

# EV THERMAL MANAGEMENT APPLICATIONS WITH SABIC'S ULTEM™ RESIN

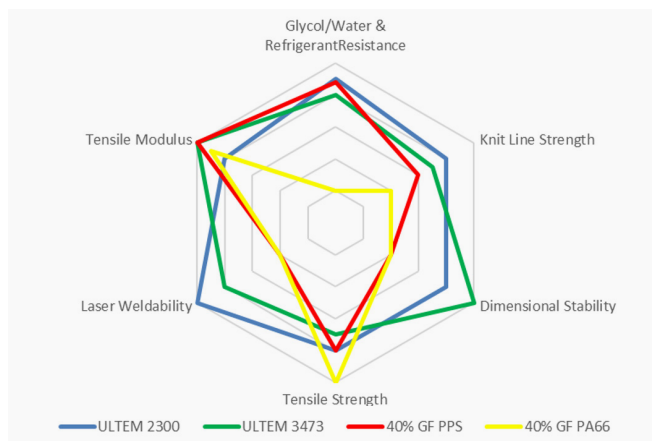
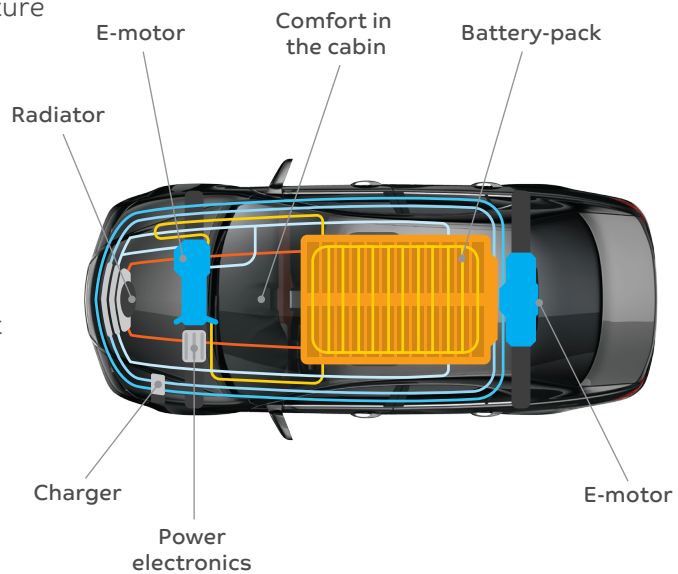
## RELIABLE PRECISION & STRENGTH WITH CHEMICAL RESISTANCE

From thermal runaway mitigation to the ever-growing number of power electronics, designing an efficient thermal management systems (TMS) plays a critical role within electric vehicles to improve performance and reliability across temperature range while ensuring passenger comfort.

### The main trends driving further development in TMS are:

- Higher voltage architectures
- Increased electronic components
- Fast / Super Fast charging
- Thermal runaway mitigation

Material selection is critical for development of innovative TMS architectures to withstand direct exposure to refrigerants and coolant fluids while providing reliability benefits in the overall design of electric vehicles and charging infrastructure.

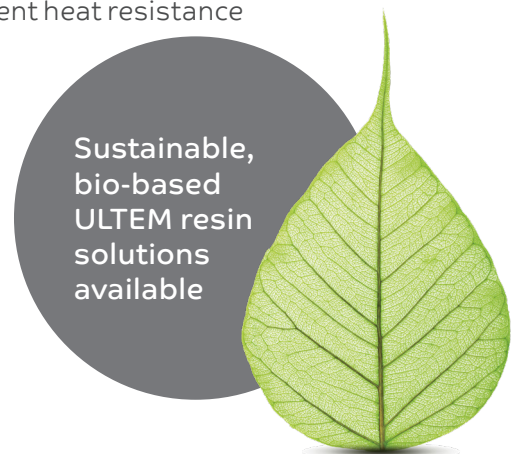


SABIC's ULTEM™ resin (PEI) meets chemical resistance exposure testing similar to PPS (GF 40%) and PA66 (GF 40%) while offering the following benefits:

- Dimensional stability (-40c to 130c)
- Low CTE for precision tolerancing
- Laser weldability for ease of assembly
- Light weighting
- Design freedom for integrating features & part consolidation
- Inherent heat resistance

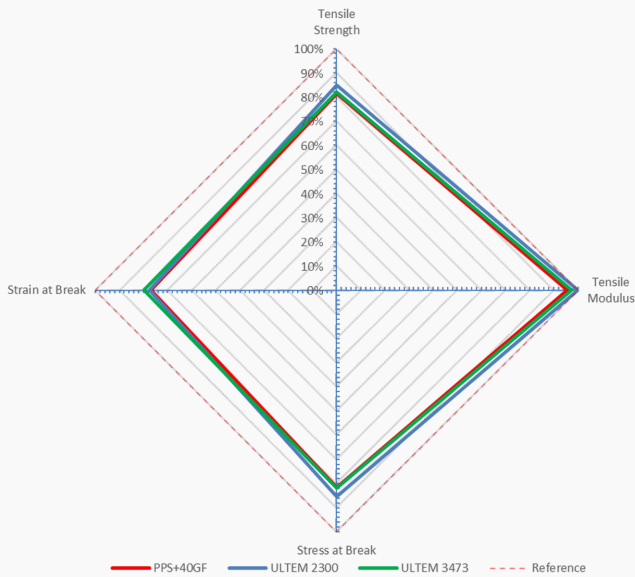
### POTENTIAL APPLICATIONS MAY INCLUDE:

- On-board chargers
- Power inverters
- DC/DC converters
- Fast-charging handles
- Hoses
- Sensors and lenses
- Connectors



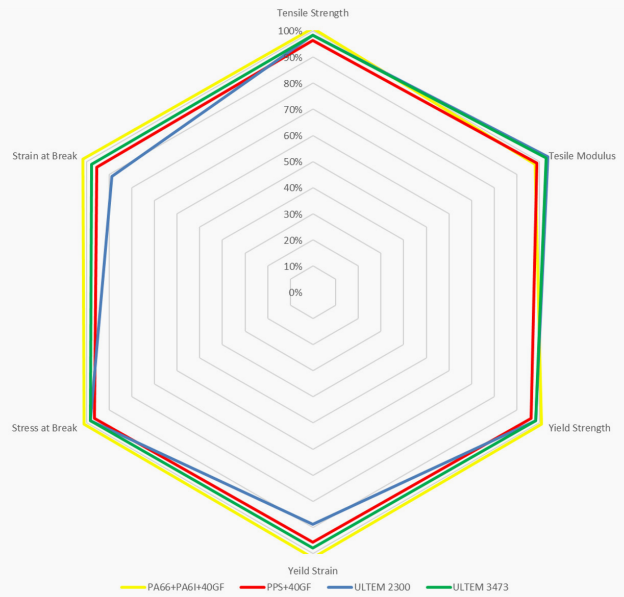
# ULTEM™ RESIN PROPERTY RETENTION COMPARISON

3000 HOURS @ 130°C GLYCOL / WATER EXPOSURE PROPERTY RETENTION



PA66 (GF 40%) did not withstand 3000 hours

2000 HOURS @ -40°C R1234yf REFRIGERANT EXPOSURE PROPERTY RETENTION



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