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DECOAT Joins forces to close the loop for materials difficult to recycle!

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The EU-funded Project DECOAT is now halfway through the time allotted to investigate triggerable smart polymer material systems and appropriate recycling processes.

The project consortium, led by Belgian R&D centre CENTEXBEL, consists of 17 partners from across Europe from across the value chain including design, manufacturing, NGOs, and research and innovation.

As ambitious plastic recycling targets of 50% have been set by the European Plastics Industry, DECOAT is considering smart solutions to enable the circular use of textile and plastic parts with multi-layer coatings. Many materials consist of more than one chemical component, hindering their recyclability, such as coated and laminated products. Ideally, all the components of an object after its end-of-life should be separated and fed to the most suited recycling streams.

In order to highlight the need of innovations to increase recovery and re-use, DECOAT has joined forces with MultiCycle and ALMA, two other H2020 projects to address this topic.

The Three projects collaborated to include "Closing the Loop for materials difficult to recycle" in the September edition of Waste Management World. The article gives an insight of the innovations supported by the European Union that are making strides to increase the circularity of materials deemed 'difficult to recycle.'To facilitate circularity, these projects focus on key innovations in eco-design, end-of-life, design, and developing novel monitoring systems to optimize sorting and facilitate repair and re-use.

DECOAT focuses on enabling the circular use of textiles and plastic parts with (multilayer) 'coatings', which are typically not recyclable yet.

HOW IS DECOAT WORKING ON ECO-DESIGN FOR THE FUTURE AND IS END-OF-LIFE TAKEN INTO CONSIDERATION?

For the DECOAT project, in view of a circular and sustainable economy, eco-design is important as 80% of the environmental impact of a product is determined during the design phase. Multiple aspects can be taken into ac - count to lower the footprint, like design for repair, design for recycling, design for (dis)assembly, design for composting, design for longevity etc. Some of these design principles go hand in hand, while others are more difficult to reconcile (e.g. compostability and longevity).

Within DECOAT, the main focus is on 'design for recycling'. Multi-layered textiles and plastics are currently being incinerated or landfilled as the presence of a coating or paint hampers the recycling process at end-of-life. By removing the coatings or paints, the bulk material can be recycled, enabling circularity.

The project focusses on implementing triggerable additives into the adhesive layer during the production phase (eco-design). At end-of-life, these additives will be activated by a specific trigger (like heat, microwave, steam), leading to separation of the coatings/ paints and the bulk material. This trigger-based technology developed within DECOAT could also serve for 'design for disassembly' purposes.
A second approach which is being investigated is the use of a dissolution process (Creasolv®). This process, based on green solvents, allows coating/paint layers to be dissolved or delaminated. This debonding process can be applied to conventional products. By choosing a more easily dissolvable coating layer during the design phase, the debonding process at end-of-life can be facilitated.

The bold aim of the four-year project is to decrease landfilling of ca. 75% of the coated parts considered in the DECOAT use cases, which cover clothing, electronic goods and automotive. A reduction in the carbon footprint by at least 30% for the considered products is aimed for. By enabling the recycling of such materials, DECOAT is expected to generate on medium term a novel market of over 150 million in Europe.

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For more information on the project, visit www.decoat.eu