Toughened Polylactic Acid

Technology #20150168

Toughened Polylactic Acid

Brittle thermoplastics such as polylactide/polylactic acid (PLA) can be significantly toughened with amphiphilic block copolymers. Using the block copolymer (less than 10% by weight) in a blend with PLA improves thermoplastic tensile toughness and maintains PLA transparency (even at higher loadings). The strengthened blend can be prepared by either solvent or melt blending and only requires a low loading (~2.5%) to obtain toughening.

Stronger Thermoplastic

Polylactide, a biodegradable polyester, is an attractive replacement for nondegradable petroleum-derived thermoplastics. While PLA exhibits high strength and modulus, it is brittle and unsuitable for applications requiring high impact strength and ductility. The methods used in this technology yield substantial improvements over conventional PLA: increased ductility (20x), tensile toughness (10x) and thermoplastic tensile toughness and breaking strain (more than 5x).

BENEFITS AND FEATURES:

- Increases PLA’s ductility (20x), tensile toughness (10x) and thermoplastic tensile toughness and breaking strain (more than 5x)
- Prepared by either solvent or melt blending
- PLA transparency maintained even at higher loadings
- Low loading needed to obtain toughening (~2.5%)

APPLICATIONS:

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• Additive to polylactic acid

**Phase of Development** Proof of concept

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