

Dow, HP, Reifenhäuser, Cadel Deinking, and Karlville deliver pioneering recycling proof of concept to help close the loop for digitally printed pouches

Key industry players join forces to recycle PE-based barrier pouch into new high-quality PE pouches suitable for repeat recycling to help drive a circular economy

HORGEN, Switzerland – September 23, 2021 – Dow Packaging and Specialty Plastics, a business unit of Dow (NYSE: DOW), together with HP Indigo, Reifenhäuser, Cadel Deinking and Karlville, announce the successful delivery of the first-of-its-kind pouch-to-pouch mechanical recycling concept, enabled by a unique value chain effort.

The approach uses a multi-stage process to contribute to a circular economy for digitally printed pouches. Starting with a polyethylene (PE)-based barrier food pouch designed for recyclability, the project team have used mechanical recycling and deinking to create a high-quality dishwasher MDO-PE¹ pouch containing 30 percent recycled contents and being itself suitable for recycling.

In a next step, the team is working on a digital product passport pilot to allow for recycling-relevant packaging properties to be recorded and to make the pouch identifiable for high-quality recycling within post-consumer waste management.

See how it was made in this [video](#) and meet the team in a [webinar](#) on 14th October 2021, 3 pm CET | 9 am EST to receive first-hand details on this proof of concept.



Optimal recycling output designed from the outset

Delivering the high-quality PE-pouch has required several steps in a coordinated process with each team member applying their experience and capabilities collaboratively:

“The requirements for plastic packaging products have never been more complex than today. And we have modified and enhanced our Reifenhäuser production lines to enable films and packages not just to be economical and functional, but to meet the vast demand for recyclable packaging based on mono-material structures”, commented **Ralf Wiechmann**, Head of Film Innovation at **Reifenhäuser**:

¹ MDO-PE: Machine direction-oriented polyethylene

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“For this project we’ve broadened our machinery expertise to co-extrude the new resins on our highly flexible EVO 9-layer blown film line and produce PE-based packaging films at fast line speeds. This project shows that we can successfully both produce recyclable packaging, according to Recyclclass and CEFLEX guidelines, and use recycled materials in high value applications if we collaborate effectively along the value chain.”

“To create the new pouch, HP reverse-printed the recyclable MDO-PE film on the HP Indigo 25K Digital Press with the dishwasher pouch artwork to have it ready for lamination to the film using recycled resins at Dow’s Pack Studios,” added **Itai Shifriss**, Head of Indigo Business Supplies at **HP**. “Sustainability is a key strategic growth area for HP customers and HP, and in order to drive the circular economy we collaborate with leading value chain partners.”

“Thanks to Dow’s Pack Studios and a team of world-class scientists, we could apply our full expertise and testing capabilities to make our resins work in this proof of concept,” explained **Laura Evangelio**, senior technical service and development specialist at **Dow** Packaging & Specialty Plastics. “The first PE-rich pouch was designed for recyclability with up to 5% EVOH in the total structure for barrier functionality, and Dow’s innovative resins provided a remarkable stiffness-toughness balance, low-temperature sealability, adhesion to extruded barrier layers and excellent bubble stability. For the second PE-based pouch we used a high-performing solventless adhesive to enable the lamination of the MDO-PE film to the PE-film containing recycled resins from the first pouch. The project is not only a triumph in our industry’s sustainability efforts but a true example of focused scientific teamwork.”

“To produce the recycled PE resins for the second pouch, we used our deinking technology to achieve the best outcome,” said **Pablo Cartagena**, Business development manager at **Cadel Deinking**. “The deinking process is key because it effectively removes ink from the plastic surface to obtain a plastic with similar characteristics to the raw virgin material which helps to provide high-quality pouch-to-pouch recycling. We are very happy to collaborate closely with all these leading companies and to demonstrate that Cadel’s deinking technology is considered ‘crucial’ to achieve circularity in plastic.”

“The Karlville pouch machine is one with the most compact footprint on the market, designed for extremely low set-up waste and quick change-over, perfectly suitable for recyclable materials,” said **Gustavo Guzzi**, EMEA Sales Manager from **Karlville**. “We are proud to be part of this project to manufacture a high-quality PE-based pouch which is itself already challenging. But to allow for recyclability is amazing, and with the right project partners it is now within reach.”

Next step: closing the loop for traceability

As a further evolution of the project, the companies are working to add digital traceability to the pouches in line with the **R-Cycle initiative**, a cross-company initiative to develop an open and globally applicable traceability standard for sustainable plastic packaging. The aim of this initiative is to automatically record recycling-relevant packaging properties during production by providing a digital product passport and to pass them on through the value chain. Using special markings, usable packaging can then be identified in the recycling process and sorted into single-type fractions. This is the key to obtaining high-quality recyclates in order to continue efforts to close the loop. R-Cycle is being driven by several major stakeholders in the plastics industry, including Reifenhäuser, which is contributing the technology to the pouch-to-pouch concept.

“Dow is engaged to drive the adoption of PE-based packaging designed for recyclability, which works in recycling and recovers the value of the initial use as shown in this project,” concluded **Jaroslav Jelinek**, global marketing manager for oriented PE technologies, **Dow** Packaging and Specialty Plastics. “Through **Pack Studios**, Dow is contributing to industry-scale testing and production capabilities to accelerate the development of such projects globally. This announcement represents the latest in our efforts to address both climate change and plastic waste with our extended **sustainability targets** to protect the climate, stop the waste and close the loop.”

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About Reifenhäuser: The Reifenhäuser Group supplies tailor-made lines and components for the production of high-quality blown film, cast film, sheet film, and nonwovens, allowing producers to supply the market, achieve success, and protect the environment. Since the beginnings of the plastics industry in the 1950's, Reifenhäuser has assisted numerous customers to establish successful production lines and become top suppliers on their markets. We are still doing this today - as market leader and family-owned company. Together, the Reifenhäuser Group forms the largest competence network for plastics extrusion technology worldwide. For more information, please visit www.reifenhauser.com.

About HP Inc.: HP Inc. creates technology that makes life better for everyone, everywhere. Through our product and service portfolio of personal systems, printers, and 3D printing solutions, we engineer experiences that amaze. More information about HP Inc. is available at www.hp.com. To learn more about HP Indigo digital printing and the environment please visit: hp.com/go/indigo/environment.

About Cadel Deinking: Cadel Deinking is a technology company born to solve the problem of circularity of plastics and its main strength lies in the knowledge it has to decontaminate them. Above all, and due to all the experience in treating contaminated water once plastics have been cleaned of these contaminants, Cadel has the ambition of becoming a world leader in recycling technologies for the plastic sector. For more information, visit www.cadeldeinking.com or contact us at info@cadeldeinking.com.

About Karlville: Karlville provides converting & packaging machinery solutions for Shrink Sleeves, Flexible Packaging, Pouches & Tape Multipacks. Through a combination of Karlville-owned manufacturing facilities and strategic manufacturing ventures, Karlville offers a wide range of innovative converting and packaging machines for converters as well as brands & copackers. Karlville has support facilities in USA, Europe and Asia. Karlville Swiss has two factories focused on pouch machine manufacturing and is the sales and service center for all converting machines in EMEA. www.karlville.com

About Dow Packaging and Specialty Plastics: Packaging and Specialty Plastics (P&SP), a business unit of Dow (NYSE: DOW), combines core strengths of R&D, worldwide reach, broad product lines and industry expertise to deliver high performing technologies for end use markets in food packaging, personal hygiene, infrastructure, consumer goods and transportation. P&SP is one of the world's largest producers of polyethylene resins, functional polymers, and adhesives, and enabled by **Pack Studios**, is a leading innovator and collaborator across the value chain on sustainable application development and circular economy life-cycle design for plastics. www.dowpackaging.com

About Dow: Dow (NYSE: DOW) combines global breadth, asset integration and scale, focused innovation and leading business positions to achieve profitable growth. The Company's ambition is to become the most innovative, customer centric, inclusive and sustainable materials science company, with a purpose to deliver a sustainable future for the world through our materials science expertise and collaboration with our partners. Dow's portfolio of plastics, industrial intermediates, coatings and silicones businesses delivers a broad range of differentiated science-based products and solutions for its customers in high-growth market segments, such as packaging, infrastructure, mobility and consumer care. Dow operates 106 manufacturing sites in 31 countries and employs approximately 35,700 people. Dow delivered sales of approximately \$39 billion in 2020. References to Dow or the Company mean Dow Inc. and its subsidiaries. For more information, please visit www.dow.com or follow [@DowNewsroom](https://twitter.com/DowNewsroom) on Twitter.

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