CASE STUDY

ADVANCING THE BIOECONOMY:
REDUCING CARBON FOOTPRINT WITHOUT SACRIFICING PERFORMANCE

KRATON™

Partner: Henkel, Dow

Market: Adhesives, Packaging

Product(s): RE*volution*™ Rosin Ester Technology, SYLVALITE™ 2200

Highlights

- Reduced packaging adhesive carbon footprint without sacrificing performance
- Replaced fossil-based resins with renewable bio-based alternatives
- Maintained food safety and adhesion performance requirements
- Enabled commercial-scale sustainability through industry collaboration
- Supported greenhouse gas reduction goals across the value chain

Through a strategic collaboration between Kraton, Henkel, and Dow, the companies demonstrated that next-generation bio-based materials can help cut value-chain emissions in commercial hot-melt formulations while preserving the exact thermal stability, color consistency, and bond strength that packaging operations depend on.

CHALLENGE

Adhesive formulators have long relied on rosin ester tackifiers for their superior tack and broad polymer compatibility. However, traditional rosin esters can exhibit natural variations in color and thermal stability, leading some formulators toward fossil-based hydrocarbon alternatives. While hydrocarbons offer greater batch-to-batch consistency, they come at an environmental cost, a significantly higher carbon footprint.

This created a central dilemma for packaging manufacturers: how to reduce greenhouse gas (GHG) emissions across their value chain while preserving crucial processing efficiency, food safety compliance, and long-term adhesive strength. The industry needed a lower-carbon tackifier that offered high performance without requiring trade-offs.

SOLUTION

To bridge this gap, Kraton developed REvolution ™ Rosin Ester Technology, which is a bio-based alternative to fossil-derived tackifiers. This technology is derived from renewable paper and pulp industry by-products sourced from responsibly managed forests. REvolution delivers an exceptionally light color and high stability alongside traditional rosin ester performance. Cradle-to-gate life cycle assessments (LCAs) confirmed a lower Global Warming Potential compared with hydrocarbon-based alternatives.

To bring this innovation to market at scale, Kraton collaborated with Henkel and Dow. Henkel incorporated a proprietary blend of Kraton's SYLVALITE™ 2200 bio-based tackifiers, which boasts 97% USDA Certified bio-based content, and Dow's AFFINITY™ GA polyolefin elastomers. This combination powered Henkel's TECHNOMELT® SUPRA 100 LE and TECHNOMELT® SUPRA 106M LE low-emissions packaging adhesives. In 2024, Henkel and Kraton established a multi-year supply partnership to scale access to REvolution technology, enabling broad commercial adoption.

IMPACT

The resulting adhesive TECHNOMELT® formulations achieved a 25% reduction in cradle-to-gate carbon footprint compared with legacy products, with broader application potential offering up to 30% reduction in formulated adhesive emissions. Crucially, these environmental gains were achieved while fully maintaining required food safety standards, line processing efficiency, and adhesion integrity.

This effort answers a critical question for manufacturers asking how to meet ambitious corporate sustainability targets to prove that the bio-based materials are a viable, scalable alternative to fossil-based inputs in demanding commercial packaging applications.

CONCLUSION

By combining renewable raw materials, advanced formulation, and cross-industry collaboration, Kraton, Henkel, and Dow delivered a lower-carbon packaging adhesive without compromising product specifications. This partnership serves as a practical model for the bioeconomy, proving that targeted material innovation can deliver measurable environmental benefits while meeting the rigorous performance and safety standards expected by the modern packaging industry.

25%
Lower
cradle-to-gate
Carbon Footprint

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