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Siegwerk advances deinking solutions to support high-quality plastic recycling with a newly granted European patent

The newly granted European patent supports ongoing efforts to improve the quality of recycled plastics by enabling more effective removal of printed decoration during recycling.



Siegwerk, one of the leading global providers of printing inks and coatings for packaging applications and labels, has secured a new European patent, marking another step in its development of deinking solutions for plastic packaging recycling ([EP4107326](#)). The patent protects a primer technology that enables printing inks not deinkable by commercially used conditions to be removed from plastic substrates during recycling, including more complex printed flexible packaging structures. The patented technology covers solvent-based and water-

based deinking primer technologies, while Siegwerk's broader deinking portfolio also includes solutions for UV printing applications.

The grant comes as Europe is raising requirements for recycling plastic packaging. Under the [Packaging and Packaging Waste Regulation \(PPWR\)](#), plastic packaging will need to include minimum shares of post-consumer recycled material from 2030, increasing the need for clean, high-quality recyclates. [According to CEFLEX](#), around 2.5 million tones of flexible packaging-derived post-consumer recycle will be required by 2030 to meet PPWR recycled-content targets for flexible packaging alone. Effective ink removal can help improve recycle quality by reducing discoloration, odor and contamination.

Deinking gains relevance – but flexibles raise the complexity

For rigid packaging, ink washability and the removal of print and decoration are increasingly reflected in European Design for Recycling criteria. Current CEN standardization work from the EN 18120 series considers deinkability as well as the removability of labels and sleeves when assessing the recycling compatibility of certain rigid packaging structures. For flexible packaging, the situation is more complex. Printing inks often cover larger surface areas or are embedded within laminated structures, while adhesives, barrier layers and multilayer constructions can further complicate sorting, washing and recycling. This makes effective ink removal particularly important for improving the quality of recovered polymers. Deinking is therefore gaining relevance as a complementary step in mechanical recycling. [Recent CEFLEX research](#) identifies deinking alongside advanced washing, delamination, extraction and dissolution as key technologies for addressing recycle quality limitations in flexible packaging.

From early insight to validated deinking solutions

Siegwerk recognized early that effective ink removal can improve recycle quality and has been developing dedicated deinking solutions for printed plastic packaging for several years. One of these solutions is now covered by the newly

granted European patent ([EP4107326](#)). At its core is a functional primer positioned between the plastic substrate and the printing layer. During alkaline washing, the primer enables the printing layer to be released and removed before the polymer is reprocessed. The protected concept is not limited to simple surface-printed structures. It also covers constructions in which the ink is located between additional layers, extending its applicability to complex flexible packaging, labels and shrink sleeves.

Siegwerk has validated the technology across different substrates, ink technologies and packaging constructions in its internal deinking laboratory, as well as in collaborative research and industry projects. One example is the [deinkable mono-material flexible pouch concept](#), with which Siegwerk and partners demonstrated effective print removal during recycling while maintaining the recyclability of the packaging structure and received the German Packaging Award in Gold. For converters and brand owners, Siegwerk's deinking expertise creates additional options for designing printed packaging with higher-quality recycling in mind. Combining primer, ink and coating expertise, Siegwerk can tailor ink removal solutions to specific structures and ink systems while maintaining the required print performance and functionality. "We recognized early that removing printing inks can contribute to improving the quality of recycled plastics," says Lara Kleines, Recycling and Polymer Expert at Siegwerk. "This becomes even more relevant as the value chain needs to deliver significantly more recycled material at the quality required for its next application. Especially for flexible packaging, there will not be one solution for every structure and recycling stream. Our early investment in deinking solutions and the expertise we have built put us in a strong position to support the industry wherever ink removal becomes an important lever for recycle quality."

Supporting future recycling requirements through innovation

The new European patent complements US Patent [US12291051B2](#), granted in May 2025, and reflects Siegwerk's ongoing efforts to develop practical deinking

technologies that support the transition towards a circular packaging economy. For Siegwerk, the patent reflects a broader innovation approach: identifying recycling challenges early and developing practical technologies to address them. As demand for recycled content grows, Siegwerk's deinking expertise provides a strong basis for addressing one key factor influencing recycle quality: the effective removal of printing inks.

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