Sabic’s New LNP Colorcomp Compound Uses Nanotechnology to Enable Differentiated Foams

2021-01-29
SABIC introduced LNP™ COLORCOMP™ WQ117945 compound, a breakthrough material based on advanced nanotechnology that facilitates efficient production of polyethylene terephthalate (PET) foams for core materials in sandwich structures. This new compound improves control over nucleation and cell growth, resulting in decreased cell size and uniform, narrower cell size distribution.

These attributes can reduce the foam’s weight by minimizing resin uptake in sandwich structures. It can also potentially improve shear strength/strain properties for better fatigue performance. Enhancing PET foams with SABIC’s new LNP COLORCOMP compound can address the evolving needs of multiple industries, including marine, building and construction, packaging and wind energy.

“Our novel LNP COLORCOMP WQ117945 compound may help to expand adoption of PET foam materials in a wide range of applications, from building insulation and cladding, to boat hulls and decks, to the core of wind turbine blades,” said Sunamita Anunciação, LNP Business Development Manager, SABIC. “In addition to improving PET foam’s mechanical properties, our technology helps reduce weight, which opens new opportunities for sustainability. For example, lighter foam core materials can allow designers to create longer, more-efficient wind blades. Lighter materials also reduce environmental impacts from shipping. Working with our customers, SABIC continues to develop solutions that advance multiple aspects of performance and sustainability.”

CORE MATERIALS FOR WIND ENERGY

Disposal of wind blades is becoming a global concern. Due to their huge size and complexity, most blades are currently sent to landfills. The adoption of PET foams in the core of wind

turbine blades offers the industry a strong, light, recyclable option over incumbent materials, such as balsa wood and PVC foam.Weight reduction is also a key issue in wind blade design. Extending blade length to increase the amount of captured energy adds significant weight to the blade. SABIC's LNP COLORCOMP WQ117945 compound can significantly reduce foam cell size (as much as three-fold) compared to standard nucleating agents such as talc, while decreasing cell size disparity by a factor of up to five. These factors help to reduce resin uptake by the foam during composite manufacture, resulting in a lighter-weight blade.

In terms of strength and other mechanical properties, high-density PET foams can potentially compete with balsa wood, while avoiding wood's natural variations. Further, as thermoformable polymers, PET foams offer greater freedom in the design and shaping of wind blades as compared to balsa. They also offer stable supply, cost-effectiveness, consistent material properties and much less resin uptake.

BEYOND PET

Besides being used as an effective nucleating agent for foaming processes such as extrusion foaming, injection foaming and bead foaming, SABIC's new nanotechnology solution can also act as a rheological modifier for improving melt strength and thermoformability. The nanotechnology SABIC is using can be adapted for other resins besides PET, making it a good candidate for use in a wide range of different industries.

Graphs and images show cell analysis of polyethylene terephthalate (PET) foam produced using conventional nucleating agents compared with PET foam produced using SABIC's new LNP™ COLORCOMP™ compound. This new compound improves control over nucleation and cell growth, resulting in decreased cell size and uniform, narrower cell size distribution.

Read the original article on SABIC.