

HEV/EV industry growth sparks leap in magnet wire performance

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As the market for hybrid-electric and electric vehicles has grown, so too has the demand for ever-higher performing magnet wires. Suppliers, such as Superior Essex, are gearing up their R&D operations and launching new products tailored to this increasingly important customer base.



The market for hybrid-electric (HEV) and electric vehicles (EV) is growing at a rapid pace. In 2011 there were less than 100,000 EVs on the road globally. Today there are more than a million. During this time HEV and EV manufacturers have worked hard to gain public acceptance, by improving both the efficiency and reliability of their electric motors. One way they have achieved this higher performance is by using ever higher grades of electrical steel in the magnetic cores. Automakers, at the same time, have placed greater demands on their winding wire suppliers, asking for higher dielectric strength, thermal performance and resistance to chemicals from the magnet wire insulation.

“Keeping pace with the speed of development in the HEV and EV industry has been challenging to say the least but rewarding at the same time,” says Baber Inayat, Vice-President of Technology & Customer Care at magnet wire supplier, Superior Essex. “We’ve always made incremental improvements to our products but the last few years have required us to make serious investments in our R&D operations and make a leapfrog in technology. We’ve also been working closer than ever before with motor designers and co-innovating with them to ensure the best possible performance from their end product.”

Superior Essex innovations in response to the demands of the HEV and EV markets have spanned both materials and processes. Last year the company was granted a patent for a brand new magnet wire insulation for higher voltage applications, which it will be promoting at the forthcoming CWIEME Berlin exhibition for coil winding, insulation and electrical manufacturing. The magnet wire supplier has also installed a state-of-the-art surface flaw detection system as part of its standard manufacturing process to gain a competitive edge in product quality.



Figure 1. High Voltage Magnet Wire for HEV/EV Applications



Figure 1. Inline Surface Flaw Detection System

Meanwhile, Superior Essex has sought to cater to differing regional requirements of the HEV and EV industries. So far the USA has proved the biggest driver of HEV and EV growth, closely followed by China and Japan. Significant gains have also been made by several European automakers.

“In the spirit of positive performance and competition, each automaker around the globe has developed distinct motor designs requiring diverse magnet wire characteristics to differentiate themselves. Sourcing the right magnet wire locally can be tricky, if a customer decides to begin manufacturing their design on a new continent. As one of the largest magnet wire suppliers in the world with global manufacturing locations, we have the knowledge and expertise to deliver the right combination of characteristics regardless of where the motor is being manufactured and where it was originally designed,” Inayat says.

Seminar and panel discussion

Along with its new magnet wire insulation, Superior Essex will be showcasing this global knowledge and experience at CWIEME Berlin. Baber Inayat will begin with a 40-minute seminar, entitled ‘Technical Advancements in Magnet Wire for Automotive

HEV/EV Applications’, at the CWIEME Central theatre on Wednesday, May 11th at 15:25. He will discuss how the performance required by the automotive industry is pushing the limits of current magnet wires and insulation systems and how wires for various motor architectures have been designed to resolve issues relating to HEV/EV applications, such as partial discharge and chemical resistance.

Inayat will then be joined on stage for a 20-minute panel discussion by the Superior Essex global hybrid and electric vehicle team – Wilfried Von der Heide, Director of Technology & Customer Care for Superior Essex Europe; Albert Lee, Executive Director of Technology & Customer Care for Superior Essex China; and David Cain, Manager of R&D and Technical Services for Superior Essex North America. The team is keen to take questions from the audience but will also be available throughout the show at the Superior Essex booth (4.2 / A29) to help with any technical queries. Experts will be on hand at the booth to discuss challenges and potential solutions in the energy, industrial, and commercial and residential segments as well.

“Our CWIEME Berlin panel has a combined 75 years of experience within the magnet wire industry. Several of us have also worked as engineers at electric motor OEMs so we understand very well many of the technical challenges our customers face. CWIEME Berlin is a very prestigious forum for the magnet wire world – most of our customers in the automotive industry will be there – and I look forward to sharing our knowledge and expertise as it relates to leading-edge automotive HEV/EV applications. I’m anticipating some very interesting and worthwhile discussions,” Inayat concludes.

About Superior Essex

Superior Essex is a global leader in the design, manufacture and supply of wire and cable products. Our Magnet Wire and Distribution business segment is the world’s largest producer of magnet wire, also known as winding wire. Magnet Wire is an insulated copper or aluminum conductor used by major original equipment manufacturers and distributors. Magnet wire is found in industrial motors, transformers and generators, automotive applications, electrical coils and controls, and appliances. It is also used in motor and transformer repair.