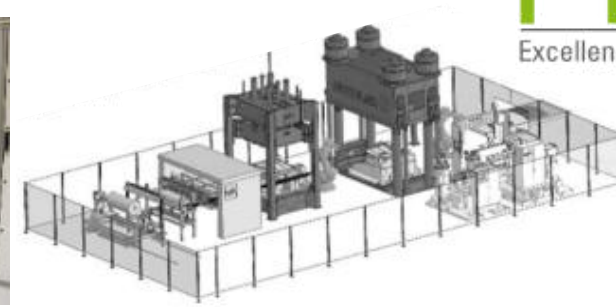
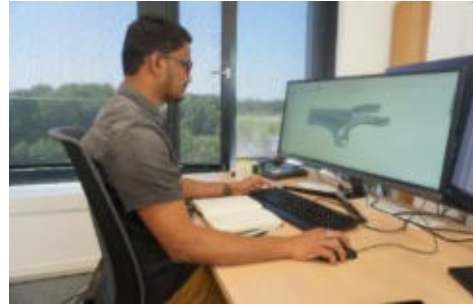


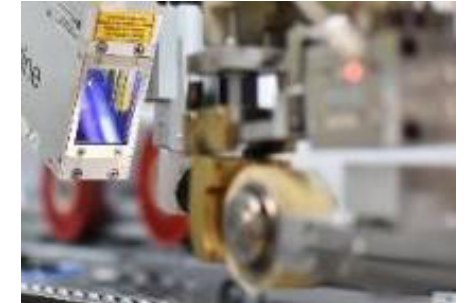
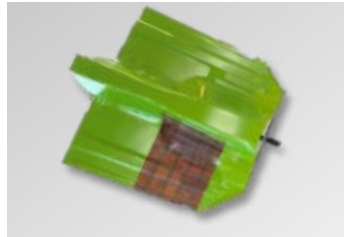
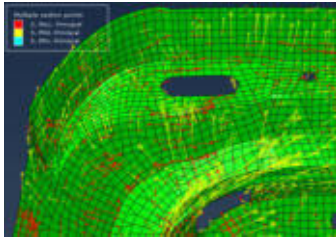
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AZL Engineering and Service Portfolio

Business Development | Technology Development | Lightweight Production

In cooperation with:

Logo weiterer
Kooperationspartner

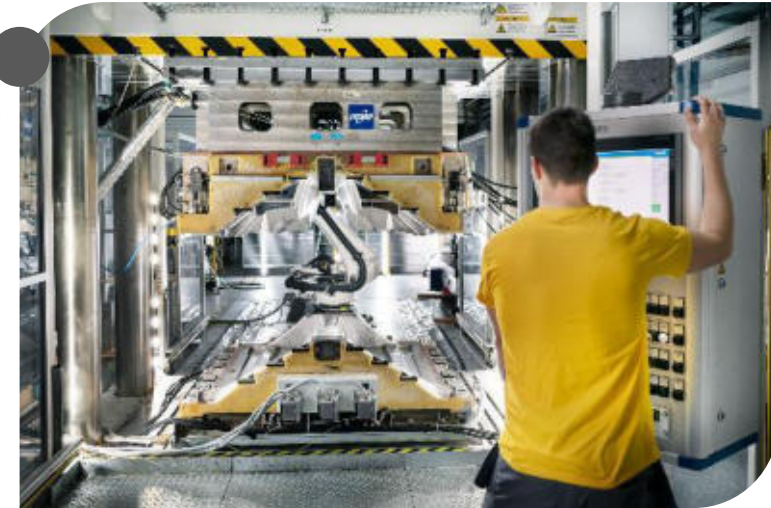
Know-How and Networks for Excellence in Lightweight Production

Our Assets for Business and Technology Development



Our systematics
for combining
**Market and
technology
intelligence**

Our technology
know-how:
**Composite-based
multi-material
technologies**



Our international cross-industry network:
80+ companies from 21 countries



Our high-tech ecosystem:
RWTH Aachen Campus



Copyright: Campus GmbH/Steindl

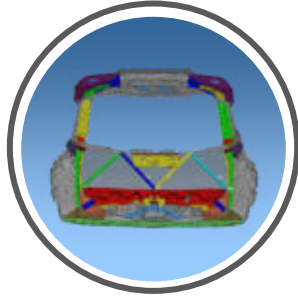
AZL Engineering and Service Portfolio

Services for Business and Technology Development



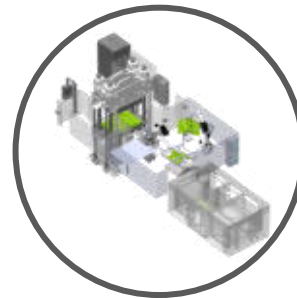
MARKET AND BUSINESS OPPORTUNITY IDENTIFICATION

- Technological and economical benchmarking analysis
- Market and technology analysis
- Technology screening, identification and monitoring



COMPONENT DESIGN AND PRODUCTION CONCEPTS

- Specification definitions
- Concept design
- CAE
- Production layout
- Prototyping, process validation
- Testing



SYSTEM AND PROCESS DEVELOPMENT

- Concepts and design
- Proof-of-principle and prototyping
- Integration in existing productions



SUPPORT FOR INDUSTRIAL IMPLEMENTATION

- Customer, partner, supplier analyses and matchmaking
- Consulting during ramp-up of production

Market and Business Opportunity Identification

An Example: Market and Technology Studies

Structuring and
analysis of
**trend markets and
market segments**



Systematic analysis of
attractive applications



Identification and benchmarking of
technologies and enablers



Analysis of
business cases



Systematic and
established approach

Market analysis
through the eyes of
technology experts

Market and Business Opportunity Identification

Examples of Joint Market and Technology Studies

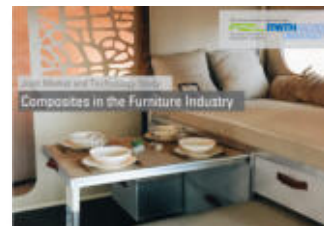
Example joint studies:

- Mass Production for Lightweight Composite Structures
- Composites in Buildings and Infrastructure
- Energy Storage Systems
- Composites in the Furniture Industry
- Next Generation Mobility Solutions
- High-Performance SMC
- Potentials and Challenges of Thermoplastic Tapes for SME Injection Molders
- Bio-based Composites



“The AZL study on Buildings and Infrastructure provided us a **great networking with key players** and gave us a **proper market understanding** including market size/volume in numbers to prove the value of this technology to building industry.”

Justin Jin, CEO of AXIA Materials



Component Design and Production Concepts

Design Services Listing

OUR SERVICES

- Specification definitions
- Concept design
 - Multiple concepts, multiple materials
 - Cost & weight analysis
- CAE
 - Mechanical, optimization
 - Process design and parameter optimization
- Production layout
- Prototyping, process validation
- Testing
- Senior expert consulting

WHY WORK WITH US?

Professional team with:

- Design knowledge
- Production focus
- Cost & business insight
- Hands-on prototyping
- Aachen Campus network
- Partner network
- Material & technology neutral

YOUR BENEFITS:

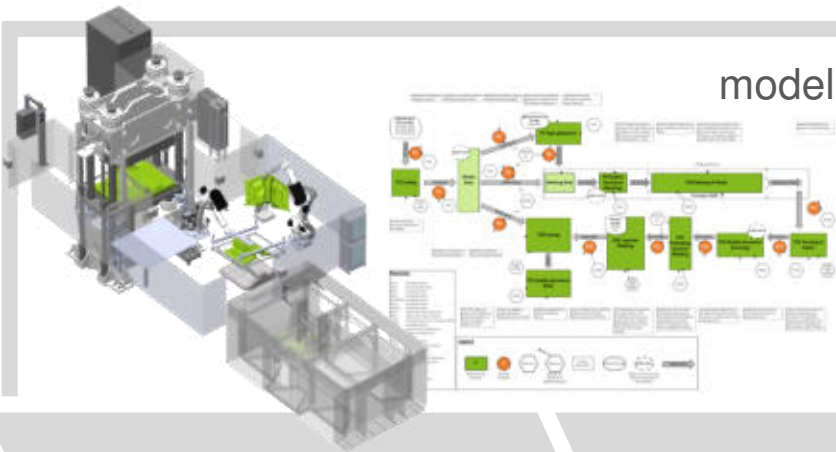
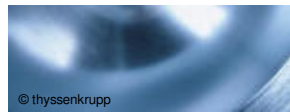
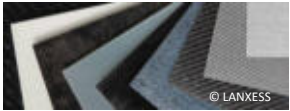
- Lighter components
- Cheaper components,
- which are competitive
- Reduced risk and support towards production

Use a design brain storming session at AZL, to learn what would be possible in your case.

Component Design and Production Concepts

An Example: Concepts Studies for Lightweight Components

Substructures,
material selection,
topology optimization



Process chain
modelling and benchmark

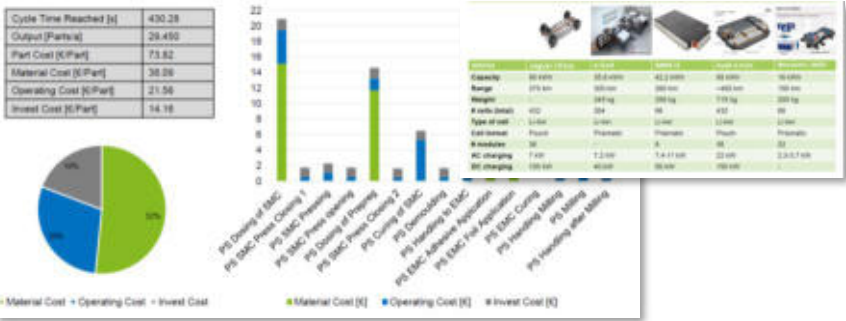
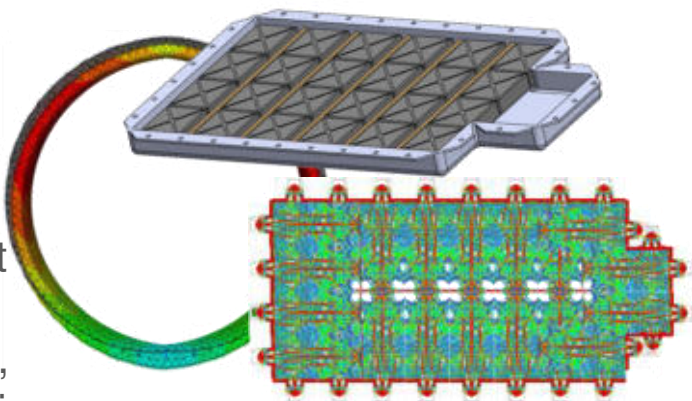
Component requirement
analysis

Multi-material
component concept
design and
simulation

Identification and
evaluation of
production
concepts

Cost analysis and
sensitivity analysis of
production-related
KPIs

Material- and
process-independent
design concepts,
detailed CAD design,
finite element analysis



Costs, capacities, weight,
scalability

System and Process Development

Systems for Continuous Production of FRP Semi-finished Products Developed at AZL



Scalable double-belt press

- Energy- and cost-efficient
- Consolidating and impregnating a wide variety of composite materials
- Highly flexible: all parameters adjustable within minutes (e.g. pressure, temperature, speed)

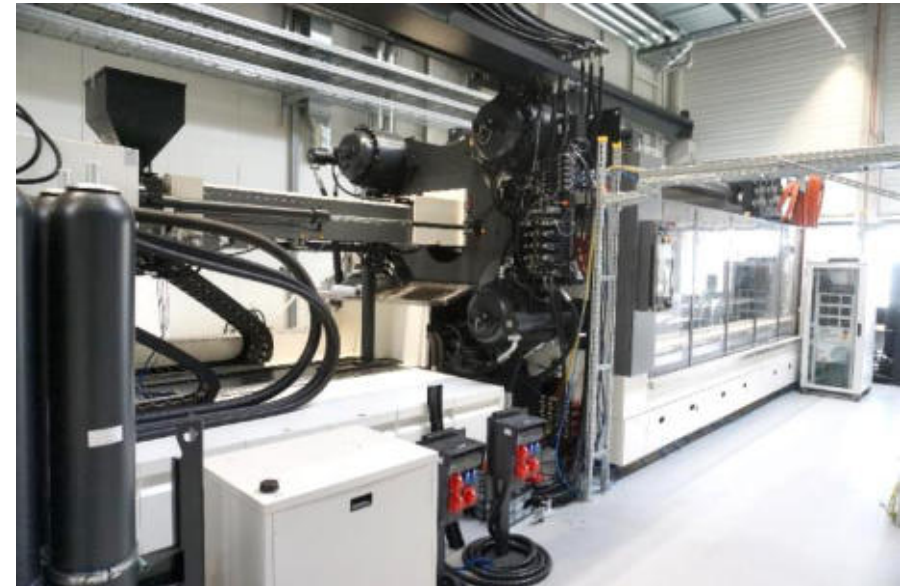
Ultra-fast consolidator machine system

- Mass-production of individual tailored blanks
- Laser-assisted thermoplastic tape placement
- In-situ consolidation
- Modular production system



Large-scale Lightweight Production Systems at AZL Tech Center

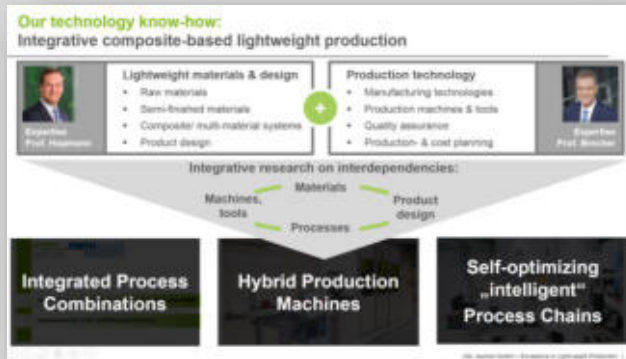
One of 9 Composite Tech Centers at RWTH Aachen Campus



AZL Innovation Strategy

We Bring Industry and Academia Together for Efficient Industry Solutions

Technology Push 9 RWTH institutes



AZL

Innovation strategy
of the AZL and its
industrial partners

Market Pull 80+ partner companies from 21 countries



Our 9 RWTH Partners

Research along the Entire Value Chain of Lightweight on 1000m



1987

today



“AZL’s way to work internationally and open minded, makes me feel welcome every time I come to Aachen. I do appreciate the broad background available in Aachen and the effective and pragmatic approach of the Joint Partner Projects.”

Thierry Renault, Composite Technologies – Manager of Partnerships at Faurecia Clean Mobility

Our International Cross-Industry Network

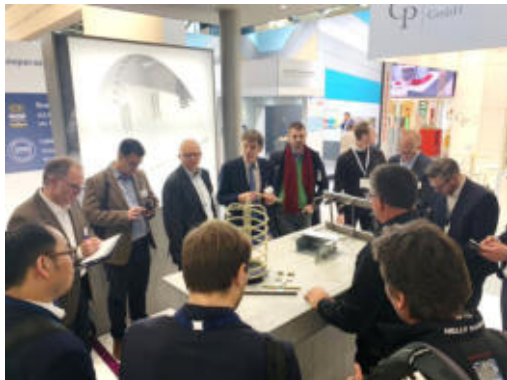
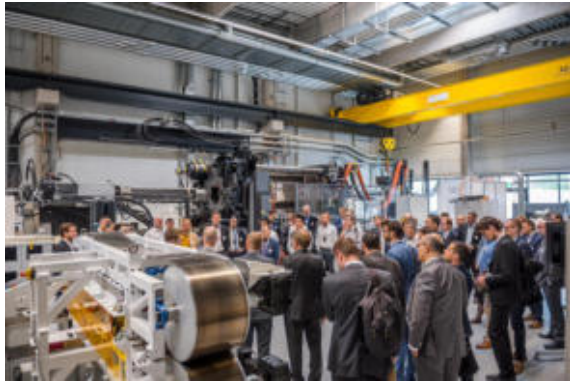
80+ AZL Partner Companies from 21 Countries



» The AZL offers an excellent platform for networking and information exchange as well as industrial relevant developments in the field of composite technologies.



**Dr.-Ing. Ahmad Al-Sheyyab,
Head of Technology Platform
Composites at REHAU AG + Co**





For me personally as a business developer, the AZL partnership offers valuable market insights and sustainable cooperation with the entire value chain.

**Arne Böttcher, Market Development Composites
at Covestro Deutschland AG**

AZL
AACHEN
EXCELLENCE IN
LIGHTWEIGHT
PRODUCTION
PARTNERSHIP

ENGINEERING AND SERVICES

- Market & business opportunity identification
- Component design and production concepts
- System and process development
- Support for industrial implementation

AZL PARTNERSHIP

- Pre-competitive, trusting collaboration along the entire value chain
- Regular meetings in workgroups
- Joint projects
- Cross-industry networking and matchmaking



Business+ Partnership

- Easily join and set up projects with the included project budget
- Without administrative effort
- Definable budget, min. 15,000 €

Many thanks!

We Are Looking Forward to Working with You



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In cooperation with: