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Borouge, Siegwerk, and TPN Food Packaging launch fully recyclable mono-material packaging solution

First-of-its-kind mono-material pouch designed for circularity and high-performance protection of oxygen-sensitive dry products such as nuts and pet food. Enables 100% recyclability and production of high-quality recycled polyethylene for future packaging applications. Collaboration demonstrates the power of cross-industry expertise in advancing sustainable packaging solutions.



Siegwerk, Germany- 30 SEPTEMBER 2025 - Siegwerk, one of the leading global providers of printing inks and coatings for packaging applications and labels; Borouge, a leading petrochemicals company that provides innovative polyolefin solutions; and TPN Food Packaging Co., Ltd. (TPN), a leading food packaging manufacturer in Thailand, today announced the launch of a fully

recyclable, mono-material barrier stand-up pouch to meet the needs of converters, brand owners, and consumers seeking sustainable, high-functioning packaging.

This innovative packaging solution is the first co-development under the broader Siegwerk-Borouge partnership, with TPN handling production of the new de-inkable stand-up pouch with oxygen barrier. The pouch provides robust protection, superior functionality, and circularity through deinking technology that enables high-quality recycled polyethylene feedstock for next-cycle applications.

Anton Wolfsberger, Vice President, Circular Economy and Packaging, Global Marketing, Borouge, said: “This collaboration brings together material science, ink innovation, and manufacturing excellence to deliver a mono-material solution that is fully recyclable and de-inkable. It supports our customers in creating packaging that is not only high-performing but also designed for a circular economy.”

The new barrier stand-up pouch features a full polyethylene (PE) triplex laminate structure, incorporating Borouge’s Borstar® FB5600, a bimodal high-density PE produced using Borealis’ proprietary Borstar® technology, and Anteo™ PE sealant film with low sealing initiation temperature for high packing speed. While mono-material, the pouch maintains high stiffness, mechanical strength, seal integrity, and printability, providing a drop-in replacement for traditional multi-material laminates without compromising performance.

Siegwerk’s advanced oxygen barrier coating, CIRKIT OXYBAR BC1582, and its de-inking coating, CIRKIT CLEARPRIME, provide low oxygen transmission and enable efficient de-inking for recycling end-of-life printed materials. Leveraging TPN’s rotogravure printing expertise, the MDO-PE printing layer achieves high stiffness and flatness at production speeds of ~200m/minute. This resulting oxygen transmission rate (OTR) is below 1cc/m2/day at 23°C at 50% relative

humidity, comparable to metallized PET. The pouch's innovative design enables circularity through de-inking technology that delaminates printed laminate films to remove inks and generates better quality uncolored recycled PE materials for next-cycle life.

Dr. Stephane Bertaux, Head of Brand Owner Collaboration and Sustainability for Southeast Asia at Siegwerk Thailand, said: "This development is a great example of how collaboration between different areas of expertise and knowledge can achieve the production of high-performance mono-material packaging that is de-inkable and fully recyclable. This project demonstrates how cross-industry collaboration can produce scalable, sustainable packaging solutions."

This mono-material solution meets the needs of converters, brand owners, and consumers seeking sustainable, high-performance packaging for oxygen-sensitive, dry products such as nuts and pet food. By combining material science, ink innovation and printing and lamination expertise, Borouge, Siegwerk and TPN have delivered a real-world solution that advances the packaging industry's move towards circularity. This project underscores the value of collaboration across the supply chain to scale innovations, accelerate recycling adoption, and support a more sustainable packaging ecosystem.

Image: Fully recyclable, mono-material stand-up pouch

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