

Automotive Solutions

Smarter Innovation for Emerging Challenges



Innovation you can build on™

CRODA

Smarter Solutions for Emerging Challenges

Croda Smart Materials offers innovative technologies to support our customers in developing multifunctional, higher performing, more durable, lighter and cost-effective solutions. All this whilst offering a pathway to low carbon solutions. Croda has committed to partnering with the automotive market by designating its experienced industry professionals to align our sustainable innovation with the disruptive evolution of tomorrow's demands. With solutions for coatings, adhesives, sealants, plastics for interior and exterior components, we can advance your developmental efforts to reach and meet the challenging specifications the industry is advancing toward.



Sustainable



Automotive

Smart Solutions: Case Studies

A manufacturer of high end cars was using a polymer additive to improve mold release and anti-scratch properties in their instrument panels. The customer noticed that over time the dashboard began to feel sticky, due to exposure to high temperature and UV light.

The customer approached Croda for a solution to this problem. We recommended using **Incroslip™ SL** at 1%. The customer reported that by using Incroslip SL the tackiness was eliminated and mold release and anti-scratch properties remained high.



lonphase™ has been working with a major automaker for over 10 years in efforts to prevent dust on interior component trim and instrument panels. With the inclusion of additional HMI displays, the demand to suppress particulate has become a significant aesthetic requirement.

The investment to meet specifications such as mechanics, long term environmental testing, colour matching, and optimal charge decay time have proven lasting benefits in PC blends host polymers and extending to other engineered and emerging materials.



Priplast™ 1838 forms a high performance protective barrier in LED light potting or encapsulation offering improved lifetime of the LED in humid environments.

With an improved bio-based content in end formulation, the manufacturer was able to avoid emissions associated with LED manufacturing equivalent to 13 homes' energy use for one year.

In total, the material enables the increase of a bulb's lifetime significantly enough to displace the additional manufacturing of an estimated 50,000 LEDs per year.

Smart Solutions for Interior Plastic

Anti-scratch Additives

As the demand for aesthetics and durability escalates for interior automotive trim and instrument panels, Croda specialty additives provide scratch resistance by reducing the scratch width, depth and appearance. Our anti-scratch products work by controlled migration of the additive through the polymer matrix to reduce the friction at the polymer surface.



Anti-scratch

Key Benefits

- Reduced scratch width & depth
- Reduced scratch appearance
- Reduced friction
- Excellent colour and oxidative stability
- Elimination of tackiness
- Low volatility

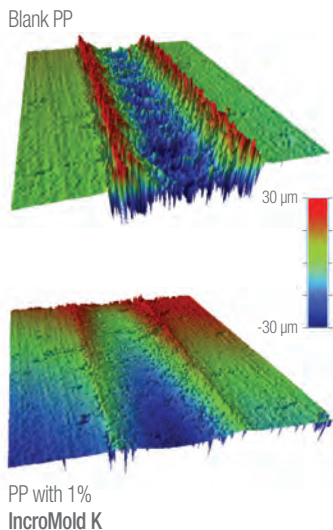


Figure 1: 3D scratch depth and width microscopy imaging after 10N force with 1mm stainless steel scratch tip applicator.

IncroMold™ K has been specifically developed to reduce scratch width, depth and visibility. The product has also shown excellent performance in reducing scratch whitening in PP impact copolymer.

Automotive parts are often subjected to challenging conditions such as high temperature and strong UV light, over a prolonged period of time. Conventional anti-scratch additives deteriorate in such conditions, causing decreased resistance to scratch and mar as well as increased visible bloom. **Incroslip SL** is a fully saturated additive that does not break down, resulting in excellent anti-scratch performance with no negative impact on the part.

Permanent Anti-static Additives

Our **Ionphase** range of Inherently Dissipative Polymers (IDP), also known as permanent anti-statics or ion conductive polymers, reduce the resistivity of the polymer providing control and safety for static related issues.



Anti-static

Key Benefits

- Immediate and permanent effect
- Humidity independent
- Uniform and homogenous distribution with no hot spots
- Minimal change to host polymer properties
- Good compatibility with the host polymer
- Excellent processability and surface quality
- Suitable for compounding, extrusion or injection molding
- Allow compliance with key industry standards for EPA and EX areas

How Do Permanent Anti-static Additives Work?

Permanent anti-static additives, also known as non-migrating additives, based on a high molecular weight polymer, do not move or migrate through or out of the plastic.

Permanent anti-statics are based on a co-continuous ion conductive polymer phase. Ions acting as charge carriers within the additive will dissipate the static field. This can be measured as lowered resistivity of the material.

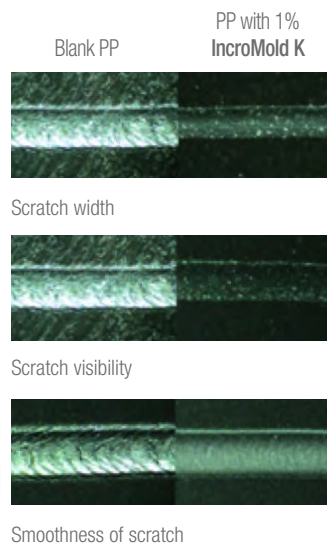


Figure 2: Comparative scratch whitening appearance after 10N force with 1mm stainless steel scratch tip applicator.



Smart Solutions for Coatings and Adhesives

We offer sustainable and durable solutions that protect your car against severe environmental factors such as extreme weather conditions, heat, UV and road debris. Our smart ingredients enhance the performance of adhesives, coatings, engineering plastics and foams used in cars and other means of transportation and reduce production processing time and maintenance costs.

Anti-stat additives for dust prevention on interior surfaces

Functional additives for scratch resistance and self-healing for ADAS

Bio-based dispersants for liquid applied sound dampening for NVH

Anti-scratch for IP and interior trim

Performance Polyols for strength and flexibility for adhesive structural bonding

Durability and weather resistance for electronic potting

Additives for anti-fog in PC and PMMA materials

Chip resistance for Clear Coat

Strength and flexibility for 3D and EP printed components

Adhesives & Sealants

Our range of high performance bio-based ingredients provide improved adhesion and durability to a wide variety of substrates



Hydrophobicity

Key Benefits

- Low temperature flexibility and high temperature resistance
- Good barrier protection for electronic potting
- NVH reduction for relaxed driving
- Enables advanced functionality to light weight designs
- Water resistance and durability for PU sealants



Interior & Exterior Coatings

Our bio-based smart materials offer performance benefits in coatings that bring performance beyond specification



Innovation

Key Benefits

- Stone chipping resistance
- Colour intensity improvement
- Improved cure capabilities
- Three wet application
- Soft touch feel of coated plastics, textile and leather
- Added toughness to critical components

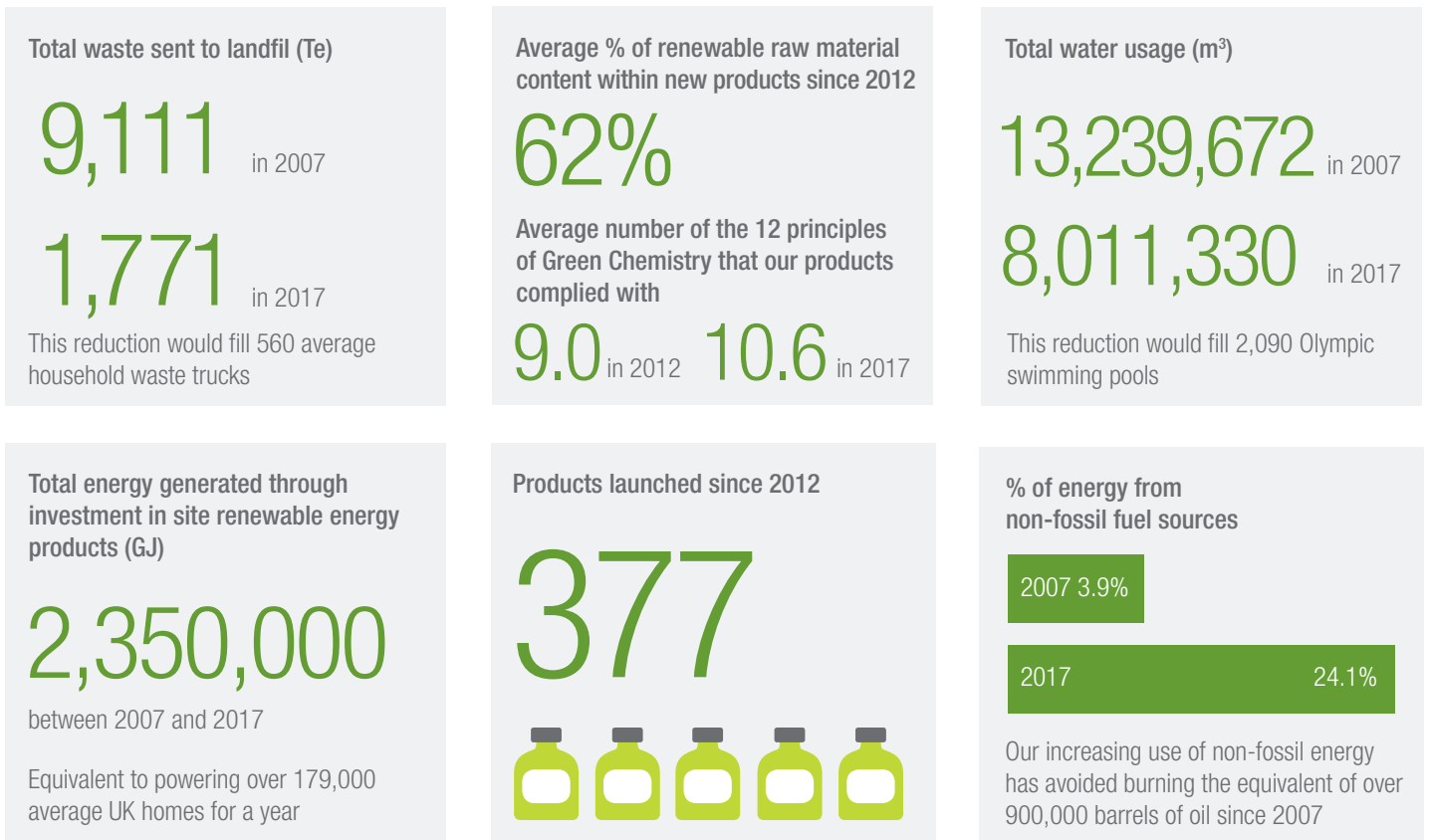


Protection



Smart Solutions for Global Sustainability

Croda's commitment to responsibly innovating and manufacturing performance materials aligns with global initiatives in the automotive industry to promote ethical, conscientious, and responsible practices. Croda has invested in a culture of suitability as demonstrated below.



* Information sourced from the 2017 Global Sustainability Report

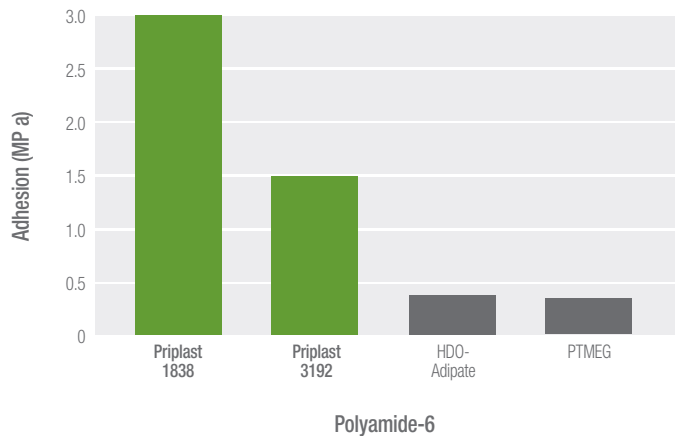


Sustainability is integral to everything we do. From the raw materials we source and the way we use them, to the ingredients we create and the people who produce them, we believe in being a responsible company.

With 100% renewable materials available to enhance product performance, Croda can significantly impact carbon footprint while providing optimal benefit of functionalities.

Sustainable Success

Adhesives developed using a Croda polyol with 82% renewable carbon materials was able to provide superior performance at low and high temperatures while providing extensive water resistance, and enhanced adhesion to low surface energy dissimilar substrates.





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