



**Westlake Chemical
Corporation**

Epolene® E-43 as a Compatibilizer for Nylon/ Polypropylene Composites

Interest in polymer alloys and blends has greatly increased in recent years. However, a problem encountered by compounders when blending polymers is incompatibility/immiscibility of one polymer with another. This can lead to delamination of one polymer from another and poor physical properties in an alloy.

To overcome the problems caused by immiscibility, a compatibilizer is often added. A compatibilizer can be defined as a material that is added to a polymer blend to improve physical properties, processing, or long-term stability of the polymer blend. Compatibilizers often improve the dispersion of the minor polymer in the major polymer phase, resulting in a reduction in particle size. The use of maleated polypropylene, such as Westlake's Epolene E-43, as a compatibilizer for nylon/polypropylene blends has been known for some time.

Epolene E-43 can be incorporated into the polymer blend by adding it in pellet form or by adding it in powder form to a dry blend of the component polymers. For maximum dispersion, a concentrate of Epolene E-43 in the polyolefin can be prepared. This concentrate can then be dry blended with the component polymers. Once the dry blend is prepared, the extrusion and molding processes would follow.

The addition of 0.25%-1% of Epolene E-43 wax to 90% nylon 6/10% polypropylene blends resulted in improvements in physical properties (Table 1) and a reduction in the particle size of the polypropylene phase in the nylon matrix (Figure 1). Hardness, flexural properties, and other physical properties were not significantly affected. Similar trends were observed for 90% polypropylene/ 10% nylon 6 blends (Table 2 and Figure 2). Thus, when a compounder has a need to blend nylon with polypropylene, Epolene E-43 wax at low addition levels can lead to a product with higher tensile strengths and unnotched impact strengths, as well as improving the dispersion of the minor polymer in the blend.