

AN OVERVIEW ON COMPOSITES IN THE AUTOMOTIVE SECTOR

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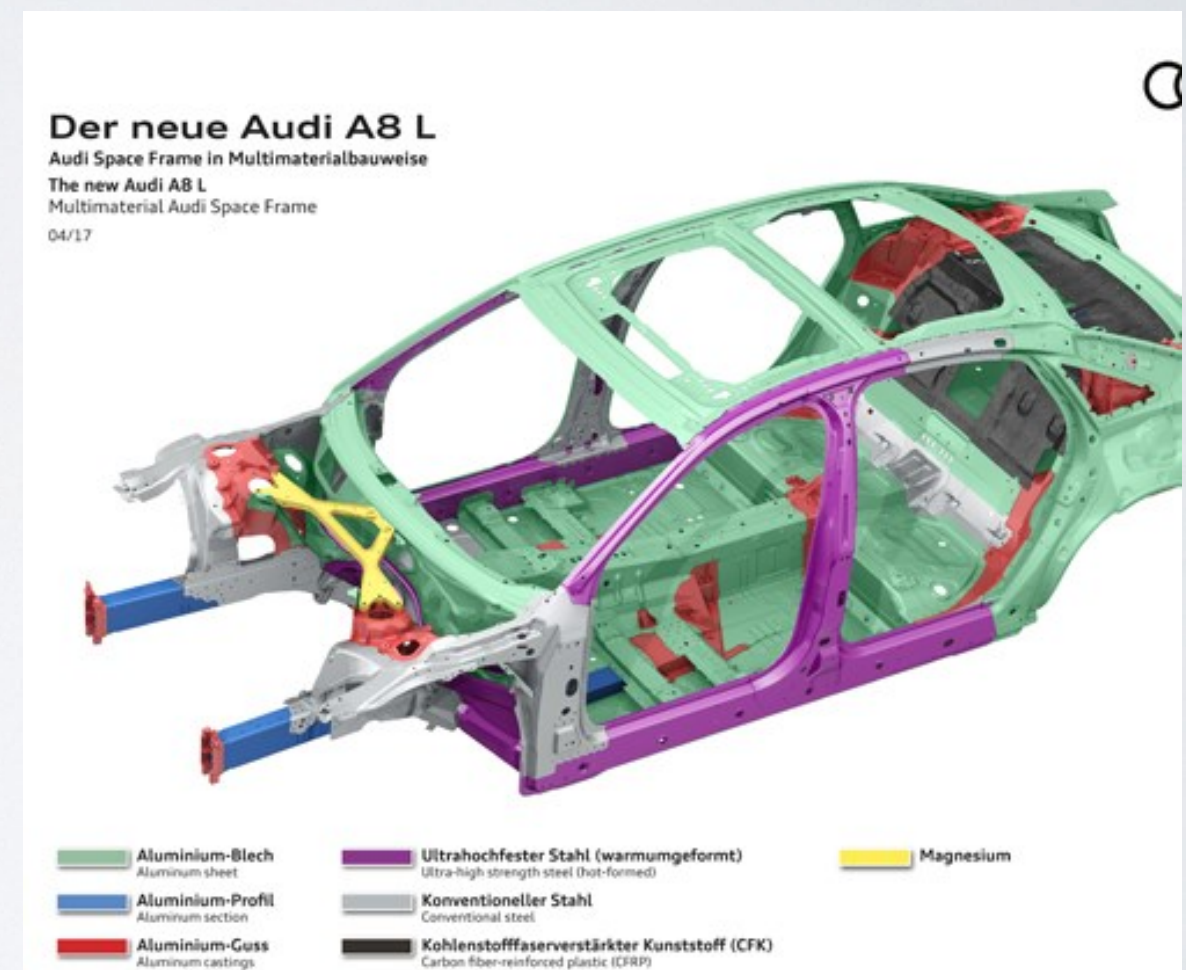
JEC ASIA, Korea

A CASE OF COMPETING MATERIALS

- Steel, Aluminum and Plastics
- These established industries are continuously moving forward at a great speed
- Different developments are addressing the same “basic” benefits that composites can bring, e.g.
 - Weight reduction —> Better Steel, Aluminum; use magnesium
 - Part Integration —> Casting

A CASE OF CO-OPETITION

- A car in itself is already a “Composite” product
- Multiple material strategy adoption
- At a part level, multiple material is already used



CURRENT APPLICATIONS AND PROCESSES

- Thermoplastics VS Thermoset
- Compression molding, Injection Molding and Overmolding
- Short fiber, Long fiber and Continuous fiber

PICK-UP BOXES

- Pick up boxes
- SMC: Toyota Tacoma, Honda



LEAF SPRINGS

- 500,000 LEAF SPRINGS P.A. FROM 2020 ONWARDS FOR S60, S90, V60, V90 AND XC60
- RTM or Compression molding
- 18kg \rightarrow 8kg



SOURCE:

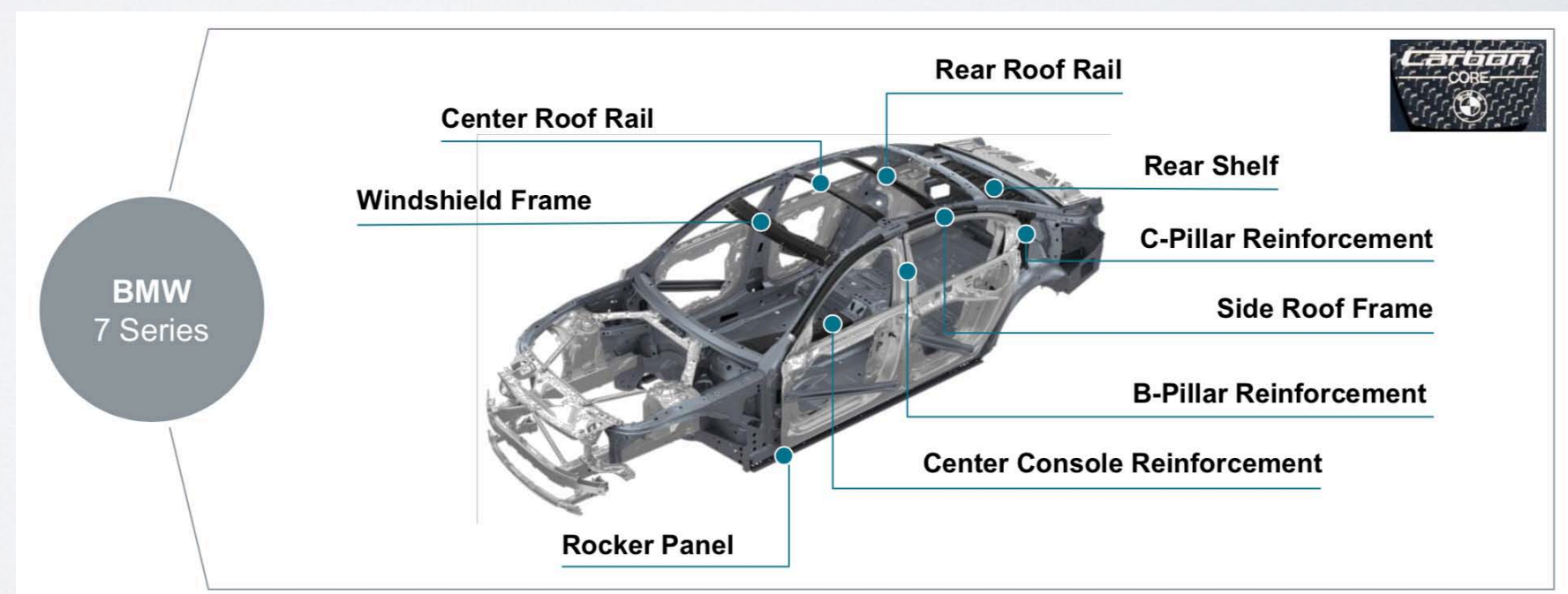
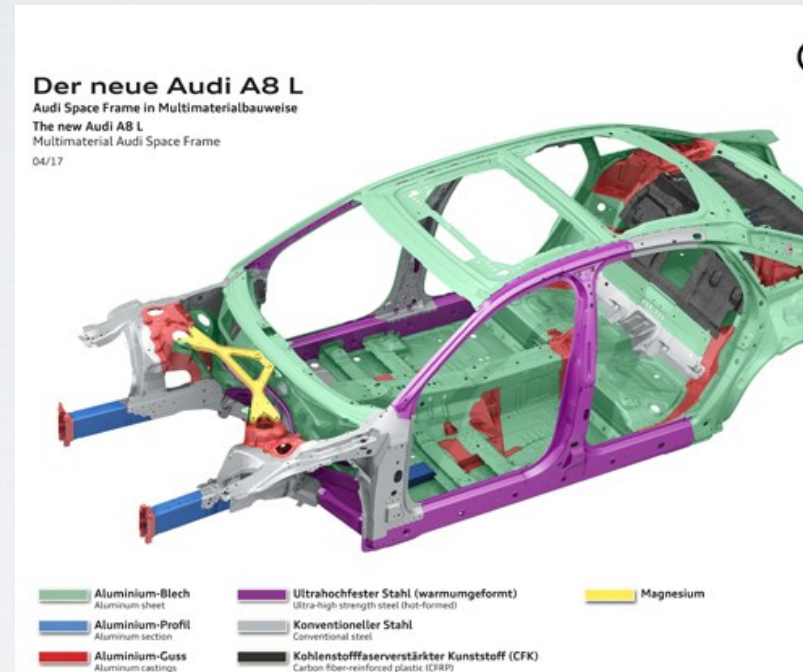
NATURAL FIBERS

- First roof frame made entirely of natural fibers that BASF developed in partnership with IAC for the Mercedes-Benz E-class. BASF's Acrodur® – a water-based, low-emission binder – strengthens the natural fibers creating a sustainable, stable and lightweight solution for car roof frames.
- Inner door panel - compression molding



B-PILLAR AND REAR WALL

- Multi-material BIW
- RTM, FTP
- Many other parts in this category



ROOF MODULE

- Compression molded
- Crushed sandwich core
- Thermoformed skin that can be the finish skin or a class A surface for painting



TAIL GATES

- Combinations of Thermoplastic - LFT and Thermoset - SMC
- up to 25 percent mass savings, greater design flexibility with deeper draws and tighter radii, reduced complexity of the total liftgate module, delivered as complete assemblies, lower tooling investment and increased throughput at the assembly plant.



SOURCE: 2019 JEEP Cherokee and Acura RDX - MAGNA

BATTERY BOX

- Battery box covers
- Different processes, not settled yet.
- Fire retardant, EMI shielding



Hollow CFRP side sills contain aluminum fins (left) that channel cooling air from the front crush-can structures (twin projections at far right) to cool the batteries. SOURCE: WEA and TheEngineer.co.uk

HOW THE AUTOMOTIVE SECTOR WILL APPLY COMPOSITES IN THE FUTURE

- Cost
 - Material cost
 - Reduce scrap - UD, Fiber patch, Embroidery/Braiding
 - Automation
- Takt time

HOW THE AUTOMOTIVE SECTOR WILL APPLY COMPOSITES IN THE FUTURE

- Product integration
 - Other materials
- Finishing
- Sensor
- Product specialization



HOW THE AUTOMOTIVE SECTOR WILL APPLY COMPOSITES IN THE FUTURE

Companies in the composites industry need to
have clear strategies and objectives for how
they want to compete

(what materials, applications, segments,
technology, etc.)

SOURCE: LUCINTEL