



Session 7	Scale-up of novel biomaterials and processes, powered by INN-PRESSME
Pitch Title	Sustainable materials for additive manufacturing
Company	Aitiip
Speaker	Raquel Navarro Miguel
Keywords feedstock	Biobased materials
Keywords technology	3D printing, biobased materials, additive manufacturing, natural fibers, sustainability
Keywords End-Product	Consumer and automotive goods

Abstract:

The use of bio-based materials as a sustainable alternative to fossil derivatives is growing in several industries, including transport, and consumer goods. The European Project INN-PRESSME (Grant Agreement N° 952972) focuses on the development of bio-based polymers reinforced with natural fibers to obtain industrial composite products more sustainable and environmentally friendly. Tailoring natural fibers such as flax and hemp are getting more attention as alternative for synthetic fibers (like carbon fibers or glass fibers) because are relatively low cost, comes from renewable resources and have high specific strength and stiffness.

Research includes thermoplastic polyurethane (TPU), which is being investigated as a replacement for synthetic rubber in footwear due to its flexibility and abrasion resistance. In automotive applications, bio-based polyamide 10.10 (PA 10.10), made from 99% renewable resources, is being considered as a substitute for conventional polyamides. The incorporation of natural fibers in both materials enhances their mechanical properties and aesthetics, while also enabling their use in emerging manufacturing technologies like 3D printing.

Additive Manufacturing, particularly Fused Filament Fabrication (FFF), offers potential for using these new materials sustainably. However, challenges in processing TPU (e.g., clogging during extrusion) and PA 10.10 (e.g., shrinkage issues) were encountered. Optimization of processing parameters allowed successful prototyping of shoe soles and automotive components that meet industry specifications.