Enabling Performance through Engineered Material Science

Chuck Evans

October 24, 2018
SAA Lightweight Summit, Detroit
## About Henkel

A global leader in Adhesives, Sealants, and Functional Coating solutions

| World's largest adhesive company | Based in Germany | €20B Sales: €20 Billion | 3 Business Segments: Adhesive Technologies, Beauty Care, Laundry & Home Care | 188 Production Sites / 50K employees | 130K industrial customers | 40% of sales to emerging markets |
Industry Mega Trends

- Rapid Urban Growth
- Revolutionary Mobility Models
- Persistent Shift to Electrification
- Demand Plateau Imminent

Solutions are needed that outpace the rate of change
Industry Response

1. **Lightweight Design**
   Emissions and safety regulations require weight reduction with improved passenger safety

2. **E-Mobility**
   Integration & protection of electric powertrains enable changing transportation business models

3. **MaaS***
   Vehicle architecture is changing as consumers continue to shift away from vehicle ownership

*Maas = Mobility as a Service
Lightweight Design Requires Multi-material Solutions

Source: CAR Research
Enabling Lightweight Design through Material Science
Henkel Material Science

Unbound by Chemistry & Application

Leveraging knowledge and best practices across all industries for impactful solutions
Enabling Lightweight Design through Engineering
IIHS Roof Crush Simulation

Engineered Materials Model

• Achieving the targeted crush performance
  SWR > 4 ; 5.1 Achieved

• - 5.4kg weight savings through downgauging of the A-/B-pillar reinforcements 1.0/0.7mm
Enabling Lightweight Design through Agility
## Pilot Engineering Concept

### AMBITION

- Evaluate the potential of new **lightweight** concepts
- Using an E-SUV, integrate new concepts into the structural design of the vehicle
- Solution must be cost neutral and perform equal to or better than safety requirements

### LIGHTWEIGHT BODY CONCEPT:

- E-SUV with 80kWh battery
- 75% Aluminum / 25% Steel
- Weight: 2500kg / BIW Weight: 431kg (including closures and hang-on parts)
Pilot Engineering Results

RESULTS

• Reduced BIW and Closure weight by 42 Kg (from 431kg to 389 kg)
• Achieved crash performance targets
• Reduced joining elements by 6%
• Use of structural hybrid solutions, structural adhesives and panel reinforcements
• Additional NVH benefits

Solutions are available now. OEMs that leverage supplier expertise & knowledge earlier in the design phase will win in the future!
Thank You