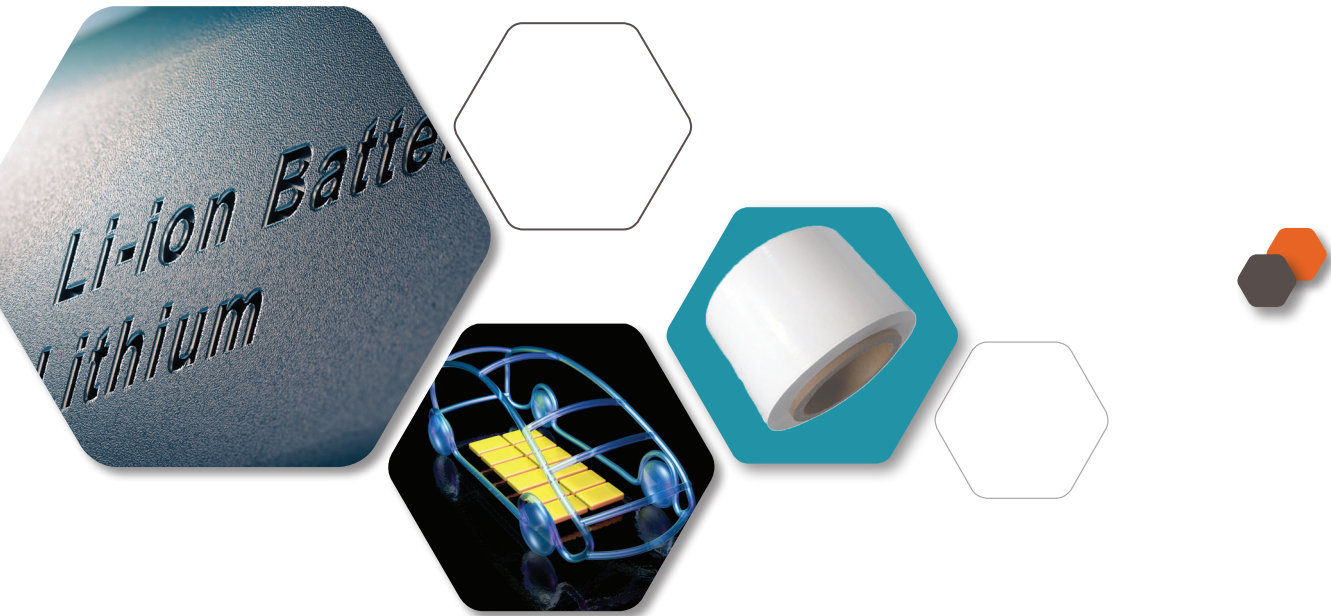




SPECIALTY ALUMINAS FOR LITHIUM-ION BATTERY SEPARATORS

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The SEPAl range has been developed as a ceramic coating for LIB separators.

Special attention is paid to particle size distribution, moisture level and iron content. SEPAl ceramic coating for LIB separators provides:

- Improved thermal stability (>130-150°C)
- Resistance to metallic dendrite penetration that causes short-circuiting
- Thermal shutdown support
- **The value option for ceramic coating**

Lithium-ion batteries are the best rechargeable energy sources currently available.

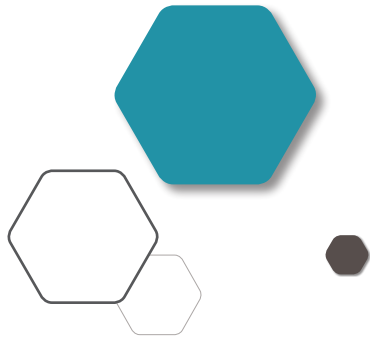
Their superior energy density and long cycle life have made them ideal for:

- **Consumer electronics** (smartphones, tablets, laptops)
- **Electrical vehicles** (battery EV, hybrid EV, e-buses)
- **Energy storage systems** (collecting, storing and transmitting electricity)

A SEPAl alumina ceramic coating for separators will improve the safety of Lithium-ion batteries.

- It is easy to process and disperse, so reduces the production cost
- Has >99.9% purity providing more safety to the LIB battery
- It is designed to meet the diversity of separator needs:
 - Low water absorption
 - Ultra-thin coating
 - High-temperature resistance



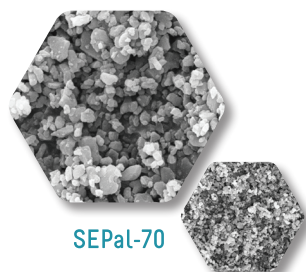
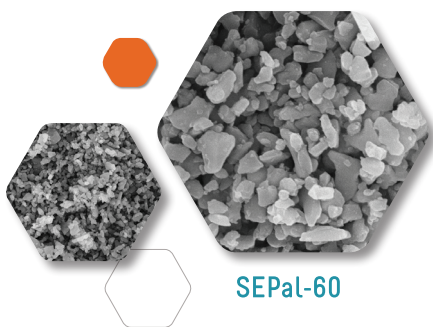


SEP_{al}-60 & SEP_{al}-70 for separator coating provide:

- Very fine crystal size (0.4 - <1μm)
- Strictly controlled:
 - D90 value (close to 1μm)
 - Chemical analysis
 - Contamination management

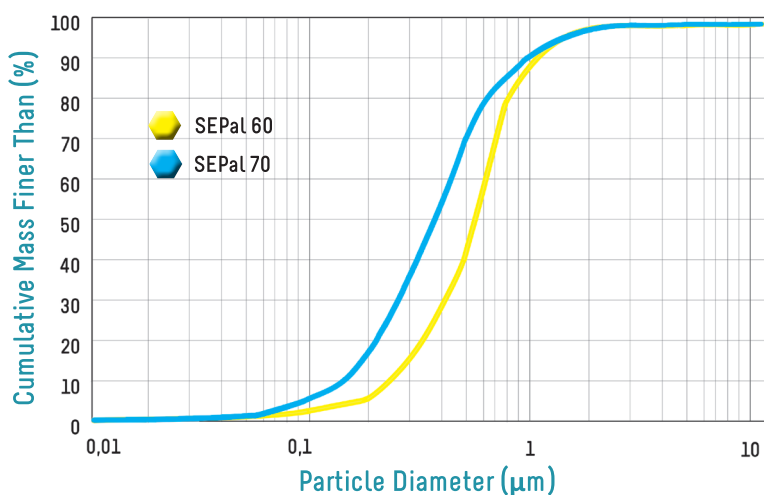
Key benefits

- High quality product
- Expandable production capacity with local facilities
- Cost efficient solutions



		SEP _{al} -60	SEP _{al} -70
CERAMIC COATING FOR SEPARATOR FILMS			
Physical Properties	Unit		
Particle Size Distribution (Sedigraph)			
D10	μm	0.28	0.18
D50	μm	0.55	0.40
D90	μm	1.10	0.90
D95	μm	1.50	1.40
Specific Surface Area BET	m ² /g	5.5	7.5
Loss on Drying 20-105°C	%	0.10	0.15
Loss on Ignition 20-1000°C	%	0.40	0.50
Chemical Properties			
Al ₂ O ₃ - on dry basis	%	99.9	99.9
Na	ppm	220	300
Ca	ppm	150	150
Si	ppm	165	150
Fe	ppm	125	115
Mg	ppm	15	15
Zn	ppm	<5	<5
Cu	ppm	<5	<5
Cr	ppm	<5	<5
Ni	ppm	<5	<5
Magnetic Fe	ppm	<1	<1
pH	-	9.2	9.7

Typical data



ALTEO R&D

For Alteo, innovation and application R&D are major parts of its growth strategy.

Alteo enhances its R&D capabilities through its **application laboratory**: the installation of **state-of-the-art equipment**, the recruitment of **technical experts** and collaborations with key partners and **university laboratories**.

Alteo has the know-how and equipment to analyze and evaluate raw materials and finished parts, as well as being able to simulate production processes.

Contact our R&D team now at
www.alteo-alumina.com/contact



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To meet your highest expectations, our Customer Care team will always strive to ensure a **first class** service.

Our commitment is to provide **full support** from your first call to the delivery of our products; with technical assistance, packing solutions and short lead times.

ALTEO AT A GLANCE

- A world leading fully-integrated supplier of specialty aluminas with a capacity of more than 600 000 tonnes of alumina based products (hydrates and calcined aluminas).
- Global sales network with 4 regional hubs, 17 offices and local warehouses around the world.
- Research & Development centre in France.
- Leading raw material supplier to the following industrial markets: Ceramics, Refractories, Specialty Glass, Polishing, Fillers and Coatings.
- Partner in the joint-venture Alteo-Ginet (Suzhou) Lithium Battery Material Technology to promote SEPal in China.

Design : www.emtacom.com



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