TAPPI INTERNATIONAL FLEXIBLE PACKAGING & EXTRUSION DIVISION

2024 FlexPack PLACE Conference
April 14-17, 2024 • San Diego, CA • Wyndham San Diego Bayside

Solutions to Preserve Film Performance when Incorporating Polyethylene Recycled Content

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Westlake Polyethylene™

Westlake's longstanding core values have led to recently published sustainability commitments

In 2022, Westlake introduced our first ESG goal: reducing carbon intensity

Carbon Goal

20% Reduction in Scope 1 and Scope 2 CO_2e emissions per ton of production by 2030 from a 2016 baseline.

In Q2 2023, Westlake established five additional high-level ESG goals, including circular economy

Circular Economy Goal

Continue to expand our participation in recycling and sustainable products.

For more details, please view our 2022 ESG Report www.Westlake.com/environmental-sustainability-and-governance

Westlake Polyethylene™

Legislation, regulation, and brand commitments drive PCR incorporation along with innovation

20% PCR by 1/1/2024

Trash bags ≥1.0mil *(less for thinner)*

New PE PCR Food Pkg in NA

ST. JOHNS PACKAGING

EMERALD PACKAGING

Change Leaders in Industry

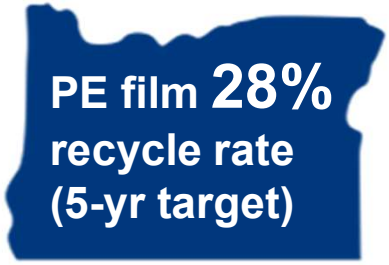
MAKING SUSTAINABLE CHANGE
AMERICA'S PLASTIC MAKERS℠

ALLIANCE TO END PLASTIC WASTE

ELLEN MACARTHUR FOUNDATION

EPR Alignment

2023: No new states



2025 Brand Owner Commitments

Unilever
25% recycled plastic content

at least **25%** recycled plastic content
reckitt

30% average recycled content

Industry Collaboration

OpX Leadership Network
Moving Operational Excellence Forward

PMMI

FPA

BEST PRACTICE
Transitioning Flexible Materials

Westlake Polyethylene™

Customer feedback indicates 3 main challenges when incorporating PCR in high performance film

1. Sourcing is critical

Sourcing a clean, consistent supply requires technical resources and supply partnerships in a fragmented and competitive PCR market

2. Variability must be managed

PCR often exhibits variability in resin properties (e.g. MI, Density), composition (e.g. LD, LL, HD, ash, etc.), and contamination (e.g. cellulose, other polymers, etc.)

3. Formulations must meet end use requirements

Significant development work is required to formulate a resin blend that accounts for the PCR properties and is suitable for end application property requirements

Customers are navigating these challenges amidst increasing pressure from legislation, end user, and brand owner requirements

Westlake Polyethylene™

Westlake combines market and technical experience to support film producers' desire to maintain quality

Film Processability

- Operating Rates
- Up Time
- Yield %
- Scrap Rates

Film Performance

- Dart, tear, puncture
- Clarity, gel count, appearance

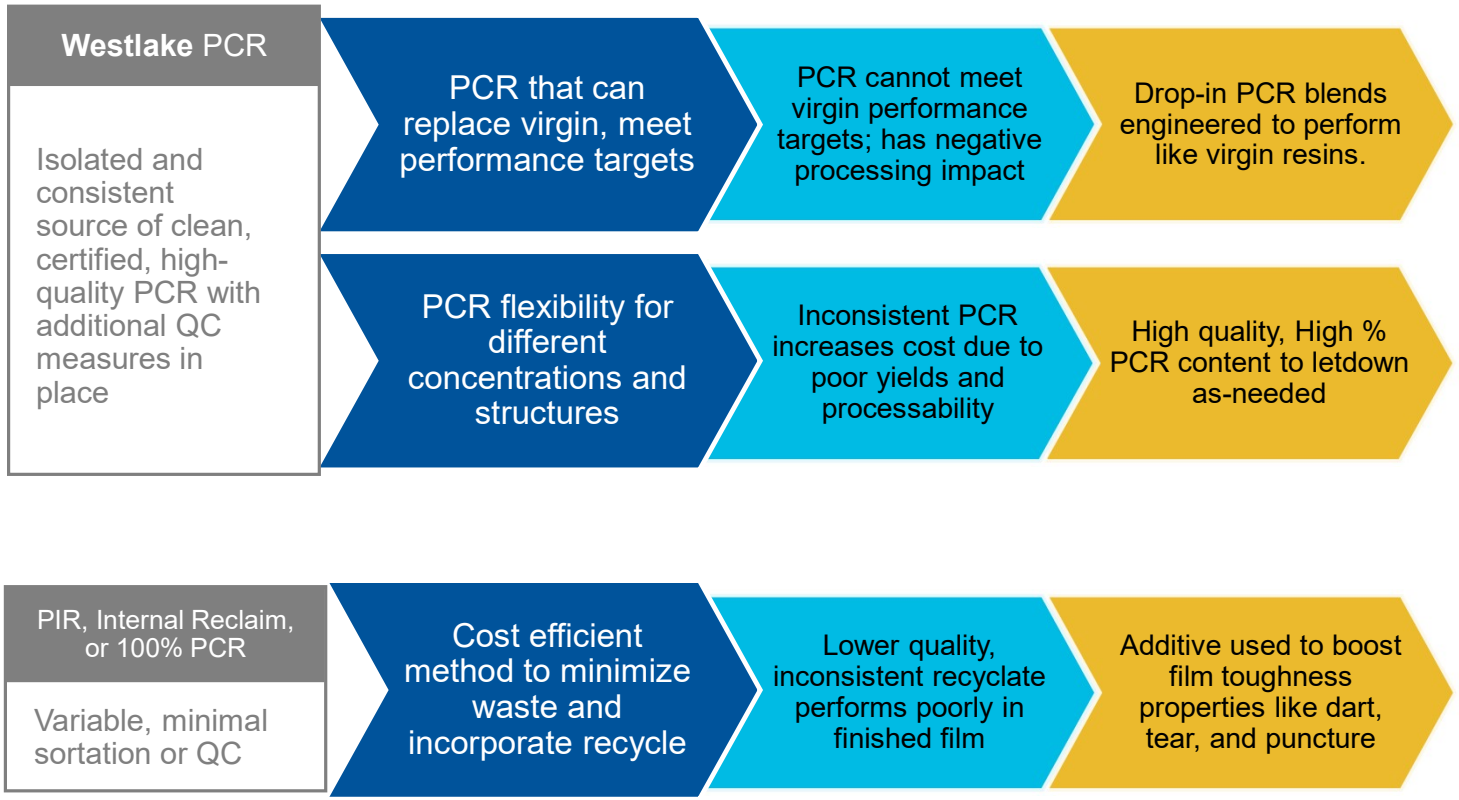
Managing parameters that are critical to quality, Westlake created **PIVOTAL™** to offer a reliable, *one-pellet PCR solution*

PIVOTAL™

Maintaining Quality

- PCR products with minimal lot-to-lot variability by employing a more uniform PCR composition
  - ➥Managing non-plastic contaminants
  - ➥Reducing the impact of commonly used non-PE polymers on film properties
- Establishing specification limits

PCR is not one-size-fits-all, Westlake provides solutions for various recycle incorporation needs



PIVOTAL™

Performance Grades

Grade	MI (g/10min)	Density (g/cm³)	PCR (%)
RA81025	0.85	0.915	25
RA81035 RA81045	0.85	0.915	35 45

Masterbatch Grades

Grade	MI (g/10min)	Density (g/cm³)	PCR (%)
RA80070	1-1.5	0.915 - 0.925	70

STEP UP™

Recycle Modifiers

Grade	MI (g/10min)	Density (g/cm³)
PM30200	0.5	0.906
PM30100	0.7	0.910

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