

1ST ROUND - FEBRUARY 2019



2ND ROUND - OCTOBER 2019



FINAL ROUND - JUNE 2020



- Results of the PA's will be included in the Handbook "Sustainable Paper Plastics Design"
- Aim to serve as an inspiration for other companies to make use of the business support service



Pilot action at PAKMAR

FOUNDATION: 1991

EMPLOYEES: small size company

KEY PRODUCTS/SERVICES:

- Flexible materials
- Sealing bags: vacuum packaging, with a line for ziplock type bags doypack
- Sealers for bags, paper/PE and bag-in-box

KEY MATERIALS:

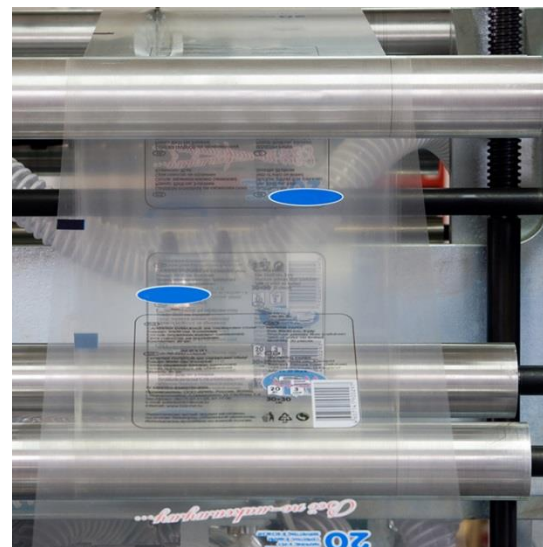
- laminates: PA / PE, PET / PE, PET / AL / PE and others



Pilot action at PAKMAR

Suggestions:

- replacing PE with Ecovio
- suitable dispersion lacquer (lower cost and the same barrier water and barrier properties)



Pilot action at PDO



FOUNDATION: 1997

EMPLOYEES: medium size company

KEY PRODUCTS/SERVICES:

- food packaging including frozen foods, meats,
- cosmetic packaging for wipes, toilet paper,
- labels for bottles,
- household packaging for washing powder, liquid detergent, etc.
- packaging for electronic accessories.

KEY MATERIALS:

- plastics, including: LDPE, HDPE, CPP, PET, PET TWIST, OPP, OPA.
- paper and paper / PE, paper / aluminum / PE components.
- inks: water base flexographic, solvent based flexo, and low migration inks for food contact.



Pilot action at PDO



Pilot action at McDonald's



FOUNDATION: 1940 / 1992 in Poland

- world's largest restaurant chain by revenue,
- serving over 69 million customers daily in over 100 countries across 37,855 outlets (as of 2018).
- In July 2019, more than 24,000 employees were employed in 427 Polish premises of this network, located in over 150 cities.

Acquiring McDonald's as a case in a pilot action gives important insight from the end-user's perspective, that is a major corporation with a great potential for the usage of biocomposites.



Pilot action at McDonald's



McDonald's value hierarchy for sustainability:

- 1) reducing the volume of packaging by limiting their usage only to the most necessary cases.
- 2) reducing packaging's weight if possible.
- 3) incorporating paper as the main material.
- 4) biomaterials and biocomposites.



Pilot action at McDonald's

- McDonald's has removed single-use plastics from its salads range and plastic lids from all McFlurry ice creams, in a major drive to reduce plastic packaging.
- All meals and salads are to be served in 100% renewable and recyclable cardboard containers instead of single-use plastic.
- The new salad and meal containers are made from cardboard which contains 50% recycled content and 50% new, which itself comes from certified sustainable sources.
- The coating on the containers, designed to keep them rigid, is also 100% renewable.
- McDonald's also plans to switch to fiber-based packaging made from recycled materials in every location by the end of 2020.



Pilot action at McDonald's

- In accordance with the Directive (EU) 2019/904 on the reduction of the impact of certain plastic products on the environment (Single-Use Plastics Directive) from June 12, 2019 McDonald's Polska in replacing their cutlery from hard-to-recover polystyrene with those made of completely recyclable polypropylene.
- By 2025, the McDonald's chain of restaurants is to replace all their packaging with packaging that comes from recycling or certified production and is to be 100 % biodegradable, with Forest Stewardship Council (FSC) certified raw materials preferred.
- Reducing its greenhouse gas emissions by a third by the end of the next decade



Pilot action at POL-ZDOB

FOUNDATION: 1990

EMPLOYEES: medium size company

KEY PRODUCTS/SERVICES:

- flexographic overprints on paper-based and foil surfaces
- overprints in HIGH DEFINITION FLEXO technology
- FLEXO technology printing with low-migration UV inks and solvent inks

KEY MATERIALS:

- virgin paper,
- coated paper,
- plastics



Pilot action at POL-ZDOB



- TEST 1: Recyclability.
- The testing phase included several types of coated papers.
- The papers are coated with PE (polyethylene) with and addition of EVOH (Ethylene Vinyl Alcohol Copolymer), glueing and print (solvent, spirit, UV).
- The average amount of fabers recycled from the tested coated papers was at the level of approx. 70%.
- The main reccomendation during this stage of testing was to switch from PE to Ecovio, a biodegradable material produced by BASF.



Pilot action at POL-ZDOB

- Test 2: Testing of material adequacy
- Testing focused on the following properties:
 - Water resistance
 - Seal ability
 - Recyclability with paper
 - Composability



Pilot action at POL-ZDOB



Testing of materials for paper coating and tea envelopes.

The company was seeking for a bioplastic material for tea envelopes that could be printed and would be biodegradable.

Potential material alternatives were considered:

- Ecovio,
- dispersion barrier
- Biotec material which is certified for home compost.

There were other materials that were taken into consideration due to their properties, such as PLA or cellulose, and materials produced by Futamura, e.g. Naturflex.

During the further testings, the SunStar DFC Coating was chosen as the most suitable.



Pilot action at POL-ZDOB



The SunStar DFC Coating:

- an aqueous coating intended for application to paper, carton board and natural fibre packaging.
- The coating improves moisture barrier and grease resistance properties.
- It is a more ecologically friendly alternative to polyethylene extruded boards.
- It is also suitable for food packaging, for both indirect and direct food contact.

The first tests were performed manually in order to ensure the adequacy of the different types of materials. In order to carry out the procedure a so called „stick” was applied by a flexo printing technology. Although this type of testing allows to achieve representative end results in a relative cost effective way.



Pilot action at POL-ZDOB

Test 3: Compostability

In accordance to EN 14806:2005 - Packaging.

Preliminary evaluation of the disintegration of packaging materials under simulated composting conditions in a laboratory scale test.



Pic. 1. Tested sample of coated paper produced by POL-ZDOB



Pilot action at POL-ZDOB

Test 4: Recyclability with paper

The tests were performed in accordance with the following standards and test methods:

- EN-13430 "Packaging. Requirements for packaging suitable for recovery through material recycling ",
- EcoPaperLoop test methods - method 1 "Recyclability Test for Packaging Products",
- PN-92 / P-50092 "Raw materials for the paper industry. Wood. Chemical analysis ",
- ISO 2470-1: 2016 "Paper, board and pulps - Measurement of diffuse blue reflectance factor



Pic. 2. Samples of the coloured pulp after the defibering and sorting step



Pilot action at POL-ZDOB

The improvement of the recyclability of the coated papers was significant.

The papers coated with polyethylene with and addition of EVOH had the average amount of fibers recycled f at the level of approx. 70%.

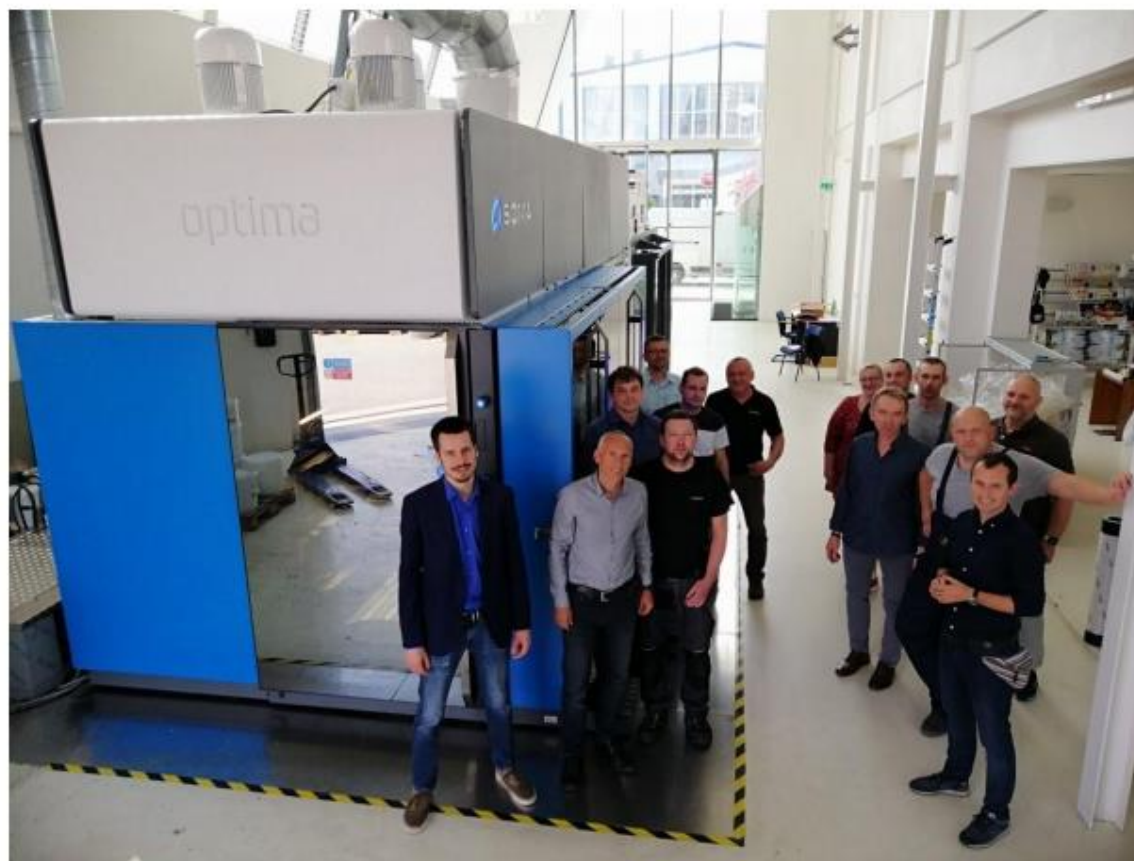
The SunStar DFC Coating improved the recyclability levels to approx. **83% - 85%**.



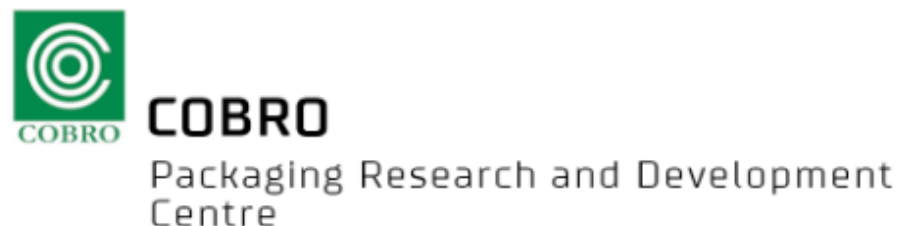
Pic. 3. Film samples removed from the pulp after the defibering and sorting step



Pilot action at POL-ZDOB



OPISY STUDIÓW PRZYPADKU AKCJI PILOTAŻOWYCH



THANK YOU!

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