

# Graphite Rounding: The Key to Premium-Quality Lithium-Ion Batteries for Electromobility

Electromobility is the key to climate-friendly mobility. The growing production of lithium-ion batteries for electric vehicles (EVs) makes the sustainable use of valuable raw materials, such as graphite, essential. Processing solutions for lithium-ion batteries are evolving at pace to meet the rapidly increasing demand for longer-lasting products. Graphite rounding offers one of the best technical solutions for increasing EV battery quality, storage capacity and longevity.

On 14th February 2023, the European Parliament formally approved a landmark law to ban the sale of new petrol and diesel cars in the EU from 2035, with car manufacturers obliged to achieve an ambitious 100% cut in CO2 emissions (a 55% cut in CO2 emissions is required for new cars sold from 2030 – known as the EU's 'Fit for 55' package). Making electric vehicles more affordable and more practical, in terms of battery range and the recharging infrastructure, is going to be crucial for car, lithium-ion battery and graphite manufacturers.

Traditionally, battery production has largely taken place in Asia, but Europe is in the midst of developing its own dynamic battery market, with investors backing lithium-ion battery Gigafactory projects throughout the continent. Manufacturers are keen to reap the benefits of customs duty exemptions and shorter transport routes for the raw materials, while additional advantages include securing supply chains and being able to adapt capacity and quality more easily to meet the needs of individual markets. For car manufacturers and lithium-ion battery producers alike, this means working together to be as sustainable and efficient as possible while manufacturing premium-quality products that consumers are satisfied with and want to buy.

## Game-changing EV battery production with more efficient graphite processing

Synthetic and natural graphite are the most important anode materials used for producing lithium-ion batteries and with natural graphite now classified as a critical raw material by the EU Commission – and the demand for the material increasing in line with the demand for more efficient, longer-lasting lithium-ion batteries – it is estimated that up to 1,600,000 tonnes will be required globally by 2030, increasing almost five-fold by 2050. The graphite used in lithium-ion battery production must therefore be processed to as high a yield as possible.

The three-stage process of 'rounding' the graphite comprises grinding, rounding and dust removal. It increases the tap density to ensure a better volumetric storage capacity of the battery anode and improves the intercalation kinetics to allow the battery to charge more quickly whilst also being more durable and its cycle stability increased.

Traditional graphite rounding produces yields of only 30% to 50%, but Hosokawa Micron Group – renowned worldwide for its innovative powder processing techniques and equipment – has developed new graphite rounding techniques and a collection of specialist tailor-made milling equipment that, between them, efficiently produce a higher quality natural or synthetic graphite product with low BET values, which is perfect for the lithium-ion battery market. Material yields of between 80% and 90% are typical and achievable in a shorter, more energy-efficient and cost-effective processing time.

For platelet-shaped natural graphite the Alpine Particle Rounder APR, in concert with a classifier mill, has the capability to almost double the tap density of the graphite material, while the pressure-shock-resistant Zirkoplex ZPS is the perfect all-in-one option for rounding synthetic graphite.

Despite the challenges of building lithium-ion battery Gigafactories, aligning their supply chains and improving EV battery products, there is rapid European market growth to produce higher quality graphite for lithium-ion batteries as the global appetite for electromobility increases.

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Tap density of feed material 691g/L



Tap density of rounded graphite 1,002g/L



Hosokawa Alpine Zirkoplex ZPS