



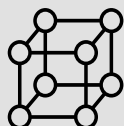
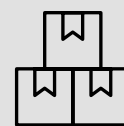
Exceed™ Tough+

Vistamaxx™

Exceed™ Stiff+

Exceed™ Flow

ExxonMobil Signature Polymers and XL Recycling collaborate to create high-performance stretch & shrink hood film solutions containing post-consumer recycled (PCR) content

**Incorporates
PCR content****High elasticity and
holding force****High puncture
resistance****Pallet
stability**

Data and results presented herein apply specifically to the noted application under this fact sheet. Your results may differ depending on factors such as operating conditions, equipment and materials used.

Challenge

Increasing consumer requests and evolving regulations on plastic circularity are driving brand owner interest in packaging solutions with PCR content. For instance, the European Packaging and Packaging Waste Regulation (PPWR)¹ mandates 35% PCR content in industrial packaging by 2030. This trend is increasing the demand for premium quality PCR polyethylene (PE) content to meet performance requirements.

ExxonMobil has partnered with XL Recycling, a French PCR resin producer and part of the Reborn® group, to develop thin, high-performance stretch and shrink hood film solutions incorporating PCR content while maintaining required film quality and integrity. XL Recycling PCR resins can be directly extruded with virgin ExxonMobil Signature Polymers performance PE, providing greater formulation flexibility compared to PCR-rich compounds.

"We've been actively engaged in commercial and industrial films waste collection since 2018 and our PCR grades have already been used in over 3 billion packages designed with a majority

RecyClass



EN 15343

**XL Recycling is
RecyClass certified²**

of our rLDPE and rLLDPE resins," said Mr. Matthieu Abiteboul, Managing Director at the Reborn Group. "Our teams have developed significant expertise in helping clients integrate a high quantity of recycled polyethylene in films. It was a no-brainer to collaborate with ExxonMobil Signature Polymers to boost PCR content incorporation using performance PE resins when needed, creating value and enhancing performance for our clients."

¹ <https://eur-lex.europa.eu/eli/reg/2025/40/oj>

² <https://recyclass.eu/get-certified/recycling-process/list-of-certificates/>

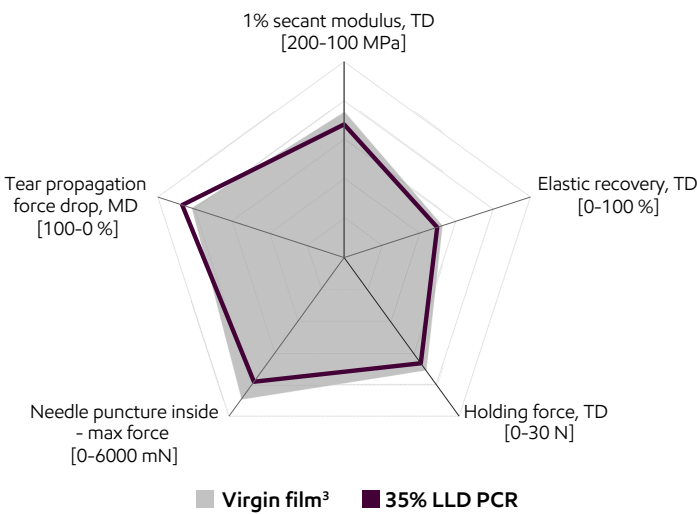
Stretch hood solution

Meeting the PPWR mandate in stretch hood applications is not a simple task. To address the requirement of incorporating 35% PCR content by 2030, the XL Recycling portfolio offers rL2015PC, an rLLDPE grade that can be blended with virgin ExxonMobil Signature Polymers performance PE grades to create outstanding stretch hood films.

The chart below shows the properties of stretch hood 90 µm film incorporating 35% PCR content, combining rL2015PC with Exceed™ Tough+ and Vistamaxx™ performance polymer grades. It shows that mechanical and optical performance are comparable to the virgin formulation at the same gauge, meeting the same requirements for safe handling and transportation of goods.

Potential benefits of the 35% PCR content formulation include:

- Excellent tear propagation and puncture resistance for outstanding protection of transported goods
- Superior holding force contributing to safe transportation and pallet stability
- Low haze to facilitate goods identification and enhance brand visibility
- Compatible with design for recyclability² guidelines as Vistamaxx content is below 15%



Delphine Laurent, Industrial Packaging Development Manager at ExxonMobil Petroleum & Chemical BV, emphasizes that choosing the correct PCR grade with the optimal LLDPE-LDPE ratio is the first step towards designing a successful PCR-based film. “Appropriate recyclate quality and consistency are essential factors to consider when choosing a supplier. It is critical that the recycler has stringent quality controls and has developed the know-how to manage the source and nature of the PCR stream. XL Recycling excels in these areas and in managing the chain of collecting, sorting, and recycling,” she said.



90 µm stretch hood film with incorporation of 35% PCR content (rL2015PC)

Layers (15/70/15)	Resins	Function
Skins	Exceed™ Tough+ m 0512	Holding force, toughness, sealability, optics
	Exceed Tough+ m 0211	Holding force, gel grinding
Core	Vistamaxx™ 6102	Elastic recovery, softness, compatibilization
	PCR rL2015PC	PCR

³ Virgin film formulation: Exceed™ Tough+ m 0512 in skin layers, Exceed™ Tough+ m 0512 and Vistamaxx™ 6102 in core layer.

The low melt index of Exceed Tough+ m 0211 performance polyethylene allows for efficient mixing of the PCR grade in the core layer of three-layer stretch hood applications, making it a great blending partner during extrusion while boosting the film properties. Exceed Tough+ m 0512 and Exceed Tough+ m 0211 resins provide increased toughness, elastic recovery, and good optics. Vistamaxx 6102 polymer grade improves the softness and toughness of the film.

² The terms “recyclable” and “recyclability” are intended to refer to the potential for recyclability of packaging solutions designed and manufactured in accordance with recycling guidelines such as RecyClass (<https://www.recyclass.eu/>) and are limited to Europe. Ultimate recyclability of packaging incorporating ExxonMobil’s performance PE resins will depend on a number of factors outside of ExxonMobil’s control including, but not limited to, availability of programs and facilities that collect and recycle plastic packaging within a given community. Any and all claims about the recyclability of packaging are the sole responsibility of the packaging manufacturer. <https://recyclass.eu/wp-content/uploads/2024/03/2023-PO-011012-vf.pdf>

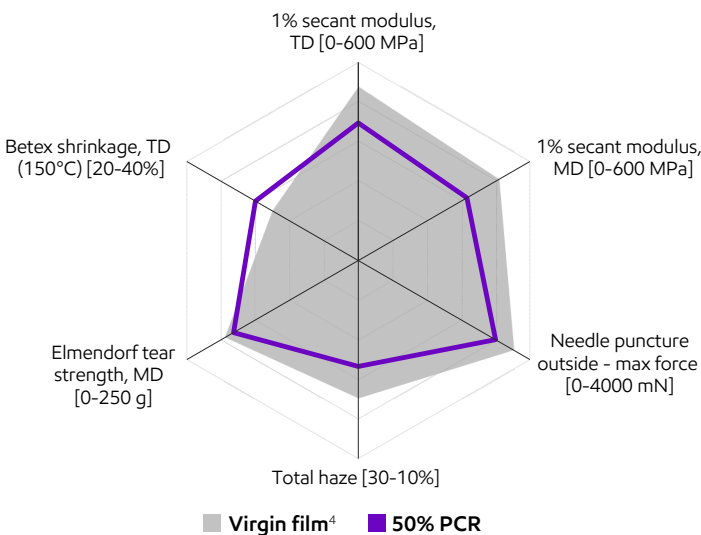
Shrink hood solution

For shrink hood applications, rLDPE resins are typically a better choice than rLLDPE resins given their faster shrinkage speed. The XL Recycling portfolio includes rS2503PC PCR grade, sourced from post-consumer LDPE-rich waste streams. This PCR resin can be incorporated with virgin ExxonMobil Signature Polymers resins to create a high-performance shrink hood film.

The chart below shows the properties of shrink hood 80 µm film incorporating 50% PCR content, combining rS2503PC with Exceed™ Stiff+ and Exceed™ Flow performance polymers. It demonstrates that the mechanical and optical performance are equivalent to the virgin formulation at the same gauge.

Potential benefits of the 50% PCR formulation include:

- Excellent shrinkage and high holding force to ensure good pallet stability
- Superior tear and puncture resistance to effectively protect goods during transportation
- Low haze to facilitate goods identification and enhance brand visibility
- Good processability to enable high-output film production



The higher density of Exceed™ Stiff+ m 0238 resin helps obtain a high holding force even for thin films. Exceed™ Flow m 0327 resin provides the film with better sealability, higher toughness, and lower haze. ExxonMobil™ LD 03322 polymers can be used as a minor blending partner to boost the shrinkage speed. As with the stretch hood solution, all PCR content is incorporated in the core layer of the three-layer film structure.

The combination of ExxonMobil Signature Polymers and XL Recycling PCR resins enables the incorporation of recycled content into packaging without compromising key performance characteristics. With consumers increasingly demanding products with recycled content, this material combination of virgin and recycled PE can help address their needs.



80 µm shrink hood film with incorporation of 50% PCR content (rS2503PC)

Layers (15/70/15)	Resins	Function
Skins	Exceed™ Stiff+ m 0238	Holding force
	Exceed™ Flow m 0327	Toughness, sealability, optics
	ExxonMobil™ LD 03322	Shrinkage speed
Core	Exceed Stiff+ m 0238	Holding force
	PCR rS2503PC	PCR

⁴ Virgin film formulation: Exceed™ Stiff+ m 0238, Exceed™ Flow m 0327, ExxonMobil™ LD 03322 in skin layers; Exceed™ Stiff+ m 0238 in core layer.

XL Recycling PCR⁵ pellets for high-performance films

Derived from post-consumer commercial & industrial sources

	rL2015 PC	rS2503 PC
Dominant PE type	LLDPE	LDPE
Target MFI ⁶ (g/10 min)	1.5-1.9	0.1-0.5
Density (g/cm ³)	916-925	920-930

⁵ According to ISO 14021
⁶ 190°C/2.16 kg. XL Recycling recyclates come with their own certificates of analyses and test methods.

They are available upon request directly at contact@xlrecycling.com and the grades can be found on the XL Recycling website: <https://xlrecycling.com/en/products/> (accessed on May 21st 2025)

What's new: ExxonMobil Signature Polymers

All our polymers are now positioned under a single portfolio brand: ExxonMobil Signature Polymers. The aim is to simplify our product architecture and naming to improve portfolio navigation for you. We would like to stress that our commitment to high quality products remains the same, it is the names that change. Everything else remains the same. We will be making these modifications over the next six months so you will see both old and new grade names highlighted during that time.

Here's a quick overview of brands and grade names that have changed in this document:

Legacy commercial name	New commercial name
Exceed™ XP 7021	Exceed™ Tough+ m 0211
Exceed XP 7052	Exceed Tough+ m 0512
Enable™ 4002	Exceed™ Stiff+ m 0238
Enable 2703	Exceed™ Flow m 0327
ExxonMobil™ LDPE LD 165	ExxonMobil™ LD 03322

Some of our existing Exceed, Achieve, Paxon and premium PP/HD grades have moved to Exceed brand; most existing Enable grades have moved to Exceed Flow[+]; most of our existing Exceed XP grades have moved to Exceed Tough[+]; most of our existing Exceed S grades have moved to Exceed Stiff[+]. More details here https://www.exxonmobilchemical.com/en/brands/signature-polymers/exceed_high_performance_polymers or contact your ExxonMobil representative to know more.

Want to see what's changed in our portfolio? Go to [exxonmobilchemical.com/sptransform](https://www.exxonmobilchemical.com/sptransform)

Test item	Test method	Parameter	Unit
Tensile properties	ExxonMobil method	1% secant modulus	MPa
Stretch hood test TD	ExxonMobil method	Elastic recovery	%
		Holding force	N
Stretch hood test MD	ExxonMobil method	Tear propagation force drop	%
Needle puncture	ExxonMobil method	Maximum force	mN
Elmendorf tear	ASTM D1922	Elmendorf tear strength MD/TD	g
Haze measurement	ASTM D1003	Total haze	%
Betex shrink at 150°C	ExxonMobil method	Betex shrink percentage (MD or TD)	%

Data traceability

Stretch hood virgin: B2409-002983909

Stretch hood 35% PCR: B2409-002983910

Shrink hood virgin: B2404-000149721

Shrink hood 50% PCR: B2404-000149722



Bring your impossible

ExxonMobil Signature Polymers was born from the belief that people fuel progress. From automotive and construction to packaging, agriculture, industrial, and beyond, we leverage the scale and reach of ExxonMobil to deliver the insights and innovations that empower our diverse, global partners to take their businesses to new heights. We continuously work to provide the listen-first, service-driven, game-changing collaboration that unlocks opportunities for our partners and advances their business goals.