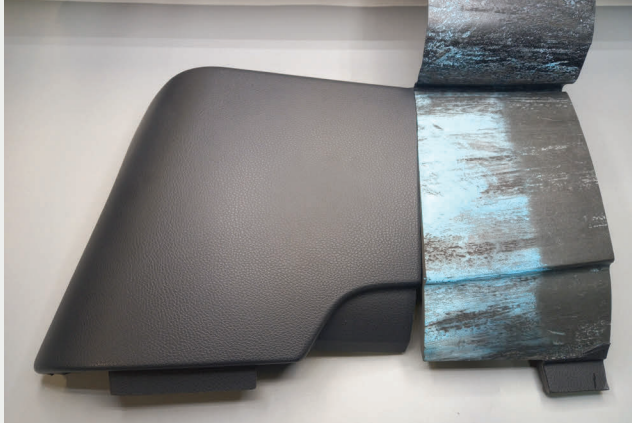


MBT | Bus Cockpit Parts

Up to now, there is no regulation for End of Life Vehicles in the case of buses and trucks. Mercedes Benz Trucks wants to be pro-active and engage in increased recycling.

MATERIALS



- Separate damaged foil coatings from cockpit component used on the dash boards of the buses
- Substrate material is a polyurethane (PUR) foam
- The coating is a PVC foil
- The PVC foil can be mechanically recycled, and PUR recycled chemically

IMPACT

Both parts are currently not recyclable. Yearly production of buses is approx. 25000. The total amounts of PU-PVC parts is approx. 100kg and 15m² per bus respectively.

MBT expects increased recycling will reduce the amount of waste material, as well as the cost. It will also contribute to their aim to achieve zero emissions and promote sustainability.

RESULTS

Validation was carried out with physical material tests and simulation support.

- ▶ Real production parts were successfully decolored using INDAR primer, based on cut samples. Separation was good enough to suggest the possible reuse of the PUR foam (structure of part).
- ▶ The next tests will focus on decolored a full scale part and then rebond the PVC foil (2nd life : reuse).

DECOAT is focused on recycling of painted plastics and coated textiles, which currently present a significant challenge to recycle and end up in landfills or incineration. The project has tested innovative methods to remove the coatings/paints and reprocess the uncoated bulk material, with the aim of recovering high-value materials. The new solutions will improve the sustainability of a range of industries, including packaging, reducing waste and their environmental impact.

DECOAT Innovation Potential

Recycling of Coated Plastic Parts

The current technology often being used is based on chemical bath, which is expensive, prone to contamination, and difficult to implement on small scale. DECOAT is looking to find more environmental-friendly processes that are easier and cheaper to implement. It aims to achieve a removal efficiency of >99% in a single step, leading to higher quality recycled material at a market affordable price.

Recycling of Coated Textiles

The project is working on coating solutions made with recycling in mind, both from the design and materials side. The development is aimed at creating a novel process step prior to the existing pure (thermo-) mechanical or chemical recycling processes. By separating the coating from textile substrate, these solutions will help to enhance the recycling of coated textiles.

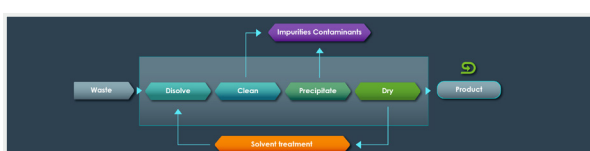
Recycling of Automotive Plastics

DECOAT is developing novel solutions to enhance recycling. The new technologies enable active layer separation, making it easier to upgrade used parts by removing the coating so it can be recoated. It offers the possibility to remanufacture plastic coated parts. DECOAT will be useful to the further development of parts designed for recycling which will enable the growth remanufacturing sector.

DECOAT Technologies

Solvent-Based Recycling

The solvent-based technology from Fraunhofer IVV utilizes a solvent that is able to selectively dissolve specific polymers, leaving behind any other materials or impurities. The dissolved polymer can then be dried and recovered as a pure material. The polymer structure remains intact throughout the process. The process is efficient and environmentally friendly; the solvent mixture is non-toxic and can be reused. The technology has already been successfully used to recycle a wide range of products, including laminated packaging, and multilayer films, and can also be applied to dissolve or delaminate coatings, to recover the uncoated substrate.



Debonding Primer-Based

The INDAR primer from Rescoll is a technology that allows to debond materials on demand using thermal triggering. The primer is deposited between the substrate and coating layer(s). When heated, the primer will separate the material layers, leading to quick and simple coating removal. If needed, the separated materials can be easily cleaned with alcohol after debonding, thus enabling good recycling options with high quality outputs. The addition of the primer has no impact on the functional properties (static and dynamical mechanical properties, fire resistance, etc).

