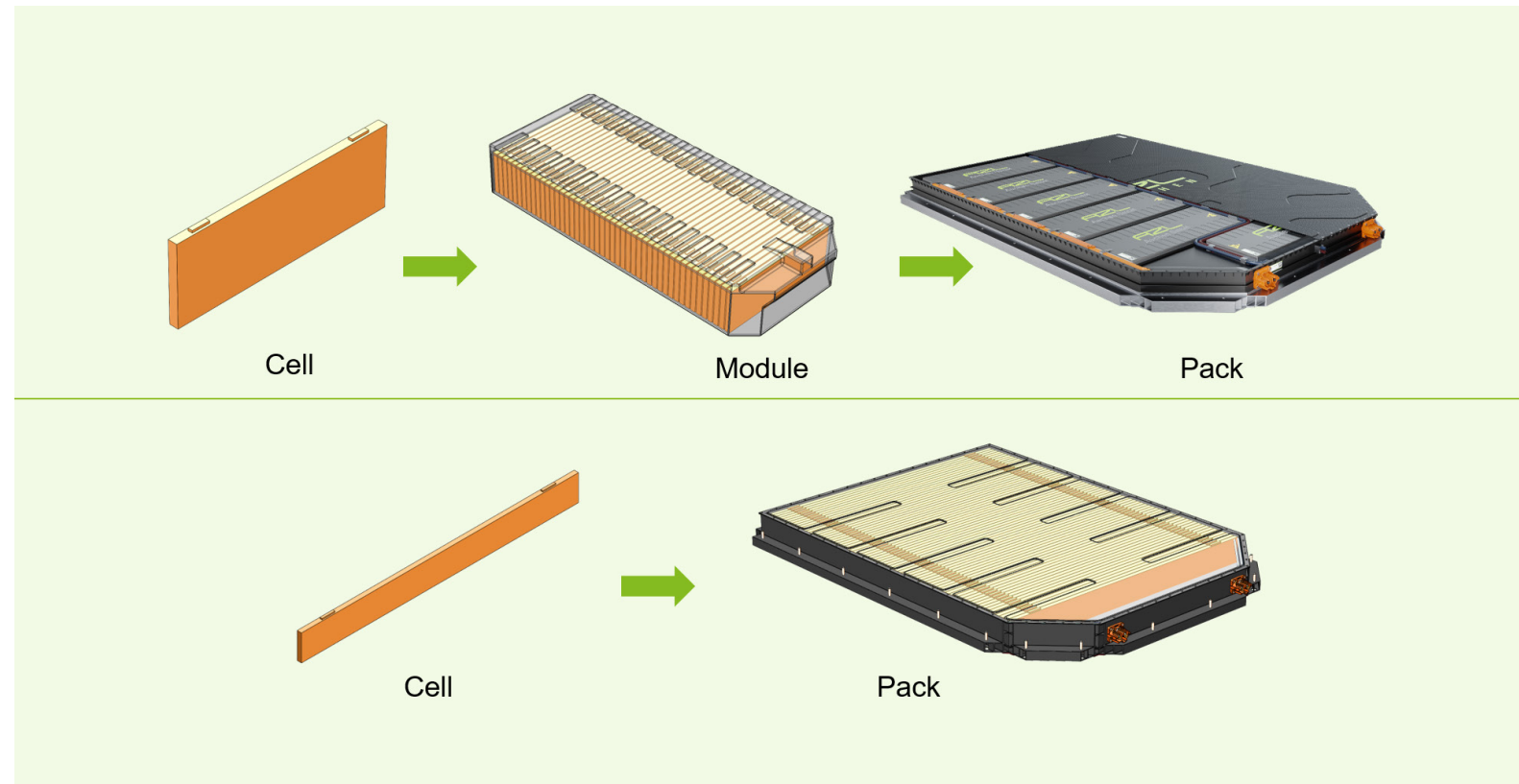
Get the report!

What's inside the report?

- Market & technology screening e.g. types, packs, assembly, thermal solutions
- Design specification, requirements, test standards
- Material properties
- Design layouts and concepts
- CAE results
- Bottom protection plate
- Lid Design
- Cell Cooling
- Thermal runaway propagation prevention
- Thermal runaway example on pack level
- Cell compression
- Torsional stiffness
- Evaluation of e.g. volume efficiency, repairability/recyclability, cost & CO₂

Sneak peak of the results:

- Up to 30% cost savings with composite based designs
- Improved volume efficiency with cell-to-pack layouts
- Cells contribute significantly to the pack strength and stiffness



AZL Engineering Service

Application Relevant Bottom Impact Protection Procedure for Battery Casings

- Simulates oblique angle impact occurring in high-speed driving over hard objects
- 2 different angles for impact possible: 90° and 25°
- 15 mm dart impactor, max. height 4 m, max. mass 60 kg

Test specimen size 400 mm x 400 mm, Approx. 2 specimens for each angle

AZL's Expertise

- Improvement of an existing test bench* for 25° oblique impact and setup of test procedure
- 25+ materials tested and compared
- Impact on performance, weight and cost

*Original test bench developed by Thyssenkrupp