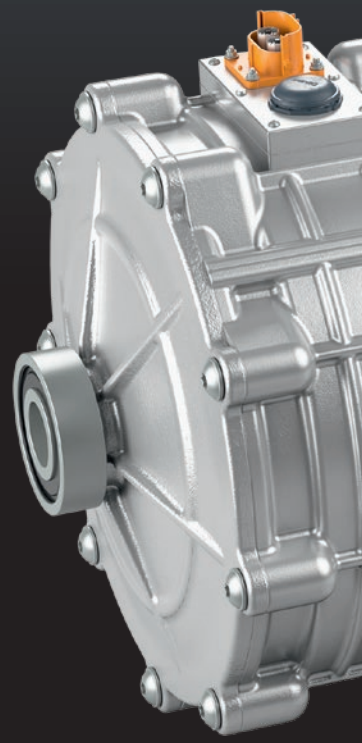

MAXIMIZE
E-FFICIENCY
Ultrason® for e-mobility –
boosting power, reliability and
lightweight of e-motors
BASF
We create chemistry

E-FFECTI

Ultrason® for e-motor applications

What do you think of when you hear the word “e-mobility”? You probably think of battery and charging. Now think again – and think of the electric engine! This drives all electric vehicles, be it hybrid, plug-in, battery or fuel cell cars. And when you think of the e-motor, then Ultrason® is not far off! BASF’s polyarylethersulfone (PAES) is the perfect material for all high-performance, challenging parts in the electric engine – and BASF also offers excellent application know-how, supply reliability and global presence!



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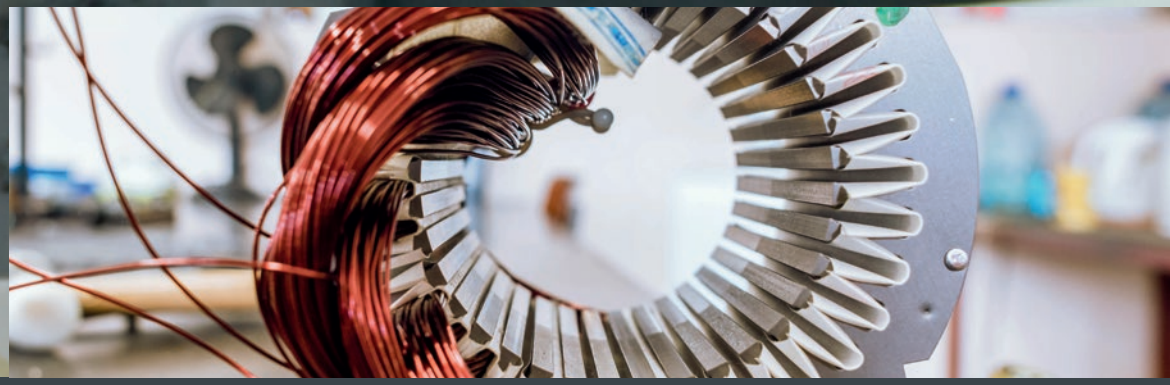
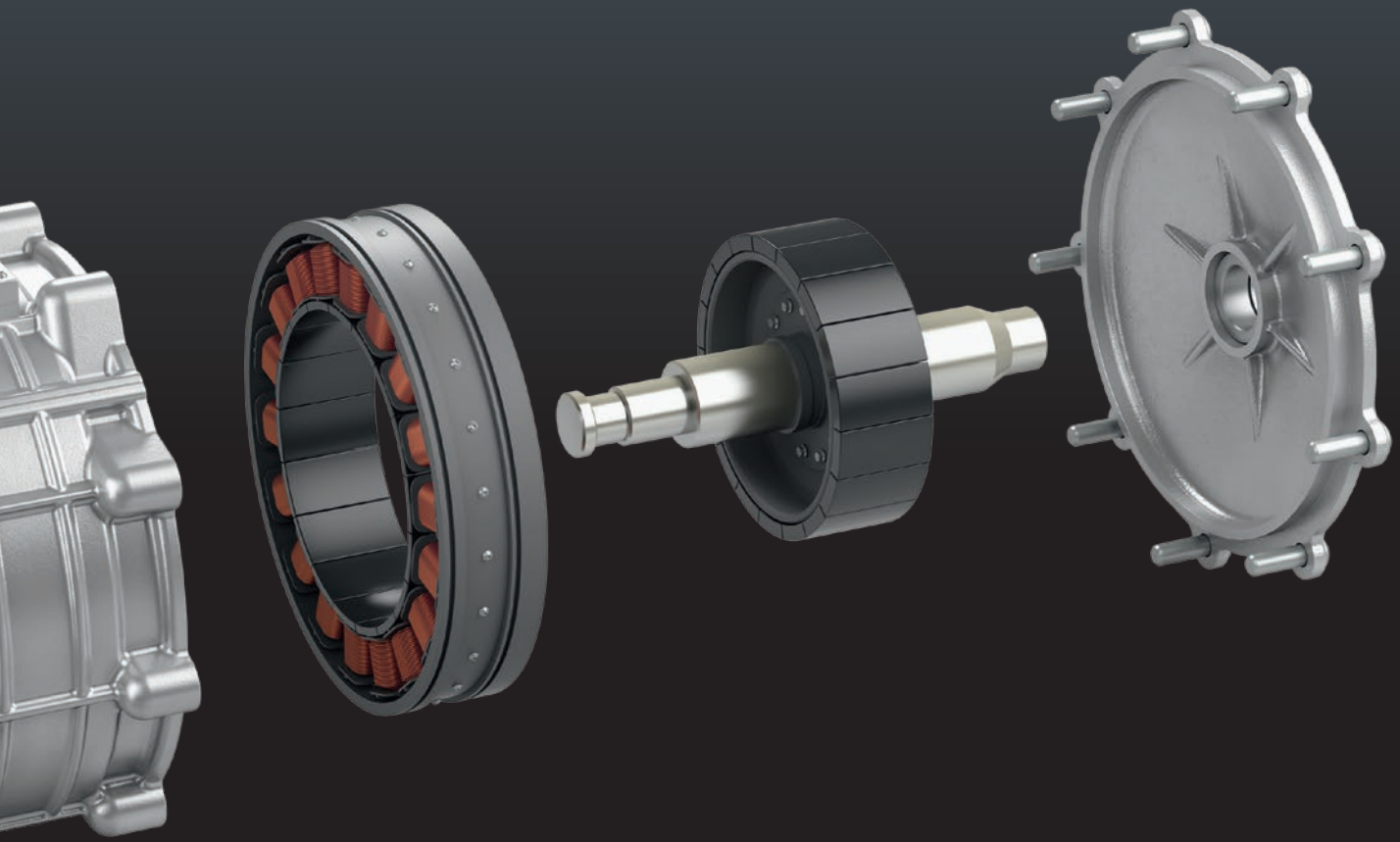




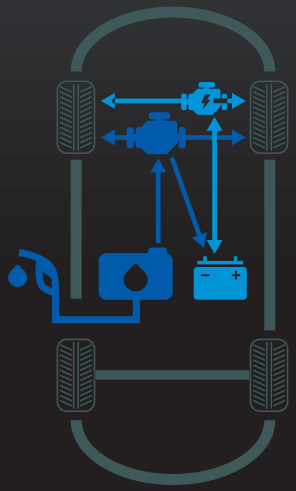
Our Ultrason® grades (PSU, PESU, PPSU) **come into play wherever other plastics or metal fail regarding**

- high engine performance
- design freedom
- efficient processing

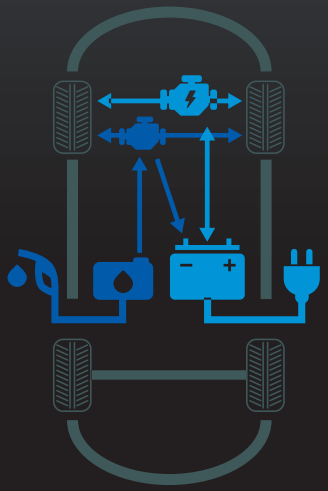
E-SSENTI

Ultrason®

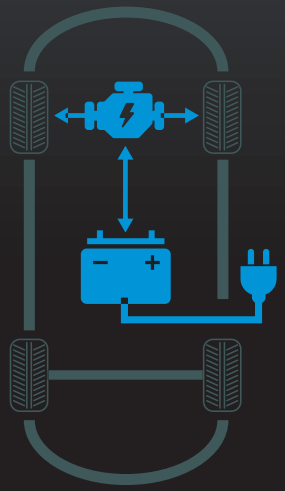
Let's make your e-car more powerful, more reliable and lighter –
with a small but efficient engine for increased range!



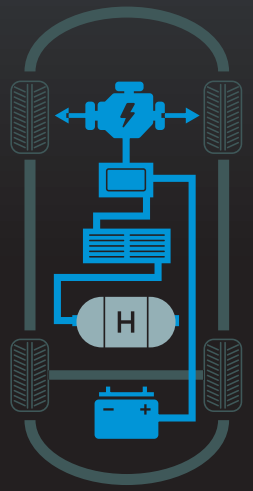
FHEV
Full Hybrid Electric Vehicle



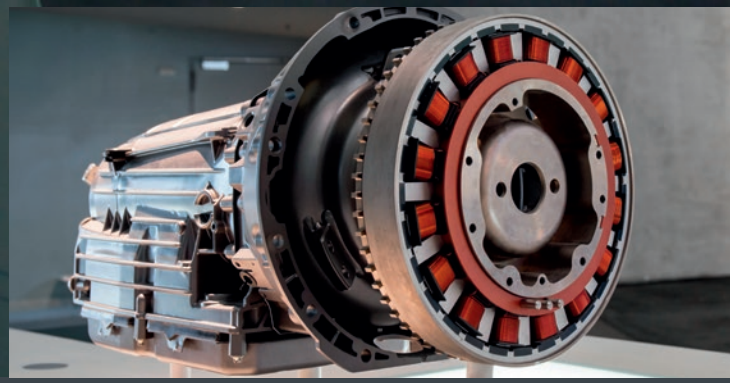
PHEV
Plug-in Hybrid Electric Vehicle



BEV
Battery Electric Vehicle



FCEV
Fuel Cell Electric Vehicle



Ultrason® material benefits

for efficient, high-performance e-motors

- **Temperature independent properties** (-30 °C to 180 °C)
- **Very high long-service temperatures**
- **Very good dimensional stability**
- **High mechanical strength**
- **Excellent chemical resistance**
- **Good electrical insulation**
- **Very good, inherent flame retardance**
- **Outstanding hydrolysis resistance**
- **Comparative tracking index** (CTI) **>175 V possible**
- **Sustainability**
  parts made of Ultrason® can be mechanically recycled

Ultrason® processing benefits

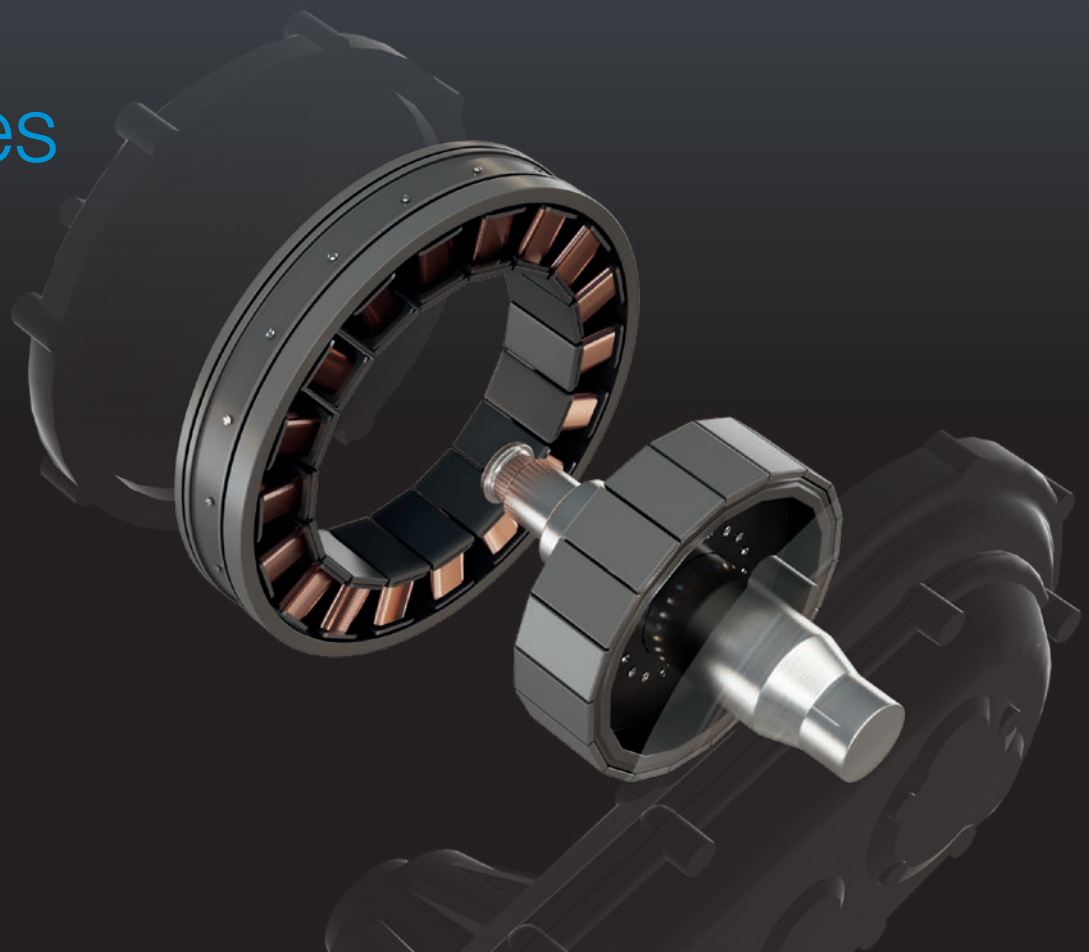
for reducing production costs

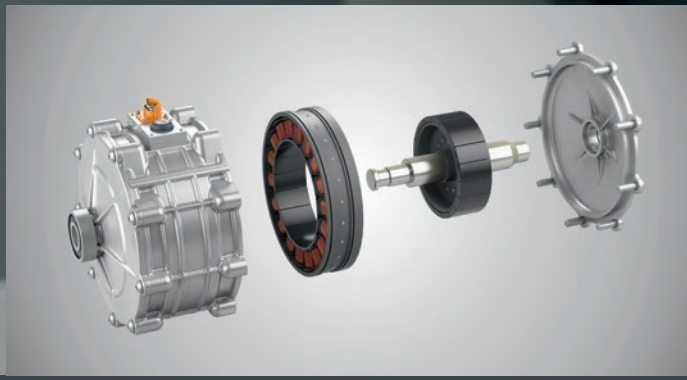
- **Easy manufacturing**
  by injection molding or extrusion
- **Adapted viscosity**
  for the respective manufacturing process
- **Complex, thin-walled parts**
  for tight installation spaces
- **Good stiffness**
  for assembly

E-XPERT

Ultrason® for demanding applications in all e-engines

Ultrason® is the solution for the e-engine in contact with oil and water circulation, wherever there are high temperature resistance plus high mechanical performance required. Thus, efficient e-engines are possible which reliably work at high voltages, high temperatures and aggressive coolant media.





Ultrason® applications

for all e-engines

- Slot liners
- Slot wedges
- Magnet wire insulation
- Cooling
- Slip ring
- Rotor / winding cap
- Oil / water pumps
- Stator seals and seal rings

Tailored Ultrason® grades for electric engine applications

(PSU, PESU, PPSU)

Ultrason®	Material properties	Possible applications
E2010 MR HM BK	Unreinforced, standard injection molding grade of medium viscosity, demolding optimized, reduced heat accumulation	Lighting
S2010 NAT	Unreinforced, medium viscosity standard injection molding grade	Seals, seal rings
Dimension E0510 G9	Injection molding grade, 45 % glass fiber reinforced	Valves/ pistons
E 2010 G4	Medium viscosity injection molding grade with high rigidity and strength, 20 % glass fiber reinforced	Rotor/ winding cap/slot clamps
E 2010 G6	Medium viscosity injection molding grade with high rigidity and strength, 30 % glass fiber reinforced	Rotor/ winding cap/slot clamps
E 0510 C2TR	Low viscosity injection molding grade with 10 % carbon fiber reinforced, good flowability and improved tribological properties	Fluid pumps
E 3010 M4*	CTI improved extrusion grade	Slotliner
E 6020 P	Polyethersulfone flakes, e.g. for membrane applications and coatings	Humidifier
S 6010 NAT	Unreinforced, higher viscosity grade, tougher and with improved chemical resistance	Humidifier

* Development product

E-XCITING

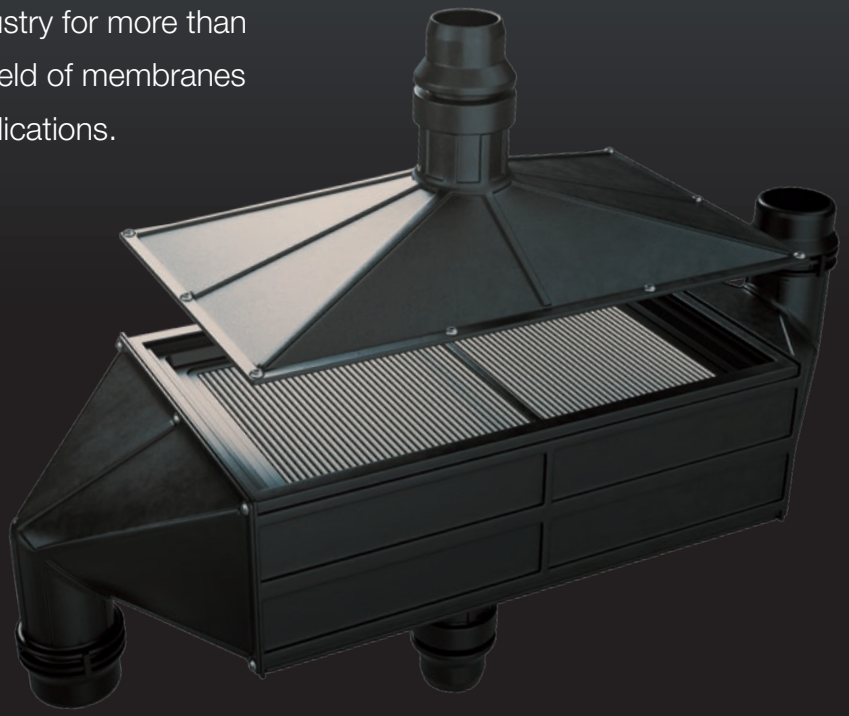
Focus: High-performance membranes made of Ultrason® for humidifiers in fuel cells

Ultrason® can do more than enhance the performance of e-engines! In fuel cell cars, it can be used as membrane material in the humidifier. The humidifier keeps the humidity in the fuel cell on a constant level and thus ensures optimal performance of the fuel cell. During operation water is formed in the fuel cell, this needs to be removed. In addition, dry air from outside needs to be humified.

The humidifier uses the water from the fuel cell to increase the humidity of the outside air. This is achieved by a membrane which selectively transports water (vapor) from the wet (from the fuel cell) to the dry gas (flowing towards the fuel cell).

Why Ultrason®?

Ultrason® is an established material for membranes used in the water filtration industry for more than 20 years. BASF has gained extensive and profound application know-how in the field of membranes and is the ideal partner for bringing this technology to the next level in fuel cell applications.



Advantages of Ultrason® for reliably working membranes:

- excellent chemical resistance (e.g. to water, acids)
- good pore size control
- good mechanical properties
- high flux
- high purity with low oligomer content
- good thermal and hydrolytic stability
- sustainable alternative to currently used materials
- soluble in solvents commonly used

Please note:
The figures given here are standard values obtained from a representative number of measurements. They refer to uncolored material. The standard values cannot be extrapolated to moldings of arbitrary geometry without reservation. As with other thermoplastics, the geometry of the molding and the processing conditions have to be taken into consideration.

Explore the full potential of Ultrason® and find the suitable grade for your application!
Ultrason® Product Selector on www.ultrason.basf.com

Further information on Ultrason® can be found on the internet:
www.ultrason.basf.com

Please also visit our websites:
www.plastics.basf.com

Request of brochures:
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