RE-USE project

Extremely-thin coating for better recycling rates

Packaging for sensitive products such as food and pharmaceuticals are multilayer systems consiting of a mix of materials (including different polymers and functional layers) which make it extremely problematic to recycle. To address this problem, four Frauenhofer Institutes have joined forces as part of the RE-USE project (Recyclable Functional Packaging for the Food and Pharmaceutical Industry Based on ultra-thin Barrier Layers) to develop nanometer-thin barrier layers, which will enable packaging to be made from a single material in future. The amount of secondary material applied to the base polymer is so small that the packaging can be easily recycled as a mono-material.

To ensure these "super barriers" meet the necessary quality standards, Fraunhofer IPM is developing an inline-capable solution, which can thoroughly check (and also regulate) the thickness and composition of the barrier layers during the manufacturing process. This technology relies on the characteristic spectral properties of the different coatings in the infrared region. By shining an infrared light onto the coating at an angle, the system can detect the spectral signature of both the layer itself and the substrate. These spectral characteristics can then be interpreted to give information about the thickness and chemical composition of the different layers.

Funded by the Fraunhofer-Gesellschaft (PREPARE project)

Sensitive products are often packaged using compound materials; however, equivalent packaging made from mono-materials is much easier to recycle.

from: Fraunhofer IPM: Measuring, Monitoring, Optimizing. Annual report 2021/2022, Freiburg i.B., 2022. p. 33