AZL at your service:

- Development of smart production systems (CPPS)
- Process chain development
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- Production machine design
- Bilateral and joint partner projects

Project introduction iComposite 4.0

Project key figures

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Key figures:

Duration:

01.01.2016 – 31.12.2018

Project budget: 5,147,000 Euro

Sponsored by BMBF

Managed by PTKA

Project content:

"Development of an integrative and self-regulation production system for the large-scale production of multi-material FRP Parts"

Project partners:

SCHULER Member of the ANDRITZ GROUP

FRIMO

INSTITUT FÜR KUNSTSTOFFVERARBEITUNG IN INDUSTRIE UND HANDWERK AN DER RWTH AACHEN

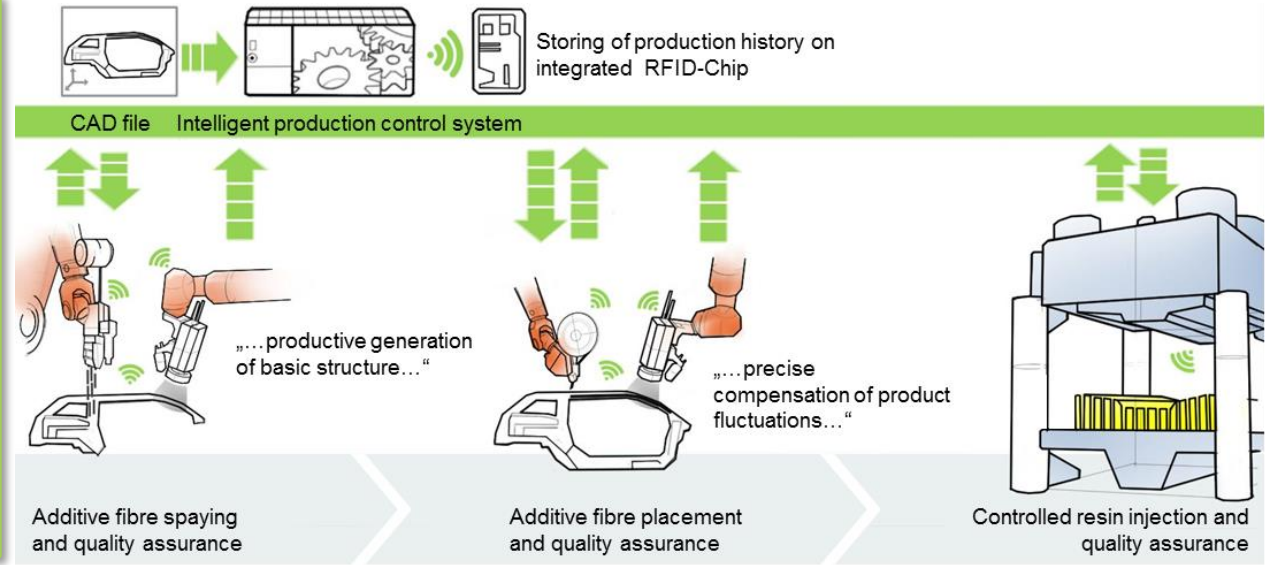
SIEMENS

apodius

BACOMPOSITES

TohoTenax

ID Systec® Vertrieb Deutschland GmbH



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Raising productivity for large-scale production

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- Increasing need for lightweight design for various markets
  - ➢ Composites are one key enabling technology

BUT:

- Inefficient material usage (scrap up to 50%)
- High reject rates (up to 20%)
- Limited automation
- No consecutive quality assurance
  - ➢ Small and medium production volumes
  - ➢ Increased productivity is required

Aim of iComposite 4.0: **50 % part cost reduction** by automated preforming and product function oriented production

[Lamborghini, BMW]

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Setup of a self-regulating production system

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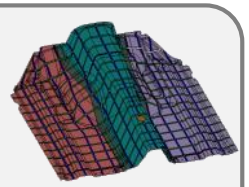
9. Process & machinery integration

1. Multi-material design



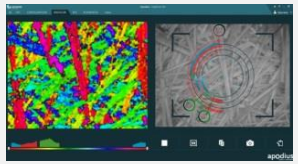
[Toho Tenax]

2. 3d fibre spraying

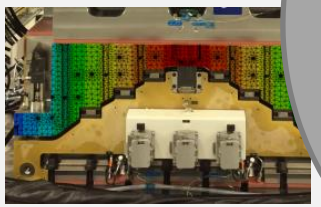
8. Data tracking

3. Comparison of mechanical properties

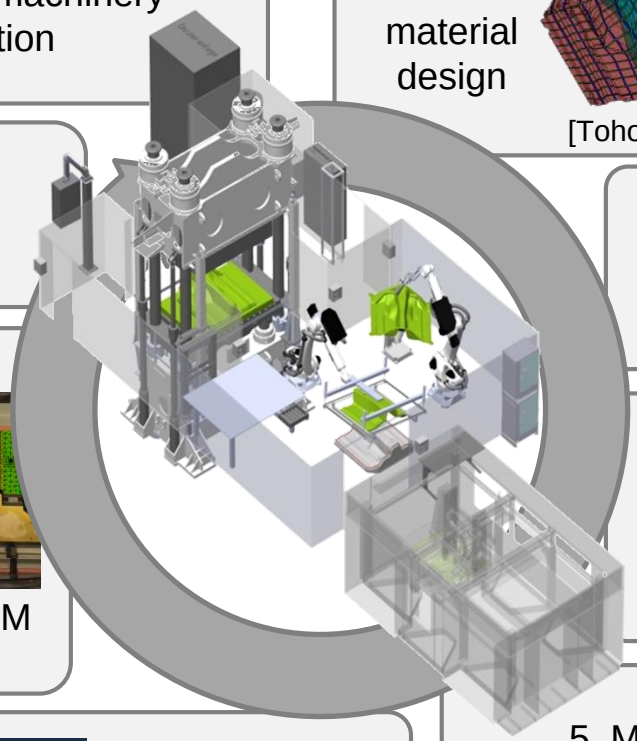
[Apodius]



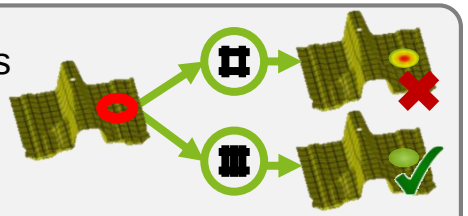
[AZL]



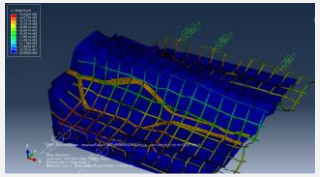
7. Adaptive RTM process



4. Autonomous adaption of continuous fibre design



[Toho Tenax]



6. Automated draping

[AZL]

5. Manufacturing of individual continuous fibre patches

[BA Composites]

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Cost reduction by automated preforming

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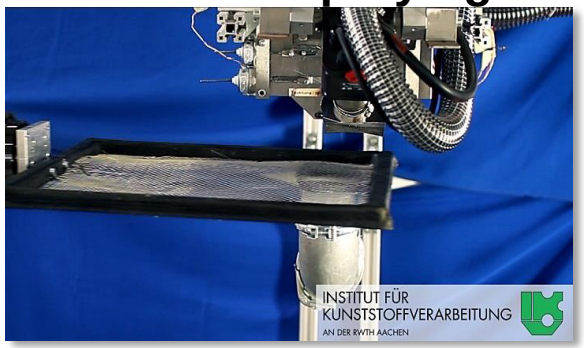
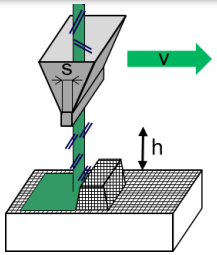
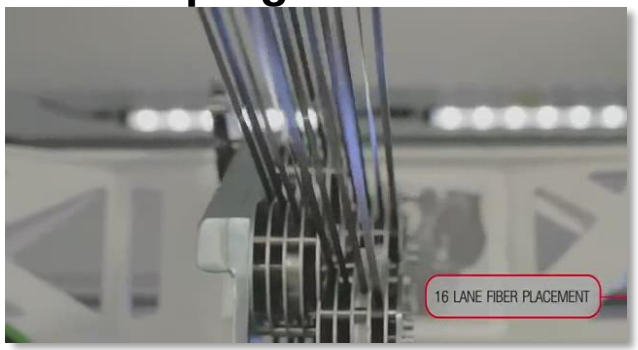
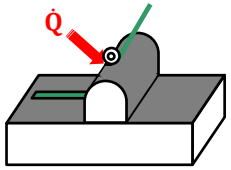
3d-Fibre Spraying



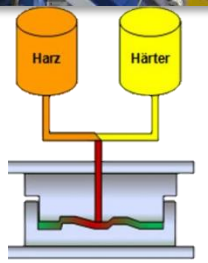


Towpreg Placement





Resin Transfer Moulding

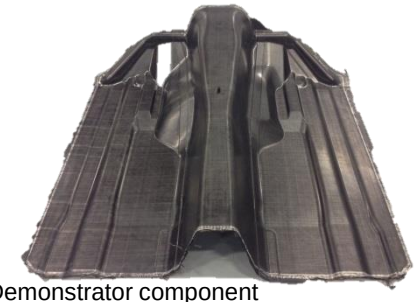


Cost reduction by:

+ Load optimized multi material design and cost efficient base materials
+ Automated preforming and no scrap production

However:

– Product fluctuations possible
– Production solely oriented on geometrical tolerances



Demonstrator component

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Cost reduction by product function oriented production

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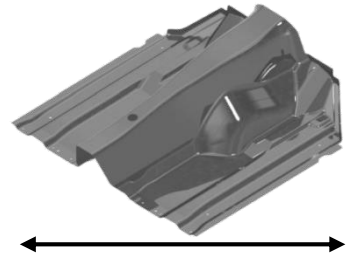
Material- and cost efficient part production



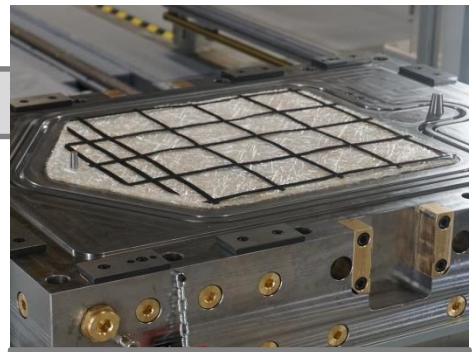
≈ 2,000 mm

3d fibre spraying: Process fluctuations can result in scrap

Adaption of reinforcement to simulation

Prediction of mechanical properties by structure simulation

Inline quality control



Reinforcement with individualised pattern for compensation of fluctuations

Modell based process control

Adaptive RTM: “zero scrap” due to adaption of process to individual preform

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The future of composite manufacturing at AZL

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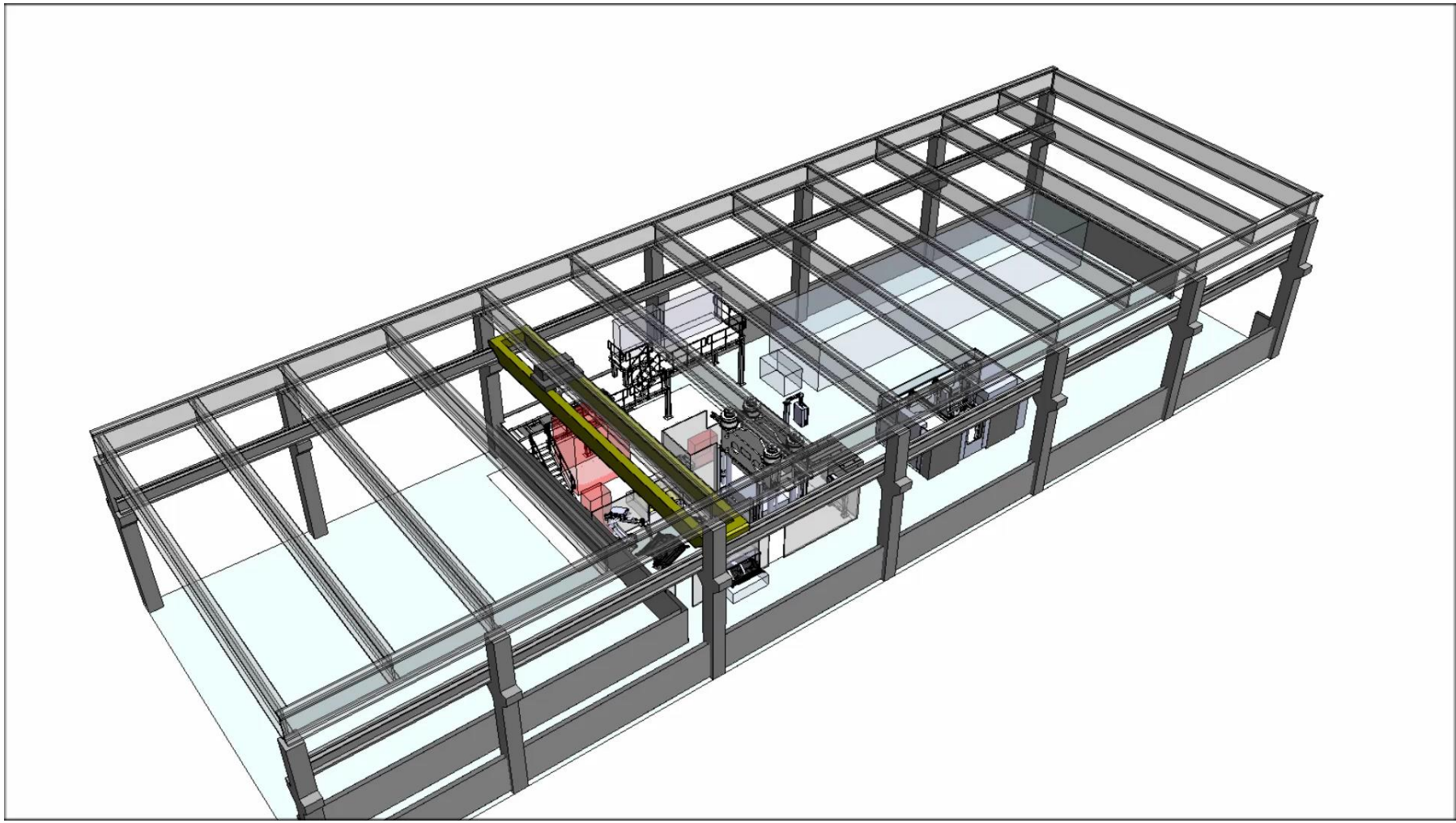

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Setup of production system at AZL started

RTM press and tooling

textile demonstrator preform

3d fibre spraying and optical measurement system

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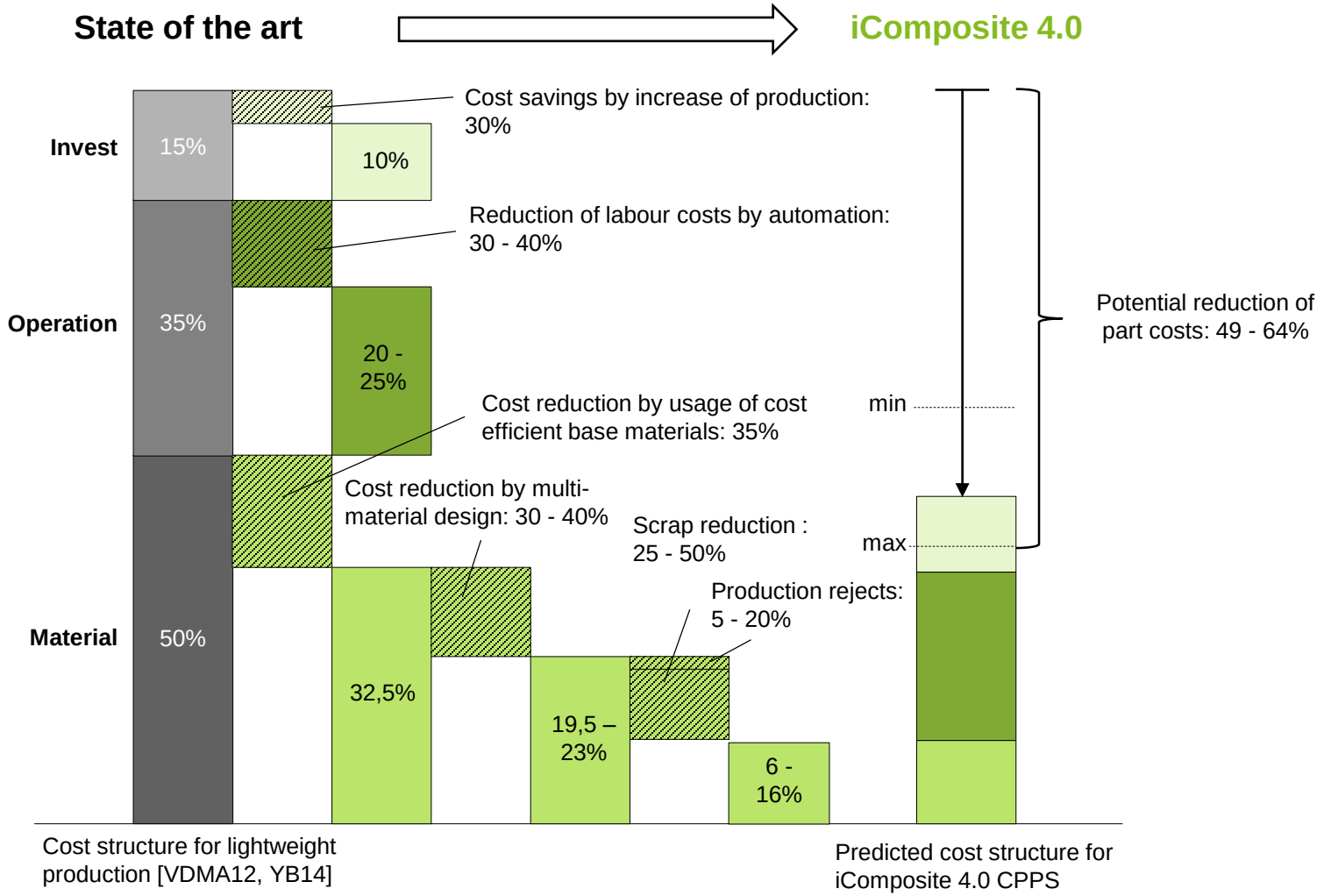
Predicted cost savings by iComposite 4.0



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Project partners and funding

Project partners:

Sponsored/ managed by:

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