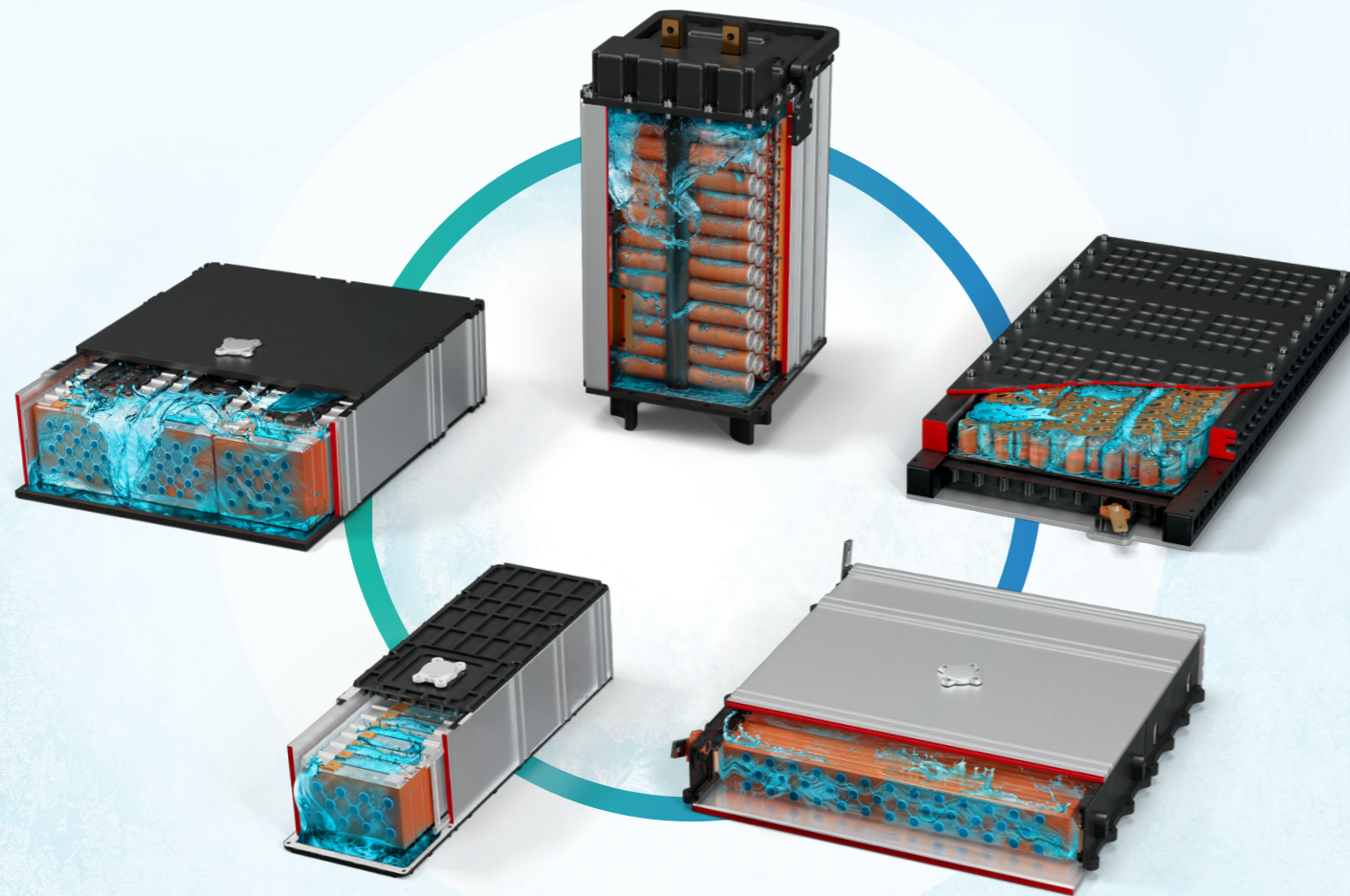
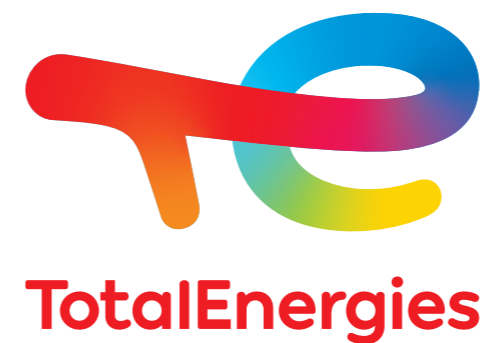
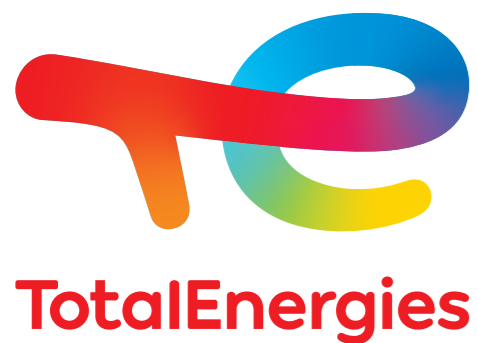


**QUARTZ**  
EV FLUID

# Material compatibility guide



# Immersion cooling fluids



# Quartz EV-Battery fluids

TotalEnergies Immersion Cooling Fluids are dielectric fluids specifically designed for lithium battery immersion cooling technology.

These fluids offer a **high level of cooling performance**, allowing the cells to accept high charge currents, increasing the battery lifetime, reducing the carbon footprint and **reducing the risk of thermal runaway propagation** in lithium batteries.

Technical data sheets and material safety data sheets for TotalEnergies Immersion Cooling Fluids are available upon request.

## Types of applications

All type of batteries, cells (pouch, prismatic, cylindrical), chemistry and battery applications.



High cooling and energy efficiency with a low volume of fluid.

Enhanced design, simplification and weight reduction

Enables extreme fast charging with a perfect heat dissipation.

Sustainability and cost efficiency, thanks to immersion cooling technology.

Protect against the risk of fire and cell thermal runaway propagation by a very high thermal stability of the fluids.

## Key highlights



Unique coolant formulation dedicated to battery constraints, for high stability at high temperatures.



Very low viscosity, even at low temperature.



Absence of halogens, no toxicity and biodegradability.



Safety enabler thanks to thermal runaway propagation and fire prevention.



Very good oxidation resistance and protection from corrosion.

Chemical Family	Type	E-Cool	Eco-Friendly	Cell-Shield	S-Cool
<b>ELASTOMER</b>					
Hydrogenated Nitrile Rubber	HNBR	•••	•••	•••	•••
Nitrile Rubber	NBR	•••	•••	•••	•••
Fluorocarbon Rubber	FKM, Viton®, FFKM	•	•	•	•
Polyacrylate	ACM	•	•	○	○
Ethylene Acrylic	AEM	•	•	○	○
Polyurethane Rubber	PUR	•	•	•	•
Polytetrafluoroethylene	PTFE (Teflon®)	•	•	•	•
Butyl Rubber	IRR (Butyl®)	○	○	○	○
Chlorosulfonated Polyethylene	CSM (Hypalon®)	○	○	○	○
Ethylenepropylenediene Rubber	EPDM	○	○	○	○
Silicone Rubber	VQM	○	○	○	○
Liquid Silicone Rubber	LSR	•	•	○	○
Fluorosilicone Rubber	FVQM	•	•	○	○
Chloroprene Neoprene Rubber	CR (Neoprene®)	•	•	○	○
Natural Rubber	NR	○	○	○	○
<b>METAL</b>					
Aluminium	Al	•	•	•	•
Copper	Cu	•	•	•	•
Nickel	Ni	•	•	•	•
Nickel Plated Steel	NPS	•	•	•	•
Steel	ST	•	•	•	•
Phospor Bronze		•	•	•	•
Iron	Fe	•	•	•	•
Brass		•	•	•	•
Zinc-Plated Steel	ZPS	•	•	•	•
Silver	Au	•	•	•	•
<b>PLASTIC</b>					
Polyamide 6	PA6	•	•	•	•
Polyamide 66	PA66	•	•	•	•
Polyamide 6T/XT	PA6T/XT	•	•	•	•
Polyamide 6T/66	PA6T/66	•	•	•	•
Polyamide 610	PA610	•	•	•	•
Blend Polyamide 610 / Polyamide 66	PA610/PA66	•	•	•	•
Polyamide 12	PA12	•	•	•	•
Polyamide 46	PA46	•*	•*	•*	•*
Polyamide	PA	•	•	•	•
Polyphthalamide	PPA	•	•	•	•
Nylon		•	•	•	•
Polybutylene Terephthalate	PBT	•	•	•	•
Polytetrafluoroethylene	PTFE	•	•	•	•
Polyurethane	PU	•	•	•	•
Polyoxymethylene (acetal copolymer)	POM	•	•	•	•
Polyvinyl Chloride	PVC	•	•	•	•
Polyimide	PI	•	•	•	•
Polyethylene Terephthalate	PET	•	•	•	•
Polyethylene	PE	○	○	○	○
Polypropylene	PP	○	○	○	○
Polyketone	PK	○	○	○	○
Polyether ether ketone	PEEK	•	•	•	•
Polycarbonate	PC	•*	•*	•*	•*
Polystyrene	PS	•*	•*	•*	•*
Acrylonitrile butadiene styrene	ABS	•*	•*	•*	•*
Polyethylene Terephthalate Glycol	PETG	•*	•*	•*	•*
<b>GLASS</b>					
Polyamide / Glass	PA / Glass	•	•	•	•
Polybutylene Terephthalate / Glass	PBT / Glass	•	•	•	•
Polyethylene / Glass	PE / Glass	•	•	•	•
<b>ADHESIVES   SEALANTS</b>					
Epoxy bi-component		•	•	•	•
<b>OTHERS</b>					
Soldering Flux		•	•	•	•

\*Based on technical judgement on similar materials (no test performed).  
\*\*Special attention to each OEM reference.

## Important remarks

This document provides a non-exhaustive summary of material compatibility data for dielectric fluids used in lithium battery immersion cooling.

This guide aims to help our customers in selecting compatible materials in contact with our dielectric fluids, such as elastomer seals, thermoplastic materials, and metals.

The reported results are based on tests performed at our laboratories, or in collaboration with external laboratories and material suppliers.

## The conclusion:

“•” indicates that at least one reference has been validated through tests conducted by material suppliers, external laboratories, or internal studies by TotalEnergies.

“○” indicates that, based on our current knowledge, the material is not compatible with our dielectric fluids and should not be considered for use in immersion cooling applications involving the specified fluid.

The appearance of the material after test is not considered.

Material compatibility is typically evaluated using accelerated laboratory aging methods to simulate battery lifespan. However, we also recommend in situ testing to validate product performance under the actual operating conditions of specific applications.



Since materials and formulations can vary between suppliers, it is strongly recommended to test the specific material grade for compatibility to ensure conformity.