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About AZL

AZL stands for excellence in lightweight production. 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

AZL Expert Consortium along the complete value chain



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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

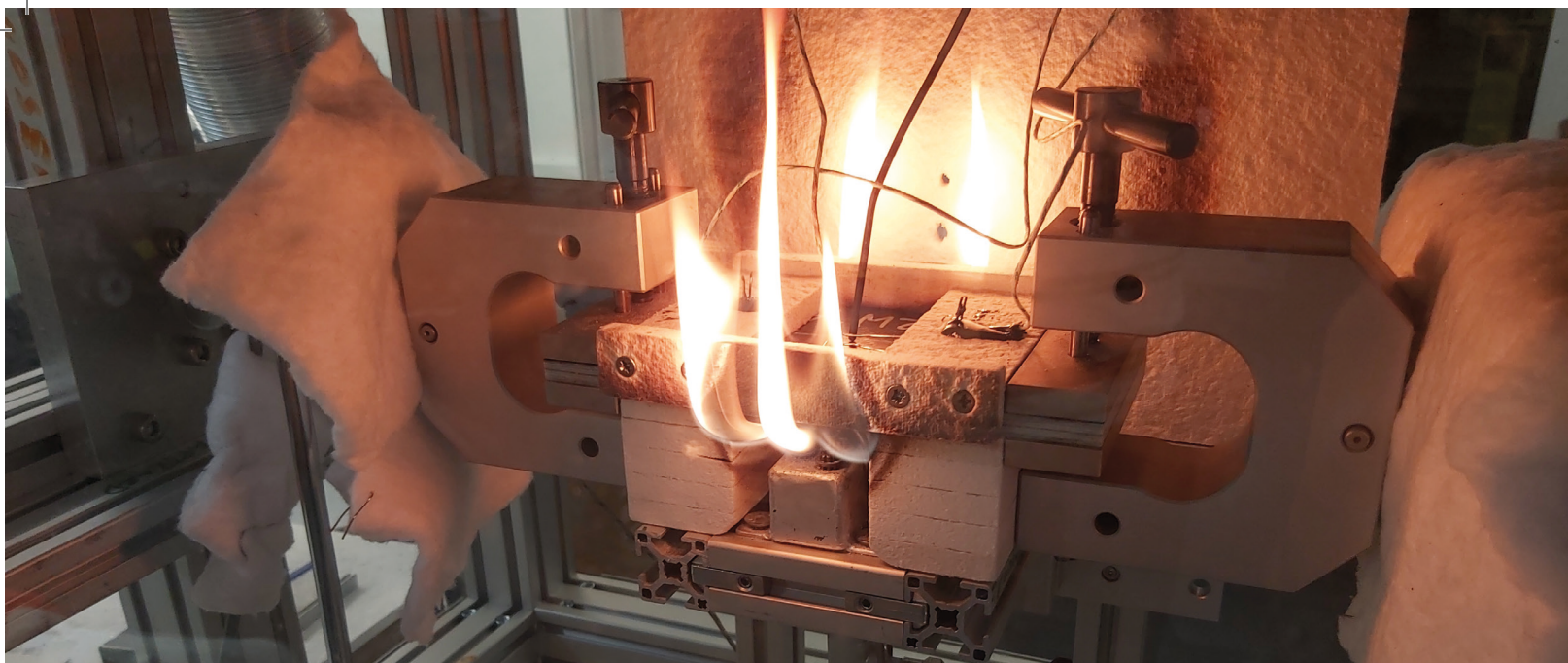
AZL conducted several consortium projects with 76 industrial companies along the complete value chain, investigating:

- Worldwide standards, regulations and specifications
- 60+ state of the art casings and future concepts
- About 30 different multi-material design concepts, including future cell-to-pack designs
- 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
- Experimental testing of high speed oblique foreign object impact protection, more than 25 different materials
- CAE design relevant fire safety testing, more than 50 different materials and protection layers

Battery Casing Products & Services



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



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

AZL Joint Partner Project completed in 2022:
Fire Protection – Application Relevant Fire Test Procedure for Composites

- Consortium of 24 industrial partners along the complete value chain
- Setup of test procedure and test bench with 3 different temperatures measuring the material strength under fire load
- 50+ materials tested and compared
- Impact on performance, weight and cost

AZL Engineering Service Application Relevant Bottom Impact Protection Procedure for Battery Casings

- Simulates oblique angle impact occurring in high-speed driving over hard objects
- 3 different angles for impact possible: 90°, 45° and 25°
- 15 mm dart impactor, max. height 4 m, max. mass 60 kg
- Large-scale tests and small-scale tests (only 90°)

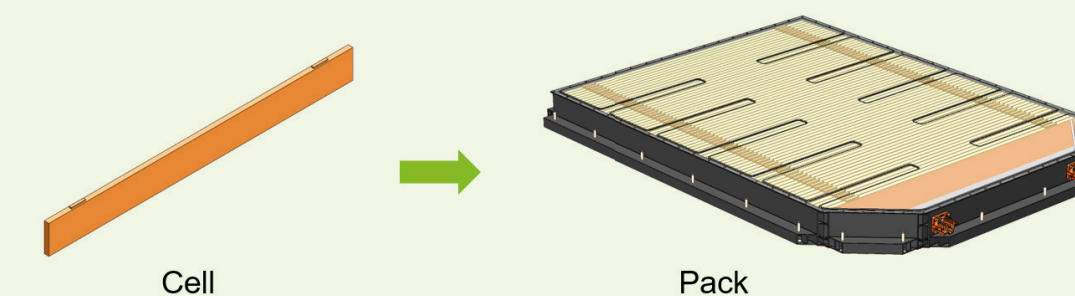
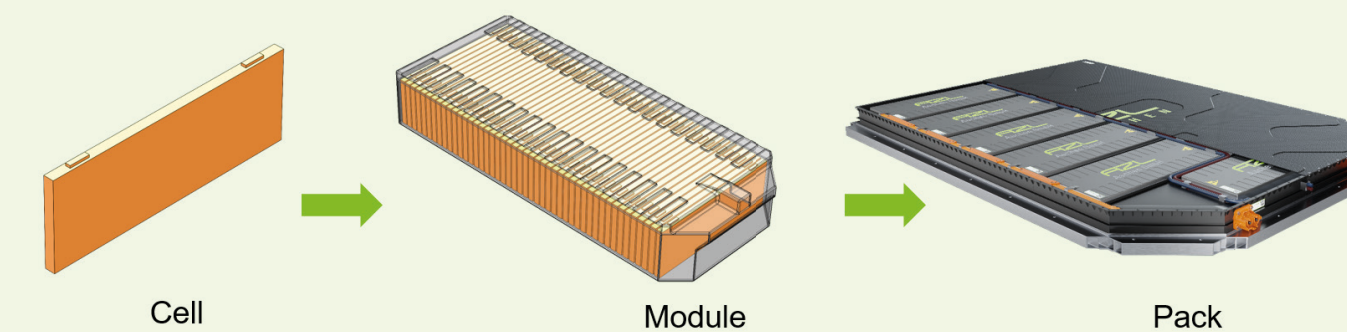
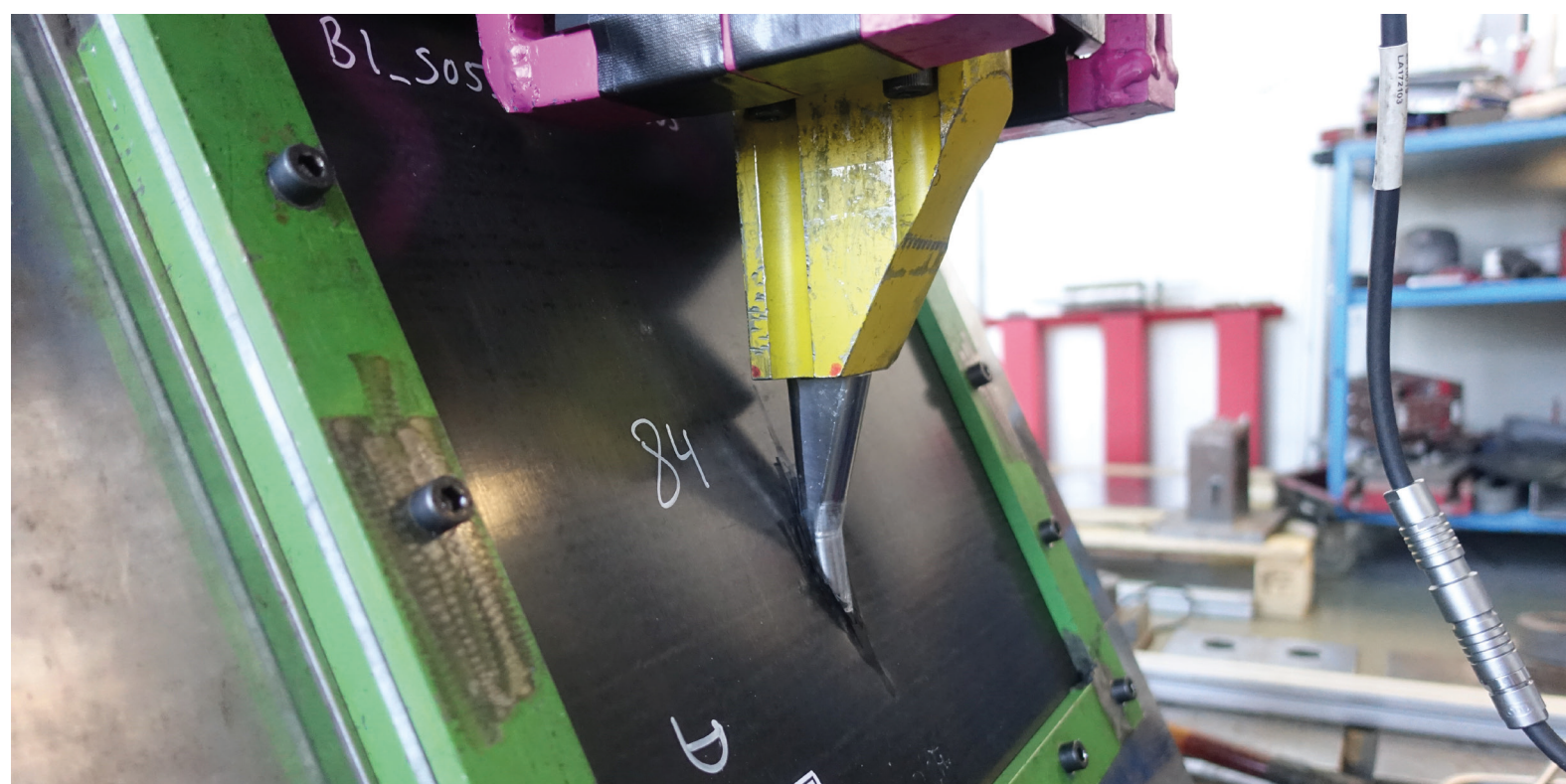
Test specimen size for large-scale 400 mm x 400 mm, small-scale 120 mm x 120 mm
Approx. 2 specimens for each angle in large-scale test, 10 specimens for small-scale test

AZL's Expertise

AZL Joint Partner Project completed in 2022:
Application-relevant test method and investigation of the relative safety performance of different material options for bottom impact protection of battery casings

- Consortium of 13 industrial partners along the complete value chain
- Improvement of an existing test bench* for 25° oblique impact and setup of test procedure
- 20+ materials tested and compared
- Impact on performance, weight and cost

*Original test bench developed by Thyssenkrupp



AZL Joint Partner Project Concept Study & Development of Cell-to-Pack Battery Casings

- Recently started project with 32 participating companies including Audi, Jaguar Land Rover and Toyota
- Objective: reveal the potential for multi-material combinations of the battery casing of the future
- Work Packages:

- ✓ Screening of market and technology developments
- ✓ Update of existing reference specification sheet
- ✓ Sketch design & dimensioning of multiple alternative concepts
- ✓ CAD visualization
- ✓ Process chain & business case analysis including CO₂ analysis (cradle-to-gate)

- Next report meeting: June 14th, 2023