SSbD4CheM Project For New Innovative And Sustainable Materials

Mine TÜrkay Kankiran*[1] and Onur Çelen*[†]

[1]KORTEKS MENSUCAT SAN.TİC.A.Ş. – Turkey

Abstract

The European Horizon project **SAFE AND SUSTAINABLE BY DESIGN FRAMEWORK FOR THE NEXT GENERATION OF CHEMICALS AND MATERIALS (Ssbd4Chem, Grant No. 101138475)** aims to support the development of safe and sustainable chemicals and materials by integrating environmental, health and circularity aspects into product design. The project brings together industrial and academic partners through three demonstration cases focusing on the automotive, textile and cosmetics sectors.

KORTEKS contributes to the textile demonstration by developing sustainable textile structures compatible with PFAS-free functional coating systems. The objective is to obtain antibacterial and self-cleaning textile surfaces while minimizing environmental impacts throughout the product life cycle. Within this scope, three different yarn types were produced: conventional polyester (PET), recycled polyester (rPET) and polylactic acid (PLA). These yarns were subsequently converted into woven and knitted fabric structures to serve as demonstrators for coating applications and microplastic emission studies.

The textile case also addresses the development of experimental and analytical methodologies for the identification, quantification and monitoring of nano- and microplastic particle emissions released from textile materials during use. In parallel, life cycle assessment (LCA) studies are being performed to evaluate the environmental performance of the developed products and to establish a methodology that can be integrated into future digital product passport systems.
The results obtained within the project are expected to contribute to the development of next-generation textile materials combining reduced carbon footprint, lower microfiber release and PFAS-free functional performance. The study demonstrates how material selection, textile structure and sustainable finishing technologies can be integrated within the Safe and Sustainable by Design (SSbD) framework to support the transition towards environmentally responsible textile products.

Keywords: Safe and Sustainable by Design (SSbD), PFAS, free coatings, Sustainable textiles, Polyester (PET), Recycled polyester (rPET), Polylactic acid (PLA), Microfiber emissions, Life Cycle Assessment (LCA

*Speaker
[†]Corresponding author: onur.celen@zorlu.com