Formerra™

Sustainable Solutions Line Card

MATERIAL SOLUTIONS TO BUILD **A BETTER LIFE**

Formerra.com

Helping Our Customers Achieve Sustainability Goals

By collaborating with suppliers focused on sustainability, we help our customers achieve their sustainability goals, such as lowering carbon emissions, reducing waste, combatting the plastic waste problem, increasing the use of renewable resources, and more!

Our Suppliers

AFC ECOPLASTICS
AVIENT
BIRCH PLASTICS INC.
Celanese The chemistry inside innovation™
covestro
danimer scientific
Delrin
DOW
DUPONT
EASTMAN
EVONIK Leading Beyond Chemistry
GEON Performance Solutions
INEOS STYROLUTION
INVISTA
LYB LyondellBasell
Nylene
PURECYCLE
RheTech A HEXPOL COMPANY
VEOLIA
Westlake Dimex

Our Sustainable Solutions Fall Into 3 Categories

Recycled Content

Post-Consumer Recycled (PCR)
(After Consumer Use)

Ocean Bound Plastic (OBP)
(At Risk of Ending Up in an Ocean)

Post-Industrial Recycled (PIR)
(Production Surplus)

Bio-Polymers

Bio-Derived and Bio-Circular Feedstocks
(Beginning of Product Life Cycle)

Biodegradable and Compostable Grades
(End of Product Life Cycle)

Efficient Consumption

Improves manufacturing efficiencies, enhances recyclability, provides lightweighting, and more!

Recycled Content

Post-Consumer Recycled (PCR) Content

- PCR - Plastic waste generated after a material is used by a consumer
- Sustainable Impact
  - Lower greenhouse gas emissions
  - Reduced waste in landfills
  - Reduced depletion of non-renewable resources
  - Contributes to a circular economy

Material	Supplier	Trade Name	Recycle Type	Sustainable Benefit
ABS	INEOS Styrolution	Terluran® ECO	PCR	50% and 70%
ABS	Veolia	Veolia REEF	PCR	100%
Color Masterbatches	Avient	Rejoin™ PCR	PCR	100% in carrier resin
HDPE	Birch Plastics	Plasteon	PCR	98-100%
HDPE	Dow	Revoloop	PCR	25%
HDPE	LyondellBasell	*Circulen*Recover	PCR	25-90%
HDPE	Veolia	Veolia REEF	PCR	100%
HIPS	Veolia	Veolia REEF	PCR	100%
LDPE	Dow	Revoloop	PCR	70%
LDPE	Veolia	Veolia REEF	PCR	100%
LLDPE	Dow	Revoloop	PCR	70%
LLDPE	LyondellBasell	*Circulen*Recover	PCR	30%
PA6 (Long Fiber Composites)	Avient	Complet™ REC	PCR	50%
PBT/PET	Celanese	Celanex® ECO-R	PCR	25%
PC	Covestro	Makrolon®* R CQ	PCR/PIR**	25% - 50%
PC	Veolia	Veolia REEF	PCR	100%
PC+ABS	Covestro	Bayblend®* R CQ	PCR/PIR**	25% - 50%
PC+PET	Covestro	Makroblend®* R CQ	PCR/PIR**	30% - 75%
PET	Celanese	Rynite® ECO-R	PCR	30% attributed using mass balance (ISCC PLUS required)
PET (Filled)	Celanese	Rynite® ECO-R	PCR	≤100%
PP	Invista	Invista™	PCR	30%
PP	LyondellBasell	*Circulen*Recover	PCR	25-30%
PP	PureCycle	PureFive™	PCR	90%
PP	Veolia	Veolia REEF	PCR	100%
PP (Filled)	RheTech	RheComp®	PCR	≤100% PP resin
TPE	Avient	reSound™ R	PCR	25%
TPV	Celanese	Santoprene® ECO-R	PCR	15-45%

* Makrolon®, Bayblend®, and Makroblend® are registered trademarks of the Covestro Group
** Depends on application and requirements

Recycled Content

Ocean Bound Plastic (OBP) Content

- OBP - Plastic waste at risk of ending up in the ocean
- Sustainable Impact
  - Lower greenhouse gas emissions
  - Reduced waste in coastlines
  - Reduced depletion of non-renewable resources
  - Contributes to a circular economy

Material	Supplier	Trade Name	Recycle Type	Recycled Content
HDPE	Birch Plastics	Plasteon	OBP	30%
TPE	Avient	reSound™ R	OBP	25%
PA6	Celanese	Zytel® PA Ocean ECO-R	OBP	30%

Post-Industrial Recycled (PIR) Content

- PIR - Plastic production surplus or waste generated from the original manufacturing process
- Sustainable Impact
  - Lower greenhouse gas emissions
  - Reduced waste in landfills
  - Reduced depletion of non-renewable resources
  - Contributes to a circular economy

Material	Supplier	Trade Name	Recycle Type	Recycled Content
Flexible PVC	Westlake Dimex	Westlake Dimex	PIR/PCR	66% PIR/7% PCR
PA6 (Long Fiber Composites)	Avient	Complet™ REC	PIR	25-50%
PA6, PA66, PA610, PA612	Nylene	Nylene® E Series	PIR	≥25%
PA6, PA66	Celanese	Zytel® PA ECO-R	PIR	30%
PA6, PA66 (Filled)	Celanese	Minlon® PA ECO-R	PIR	30%
PA6, PA66 (FR)	Celanese	Frianyl® PA ECO-R	PIR	30%
PA66	Avient	Nymax ND	PIR	20-100%
PA66	Celanese	Zytel® PA ECO-R	PIR	30% attributed using mass balance (ISCC PLUS required)
PC	Covestro	Makrolon®* R CQ	PCR/PIR**	25% - 50%
PC+ABS	Covestro	Bayblend® *R CQ	PCR/PIR**	25% - 50%
PC+PET	Covestro	Makroblend®* R CQ	PCR/PIR**	30% - 75%
PP	Birch Plastics	Plasteon	PIR	99-100%
PP (Filled)	Geon Performance Solutions	GEON® RESILIENCE® R	PIR	≤35%
PP (Filled)	RheTech	RheVision®	PIR	10-50% Bio-circular fillers ≤100% PP resin
PP (Filled)	RheTech	RheComp®	PIR	≤100% PP resin
PP (Filled)	Celanese	Tecnoprene® ECO-R	PIR	30%
TPE	Avient	reSound™ R	PIR	25-40%
TPO	Westlake Dimex	Westlake Dimex	PIR	88%
TPU (Long Fiber Composites)	Avient	Complet™ REC	PIR	15-45%
TPV	Westlake Dimex	Westlake Dimex	PIR	84%

* Makrolon®, Bayblend®, and Makroblend® are registered trademarks of the Covestro Group
** Depends upon application and requirements

Bio-Polymers

Bio-Derived/Bio-Circular: Beginning of Product Life Cycle

- Bio-Derived (or bio-based) - Materials formulated at least in part from renewable sources, such as canola, corn, straw, wood, sugarcane, and wheat
- Bio-Circular - Materials formulated at least in part from food and agricultural waste, including used cooking oil and food scraps
- Sustainable Impact
  - Lower greenhouse gas emissions
  - Reduced waste in landfills (bio-circular only)
  - Reduced depletion of non-renewable resources
  - Contributes to a circular economy (bio-circular only)

Material	Supplier	Trade Name	Sustainable Benefit
Cellulosics	Eastman	Tenite™	Bio-derived content
LCP	Celanese	Vectra® ECO-B, Zenite® ECO-B	≤60% bio-circular attributed content using mass balance (ISCC PLUS required)
PA12	Evonik	Vestamid® eCO	Produced with green energy and bio-circular feedstock
PA610, PA1010	Celanese	Zytel® RS	≤100% bio-derived content
PA610, PA1010	Evonik	Vestamid® Terra	62-100% bio-derived content
PAPACM12	Evonik	Trogamid® eCO	Produced with green energy and bio-circular feedstock
PBT	Celanese	Celanex® ECO-B, Crastin® ECO-B	≤40% bio-circular attributed content using mass balance (ISCC PLUS required)
PC	Covestro	Makrolon®* RE CQ	≤89% bio-circular attributed content using mass balance (ISCC PLUS required)
PC+ABS	Covestro	Bayblend®* RE CQ	40% - 80% bio-circular attributed content using mass balance (ISCC PLUS required)
PC+PET	Covestro	Makroblend®* RE CQ	30% - 50% bio-circular attributed content using mass balance (ISCC PLUS required)
PHA	Danimer Scientific	Nodax® PHA	100% bio-derived content, biodegradable
PLA	Danimer Scientific	Danimer Scientific PLA	100% bio-derived content, compostable
POM	Celanese	Celcon® ECO-B, Hostaform® ECO-B	≤97% bio-circular attributed content using mass balance (ISCC PLUS required)
POM	Delrin	Delrin® RA	95-100% bio-derived attributed content using mass balance (ISCC PLUS required)
PP (LFRT)	Celanese	Celstran® ECO-B	30% bio-circular attributed content using mass balance (ISCC PLUS required)
TPC	Celanese	Hytrel® ECO-B	Up to 73% bio-circular attributed content using mass balance (ISCC PLUS required)
TPC	Celanese	Hytrel® RS	Up to 73% bio-derived
TPE	Avient	reSound™ OM	35-50% bio-derived content
TPO	Geon Performance Solutions	GEON® RESILIENCE® BIO	5-17% bio-derived content
UHMW-PE	Celanese	GUR® ECO-B	>99% bio-circular attributed content using mass balance (ISCC PLUS required)

* Makrolon®, Bayblend®, and Makroblend® are registered trademarks of the Covestro Group

Biodegradable/Compostable: End of Product Life Cycle

- Biodegradable - Materials that decompose in a natural environment
- Compostable - Materials that can be broken down in an industrial composting facility or a home compost environment

Sustainable Impact
- Lower greenhouse gas emissions (if bio-derived feedstocks)
- Reduced waste in landfills
- Reduced depletion of non-renewable resources (if bio-derived feedstocks)

Material	Supplier	Trade Name	Sustainable Benefit
Additive Masterbatches	Avient	CESA™ BIO	Enhance the properties of biodegradable/compostable polymers such as PLA, PHA, PHBV, PBS, and PBAT
Color Masterbatches	Avient	OnColor™ BIO	Color biodegradable/compostable polymers such as PLA, PHA, PHBV, PBS, and PBAT
PBAT, PBS	AFC Ecoplastics	AFC Ecoplastics	Compostable
PHA	Danimer Scientific	Nodax® PHA	100% bio-derived content, biodegradable
PLA	Danimer Scientific	Danimer Scientific PLA	100% bio-derived content, compostable

Efficient Consumption

Enable More Sustainable Practices

- Part Production - Reduce cycle times, lower temperatures (energy usage), increased recycling rates, reduced VOC emissions
- Finished Part Use - Lightweighting, eliminate substances of concern
- Sustainable Impact
  - Lower greenhouse gas emissions during production or part use
  - Reduced waste in landfills (for improved recycling solutions)
  - Reduced depletion of non-renewable resources (for improved recycling solutions)
  - Eliminate substances of concern

Material	Supplier	Trade Name	Sustainable Benefit
Additive Masterbatches	Avient	Cesa™ Nox	Stabilizes recycled polyolefins during processing for improved quality
Color Masterbatches	Avient	OnColor™ IR	Makes dark plastics IR detectable for improved sorting
Color Masterbatches	Avient	ColorMatrix™ Optica™	Improve PET color tone, reduce carbon emissions through improved bottle blowing efficiencies, and enable increased amounts of PCR
Compatibilizers	Dow	RETAIN™	Enable recycling of film with EVOH or PA as barrier layer
Flexible PVC	Geon Performance Solutions	GEON® Non-Phthalate	Eliminate phthalates in risk-adverse applications
Foaming Agents	Avient	Hydrocerol™	Reduce part weight without compromising mechanical properties
Long Fiber Composites	Avient	Complet™	Lighter weight alternative to steel (~80% lighter) and aluminum (~50% lighter)
PA12	Evonik	Vestamid® eCO Vestamid® RFP	Produced with green energy and biocircular feedstock Produced with green energy
PAPACM12	Evonik	Trogamid® eCO	Produced with green energy and biocircular feedstock
Siloxane Additive Masterbatches	DuPont	MULTIBASE™	Increased throughput and reduced energy demand. Act as processing aids enabling fluoro free formulations.
Specialty Formulations	Avient	Gravi-Tech™	Eliminate lead in risk-adverse applications
TPE	Avient	reSound™ R	≤0 CO2 ekg/kg

Formerra

Convenience
•
Enhanced Visibility
•
24/7 Access

Formerra.com
A Personalized Experience

Register for an account at Formerra.com for a personalized experience with access to the information and functionality you need—all in one place!

Registered users get access to:

- Advanced product search and filtering
- Real-time pricing and product information
- Material availability
- Online ordering & reordering
- Order information and shipment tracking

Take The Next Step

Visit **Formerra.com** to:

- Explore solutions by material properties, industries, and suppliers
- Register for an account to gain access to personalized information, ordering, and more!

We're Here To Help

For general inquiries or customer service
Call **1.888.502.0951**
Email **inquiries@formerra.com**

For polymer technical support
Call **1.866.765.9824**
Email **phd@formerra.com**

Experts in these areas and beyond.

- Healthcare
- Packaging
- Consumer
- Industrial
- Outdoor High Performance
- Electrical & Electronics
- Mobility
- Building & Construction

Copyright © 2024, Formerra, LLC. All the information in this literature is for general information purpose only. Formerra makes no representations, guarantees, or warranties of any kind with respect to the information contained in this literature, including its accuracy, completeness, reliability, suitability for particular applications, or the results obtained or obtainable using the information. Some of the information arises from laboratory work with small-scale equipment which may not provide a reliable indication of performance or properties obtained or obtainable on larger-scale equipment. Values reported as "typical" or stated without a range do not state minimum or maximum properties; consult your sales representative for pricing, property ranges and min/max specifications. Processing conditions can cause material properties to shift from the values stated in the information. Formerra makes no warranties or guarantees respecting suitability of either Formerra's products or the information for your process or end-use application. You have the responsibility to conduct full-scale end-product performance testing to determine suitability in your application, and you assume all risk and liability arising from your use of the information and/or use or handling of any product. FORMERRA MAKES NO WARRANTIES, EXPRESS OR IMPLIED, INCLUDING, BUT NOT LIMITED TO, IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE, either with respect to the information or products reflected by the information. This literature or any other provided literature shall NOT operate as permission, recommendation, or inducement to practice any patented invention without permission of the patent owner. Any action you take upon the information you find in this literature is strictly at your own risk. Formerra will not be liable for any losses and/or damages in connection with the use of this literature. By using this literature, you hereby consent to this disclaimer and agree to its terms.

2024-8-SUSTAINABILITY-LINECARD-ENG