

Great potential in China

Wind energy is a booming industry in China as the country searches for cost-efficient solutions to meet the almost insatiable demand for energy of its fast growing economy. "In fact, China has one of the world's largest potentials for wind energy with the wind turbine business having grown at 40% per year between 2000 and 2006, and with 105% growth in 2006 compared to a global increase of 25% per year", explains Rob van de Laarschot, New Business Development Manager, at DSM Composite Resins.



"China's spiraling growth in wind energy production is further fueled by the Government's desire to work towards a cleaner environment", continues Rob van de Laarschot. "While foreign companies have taken the lead in producing wind turbines, domestic companies are now beginning to catch up and develop their own technologies. With both foreign and domestic companies involved, wind energy and wind turbine blade production in China is an extremely promising and exciting application and market for DSM Composite Resins."

Turbine blades

In efforts to keep pace with energy demand in China and countries worldwide, larger and larger wind

Wind energy is a booming industry in China as the country searches for cost-efficient solutions to meet the almost insatiable demand for energy of its fast growing economy.
Photos: DSM

turbine blades are being designed to transfer more and more energy from the wind. While some 20 years ago, a 20 m long blade was considered enormous, a blade of this size is small compared to today's largest blade, which is over 60 m in length. According to Rob van de Laarschot, there are even bigger blades on the drawing boards of up to 70 m in length. These are to be manufactured in new types of structural resins and adhesives based on new generations of structural resins which DSM is developing.

The Company

DSM Composite Resins is part of DSM Resins, a group within the Performance Materials cluster of DSM. DSM Composite Resins is the largest producer of structural resins in Europe with a technically innovative portfolio of resins and gelcoats. The company is expanding globally, especially in China, targeting high added-value segments. Customers are served via dedicated Competence and Expertise Centers and the company owned European FRP distribution business, Euroresins. Since DSM Composite Resins is also the global market leader in Sizing & Binders, vital functional and performance components used in the production of glass fiber reinforcements, the company can claim unique competencies throughout the composites value chain.

As van de Laarschot explains, "the wind turbine blade market has largely been dominated by epoxy resins. But to follow the trend of producing large series of bigger blades in shorter time, fast processing times are key. Producers are looking to adapt blade design and to change production processes; they want higher fiber content and thus greater stiffness and strength with a better size/weight ratio for lower production costs.

In line with these developments, DSM has recently released a second generation of unsaturated polyester resins in the well known Synolite 1777 series. These resins are now penetrating the wind turbine blade market. When combined with glass fiber reinforcement and the right sizing, Synolite 1777 resin has very high mechanical properties. Blade manufacturers supplying the Chinese market are now discovering the advantages. As well as a lower cost of the material, this new generation of unsaturated polyester resin is much lower in viscosity compared to epoxy and does not require post-curing. This makes processing faster and easier and so offers further cost advantages.

Another significant consideration for blade manufacturers is that Synolite 1777 resins can be produced locally in DSM's Nanjing plant. "Local production will become even more decisive in the choice of resin supplier. As blades become larger and larger, transport is the key issue not only because of cost but also logistics. Local production is therefore a must", says Rob van de Laarschot.

Sizing for glass reinforcement

DSM has recently launched a new sizing for the glass fiber reinforcement of the resin for wind-turbine blades. Neoxil 728 sizing will be produced at DSM's dedicated Neoxil sizing plant in Shanghai, China,

in Q1, 2008 and can also be produced in the Neoxil plant in Filago, Italy.

DSM Business Director Neoxil Sizings and Binders, Remko Goudappel, explains, "DSM believes that local production of consist-



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ent, high quality sizing for glass fiber reinforcement will meet a growing need of China's burgeoning domestic production of wind energy generators." Until now, most glass fiber manufacturers in

China have produced their own sizing in-house. It is very challenging to achieve and maintain a consistent high quality sizing, which is a critical component in the strength and rigidity of wind turbine blades.

Neoxil 728 sizing is a low molecular weight epoxy with a high solid content and has excellent mechanical properties preventing glass fiber from breaking and making the glass fiber compatible with the resin matrix. Furthermore, low migration properties reduce the cost of glass fiber production. For glass manufacturers in China, local production of purpose-designed Neoxil 728 sizing will ensure a consistent high performing solution.

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