

Evonik innovative solutions in automotive light weight design

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Vice President of Evonik for Automotive

Three segments with differentiated management

Group financials 2017

Sales

€14,419 m

Adj. EBITDA

€2,360 m

Margin

16.4%

ROCE

11.2%



Growth

**Nutrition
& Care**



**Resource
Efficiency**



Efficiency

**Performance
Materials**



Sales
€4,511 m



Adj. EBITDA / Margin
€749 m / 16.6%



Sales
€5,395 m



Adj. EBITDA / Margin
€1,174 m / 21.8%



Sales
€3,781 m



Adj. EBITDA / Margin
€660 m / 17.5%

Evonik in APN

Established global player with strong local footprint

APN at a glance

- Sales 2017: €2,158 m
- ~10% growth
- ~3,800 employees
- 18 production sites
- 1 innovation hub



Multi-User-Site-China (MUSC)

Total investment ~ € 700m Employees ~700



Evonik APN HQ in Shanghai

Total investment ~ € 45m Employees ~800



1. Sales include operative segments and others (i.e. TI, non-core)

Overview of Evonik's Key Innovations for Automotive



Fuel Saving & Emission Reduction

- Oil Additives
- Silica-Silane Technology for Green Tires
- Low Friction Part
- SCR Systems
- Green Polymers
- PU Additives
- PA12
- Electric Vehicle



Lightweight Design

- Pillar Covers
- Polymeric Glazing
- Metal Replacement
- Tubing Systems
- Sandwich Composites
- Crosslinkers
- Thermoplastic Composites
- Adhesive Hybrid Parts
- Rapid Technologies
- Adhesives



Surface Technologies

- Coating Additives
- Heat Reflective Surfaces
- Films for Interiors
- Antiscratch Performance
- Light Stable PUR Spray Skins

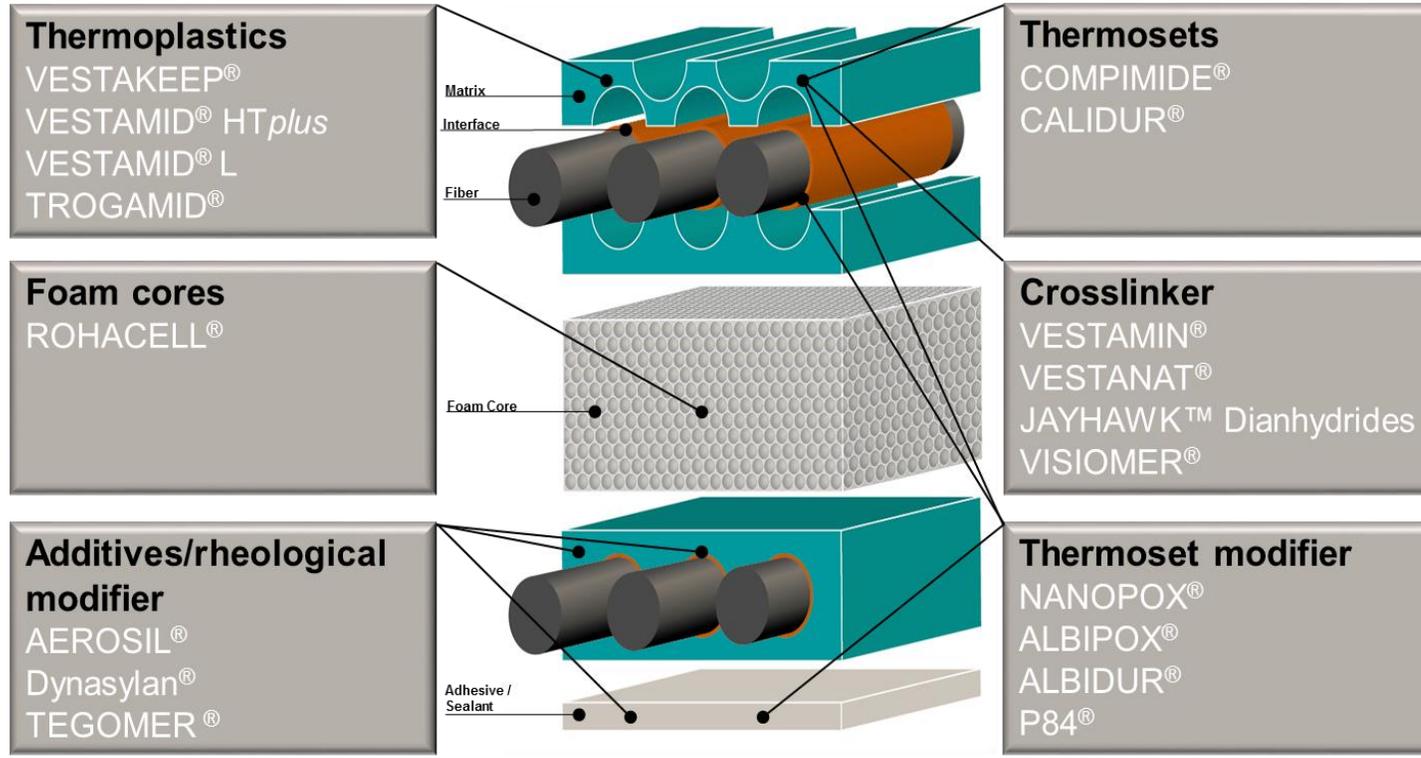


Lighting Technologies

- Rear Lights
- Headlamp Lenses
- Light Pipe Elements
- Interior Ambient Lighting

Evonik offers a broad variety of products and expertise in almost all composite sub-components

Composite sandwich system – schematic view



Understanding all aspects of a complex system is the key

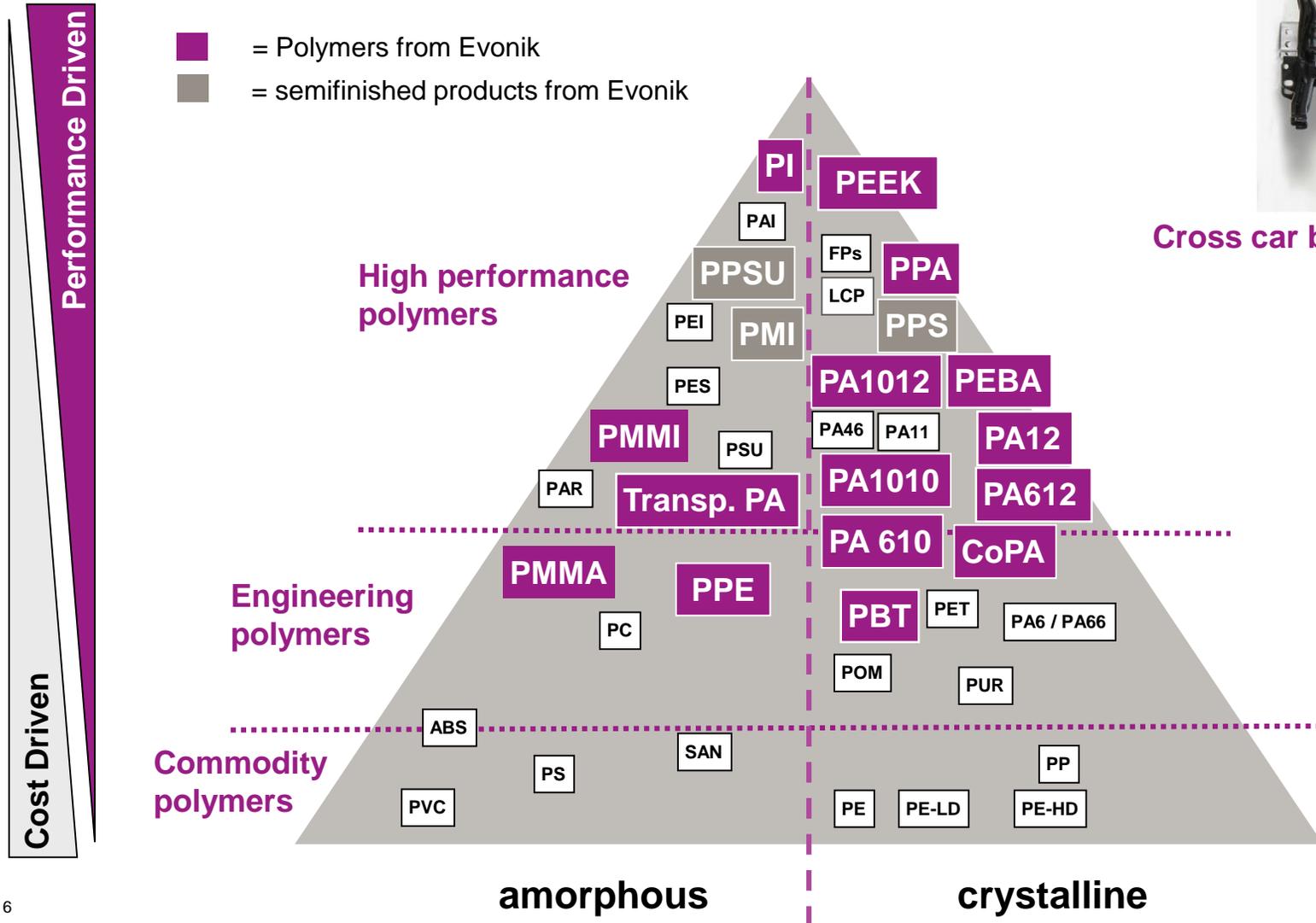
Sandwich composite, foam core from in mold foaming (Rohacell® Triple F)



Sandwich composite based on PulPress



Evonik's high performance polymers for light weight design



Cross car beam based on VESTAMELT® structure adhesive



PPA: Curve Light Adjustment, Charge Air Duct



PEEK: Transmission Sealings, Wormgear for seat adjustment

DRIVON™ technology to reduce friction of engine and transmission

Fuel economy & CO2 emission reduction



Combs VIIIs in **Engine Oils application** help reduce fuel consumption

by up to **2%**



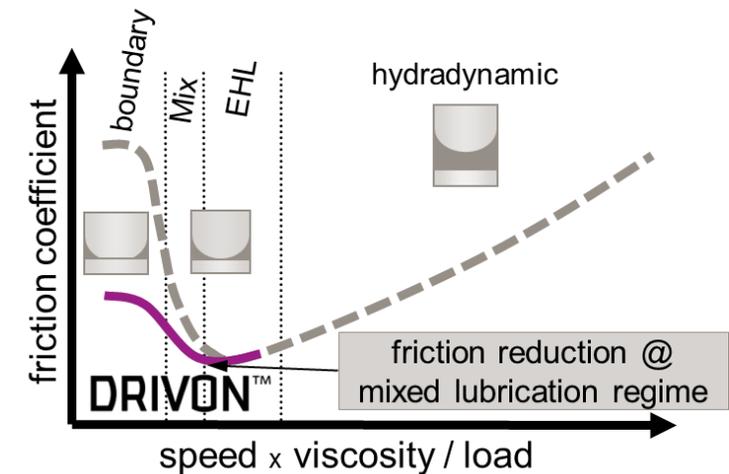
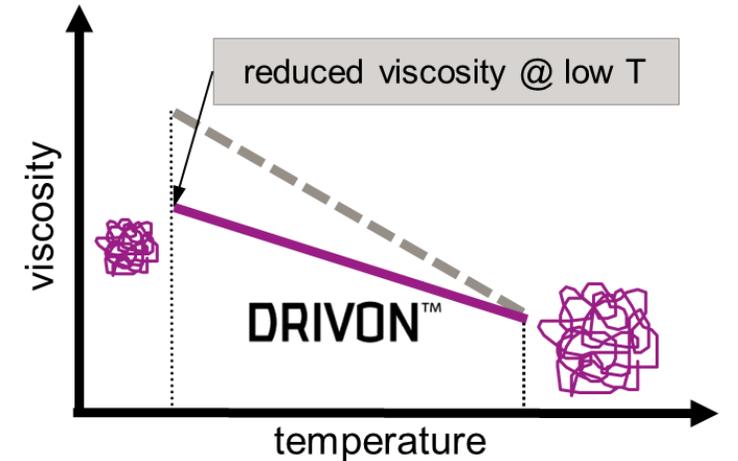
PAMA and Combs VIIIs in **Automatic Transmission Fluids application** enable fuel consumption reduction

by up to **2%**

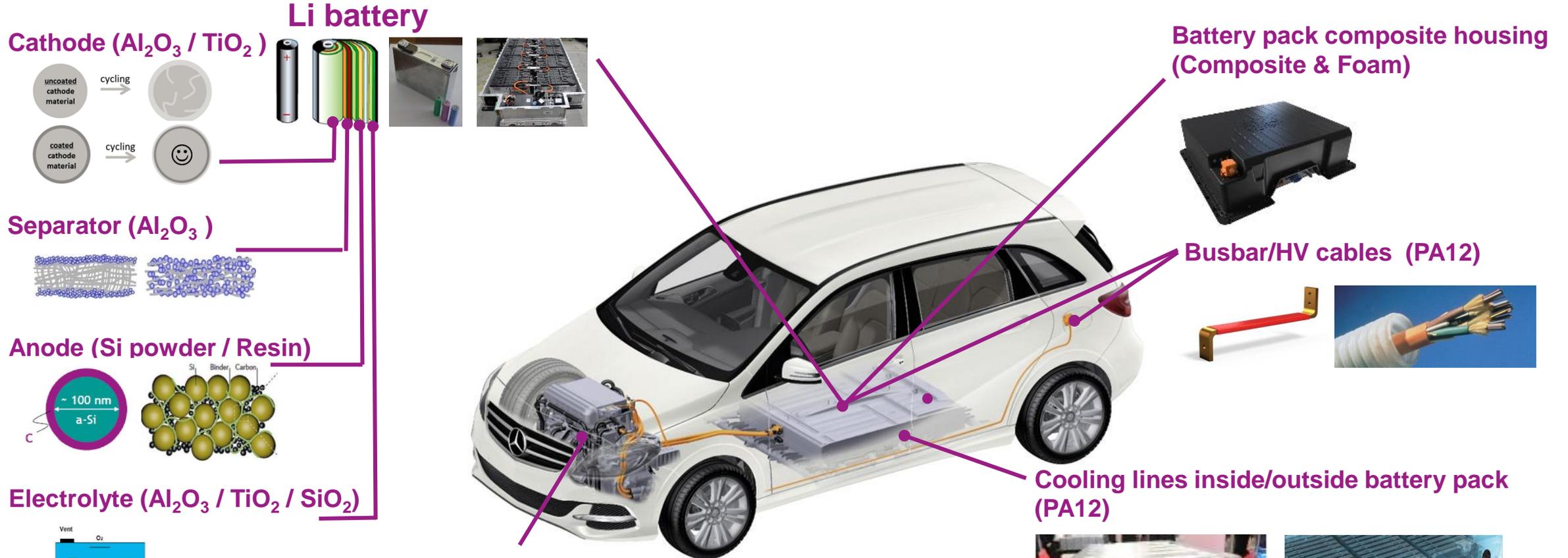


Axle Oil application enable Fuel consumption reduction about

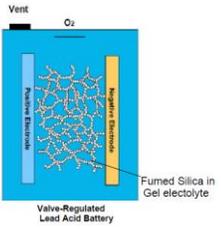
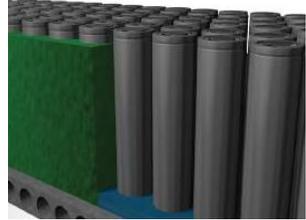
0.5%



Evonik's new development for electric vehicles



Thermal management for battery/motor/converter/inverter (Thermal conductive gap filler)



We're developing material solutions for future mobility & transportation

Concept cars



Evonik Lotus Elise 2012

Lilon battery/HV bordnet, lightweight, tires, friction



2014 Xchange EV concept car

autonomous driving, new interior , ...

base vehicle for
concept car:
TESLA S



2013 Micromax EV minibus concept car

EV, functions, urban transportation



2015 Evonik Roding roadster GT3 racecar

super lightweight, friction



NEW: 2016 Evonik virtual concept car

Material Innovations Demonstrator

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