



## WHITECYCLE CHALLENGES COMMON MISCONCEPTIONS ABOUT TEXTILE AND TEXTILE RECYCLING



Co-funded by the  
European Union  
Project Number : 101036908

Mr. know it All



All textiles are the same and can only be used for clothing.

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Textiles that you use everyday are broadly categorized into two groups: **standard textiles and technical textiles.**

The latter refers to textiles engineered for specific functional purposes. They are designed with unique performance properties, making them suitable for industries like fashion, medical, automotive, aerospace, and more.

Technical textiles often incorporate multiple layers, blended fibers (e.g., polyester-cotton blends), and specialized treatments (e.g., water-repellent finishes) to enhance their functionality.



There is no interest in recycling textiles.

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Recycling textiles reduces the amount of valuable materials sent to landfills and incinerators, which in turn decreases CO<sub>2</sub> emissions from incineration and helps prevent potential soil pollution from landfills.



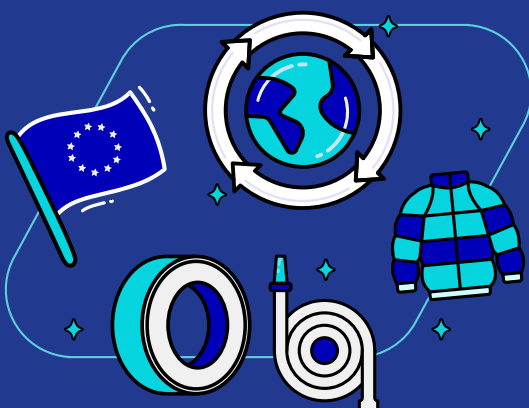
In Europe, only about 2% of collected textile waste is recycled into higher-value applications, such as textile fibers for garments<sup>1</sup>.

This recycled portion consists almost entirely of standard textiles, with minimal inclusion of technical textiles.



### Good examples of technical textiles could be:

- ✓ Jackets and coats may be composed of multiple layers, nylon or polyester blends, featuring options such as waterproof coatings and synthetic insulation.
- ✓ Textile reinforcement in the tire, designed to enhance its strength, durability, and overall performance.
- ✓ Textile reinforcement in hoses, designed to provide enhanced strength, flexibility, and pressure resistance.





**There are no solutions for implementing technical textile recycling at large scale.**

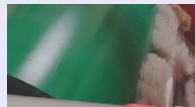
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**WhiteCycle effectively develops for technical textile at pre-industrial scale:**

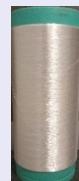
- ✓ A macro-sorting identification system, specifically designed to detect the presence of PET<sup>2</sup> in textile streams, enabling the recycling of PET-containing textiles.
- ✓ Scalable waste pre-treatment processes to enable PET enzymatic biorecycling<sup>3</sup>.
- ✓ Production of recycled PET shaped into yarn and cord, intended for the manufacturing of technical textiles used in clothing, tires reinforcement and hoses.



Prototype developed by IRIS



Electrostatic separation<sup>4</sup> developed by P'



Recycled PET produced from monomers<sup>5</sup> resulting from CARBIOS' enzymatic biorecycling



**All textiles are easily recyclable.**

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**That is not true for technical textiles. Many challenges arise in recycling this type of textile:**

- ✓ Currently, no complete industrial recycling processes have been established for these materials.
- ✓ As these materials are complex, it is necessary to first characterize them to identify the types of fibers they contain, determine if they have been treated, or assess any contamination.
- ✓ Next, the materials need to be separated based on their composition to facilitate their recycling.



1. The European market potential for recycled fashion, CBI Ministry of foreign Affairs, 2024

2. PET Polyethylene Terephthalate

3. Enzymatic biorecycling refers to the use of enzymes (biological catalysts) to break down PET waste into its original monomers (PTA – Purified Terephthalic Acid and MEG – Monoethylene Glycol)

4. Electrostatic separation is a process used to separate particles based on their electrical properties.

5. Monomers are molecular units that can join together to form larger molecules called polymers through chemical reactions like polymerization.



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