New pilot line to test recyclability of coated paper according to latest European harmonized guidelines

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Coated paper-based packaging has an important role to play in the transition to a circular economy. The extent to which these materials can be recycled is a key factor in further increasing their sustainability and circularity to meet European targets. As part of the RePac2-project, Sirris has been exploring the potential of coated paper packaging for some time and recently set up a pilot line to evaluate recyclability at lab scale.

The 'Food packaging of the future' roadmap shows that improving the recyclability of packaging is one of the key pillars to achieve the transition to circular packaging. Developing new and recyclable paper-based packaging materials helps to reduce single-use plastic packaging and create added value for the paper industry. In Europe and Belgium, ambitious recycling targets are being pushed forward to reduce the ecological impact of packaging materials: 65 and 70 per cent of packaging waste must be recyclable by 2025 and 2030 respectively (according to EU Directive 2018/852). At Belgian level, FEVIA states that by 2025, all food packaging should be recyclable, reusable or biodegradable. As a result of these ambitions, we see a renewed focus on paper-based packaging materials.

Recyclable coated paper

Paper is ideally suited as a strong and flexible circular material with properties that can be optimised for packaging purposes. The paper and board value chain is an example of circularity and shows very high recycling rates. If we want paper-based packaging to replace traditional plastic packaging materials, coatings are usually required to achieve similar properties towards, for example, water and oxygen permeability. One thing to have in mind, is that the paper should still be recyclable after coating.

To further increase the sustainability and circularity of paper and board, and to help EU member states and other European countries meet high recycling targets, the paper converting industry has established joint guidelines for assessing the recyclability of paper packaging at European and national levels. This resulted in a harmonised test method to be used as a basis for assessing and quantifying the overall recyclability of these materials and products. This method mimics the most common phases in paper making at lab scale to assess key parameters of paper and board recyclability. The harmonized European guidelines were recently published by CEPI: Harmonised European laboratory test method to produce parameters enabling the assessment of the recyclability of paper and board products in standard paper and board recycling mills (update December 2022).

Pilot line for evaluating recyclability

Sirris recently invested in a pilot line to evaluate the recyclability of coated papers at lab scale. The setup makes it possible to evaluate the three stages in producing paper from a recycled waste stream:

1. re-pulping coated paper ('disintegration'),

2. separation of non-usable fibres after recycling ('Sommerville screening'),

3. making and grading new handsheet papers from recycled paper fibres ('Rapid Köthen sheetmaking').

In coated paper recycling, the fibre yield is determined after several screening steps and the quality of the paper made from recycled fibres is evaluated both in terms of optical and mechanical properties. Microscopic inspection is aimed to detect the presence of impurities in the form of wax particles, metallic inclusions, transparent particles, ink or coloured particles, remnants of pigments or other non-cellulose constituents. On this basis, a recyclability can be graded based on a quantitative scoring grid.. The quality of repulped paper fibres can be monitored during graduated recycling steps. From this, recommendations can be formulated to increase the recyclability of coated paper.

The pilot line for testing paper recycling was installed as part of the CORNET project REPAC2, in which we offer support to companies for accelerated implementation of innovative, high-functionality and recyclable packaging materials from paper and board. The project targets the food industry, producers and converters of coated paper and cardboard packaging and recyclers. Using the pilot line, we can conduct tests to evaluate recyclability at an early stage of design of new packaging papers.

See live exactly how everything works? Some demos on our pilot line are planned during our open-lab day Circularity put into practice on 6 June 2023. More information can be found in our agenda.

Setup of an experimental pilot line at Sirris with three stages for testing recyclability of coated paper

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