



Exceed™ Tough

## Stretch film solution that incorporates post-consumer recycled (PCR) content



Wrapper  
consistency at  
150% strain



Up to 200%  
ultimate strain



Puncture force  
of up to 30 N



PCR content  
incorporation

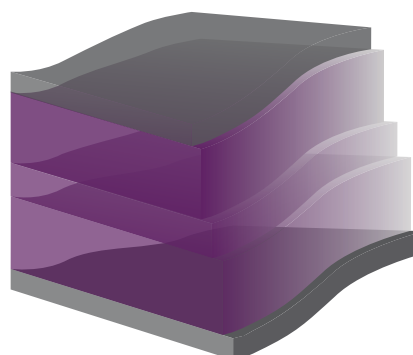
Data and results presented herein apply specifically to the noted application under this fact sheet. Your results may differ depending on factors such as operating conditions, equipment and materials used.

Based on ExxonMobil testing, a C4-LLDPE-based formulation with the incorporation of PCR content may not deliver the film and end-use level of performance required for machine wrap stretch films unless high quality recycled content is used.

Exceed™ Tough m 3812.CB performance polymer is an excellent post-consumer recycled (PCR) content blend partner. As demonstrated in ExxonMobil testing, it helps enable the incorporation of up to 20% PCR content in a machine-wrap stretch film solution, with reduced impacts from gels and improved wrapper consistency.

### Exceed Tough m 3812.CB performance polymer as an excellent PCR content blend partner demonstrated

- Higher melt index and lower density (vs reference performance PE (0.916 g/cm<sup>3</sup>; 3.5 g/10 min)) exhibiting improved mechanical performance and processing capability.
- Especially suited as a blend partner with PCR content.
- Acted as a gel grinder, reducing the amount and size of gels, and helping improve wrapper consistency.

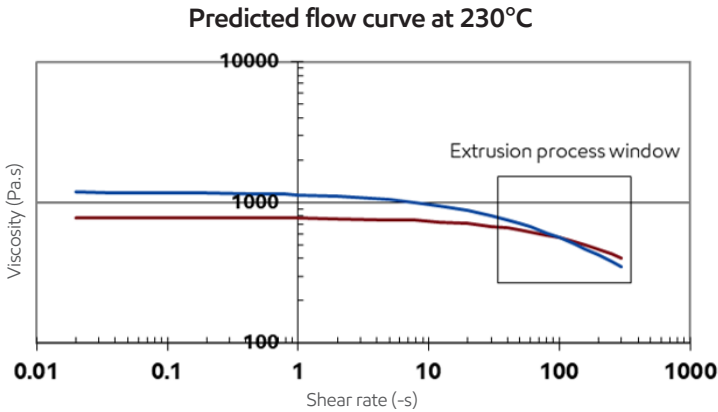


- Cling and Anti-Cling layer
- Exceed Tough m 3812.CB
- PCR content

Note: Concept applicable for 3-layer line as an illustration

Exceed™ Tough m 3812.CB performance polymer as a gel grinder delivered higher shear

Tests performed on Exceed Tough m 3812.CB and the reference C4-LLDPE (using the same PCR content batch under the same processing conditions) observed that the addition of Exceed Tough m 3812.CB performance polyethylene in the blend reduced the amount of gels. Additionally, higher viscosities generally result in higher shear, which can grind larger gels and may help lower the total number of gels.

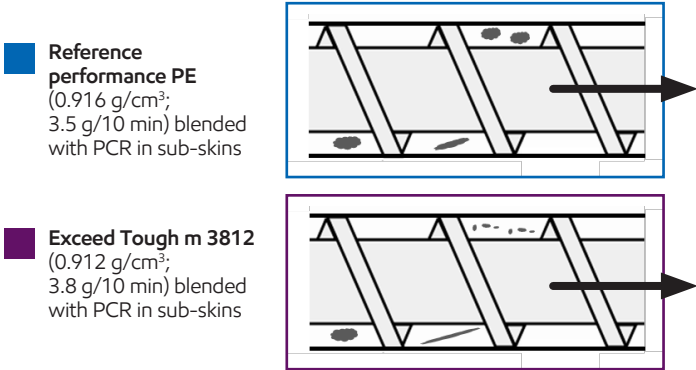


Number of gels per meter of film

	200 - 400 μm	400 - 800 μm	800 - 1600 μm	1600 - 2400 μm	2400 - 4000 μm
Reference	3145	706	35	0.4	0.0
Exceed	2708	525	21	0.1	0.0

Absolute values can vary according to the camera type and gel detection sensitivity settings.

Different shear mixing due to different viscosity



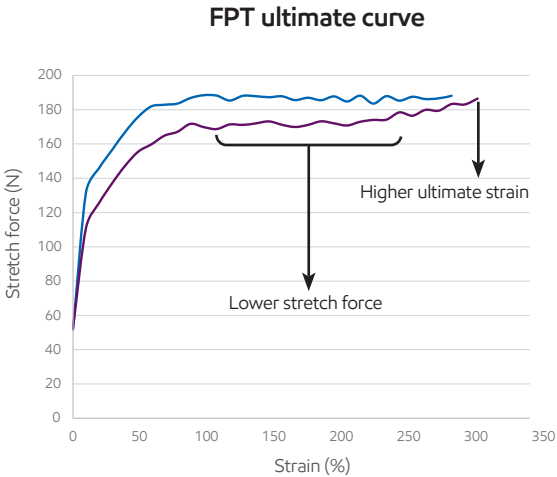
Exceed Tough m 3812.CB performance PE helped improve mechanical performance in a formulation that incorporated recycled PE content

Test results observed improved mechanical performance when Exceed Tough m 3812 performance PE was incorporated into the formulation compared to a reference C4-LLDPE:

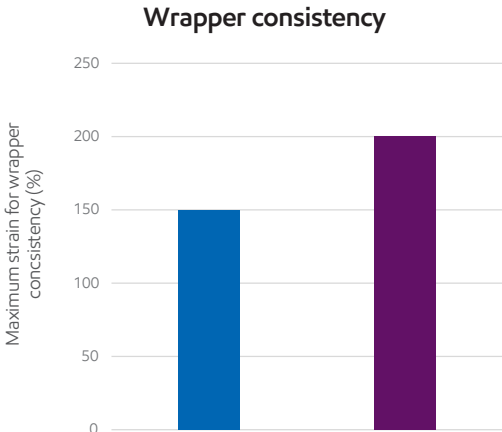
- Lower density of Exceed Tough m 3812 performance PE resulted in lower stretch force
- Improved toughness of Exceed Tough m 3812 performance PE increased ultimate strain and improved wrapper consistency

	Reference performance PE + 20% PCR content 22μm	Exceed Tough m 3812.CB + 20% PCR content 22μm
Ratio	1/8/1	1/8/1
Anti-cling		
Core	75% Reference mPE 25% PCR content*	75% Exceed Tough m 3812.CB 25% PCR content*
Cling		

Same cling and anti-cling compositions  
\*PCR-Type 2 considered in these formulations.  
PCR2-type2: > 90% LLDPE, density: 0.917 g/cm³, MI: 1.7 g/10 min



Translated into



- Reference performance PE (0.918 g/cm³ ; 3.5 g/10 min)
- Exceed Tough m 3812 (0.912 g/cm³ ; 3.8 g/10 min)

Test item	Test method
Ultimate strain	FPT-750 equipment: 30 N unwind force, -4% wind strain, 4000 mm/s line velocity, W stretch pattern
Gel count (by consistency test)	50 m of unstretched film on FPT-750 equipment: 30 N unwind force, 0% pre-stretch, 5% wind strain, 4000 mm/s line velocity, W stretch pattern, gray value 140
Wrapper consistency	50 m of unstretched film on FPT-750 equipment: 30 N unwind force, 5% wind strain, W-stretch pattern. Wrapper velocity of 50 wraps/min at 100% 150%, 200%, or 250% pre-stretch; 3 times no film break is seen as a successful test
Melt index	(190°C / 2.16 kg) – based on ASTM D1238
Density / specific gravity	Based on ASTM D792

All data in this document have been tested by or on behalf of ExxonMobil

**ExxonMobil**  
Signature Polymers

**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.



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# 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™ 3812CB	Exceed™ Tough m 3812.CB

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](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/en/brands/signature-polymers/exceed_high_performance_polymers)