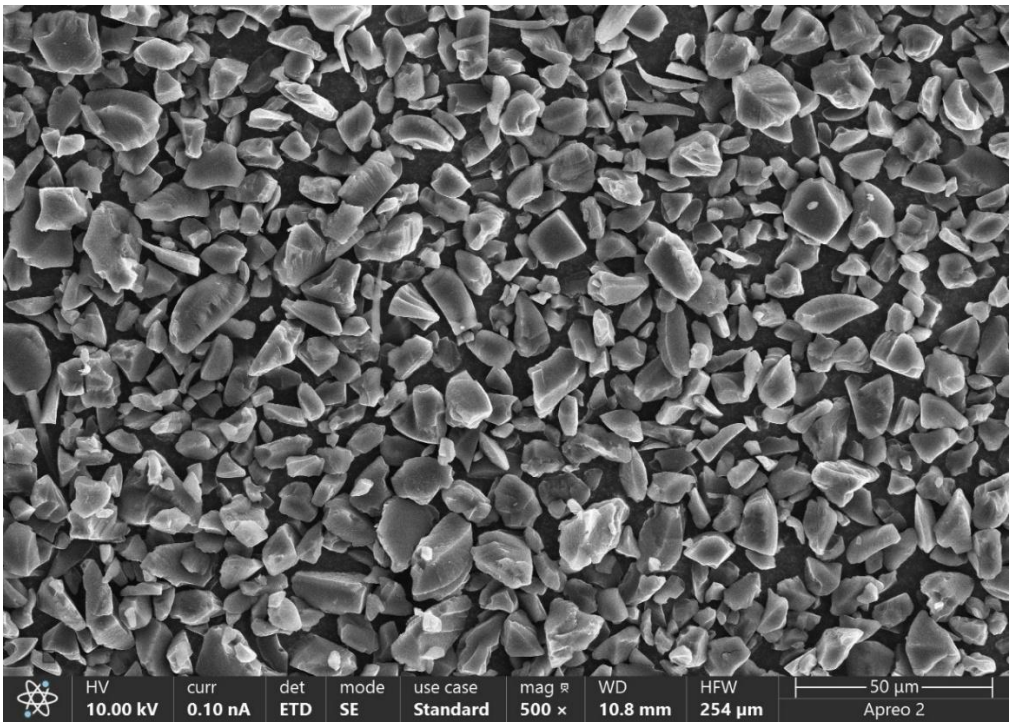


High-Performance Hard Carbon Anode

Lignavolt-HC1300 is a developmental-grade hard carbon anode material derived from a high-purity precursor. It is engineered to provide a balanced profile of high initial coulombic efficiency (ICE) and long-term structural stability, matching the performance benchmarks of leading global suppliers while offering superior supply chain security.



PHYSICAL & STRUCTURAL SPECIFICATIONS

Parameter	Unit	Target Value	Test Method / Significance
Particle Size (D ₅₀)	µm	9 ± 1.5	Laser Diffraction: balances rate & density.
Tap Density	g/cm ³	> 0.95	ISO 3953; critical for electrode loading.
Specific Surface Area (BET)	m ² /g	2.5 - 4	N ₂ Adsorption; minimizes SEI formation.
Interlayer Spacing (d ₀₀₂)	nm	0.375 - 0.385	XRD; optimized for Na ⁺ intercalation.
True Density	g/cm ³	1.5 - 1.9	Helium Pycnometry

Notice: This document represents target specifications for developmental material. Final production values may vary within established tolerances. Samples for qualification are available upon request under NDA.

ELECTROCHEMICAL PERFORMANCE

Values measured in half-cell vs. Na/Na⁺ at 25°C 1M NaPF₆ in EC/EMC/DMC 1:1:1

Parameter	Unit	Target Value	Benchmark Comparison
Reversible Capacity	mAh/g	> 360	High-tier industry standard, 0.1C
ICE	%	> 91.0	Minimal first-cycle sodium loss.
Plateau Capacity (<0.1V)	%	66	High energy density contribution.
Capacity Retention	%	>80 @ 2000 cycles	Projected for grid/EV applications.
Rate Capability	%	95%	@ 1C

CHEMICAL PURITY & COMPOSITION

Component	Unit	Target Value	Impact
Carbon Content	%	> 99.7	High electrochemical activity.
Moisture Content	ppm	< 500	Prevents electrolyte hydrolysis.
Ash Content	%	< 0.1	Minimizes parasitic side reactions.
Magnetic Impurities (Fe, Cr, Ni)	ppb	< 50	Ensures safety and cell longevity.

Processing Recommendations

- Binder System: Aqueous (CMC/SBR) or NMP-based (PVDF).
- Active Material Content: 92-95 % recommended.
- Drying Temperature: 120°C under vacuum for 12 hours.

EDS SPECTRUM

