



Creating biodegradable polyurethane coatings

Degradable coatings will increase the biodegradability of coated materials and simplify waste treatment by removing coatings from textiles. With consumers increasingly becoming aware of the negative environmental impact of plastic waste and microplastics, there is a growing demand for sustainable and environmentally friendly products. As a result, companies must switch to biodegradable materials to meet market demands.

PU waste is commonly disposed of in landfills due to its low sensitivity to physical, chemical, and biological factors, as well as the toxicity of some combustion products.

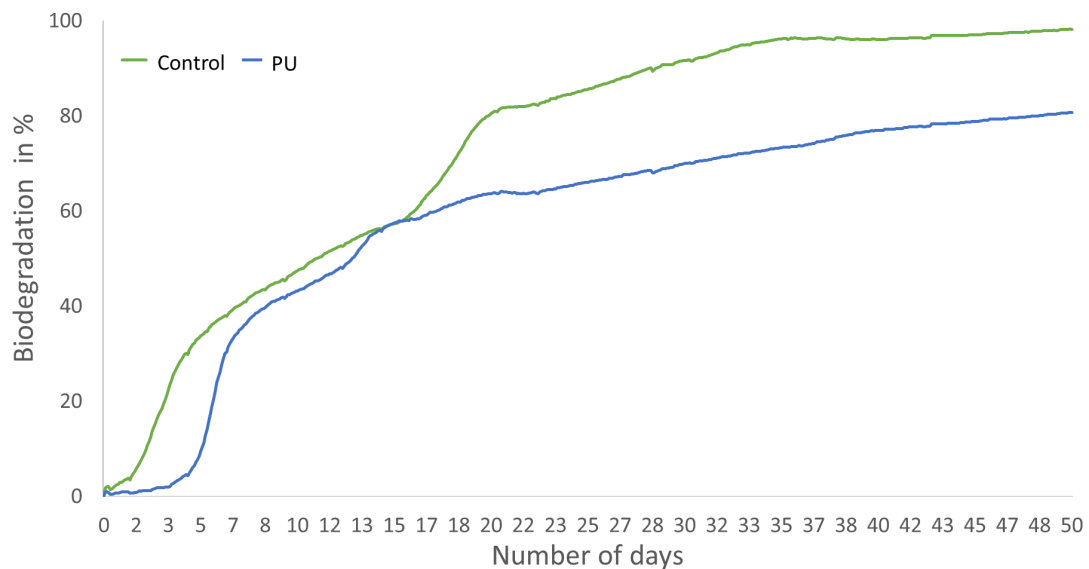
The Cornet project GUINEA, managed by Centexbel and FILK, develops degradable PU dispersions and coatings and assesses enzymes to degrade PU.

These coatings aim to increase the biodegradability of PU coated substrates, simplifying waste treatment and minimizing the environmental impact.

The use of biodegradable textile coatings minimizes pollution during the user phase (by avoiding the formation of persistent microplastics through abrasion) and increases the recyclability of coated polyester or polyamide textiles by selectively removing the PU coating through enzymatic degradation.

The soil burial test was used to evaluate the disintegration of PU coatings. Results showed that PU coatings with lower crosslinking degrees disintegrated significantly within 2 to 8 weeks. Incorporating hydrophilic groups in the PU backbone promoted disintegration, while higher crosslinking degrees decreased it. Biodegradation was assessed using a respirometer to measure CO₂ formation and O₂ consumption. The amount of CO₂ formed can be used to determine the level of biodegradation.

The graph illustrates the biodegradation of a PU dispersion developed in the Guinea project. A readily biodegradable hide powder was used as a control sample. Within 50 days, 80% of the PU had degraded. Initial experiments indicated that enzymes could also degrade PU under optimized conditions.



For more information about the Guinea project and the possibilities to test biodegradable PU in your products, please contact Guinea project manager David De Smet.

dds@centexbel.be

Mobile: +32 489 871 019

Phone: +32 9 241 86 84

<https://www.centexbelpresents.be/en/guinea>