



Sorting trials: system achieved 99.9% purity at a maximum recycling speed

Drilling down into sorting PP packaging

Trials of a tracer-based marker system to sort food and non-food polypropylene packaging provided by brand owners achieved very high sorting purity, the first step to meeting food standards requirements, writes **PROFESSOR EDWARD KOSIOR**

It has been nine years since plastics recycling consultancy Nextek started its extensive research to convert post-consumer polypropylene (PP) into food-grade packaging through mechanical recycling. Less than a year on from the launch of Nextloopp, its multi-participant project to achieve this, the results of landmark trials of the tracer-based marker system PolyPrism have been announced.

The trials, to sort food from non-food packaging, were held at Tomra's recycling facility in Germany in September, and achieved 99.9% sorting purity at maximum production speed.

This separation process is the first of three components to meet the requirements of the UK and EU food standards authorities. Once the PolyPrism labelling technologies are adopted by UK brand owners and retailers, we could see the patented marker system on shelves within two years.

The trials tested packaging submitted by Nextloopp participants, with the project seek-

ing to establish the packaging's selectivity when commingled with 20% non-food packs. The results were exciting and impressive as they demonstrated for the first time how the integrated technologies of the packaging, label with marker and near infrared/visible (NIR/VIS) automatic sorter could work



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Certainly, being able to identify and sort any number of pack variants, from bleach bottles to milk bottles, in any plastic type is a world-first.

Ralph Uepping, technical director at Tomra, concurs and says the latest trials are an excellent result to have confirmed. He explains that the results were predicted based on earlier trials which had used packs that were not from brand owners, while the latest tests did use brand owner packaging.

Uepping said: "During the recent trials, we achieved very promising results on all PP 3D samples, in all test runs with state-of-the-art NIR/VIS technology. We exceeded the required 95% purity for food-grade in each test run.

"The next important milestones will be a field demonstration and demonstrating chemical compliance with food-grade regulation."

The trials will be extended in 2022 on a fully developed series of commercially ready labels.

While sorting plastic waste into polymer types is the first step to close the loop on PP and create a global low-carbon economy, the next step requires splitting the plastic packaging into food and non-food fractions. Once this has been done, the food packs need to be processed by a special high-performance decontamination process to remove any hypothetical contaminants or residues, such as food or decorative printing.

This is the next step for which Nextloopp taps into Nextek's powerful decontamination process, PPristine. This step is vital because, without it, we would simply be left with a pile of well-sorted packaging.

The technology will remove all contaminants from the packaging resins and meet European Food Safety Authority and US Food and Drug Administration's migration requirements over a wide range of food types and test temperatures from freezing to 121°C for all aqueous and acidic food types.

Fatty foods will have reduced temperature compliance due to PP's oleophilic character as a polymer. Even more important will be any specific changes the European Commission makes to food-grade regulations, as it moves to focus on migration of substances from the package into food and less on the prior nature of the material.

Closing the loop on PP is likely to revolutionise the way society recycles the growing volume of single-use food packaging waste. It is also the catalyst for transforming current food-grade PP recycling for the next recycling success story. PET was first – now it's the turn of PP. ♻️

● Professor Edward Kosior is managing director of Nextek

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