



## SUSTAINABILITY BULLETIN

# Bio-Derived and Recycled Content Solutions

Sustainability is a high priority for consumer brands bringing more environmentally friendly products to market. To help brands reach their sustainability goals, Formerra is taking the next step in our sustainability journey by offering in demand, bio-derived and recycled-based materials.

### WHAT ARE BIO-DERIVED MATERIALS?

Bio-derived or bio-based materials offer more sustainable solutions by utilizing content from corn, straw, and wheat, reducing dependence on fossil fuels. Bio-based materials can meet a variety of performance requirements. For example, performance characteristics for bio-based polyamides (PA) include:

- Low water absorption nylon formulations with up to 47% natural filler from renewable plant sources
- Lower warpage, excellent surface appearance, and colorability
- Dimensional stability and property retention rate after water uptake
- Customized solutions to meet specific performance needs
- Cost-effective options for PA66 glass fiber reinforced materials
- Performance equivalency to PA66 glass fiber-filled formulations using bio-based material

Bio-derived materials reduce carbon emissions and contribute to decreasing dependency on fossil fuel-based raw materials.

### WHAT ARE RECYCLED CONTENT MATERIALS?

Recycled content materials contain Post-Industrial Recycled Content (PIR) and/or Post-Consumer Recycled Content (PCR). PIR is material derived from scrap reclaimed during the manufacturing process, and PCR is material derived from polymers at the end of their lifecycle. The main difference between the two is PIR is recycled from the original manufacturing process and PCR is recycled after consumer use. Incorporating recycled content in new products reduces waste, yields lower carbon emissions, decreases reliance on percentage of fossil fuel-based materials, and contributes to the circular economy.

### APPLICATIONS FOR SUSTAINABLE MATERIALS

Sustainable materials impact overall product life cycle by enabling consumer brands to bring environmentally-conscious materials to a wide variety of industries, including; manufacturing, automotive, retail, industrial, building & construction, among others. Each product offered by Formerra has a unique environmental profile with sustainability characteristics that can be matched to the needs of the consumer brand.



## BIO-DERIVED

| MATERIAL               | SUPPLIER           | PRODUCT NAME                 |
|------------------------|--------------------|------------------------------|
| Acetal POM Homopolymer | DuPont             | Delrin® RA                   |
| Cellulosics            | Eastman            | Tenite™                      |
| PA                     | Arkema             | Rilsan®, Rilsan® Clear Rnew® |
| PA                     | Celanese           | Zytel® RS                    |
| PC                     | Covestro           | Makrolon® RE                 |
| PC / ABS               | Covestro           | Bayblend® RE                 |
| PC + PET               | Covestro           | Makroblend® RE               |
| PEBA                   | Arkema             | Pebax® Rnew®, Pebax® Clear   |
| PHA                    | Danimer Scientific | Nodax® PHA                   |
| PLA                    | Danimer Scientific | Danimer Scientific PLA       |
| PPA                    | Celanese           | Zytel® HTN                   |
| TPC                    | Celanese           | Hytrel® ECO B                |
| TPC-ET                 | Celanese           | Hytrel® RS                   |
| TPE                    | Avient             | reSound™ OM                  |



## RECYCLED CONTENT

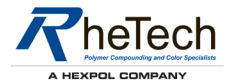
| MATERIAL                         | SUPPLIER                                 | PRODUCT NAME        |
|----------------------------------|--|---------------------|
| ABS                              | Formerra                                 | VerityPlus™ RC      |
| ABS                              | Formosa Chemicals and Fibre Corporation* | N/A                 |
| ABS                              | INEOS Styrolution                        | Terluran® ECO       |
| HIPS                             | Formerra                                 | VerityPlus™ RC      |
| HIPS                             | Formosa Chemicals and Fibre Corporation* | N/A                 |
| Long Fiber Reinforced Composites | Avient                                   | Complēt™ REC        |
| MBS                              | INEOS Styrolution                        | Zylar® Ultra Black  |
| PA                               | Avient                                   | Nymax™ PIR          |
| PA                               | Lanxess                                  | Durethan® ECO       |
| PA                               | Nylene                                   | Nylene®             |
| PBT + PET                        | Lanxess                                  | Pocan® ECO          |
| PC                               | Covestro                                 | Makrolon® R         |
| PC                               | Formosa Chemicals and Fibre Corporation* | N/A                 |
| PC / ABS                         | Covestro                                 | Bayblend® R         |
| PC / ABS                         | Formosa Chemicals and Fibre Corporation* | N/A                 |
| PC + PET                         | Covestro                                 | Makroblend® R       |
| PET                              | Celanese                                 | Rynite® PRC         |
| PP                               | Formerra                                 | VerityPlus™ RC      |
| PP                               | Formosa Chemicals and Fibre Corporation* | N/A                 |
| PP                               | LyondellBasell                           | Hostacom RE         |
| PP                               | PureCycle                                | PureFive™           |
| PP                               | RheTech                                  | RheVision           |
| PP                               | GEON Performance Solutions               | GEON® RESILIENCE® R |
| PS                               | AmSty                                    | PolyRenew®          |
| PVC                              | Dimex                                    | Dimex PVC           |
| TPE                              | Avient                                   | reSound™ R          |
| TPO (POE)                        | LyondellBasell                           | Hostacom RE         |

\*Formosa Chemicals and Fibres Corporation grades available in select regions only





formerra.com



Contact your Formerra Customer Service or Sales Representative for more information about our sustainable materials.

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