

Abstract

For a presentation at Renewable Materials Conference 2026

From Compostable to Capable: Tailoring Biobased Polyesters via Additivitation

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Biobased aliphatic polyesters such as PLA, PHA, PHB and PBS are cornerstone materials for fossil-free plastics, already entering markets from packaging and consumer goods to automotive components. However, their wider adoption in technically demanding applications is still limited by long-term stability, controllable biodegradation and insufficient fire performance. At Fraunhofer LBF we develop additive solutions that transform these polymers into robust, application-ready materials for high-value sectors.

The presentation provides an overview of recent advances in long-term, hydrolytic and UV stabilization of biobased polyesters. Tailored stabilizer packages and processing conditions significantly extend service life under thermal and humid exposure, while preserving desired end-of-life options. We show how additive selection and morphology control enable “durable-then-degradable” materials: long usage phases followed by accelerated biodegradation under defined conditions.

A second focus is flame retardancy of PLA, especially in films and foams relevant technical applications. The presentation demonstrates halogen-free systems and novel biobased flame retardants, exhibiting compliance with typical fire standards.

Participants will gain practical guidelines on how to design fossil-free plastic formulations that combine high renewable content with durability, safety and controlled end-of-life, accelerating the market penetration of biobased polyesters.