KEEP IN TOUCH

tornado.project@tecnalia.com

tornado-project.eu

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TORNADO

New routes of safe and sustainable by design water and oil repellent biobased coatings

PARTNERS

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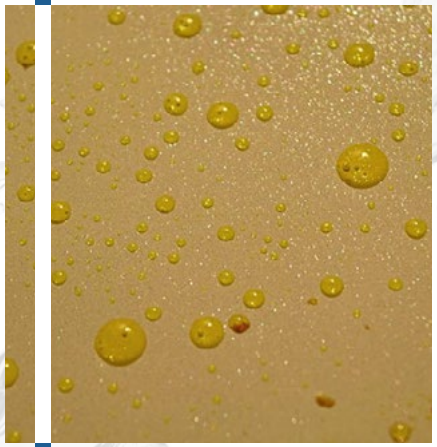
WHY TORNADO

TORNADO project aims to contribute to the transition to a **safe circular economy** by influencing how products should be designed, produced, used or treated at their end-of-life.

New organic and hybrid free-toxic coatings with water and oil repellence following **Safe and Sustainable by Design (SSbD)** criteria will be developed. The novel proposed coatings will be **PFAS free**.

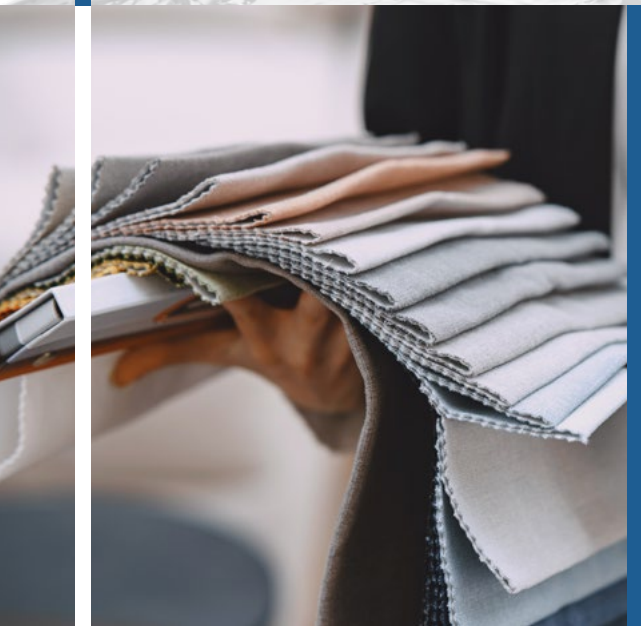


HOW IT WORKS

TORNADO idea is to research and develop:

1. Two new type of **functionalized acrylated biomonomers** with PDMS and POSS by two different chemical routes (acrylation and direct acrylation).

2. To synthesize and formulate **2 new biobased coatings** based on the functionalized biomonomers by two technologies, **waterborne organic** and **hybrid coatings** and **hybrid sol-gel coatings**.



Biomonomers and coatings will be **scale up** in an industrial environment. Coatings will be applied by different industrial processes depending on the industrial field. The two **coatings** will be validated in industrially relevant environments to obtain a **performance at least identical to PFAS coatings** in terms of **water and oil repellence** and tested according to the main **textile, packaging and kitchenware** specifications and requirements (waterproofness, oxygen barrier and durability, respectively).

The improvement in environmental performance and circularity of the new coatings will be assessed through environmental **Life Cycle Assessment, Life Cycle Cost, and social Life Cycle Analysis** (LCA/LCC/s-LCA) of the proposed new coatings compared to traditionally used hazardous coatings. **Computational tools** will be developed for efficient interfacing with publicly accessible and accepted **QSAR-models** to facilitate ease-of-use **in-silico prediction** of required physiochemical properties, toxicological end-points and degradation.