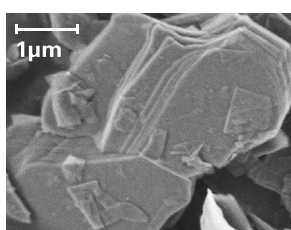




Mobile  
Energy

# SPECIALTY GRAPHITE FOR POSITIVE ELECTRODES OF LITHIUM-ION BATTERIES

## C-ENERGY™ Graphite



SEM picture of KS 6L  
Graphite

C-ENERGY™ L-SERIES is a specialty graphite range especially designed for positive electrodes of lithium-ion batteries.

### Key Features

- Enables reduced additive dosage in the positive electrode
- Enables the utilization of more economical active materials in the positive electrode
- No additional pre-dispersing unit is required
- No need for a dispersing agent
- Faster electrolyte absorption
- Reduced solvent consumption
- Higher production output

PRODUCT CHARACTERISTICS	APPLICATION BENEFITS
<b>Very High Purity</b> <ul style="list-style-type: none"> <li>• Ultra low metal impurities</li> <li>• Ultra low ionic impurities</li> </ul>	<ul style="list-style-type: none"> <li>• Increased battery safety</li> <li>• Lower rejection rate</li> <li>• Fully compatible with most electrolyte systems</li> </ul>
<b>Very High Electrical Conductivity</b> <ul style="list-style-type: none"> <li>• Extremely high crystallinity</li> <li>• Very high electrical conductivity</li> </ul>	<ul style="list-style-type: none"> <li>• High electrode capacity</li> <li>• High energy density</li> <li>• High cycling stability</li> <li>• High power density</li> <li>• Low dosage required vs conventional graphite grades</li> </ul>
<b>High Density and Low Spring Back</b> <ul style="list-style-type: none"> <li>• High electrode density</li> <li>• High electrode compressibility</li> <li>• Significantly improved mechanical strength of the electrode</li> </ul>	<ul style="list-style-type: none"> <li>• High energy density</li> <li>• High power density</li> <li>• Minimal electrode expansion after pressing</li> <li>• Improved electrode flexibility</li> <li>• Facilitates the addition of other conductive additives</li> </ul>
<b>Very Efficient Electrolyte Wettability</b> <ul style="list-style-type: none"> <li>• Rapid electrolyte absorption</li> <li>• High electrical conductivity</li> </ul>	<ul style="list-style-type: none"> <li>• Cost reduction due to faster electrolyte filling step during battery assembly</li> <li>• Improved battery performance due to more efficient cathode wetting</li> <li>• Lower dosage required vs conventional graphite grades</li> <li>• Reduced global additive costs</li> </ul>



[www.imerys-graphite-and-carbon.com](http://www.imerys-graphite-and-carbon.com)

## RECOMMENDED USE

The unique characteristics of C-ENERGY™ L-grades give unmatched performance improvements in Li-ion batteries.

**Recommended C-ENERGY™ L -grades dosage in positive active material: 1-3 wt%.**

C-ENERGY™ L-grades build a graphite matrix that facilitates the addition of other conductive additives.

Better performance is obtained when C-ENERGY™ L-grades are used in combination with ca. 1 wt% of C-ENERGY™ SUPER C65 or C-ENERGY™ SUPER C45 carbon black.

### Typical Product Properties

	Ash (%)	Fe (ppm)	Cl (ppm)	SO <sub>4</sub> <sup>2-</sup> (ppm)	AMOUNT OF MAGNETIC PARTICLES/ GRAM OF PRODUCT	TIME TO ADSORB DMC ELECTROLYTE SOLVENT (msec) (1)	IN-PLANE ELECTRICAL CONDUCTIVITY OF LFP ELECTRODES AT 2wt% OF GRAPHITE (mS/cm) (2)	IN-PLANE ELECTRICAL CONDUCTIVITY OF NMC ELECTRODES AT 2wt% OF GRAPHITE (mS/cm) (2)	DENSITY OF LFP ELECTRODES AT 2wt% OF GRAPHITE (g/cm <sup>3</sup> ) (3)	DENSITY OF NMC ELECTRODES AT 2wt% OF GRAPHITE (g/cm <sup>3</sup> ) (3)	SPRING-BACK (%)
SFG6L	0.01	10	5	25	<1	200	32	52	2.2	3.0	10
SFG6	0.07	80	10	40	3	300	29	46	2.2	3.0	10
KS6L	0.01	10	5	25	<1	200	31	51	2.2	3.0	12
KS6	0.06	75	10	40	4	200	29	41	2.2	3.0	12

More data available upon request

<sup>1)</sup> Defined as time it takes to reach a contact angle of 0°

<sup>2)</sup> Measured in presence of 1wt% of C-ENERGY™ SUPER C65, not densified

<sup>3)</sup> Measured in presence of 1wt% of C-ENERGY™ SUPER C65, densified uniaxially at 32 kN/cm<sup>2</sup>

## BENEFITS

**The use of 1-3 wt.% C-ENERGY™ SFG6L and C-ENERGY™ KS6L in the positive electrode leads to:**

- Cost savings resulting from reduced additive dosage in the positive electrode
- Cost savings due to utilization of more economical active materials in the positive electrode
- Increased mechanical stability and density of the electrode
- Eliminates the requirement for additional pre-dispersing unit
- No dispersing agent needed
- Faster electrolyte absorption
- Reduced consumption of solvents
- A graphite matrix that facilitates the addition of other conductive additives
- Higher production outputs