

Haydale Graphene Industries plc
(“Haydale” or the “Company”)
Supply Agreement with TANTEC A/S

Haydale Graphene Industries plc (AIM:HAYD), the Company focused on enabling technology for the commercialisation of graphene, is pleased to announce it has entered into an exclusive development and supply agreement with Tantec A/S (Tantec), a leading manufacturer of standard and customised plasma reactors.

This rolling two year contract will enable Haydale, in collaboration with Tantec, to continue to develop the functionalisation process to meet customer specific needs, both in terms of quantity of materials and the level of functionalisation.

The first bespoke Tantec built reactor arrived in June and has been successfully commissioned leading to Haydale having the confidence to order new units. As announced in Haydale’s preliminary results on 30 September, Haydale is due to receive two new reactors from Tantec in December 2014 to increase capacity and operational flexibility. The Tantec machines are significantly more advanced than the previous units providing greater control and precision with a consequent positive impact on performance. An added feature is the ability to monitor and control the reactor remotely which is essential as Haydale seeks to install the reactors into customers’ production facilities.

Haydale has recently been testing the functionalisation of resins for use in composite materials and has seen significant improvements in material properties including toughness, and an increase in excess of 200% in the ultimate tensile strength when using just 2% loading of Haydale functionalised graphene nano platelets (“GNPs”). This corroborates previously reported third party studies (J.APPL.POLYM.SCI 2014, DOI: 10.1002/APP.40802) when using HDPlas® materials. To achieve such improvements with a relatively small amount of functionalised GNPs demonstrates that low levels of properly functionalised GNPs can make a significant difference to large volumes of material.

Haydale’s collaboration with Tantec will facilitate Haydale providing properly functionalised graphene consistently and the ability to scale up volumes to accommodate future demand.

Ray Gibbs, CEO at Haydale, commented:

“Having already commissioned our first Tantec reactor and established a track record of performance to date, we are confident in its engineering and build quality. As a result we have agreed an exclusive supply agreement and ordered two new units. These machines not only provide us with required capacity increase but importantly provide a flexible operating capability to rapidly meet customer requirements. We also have a continual program of reactor developments to enhance the features and benefits of the machines which is expected to generate additional intellectual property to add to our existing “family” of patents.

The market reaction to the third party verification of our process and the results we have obtained with customers have led to enquiries for the use under license of a reactor. We have therefore ordered a larger unit to provide us with further capacity and also act as our “licensing” demonstrator.”

Kim Saabye, European Sales Director and partner in Tantec, added:

“Tantec is looking forward working to developing its relationship with Haydale and we are pleased to have reached this agreement with a company that has the know-how to use our reactors to functionalise materials to meet the specific needs of their customers.”

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About Haydale

Haydale has developed a patent-pending proprietary scalable plasma process to functionalise graphene and other nanomaterials. This enabling technology can provide Haydale with a rapid and highly cost-efficient method of supplying tailored solutions to enhance applications for both raw material suppliers and product manufacturers.

Functionalisation is carried out through a low-pressure plasma process that treats both mined, organic fine powder and other synthetically produced nanomaterial powders, producing high-quality few layered graphenes and graphene nanoplatelets. The process can functionalise with a range of chemical groups, with the level of functionalisation tailored to the customer's needs. Good dispersion improves the properties and performance of the host material and ensures the final product performs as specified.

The Haydale plasma process does not use wet chemistry, nor does it damage the material being processed; rather, it can clean up any impurities inherent in the raw material. The technology is a low energy user and most importantly environmentally friendly. The Haydale method is an enabling technology, allowing the Company to work with a raw material producer who seeks to add value to the base product and also tailor the outputs to meet the target applications of the end user.

The Haydale view is that the market currently does not require tonnes of functionalised graphene but rather the confidence in the materials performance and the consistent replication of that performance.

Demand will grow with increasing evidence in the performance improvements generated when using graphene. Commercialisation and hence increased demand requires the correct functionalisation of the right graphenes to improve its dispersion leading to enhanced material properties.

Haydale, based in South Wales and housed in a purpose-built facility for processing and handling nanomaterials, is facilitating the application of graphenes and other nanomaterials in fields such as inks, sensors, energy storage, photovoltaics, composites, paints and coatings.

www.haydale.com

About Tantec

The Tantec Group is a privately held company founded in 1974 and is located in Lunderskov, Denmark. It is a leading manufacturer of standard and customised Plasma and Corona systems for surface treatment of plastics and metals to enhance adhesion properties with more than 40 years of experience in delivering and manufacturing quality, high-end surface treatment products for any industry.