

# DRIVING FUTURE MOBILITY: MATERIAL SOLUTIONS FOR ELECTRIC VEHICLES

Market analysts expect the share of pure electric and hybrid electric vehicles to reach over 1/3 of total car production by 2025\*. This development is triggered by two trends: tightening regulations and rising customer demand.

Celanese supports solutions to enhance safety, reduce costs, extend range and lifetime by offering the broadest portfolio to address these challenges.



## HIGH VOLTAGE BATTERY

HV-Traction Batteries are the current key power supply for electric propulsion in the automotive industry. They have to fulfill various requirements to provide reliable lifetime operation:

- Crash Resistance
- Electrical Insulation
- Flame Retardancy
- Light weight



## HV CONNECTORS

Connectors, used in the high voltage electrical circuits have to reliably insulate to avoid short circuits followed by potential fire.

Frianyl® PA, Fortron® PPS and Celanex® PBT offer excellent insulating properties to meet the requirements for HV-Connectors:

- High CTI
- High dielectric strength
- Flame retardancy
- High stiffness & strength
- Color stability



## THERMAL MANAGEMENT

The Thermal Management system of EVs is very critical for the performance and the life time of major components like battery cells, power electronics or traction motors.

Resistance against cooling agents, long life time requirements and highest precision requirements in coolant pumps, impellers, thermostat housing drive the need for high performance engineered material solutions like Fortron® PPS, Flex PPS in pipes and tubes as well as for Celanyl® PA for connectors.



## POWER ELECTRONICS

Plastic insulating parts in the power electronics need to withstand these higher temperatures and still have to keep their insulation properties over the whole temperature range. Fortron® PPS and Celanex® PBT offer excellent electric insulating performance combined with a good temperature resistance and flame retardancy.



## TRACTION E-MOTORS

Materials used in under-the-hood applications need to withstand challenging conditions – no compromises allowed in terms of safety, quality and service life. Celanese provides high performance polymers to provide higher efficiency even in smaller motors that allow manufacturers to reduce cost and weight.

Fortron® PPS and Vectra® and Zenite® LCP grades are part of a broad portfolio of polymers for use under very high temperature and chemical conditions.



## FUEL CELL

Fuel cells provide an interesting option as energy source in an electric vehicle to reach emission requirements. Fuel cells are already used for commercial vehicles. Fuel cell technology is gaining momentum rapidly in the automotive sector.

Fortron® PPS and Vectra® LCP provide highest material requirements for end plates and bi-polar plates.



## RECYCLED MATERIAL SOLUTIONS

In addition to the ongoing trend for light-weighting solutions with the shift from metal to durable plastic there is the need to meet recyclability goals with the demand for solutions to replace prime material with eco-friendly recycled grades.

Celanese grades such as ECOMID® PA, Celanex® PBT R or POM ECO-B offer alternatives to standard grades to help reduce the carbon footprints of our customers.

