

New approach to recycling synthetic textiles

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A new approach to recycling textiles made from polyethylene terephthalate (PET) is discussed in the *International Journal of*

Technology Management and demonstrates environmental benefits in terms of life cycle assessment.

Lynn Luedemann, Andreas Felber, and Marcus Golder of the Institute of Materials Handling, Conveying and Plastics Engineering at Chemnitz University of Technology in Chemnitz, Germany, point out that recycling is an important part of efforts to reduce our [carbon footprint](#) as well as avoiding pollution. Indeed, there is a rather pressing need to ensure that materials, such as plastics, manufactured from petrochemicals are not simply incinerated, dumped, sent to landfill at end of life nor ended up fragmented and destined for the oceans. There are multiple pollution issues such as [climate change](#) and microplastic waste in our ecosystems to consider.

PET is mainly used in the manufacture of textile fibers, which represents almost two-thirds of use whereas [bottles](#) account for just under a third of applications of this plastic. While, different recycling processes exist for PET bottles and other containers, there is no straightforward method for recycling PET fibers.

The Chemnitz team has developed an approach to recycling PET fibers from textiles that can offer a 60% improvement on environmental impact of these materials at end of life. Of course, the recycling process must offset the energy, materials, and other resource costs to represent a [sustainable approach](#) to recycling and the team has now demonstrated proof of principle in this regard.

Given that half of all the world's clothing is made from polyester, amounting to more than 100 million tons every year, this could represent a significant step towards reducing the carbon footprint and waste stream. It will also have an impact on reducing our dependency on limited supplies of petrochemical feedstock. Indeed, the team's calculations show that the biggest environmental and sustainability

impact of their project will be in the savings on [raw materials](#) offered by the [recycling process](#).

However, the team offers a word of caution as concerns remain if we continue in our seemingly endless dependency on synthetic fibers. Recycled synthetic fibers might offer considerable savings on resources but still have a greater environmental impact than natural fibers obtained from hemp, wool, and cotton. There are asymmetries to in how we evaluate products when comparing textiles, their uses, the waste they generate, and their recycling. Recycling is a critical part of moving towards a [sustainable future](#), but it is just one part of a much bigger picture and we are yet to paint that picture clearly.

More information: Lynn Luedemann et al, Development of a recycling process for textiles made from PET, and proof of its environmental preference with life cycle assessment, *International Journal of Technology Management* (2022). [DOI: 10.1504/IJTM.2022.121501](#)

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