KRATON™

Sustainable Solutions.
Endless Innovation.™

UNLOCKING DESIGN-FOR-RECYCLING-READY AUTOMOTIVE APPLICATIONS WITH KRATON'S STYRENIC BLOCK COPOLYMERS

Automotive Design for Circularity

Design for Recycling (DfR) is becoming central to how the automotive industry re-thinks materials and component design. In these industry efforts, plastics remain essential due to their lightweight, durability, and design flexibility.

REGULATORY MANDATES DRIVING THE CIRCULARITY SHIFT

Accelerating European regulations and global sustainability goals requires the automotive industry to shift from a linear model to a truly circular economy. Original equipment manufacturers (OEMs) and tier 1 suppliers are now required to design for both performance and end-of-life recovery. Regulations such as the European Union's End-of-Life Vehicle (EU ELV) Directive, which targets up to 20% recycled plastics, including material sourced from end-of-life vehicles, are driving this change. With nearly 30,000 parts in a typical vehicle, circular design is essential to reduce material complexity and enable efficient recovery, remanufacturing, and recycling.

Key trends shaping automotive DfR include material simplification to minimize non-recyclable polymer systems and improve recyclability; increased integration of post-consumer (PCR) and post-industrial (PIR) recycled content across interior, exterior, and structural parts; modular design and easier disassembly to enable repair, reuse, and recycling; and lightweighting approaches that reduce mass while remaining compatible with curbside recycling streams.

HOW KRATON UNLOCKS AUTOMOTIVE APPLICATIONS DESIGNED FOR RECYCLING

Kraton styrenic block copolymers are used in a wide range of automotive components from interior parts such as door panels, instrument panels, handles, extruded profiles, and soft-touch skins to exterior applications including dynamic and static seals and thermoplastic olefin (TPO) modified bumper fascias. Their versatility and compatibility with established automotive polyolefin polymers make them well-suited for circular design requirements.

Kraton G polymers provide high strength, excellent UV and heat stability, and outstanding low-temperature impact performance. These polymers can be found in exterior applications such as bumper fascia or interior applications

such as soft skins. Their high compatibility with polyolefin systems supports material simplification and streamlines recycling at end-of-life. In addition, their ability to boost overall product performance enables incorporation of PCR or PIR content without reduction in properties, while their lightweight, polyolefin-based chemistry supports lightweight strategies.

Kraton functionalized polymers (FG) enhance the toughness and ductility of engineering thermoplastics used in automotive components, improving energy absorption and resistance to brittle failure. This enables the replacement of metal parts with lighter, high-performance plastics, supporting OEM lightweighting targets. Reactive chemistry enables improved interfacial adhesion and compatibility in multi-polymer systems.

Kraton A polymers are engineered for acoustic damping and can be used in noise-management layers and soft-touch over molding applications. Their compatibility with polar polymers enables more modular interior designs, allowing over molded components to be optimized for end-of-life recovery, while maintaining acoustic and tactile properties.

Kraton's Value in Use: Meeting End-of-Life Vehicle Requirements without Compromise

INDUSTRY / CUSTOMER CHALLENGE

Automotive OEMs must comply with EU ELV regulations by increasing recycled plastic content without sacrificing part performance. Bumpers represent a key opportunity, as they are easily dismantled and provide a consistent source of recycled polypropylene (rPP). This helps OEMs meet the ELV targets such as at least 20% of recycled plastics in new parts originating from end-of-life vehicles. However, rPP streams, particularly those containing TPO, often suffer from contamination, reduced mechanical properties, and performance degradation over multiple recycling loops.

KRATON SOLUTION:

A representative approach involves compounding 10% wt. CirKular+ ™ C2000 with rPP prior to injection molding.

KRATON VALUE

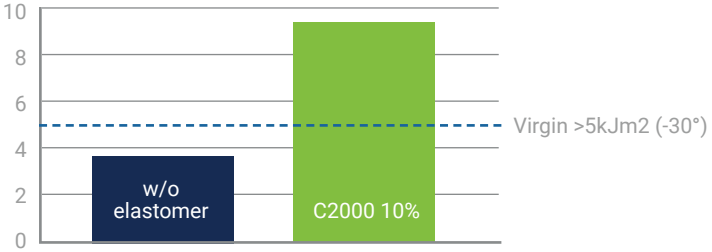
The SBC-based solution can enable end-of-life recyclability and supports compliance with EU ELV legislation. Compared with unmodified rPP, C2000 can improve impact performance by up to 200% at room temperature (23°C) and delivers approximately three times higher impact resistance at -35°C. OEMs gain a durable, high-performance material solution that supports circularity without compromising part reliability.

Impact Performance at RT in rPP

Notched Charpy @ 23C, 50%

Impact Performance at -35C in rPP

Notched Charpy @ -35C, 50%



KRATON CORPORATION

For more information, visit our website at www.kraton.com.

U.S.A. Headquarters
The Woodlands, Texas

Asia Pacific
Shanghai, China

Europe, Africa, Middle East
Almere, The Netherlands

India/ Southeast Asia
Mumbai, India