

ENTEK

Title:

Innovative Color Compounding applied to a renewable pigment. A Collaborative Approach to Circular Plastics

Abstract:

As global recycling regulations continue to evolve, material selection and processing technologies play an increasingly critical role in improving plastic circularity. This presentation highlights the collaborative work between ENTEK and BioRegion Technology (BRT) to address the recyclability limitations of carbon black pigments in plastics, the difficulties associated with compounding bio-based fillers and a novel solution to achieve a highly filled Bio-based carbon black compound.

BioRegion Technology has developed TruBlack™, an organically certified, 100% bio-based IR-reflective pigment designed to provide the appearance and performance of traditional carbon black while improving near-infrared (NIR) detectability during recycling. Unlike conventional carbon black, which absorbs the majority of infrared signals and can render plastics undetectable to automated sorting systems, TruBlack™ enables improved material identification and recovery.

The presentation will also explore ENTEK's development of a highly densified (HD) pellet process for cellulose and other bio-based fillers. Using co-rotating twin-screw extrusion technology combined with downstream pellet densification, the process creates polymer-coated filler pellets that offer improved handling, reduced dust generation, increased bulk density, enhanced throughput, and lower carrier polymer requirements compared to conventional masterbatch technologies.

Together, these innovations demonstrate how material science and advanced extrusion processing can work together to improve recyclability, manufacturing efficiency, and sustainability across the plastics value chain.