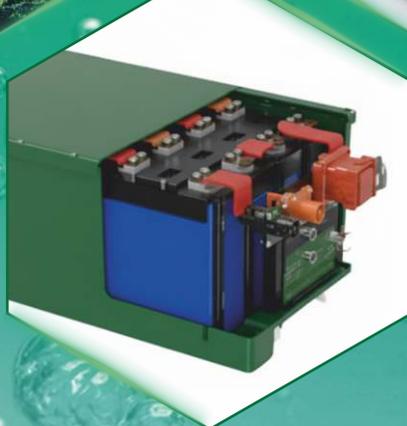
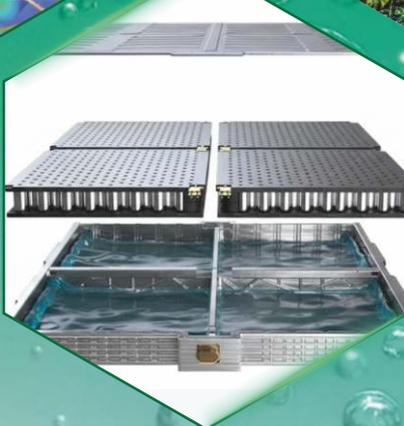
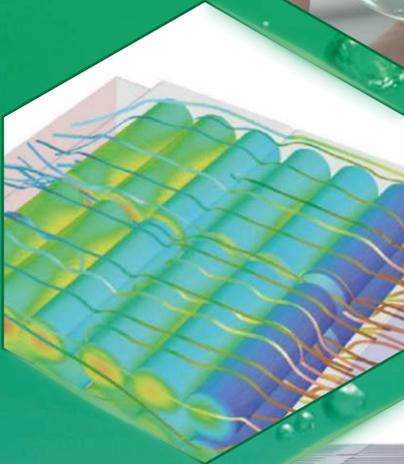


# SINGLE-PHASE IMMERSION COOLANT FOR EV BATTERY



## PERFORMANCE, SAFETY & CHARGING BREAKTHROUGH

### Revolutionizing EV Battery Cooling.

Electric vehicles demand faster charging, longer range, and uncompromised safety.

Conventional thermal management systems - air or cold-plate glycol - face limits:

- Non-uniform pack  $\Delta T$  (4–15 °C) → uneven cell aging & SOC imbalance.
- Thermal bottlenecks restrict charging above ~2C.
- Cooling power draw of 2–5% reduces driving range.
- Complex hoses and manifolds add weight and maintenance.

### QuantiCool™ changes the equation.

A synthetic ester-based immersion coolant, QuantiCool™ directly surrounds cells to deliver:

- Uniform  $\Delta T \leq 2-3$  °C, eliminating hotspots.
- 3C+ fast charging → 10–80% in ~18 minutes (chemistry dependent).
- Up to 2× operational battery life, thanks to reduced thermal stress.
- Up to 5× better heat transfer than air cooling: ~150–400 W/m<sup>2</sup>·K vs ~30–80 W/m<sup>2</sup>·K.
- Prevents battery thermal runaway and combustion - even under extreme thermal abuse conditions.

### KEY BENEFITS OF QUANTICOOL™



#### FAST CHARGING READY

- Sustains high C-rates without throttling.
- Maintains pack-level balance during fast charging/discharging.



#### SAFETY BY DESIGN

- Self-extinguishing fluid prevents propagation of thermal runaway.
- >75 kV dielectric strength; halogen-free & non-conductive.
- Proven resilience under severe abuse conditions.



#### SUSTAINABLE MOBILITY

- >85% biodegradable.
- ODP = 0, GWP < 1.
- Free from PFAS, halogens, and persistent pollutants.



#### LIGHTWEIGHT & EFFICIENT

- Reduces cooling hardware volume by 20–30%.
- Up to 90% lower cooling power draw, improving total system efficiency to ~97%.
- Enables lighter, compact battery pack design.

## TECHNICAL EXCELLENCE, COMPATIBILITY & APPLICATIONS

Item	Units / Condition	Method	QuantiCool
Kinematic Viscosity @ 25°C	mm <sup>2</sup> /s	ISO 3104	7.45
Kinematic Viscosity @ 40°C	mm <sup>2</sup> /s	ISO 3104	5.1
Pour Point	°C (maximum)	ISO 3016	-33
Density @ 20°C	kg/m <sup>3</sup>	DIN EN ISO 12185	853
Interfacial Tension @ 25°C	mN/m	ASTM D971	15.9
Neutralisation Value	mg KOH/g (maximum)	IEC 62021-1	0.011
Sulfur Content	mg/kg (maximum)	ASTM D4294	Nil
Flash Point	°C	ASTM D92	174
Fire Point	°C	ASTM D92	198
Autoignition temperature	°C	ASTM E659	>300
Thermal Conductivity @ 25°C	W/(m·K)	ASTM D7896	0.148

## MATERIAL COMPATIBILITY

Category	Materials Tested
Seals & O-Rings	Nitrile Butadiene Rubber (NBR), Hydrogenated NBR (HNBR), Fluorocarbon (FKM/Viton), Polytetrafluoroethylene (PTFE), Polyurethane (PU), Ethylene Propylene Diene Monomer (EPDM), Silicone Rubber – Not recommended for long-term use
Battery Housing	Polypropylene (PP), Polyamide (Nylon/PA), Polycarbonate (PC), Acrylonitrile Butadiene Styrene (ABS), Aluminum Alloys, Polyvinyl Chloride (PVC) – Marginal, may harden or lose plasticizer under extended exposure
Electrical Insulation	Polyimide Films, Polyether Ether Ketone (PEEK), Polyethylene Terephthalate (PET) Films, Ceramic Insulators, Epoxy Resins (FR4)
Cable/Wire Materials	Polyurethane (PUR) Cable Sheathing, Cross-linked Polyolefin (XLPE), Polytetrafluoroethylene (PTFE) Wire Insulation, Thermoplastic Elastomer (TPE)
Thermal Interface	Graphite Thermal Interface Materials, Phase Change Materials (PCM), Silicone Thermal Interface Pads
Metal Components	Copper, Aluminum, Stainless Steel, Phosphor Bronze, Silver-Plated Contacts



- **QuantiCool™** enables the next generation of EV batteries - combining 4C+ charging, uniform  $\Delta T$  control, 2x longer life, and unmatched fire safety.
- OEMs can confidently design lighter, safer, and greener electric vehicles with **QuantiCool™**.
- **QuantiCool™** - Cooling the Future of Electric Transport.

## APPLICATIONS



**Passenger EVs -**  
high-power charging,  
long-range stability.



**Commercial EVs -**  
buses, trucks, fleets  
demanding durability.



**High-performance EVs -**  
motorsport & premium  
vehicles.



**Next-Gen Chemistries -**  
LFP, NMC, solid-state  
platforms



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