

Development of a Sorption Assisted Air Conditioning System Driven by an Evacuated Tube Solar Air Collector

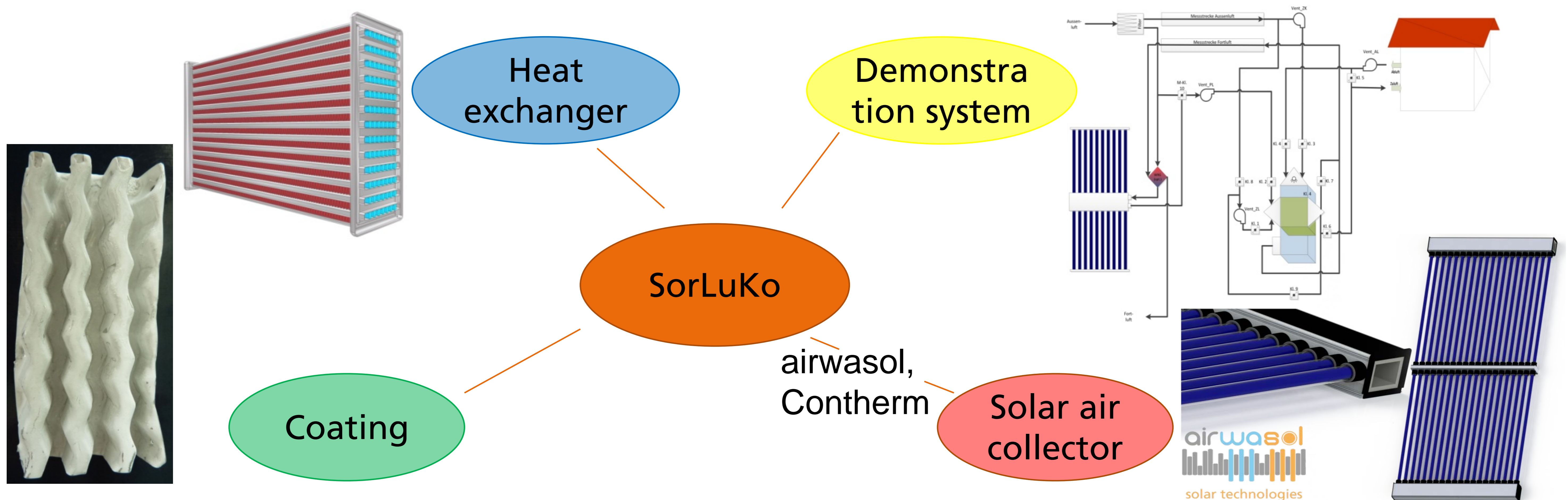
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c) Contherm Wärmedämmsysteme GmbH, Max-Eyth-Straße 31, 74632 Neuenstein, www.contherm.de

PROJECT CONSTRUCTION / DEVELOPMENT PATHS



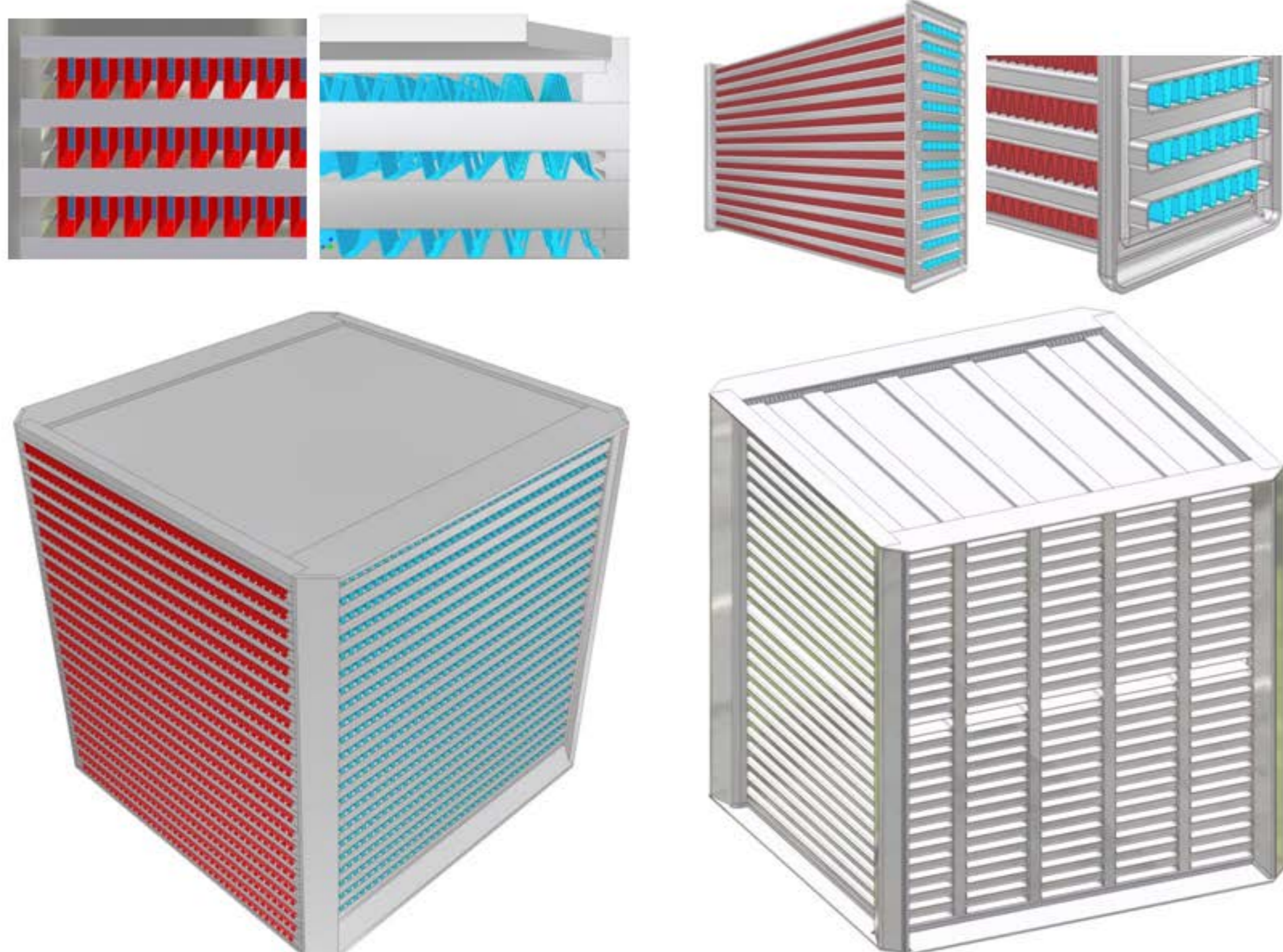
HEAT EXCHANGER DEVELOPMENT

Technical requirements:

- Leakage tightness air/humidity
- High surface area
- Good heat transfer efficiency
- Coat-ability
- Low (thermal) mass

2 Layouts manufactured:

Bar/plate setup „Hugg“ ↔ Automotive, assembled charge air coolers



Bar/plate:

- + Tightness (brazed)
- + Good efficiency
- Too massive (28kg)
- Expensive

Automotive:

- + Low mass (16kg)
- + Inexpensive
- Assembly (to be proofed)
- Coatability (to be proofed)

Heat transfer measurements and calculation showed good heat transfer performance for both layouts.

→ Final rating follows after coating and characterization / monitoring in demonstration system

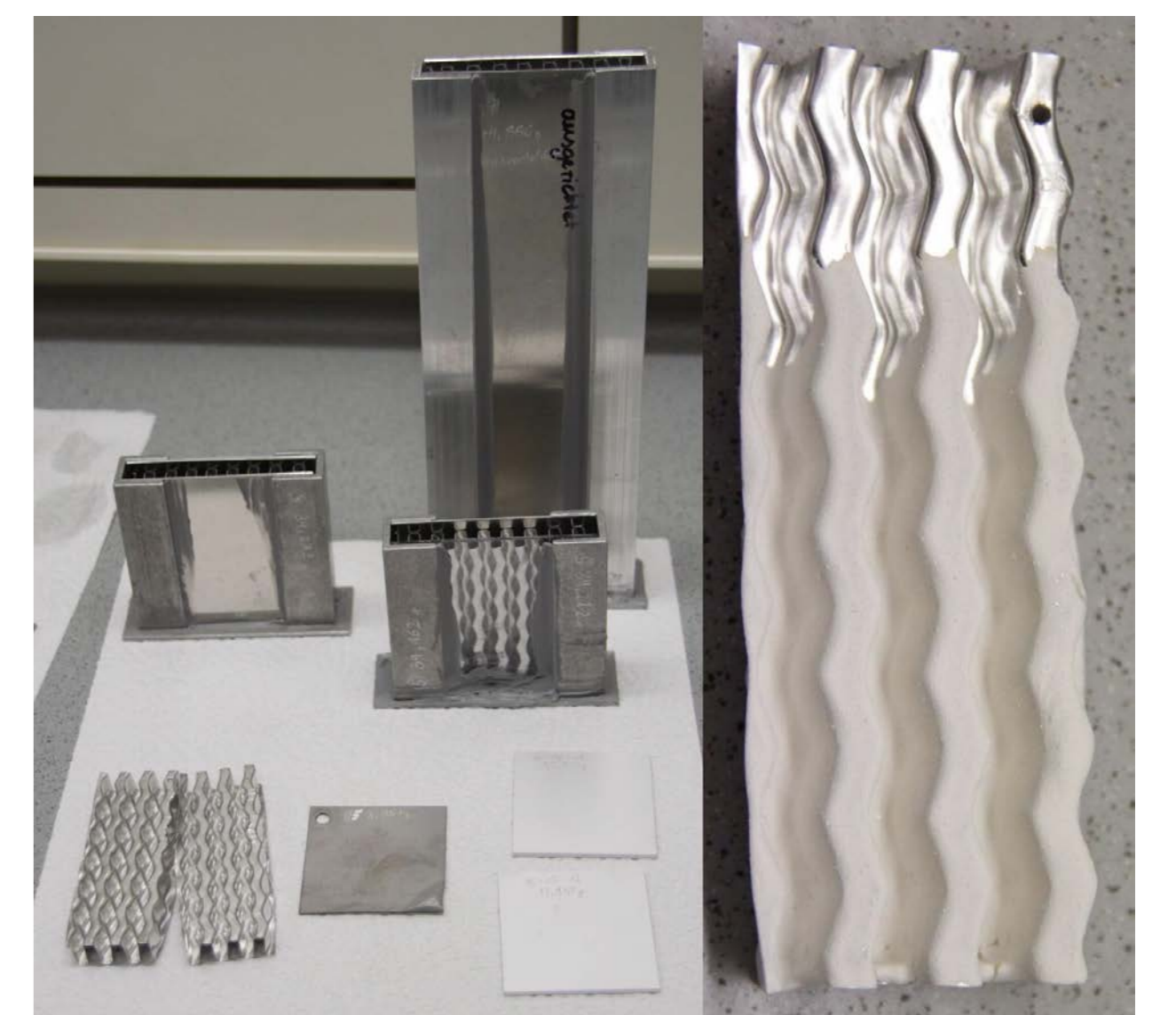
COATING TECHNIQUE

The Fraunhofer ISE patented coating:

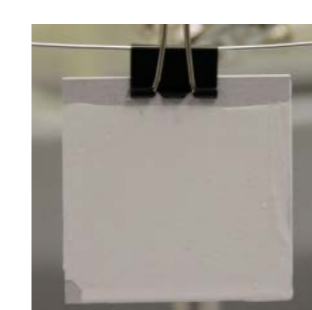
- Fast adsorption kinetics
- Good heat rejection
- Protection against condensation (hydrophobic surface)
- Long-time stability against cycling 30-120 C over more than 5.000 cycles
- Short-time stability up to 200 C

Tested in Laboratory Scale

→ Up-scaling is still a Challenging Task!



Laboratory Scale



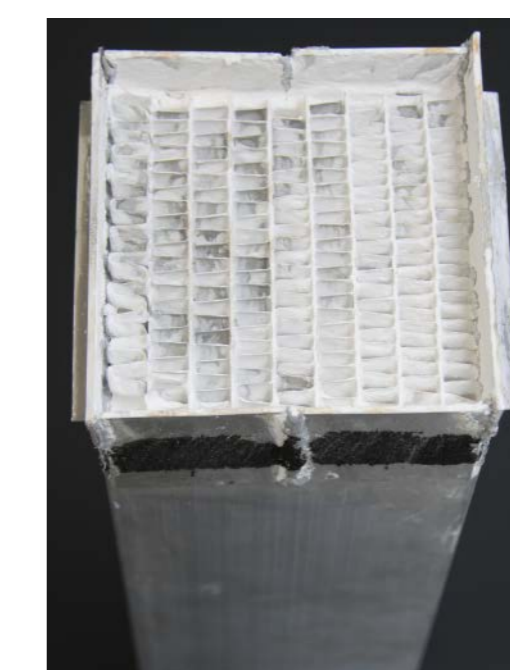
Batch: 3 g

Medium Scale



Batch: 330 g

Large Scale



Batch: 5.400 g



Heat Exchanger
Batch: 35.000 g

Research Topics for Up-scaling:

- Only small contents of solvents
- Homogenizing large batches
 - Stirring and Ultrasonic-Treatment
- General handling of large amounts
- Homogenous application on the fins
- Viscosity handling of the Dispersion

→ Medium scale is figured out!

→ Ready for large Scale

