



POLYSCOPE

fresh thinking, great products

LIGHTWEIGHT HYBRID DEVELOPMENTS

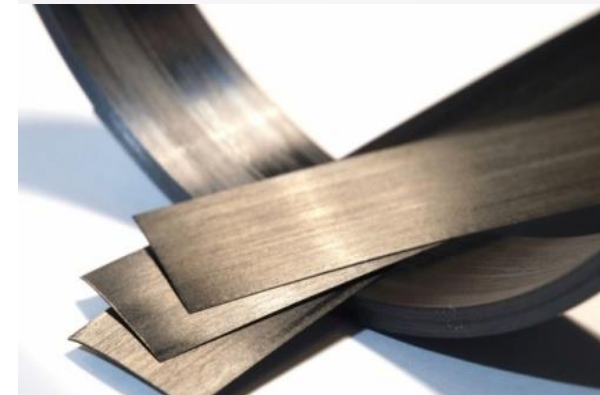
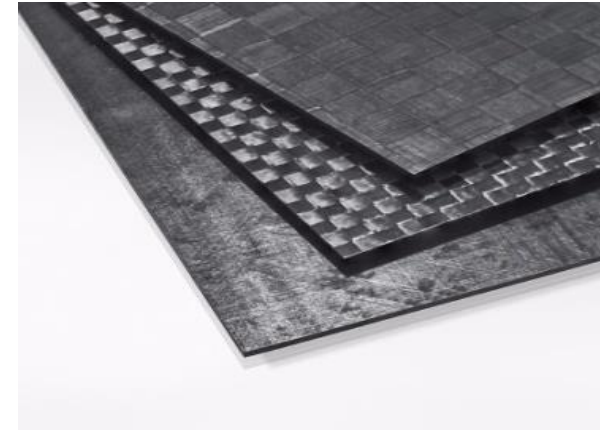
Dr.ir. Paul van den Heuvel | Innovation Program Manager

pvandenheuvel@polyscope.eu | October 19, 2019

Hybrid lightweight developments

Automotive | Transportation

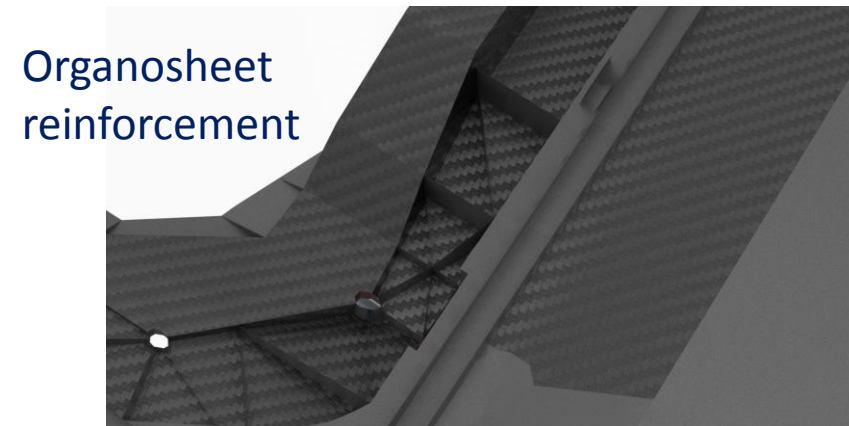
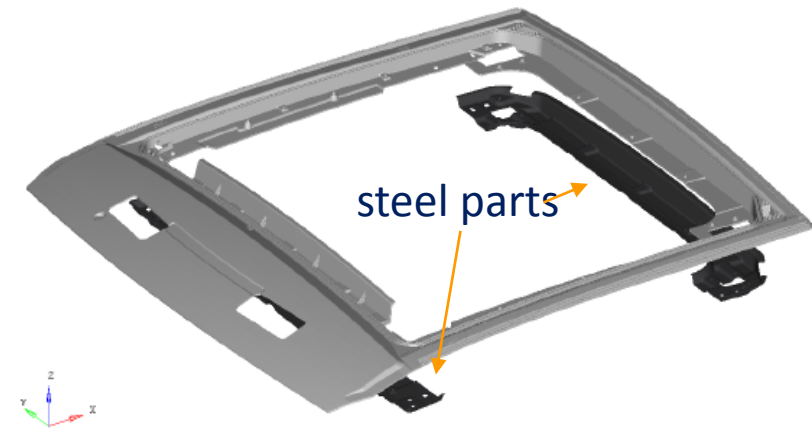
- Using SMA's
 - Dimensional stability
 - Surface functionality
 - High stiffness
- Excellent compatibility with all types of reinforcements
 - PA organosheets, tapes & rods
 - PP organosheets
 - SAN organosheets
 - metal



Our challenge: the next generation sunroof frame

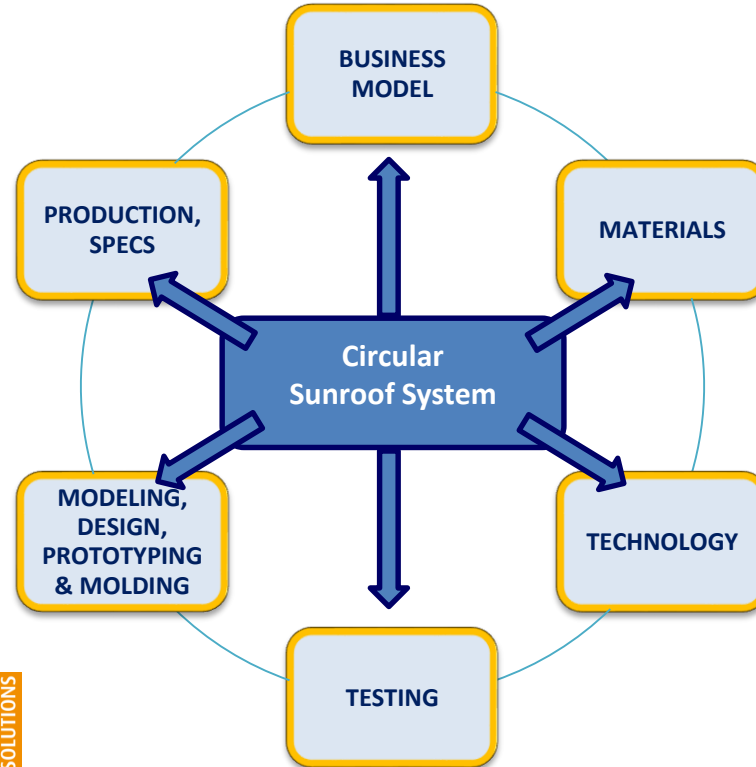
- Weight reduction
- More headspace
- Design freedom
- Cost reduction

- Remove large steel parts by using hybrid systems
 - Tapes
 - Organosheets
 - Metal inserts
 - ...



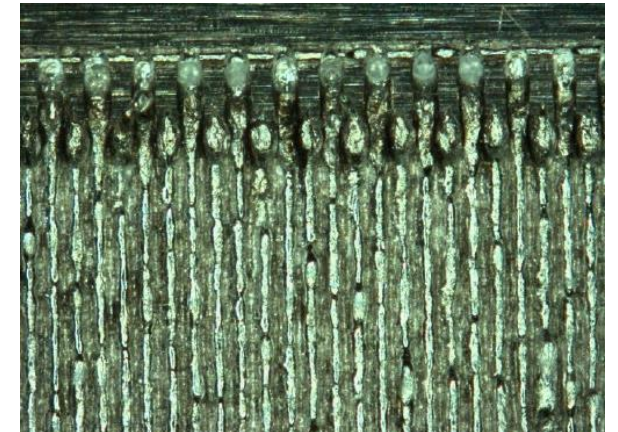
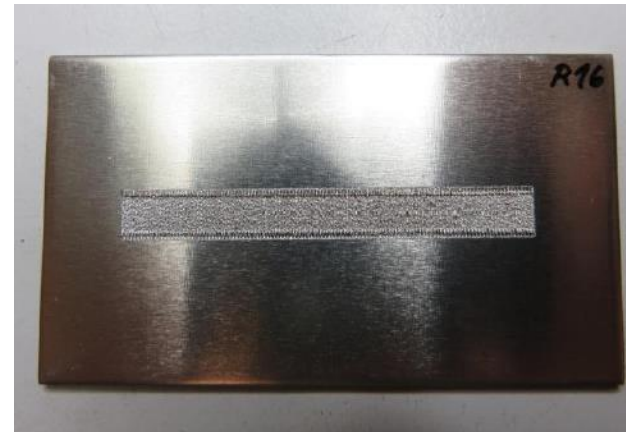
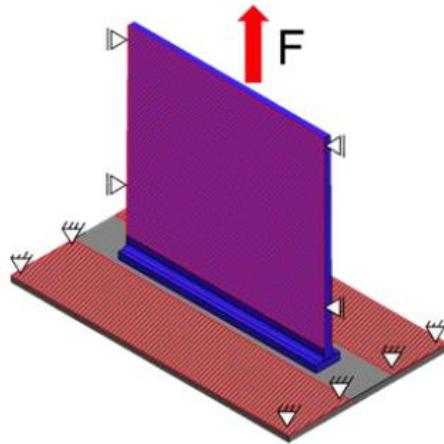
The next generation sunroof frame

Our lightweight challenge



Overmolding of metal with SMA-compounds

Rib-test (Rippenprüfkörper)



- Laser-structured Alu and KTL steel
- XIRAN® SG260 and XILOY SMI/PA-GF30
- Mold temperature 80°C
- Metal insert temperature 260°C
- Thermal cycle (PV1200) & salt exposure (DIN50021)

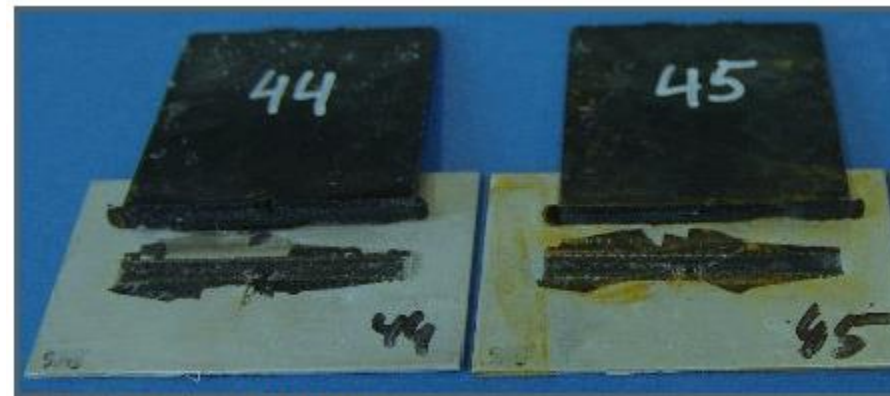
Aluminium performs better than KTL steel after environmental exposure



The laser structuring destroys the KTL coating, leading to corrosion and loss of adhesion



Before exposure



After exposure

Alu V2 + SG260 shows **improved** adhesion after environmental exposure

Outlook

- Increase our understanding of the benefits of SMA in hybrid structures
 - Dimensional stability
 - Functionality
- Short- & long-term
- Metal, tapes, organosheets





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