

Press Release

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E-magy Silicon enhances Lithium Ion Batteries, targeting for 50% additional capacity

Dutch tech-company RGS introduces nano sponge silicon that significantly improves the uptake of lithium ions and accommodates swelling during charging cycles.

Broek op Langedijk, the Netherlands - RGS announced today the launch of its E-magy nano-porous silicon to improve lithium-ion batteries, mostly for the electric vehicle market. This special silicon can be used in the anode of Li-ion batteries to enhance their capacity. E-magy can increase the capacity of Li-ion battery anodes to meet industry targets by up to fifty percent (50%) additional capacity. This translates into electric vehicle ranges of well above 500 km without adding more batteries. To provide its customers with larger quantities of E-magy material, RGS currently extends its industrial facility to Gigawatt (GW) scale. The material is now available for customer qualification.

The capacity increase by using Silicon is further enabling the e-mobility market . The huge growth of e-mobility applications has intensified the need for improved batteries, currently limited by battery materials. Replacing today's carbon material by silicon in Li-ion batteries is widely seen as the solution of choice to achieve larger battery capacities. In theory the use of Silicon can increase battery anode capacity by a factor of 10. In practice the use of silicon is significantly limited due to detrimental swelling effects during charging the battery, limiting lifetime.

E-magy resolves the swelling issue. E-magy nano-porous silicon material absorbs the lithium-ions during battery cycling by its inner porosity, similar to a sponge absorbing water. This prevents outside swelling of the battery anode, while the capacity increases by a factor of three (3) or more. E-magy will be supplied as a powder, and can be used in existing supply chains and battery factory production processes - to gradually enhance the capacity of Li-ion batteries. RGS applies its patented rapid casting technology to provide this cost effective and scalable route to manufacture this game-changing silicon material. *"RGS has achieved an excellent process for scaling up micro sized silicon particles with a nano structured morphology, suitable for the next generations of Li-ion batteries."*, says Dr. Erik Kelder, Associate Professor Applied physics at Delft University. *"This combination of structures prevents many obstacles and safety issues encountered with micron or nano sized silicon alone, and will maintain it's quality during charging and discharging."*

E-magy now available. RGS recently started manufacturing the E-magy silicon in its advanced industrial facility in the Netherlands . The material is now available for broad customer qualification. It is anticipated that E-magy will be mixed into a carbon anode at desired amounts according to customer specific formulations. RGS is currently collaborating with leading industrial customers and with renowned institutes, such as Delft University of the Netherlands and CEA of France. RGS is preparing to extend its advanced industrial facility to GigaWatt (GW) scale. The facility will be extended to a production capacity of 50 tons per year, which will supply a 1 GigaWatt-hour (GWh) of battery manufacturing capacity. *"We believe that our E-magy product, founded deeply in our silicon technology experience, will be instrumental to large scale manufacturing initiatives for battery system"*, says Dr. Axel Schönecker, CTO of RGS. *"This will benefit e-mobility, electronics and large utility storage battery applications - and will support the transition to a zero emission society"*.

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