

Maier | Automotive interior fascia

MAIER wants to validate a coating for the automotive sector that can be easily debonded from the plastic substrate. This will make decorated components easier to recycle so the materials can be reused for the very same applications, which is currently impossible because even the smallest amount of impurities produce surface defects on aesthetical parts and can impact mechanical properties.

MATERIALS



ABS

- Min. and max. process temperature: 210-250°C
- Size: 230x280x80 mm
- Total weight: 200 gr (1,5% coating)
- Coating thickness: ca 40 µm vs thickness of plastic 3 mm
- Coating materials: thermoset PU (acrylates). Two layer. Colour+clearcoat.

RESULTS

Throughout the execution of the project, it was decided to continue working with the ABS material and with the debondable primer from Rescoll (INDAR).

Despite being created for an interior part, the tested paint system is also usable for automotive exterior applications. The system consists of two layers, a color base and a clearcoat that is applied over the debondable primer (INDAR primer). Compatibility of INDAR primer with MAIER's parts and paint system was tested successfully on the following aspects:

- Tape adhesion (initial)
- Thermal cycles (5 cycles -30°C -> +85°C)
- High pressure wash
- Heat resistance (165h +70°C)
- Immersion Bac Ford (10d)

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).

