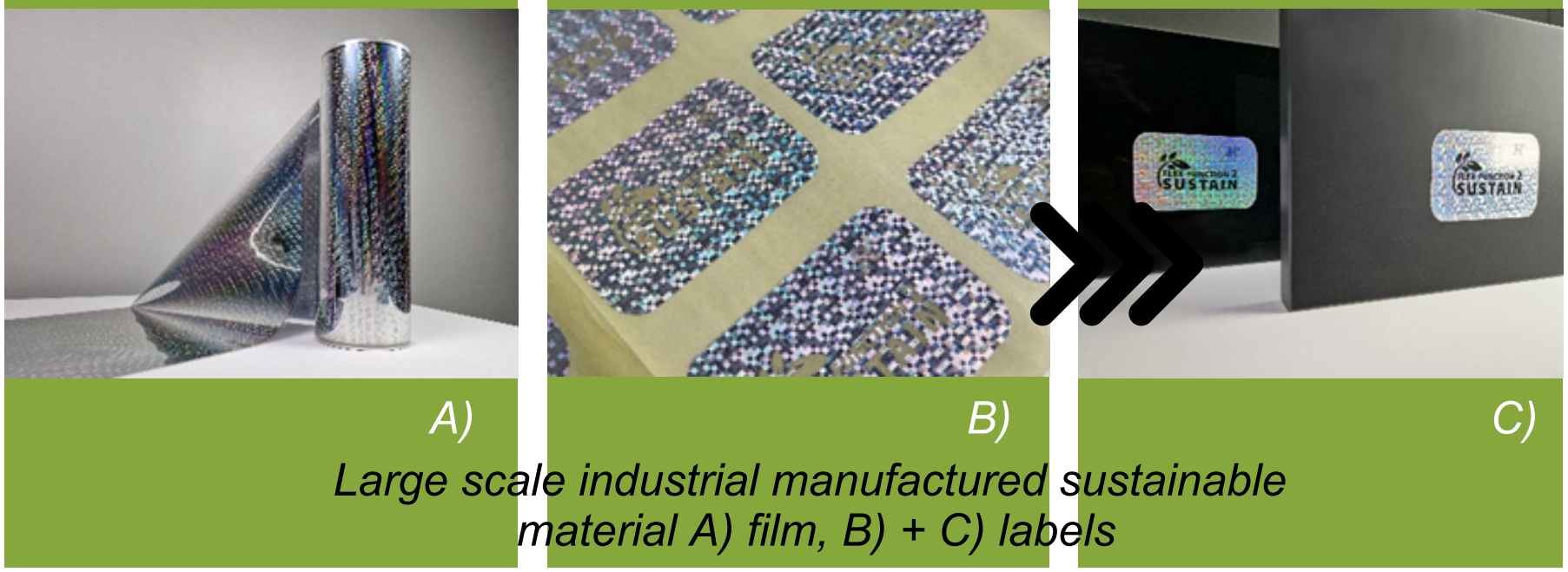
FLEX FUNCTION 2 SUSTAIN

Hueck Folien

Revolutionizing Optical Films: Sustainable Biodegradable Films for Security & Design



A) *B)* *C)*

Large scale industrial manufactured sustainable material A) film, B) + C) labels

CUSTOMER TESTIMONIAL

Hueck Folien takes a holistic approach to sustainability along the dimensions of people, the environment and the economy. As a production company and a global specialist for visually sophisticated and functional surface coatings, we bear special responsibility - the areas of energy efficiency and resource preservation therefore have high relevance and priority for us. This includes the eco-friendly selection of raw materials and processes.
With its holistic approach, the FlexFunction2Sustain project offers a comprehensive platform and has helped to intensify our efforts to improve processes and product developments in terms of environmental protection. Participation in the project makes a very important contribution to achieving the Hueck Folien sustainability target of ecologically neutral production in 2035.

Dr. Stephan Trassl Senior Manager Research

OITB SERVICE PROVIDERS

- *TiOx coating (Fraunhofer FEP)*
- *UV-bio resin and imprinting (Joanneum Research)*
- *Compostability tests and Life cycle analysis and recycling tests (IPC)*

https://www.hueck-folien.com
www.flexfunction2sustain.com

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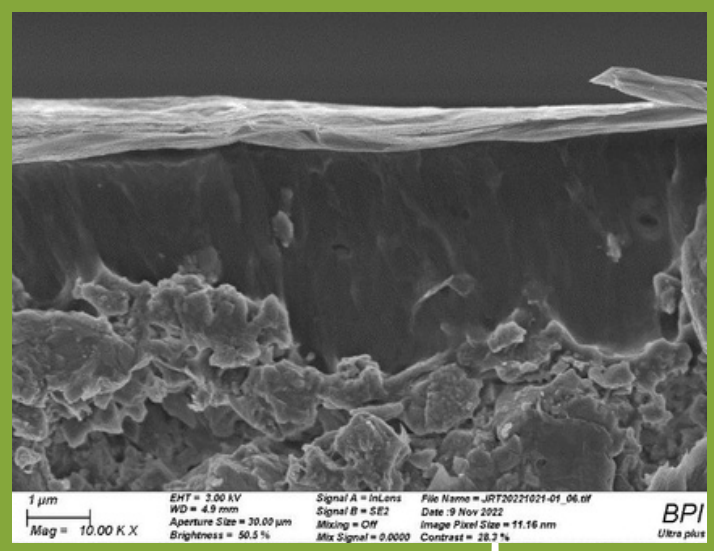
This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement n°862156

FLEX FUNCTION 2 SUSTAIN

Less Persistent Flexible Packaging

2

Example of a package made from the new barrier paper laminate structure designed to be both less persistent & paper recyclable



Cross section of one of the barrier paper laminates manufactured during the project

CUSTOMER TESTIMONIAL

The Procter & Gamble Company was pleased to partner with the FlexFunction2Sustain Project partners to further develop new to the world, disruptive, barrier paper laminates. We were able to leverage our project partners for both their deep expertise and the very wide range of coating & converting capabilities available. We also had access to a useful range of testing capabilities across the various partners, to test out the performance of the laminates formed.

Dr P.Caruso (Senior Scientist)
& Dr E.Boswell (Principal Scientist)

OITB SERVICE PROVIDERS

- *Wet coating and drying pilot scale testing services (reverse-roll coating, slot die coating, convectional air drying), WVTR testing (Fraunhofer FEP)*
- *Wet coating and drying pilot scale testing services (5 roll-to-roll coating, knife coating, slot die coating, IR lamps and convectional air drying) (COATEMA)*
- *Biodegradation testing in marine conditions (IPC)*

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FLEX FUNCTION 2 SUSTAIN

i3 Your Companion
Life Science Filtration

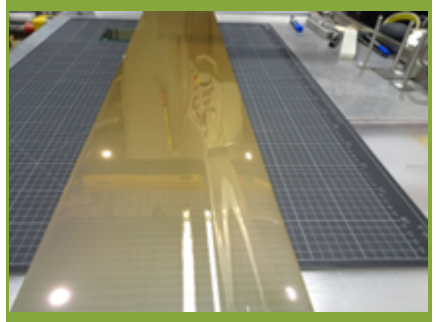
3

Revolutionizing Separation: Electrically Switchable Filter Membranes

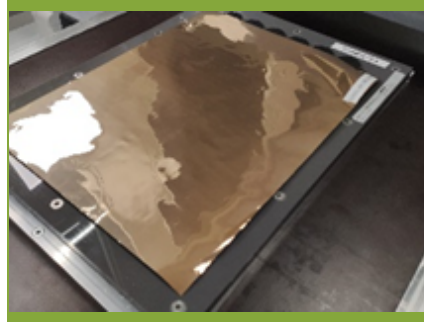
Syringe filter with coated membrane inside

Functionalized PA membrane with Au-coating

Au coating on both sides of PC membrane without wrinkle formation by using the pilot coater



Cutting an A4 sheet



Punching out 25 mm filter discs for asbestos analytics

CUSTOMER TESTIMONIAL

i3 Membrane aims at next generation membrane techniques as we believe that membranes can do more than just filter. Combining the potentials of polymer membranes and conductive metal coatings, we strive for the creation of digital membrane chromatography (DMC) solutions that enable higher product throughputs with lower buffer media consumption compared to the state of the art.
Being a use case partner in the FlexFunction2Sustain project, offered us the unique opportunity to get access to leading edge ultra-thin film technologies and co-develop new processes with technology leaders. More specifically, the project has enabled us to accelerate the development of our DMC technology and accessing larger membrane configurations at higher quality and lower costs. It has offered us technological expertise and development that would not been possible otherwise.

Dr. Florian Schmitt, CTO

OITB SERVICE PROVIDERS

- *R2R sputter coating on LabFlex200 and CoFlex600 with gold targets (Fraunhofer FEP)*
- *Trials with diverse layer-by-layer deposition techniques such as Atomic layer deposition (ALD) and electroplating (Fraunhofer IAP)*
- *Life cycle analysis and recycling tests (IPC)*

www.i3membrane.de/en/
www.flexfunction2sustain.com

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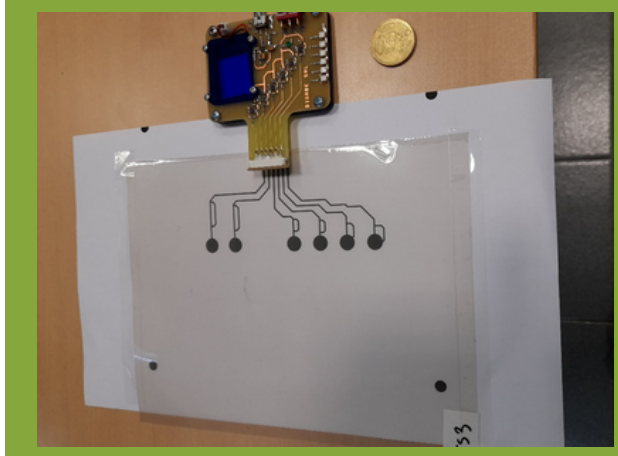
Transforming Automotive Design: Multifunctional Plastic Surfaces

4

Final Demonstrator: Front

Final Demonstrator: Rear

Physical device of the dashboard component demonstrator on flat surface



CUSTOMER TESTIMONIAL

FlexFunction2Sustain project perfectly matched Centro Ricerche FIAT's expertise and targets because surface technology and sustainability are key technologies for vehicle of the future. The first mission of the CRF is the promotion and the investigation of novel materials, technologies and systems for the automotive sector. CRF, being part of the STELLANTIS group, has the goal to develop and validate products and processes that give innovation for the car. In FlexFunction2Sustain, CRF was involved on multifunctional plastic surfaces used as coating of the dashboard displays of the car. The combination of anti-scratch, anti-reflective and anti-fingerprint surface with electronic functions on a flexible plastic surface to be integrated to complex 3D surfaces in car dashboards compliant to automotive standards, was reached. In addition, the use of resins from recycled and recyclable materials will give us the opportunity to introduce sustainability notice within interior vehicle.

Nello Li Pira, Ph.D. Global Materials R&I and Roadmaps Manager

OITB SERVICE PROVIDERS

- *Development and optimisation of the coating material with anti-scratch properties (Fraunhofer FEP)*
- *Laser patterning electronic design (Aristotle University of Thessaloniki)*
- *Life cycle analysis and recycling tests (IPC)*

www.stellantis.com/en

www.flexfunction2sustain.com

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FLEX FUNCTION 2 SUSTAIN

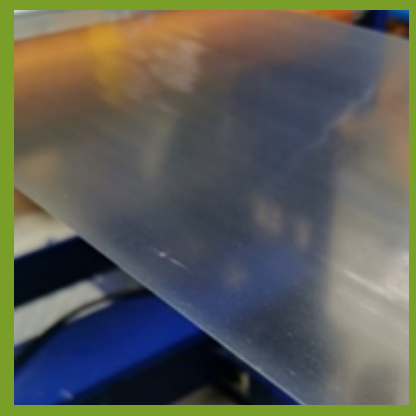
Capri-Sun

Eco-Friendly Revolution: Recyclable Mono-material Drink Pouches

5

Pre-treatment: shredding and floating

Extrusion to pellets



Casted Film

Recyclable Drink Pouches

CUSTOMER TESTIMONIAL

Being more sustainable as a brand is a crucial goal for Capri-Sun. Our focus has now been on the iconic pouch. Historically, it was made from a multi-material structure, which is difficult to recycle. Therefore, we developed mono-material pouch to ensure it is fully recyclable. The development of a new material, along with all the recycling tests, is incredibly complex and time-consuming, requiring collaboration to succeed.
We were thrilled to have the opportunity to be part of the FlexFunction2Sustain project. This allowed us to collaborate with other companies, like Fraunhofer IVV, IPC and Coatema and benefit from their expertise. We collaborated with the Fraunhofer IVV to assess the desired properties of the new packaging material. To validate the recyclability of the material, we received valuable assistance from the IPC Institute and the Fraunhofer IVV. This also helped us to further optimize the pouch to favour the recycling process. We are proud to say that we managed to launch the recyclable mono-material pouch within this project.

Beatus Schehl, Research & Development Director and Jakub Pedzinski, Senior Packaging Innovation Manager

OITB SERVICE PROVIDERS

- *High barrier coating development and production of pouches for shelf-life testing, Recyclability testing, Lab testing and assessment of the properties of the new packaging material (Fraunhofer IVV)*
- *Printing and production of laminate for pouches (Coatema)*
- *Recyclability testing and Life cycle analysis (IPC)*

www.capri-sun.com

www.flexfunction2sustain.com

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Advances in Paper Packaging

6

Protective film

FF2S Prototype: Dry food front - coat paper

FF2S Prototype: Dry food front

Paper coated_semi industrial_Coatema

FF2S Prototypes & control- Fresh food front

CUSTOMER TESTIMONIAL

MC, as a leading retailer in the food sector, is strongly committed to reducing the carbon footprint of its operations, putting people and the planet first. When it comes to plastics, we have been promoting a culture of reduction, reuse and recycling, seeking to co-develop and test sustainable packaging solutions that meet these criteria. To underline our efforts, we are proud to be a partner in the FlexFunction2Sustain project, fulfilling the overall objective of establishing new benchmarks in the market when it comes to packaging solutions, in a cooperative and science-based approach that allows the advancement of knowledge and its transfer to the market where our organization presents itself as a space for the real application of innovation.

Marlos Silva, R&D Director

OITB SERVICE PROVIDERS

- *Development and optimisation of coating through Ultrasonic Spray Coating (INL)*
- *Slot die coating (Coatema)*
- *Characterisation of materials (mechanical properties, Water Vapor Transmission Rate, Cobb. Oxygen Transmission Rate) including current solutions, paper substrates and coated papers (INL)*
- *Food contact materials migration testing (INL)*
- *Disintegration and biodegradation tests at domestic compost conditions (IPC)*

www.flexfunction2sustain.com

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