CirKular™

*Enabling Plastics Upcycling and Circular Economy*



# Compatibilization Series Product Guide

The CirKular+™ Compatibilization Series represents a family of block copolymers based on polystyrene and polyethylene/butylene rubber brought to market by Kraton Polymers. CirKular+™ products are multi-resin compatibilizers and performance enhancement additives for upcycling mixed post-consumer resin (PCR) and post-industrial resin (PIR) recycling streams. CirKular+™ can upgrade the performance of PCR and PIR streams to bring cost effective solutions suitable for multiple end use applications. In addition to modification of the recycling streams, CirKular+ additives enable efficient bioplastics performance enhancement (e.g. Polylactic Acid).

Depending on the target performance requirements and the specific formulation, typical levels of CirKular+ addition range from 3 to 5% weight of the total formulation. CirKular+™ Compatibilization Series grades are manufactured in North America and are supplied in the form of dusted pellets in foil lined bags.

Compatibilization series includes three grades:
**C1000, C1010 and C1010 (50% recycled)**

| Property | Test Method | C1000 | C1010 |
|---|---|---|---|
| Melt Flow, 230 °C and 5 kg (g/10min) | ASTM D 1238 | 22 | 34 |
| Tensile Strength* (psi) | ASTM D 412 | 1360 | 390 |
| Elongation at Break* (%) | ASTM D 412 | 395 | 361 |
| Hardness, 10 s* (Shore A) | ASTM D 2240 | 74 | 62 |
| Specific Gravity | ASTM D 792 | 0.91 | 0.9 |

* Determined on sample injection molded at 205 °C

These are typical values and should not be used to set specifications.

## Versatile End Use, Processing and Functionality

Compounding and Dry Blending

Extrusion, Injection and Blow Molding

Films and Thermoforming

Multi-layer Structure as a Tie Layer

**Recommended Processing Conditions Guide** is available on request and should be reviewed before use.

## Potential Applications

Rigid Packaging (Food or Non-food)[1]

Flexible Packaging and Films

Automotive

Consumer Products

Industrial

Building and Construction

[1]**FDA Food Contact status provided upon request**

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## Features & Benefits

### End Product Durability and Aesthetics

- Superior mechanical properties: Impact strength at room and low temperature
- Flexibility in tailoring properties: Tailored balance between stiffness and impact
- Increased recyclate homogeneity and compatibility: Enhanced processability
- Improved surface finish and colorability

### Multi-material Design Flexibility

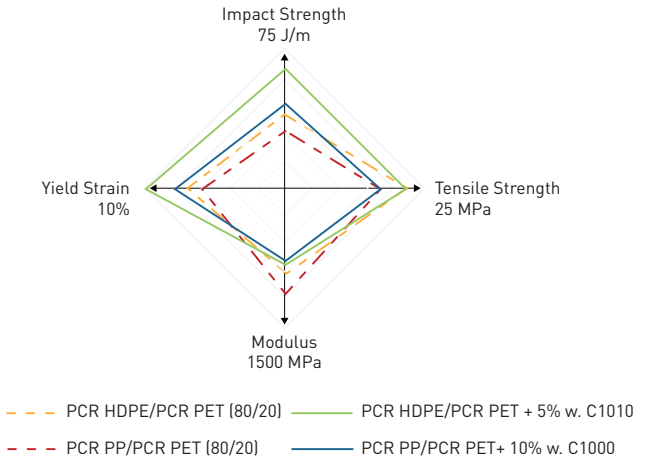
CirKular+™ products offer improved multi-resin compatibility across virgin plastics, bioplastics and post-consumer and post-industrial resin waste streams such as:

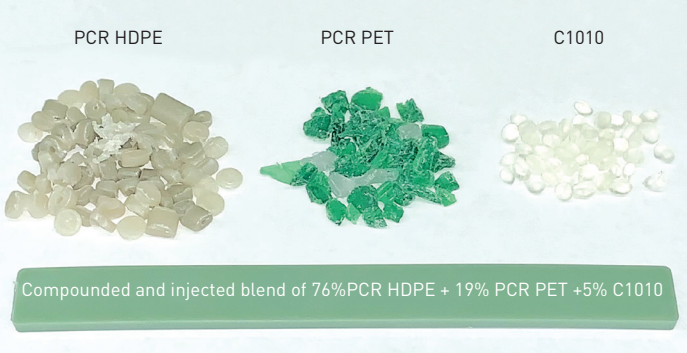
- Bioplastics: Polylactic acid
- Polyolefins and polyolefinic blends: PP, HDPE, MDPE, LLDPE and LDPE, metallocenes
- Polystyrene and high impact polystyrene
- Polar resins: PET, polyamides and nylon, PC, ABS, EVOH, PVA, EVA
- Wood plastic composites

### Increased End Product Circularity

- Higher post-consumer and post-industrial content
- Improved end life recyclability and reusability of end product
- Positive environmental impact with lower $CO_2$ emissions and plastic waste reduction

**Polyolefin Blends (contaminated with PET) Compatibilization Benchmarking**




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