



## 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

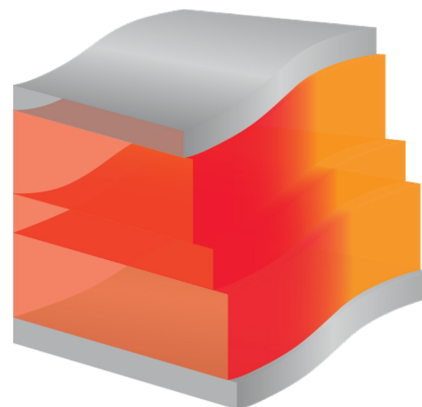
Data and results presented herein apply specifically to the noted application under this fact sheet. Your results may differ depending on factors such as operating conditions, equipment and materials used.

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™ 3812CB 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 3812CB 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.

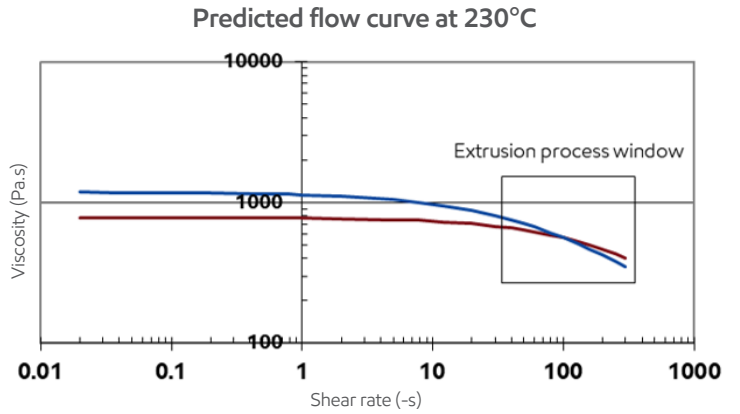


■ Cling and Anti-Cling layer  
■ Exceed 3812CB  
■ PCR content

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

**Exceed™ 3812CB performance polymer as a gel grinder delivered higher shear**

Tests performed on Exceed™ 3812CB and the reference C4-LLDPE (using the same PCR content batch under the same processing conditions) observed that the addition of Exceed 3812 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.

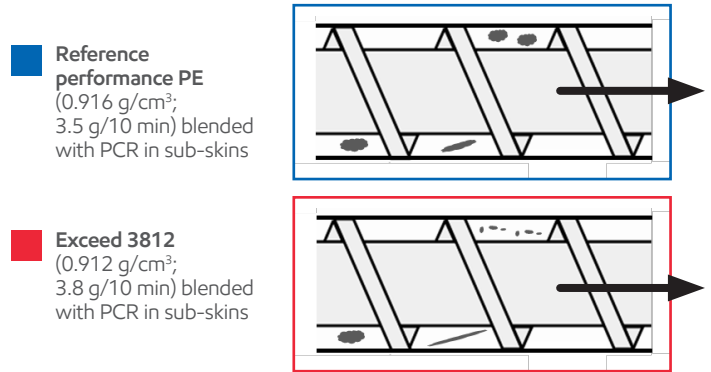


**Number of gels per meter of film**

	200 - 400 μm	400 - 800 μm	800 - 1600 μm	1600 - 2400 μm	2400 - 4000 μm
Reference (Blue)	3145	706	35	0.4	0.0
Exceed 3812 (Red)	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 3812CB performance PE helped improve mechanical performance in a formulation that incorporated recycled PE content**

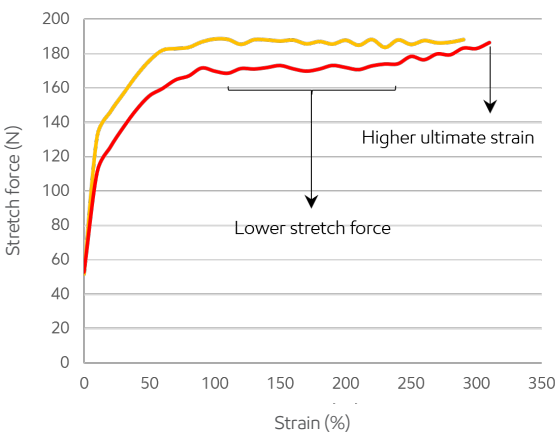
Test results observed improved mechanical performance when Exceed 3812CB performance PE was incorporated into the formulation compared to a reference C4-LLDPE:

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

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

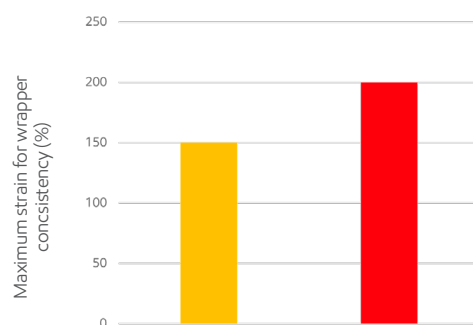
Same cling and anti-cling compositions  
\*PCR-Type 2 considered in these formulations.  
PCR2-type2: > 90% LLDPE, density: 0.917 g/cm³, MI: 1.7 g/10 min

**FPT ultimate curve**



Translated into

**Wrapper consistency**



- Reference performance PE (0.918 g/cm³ ; 3.5 g/10 min)
- Exceed 3812CB (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

## Why ExxonMobil PE? Why today?

tomorrow's  
performance  
today

What some might view as solutions that will only happen in the future, ExxonMobil PE is making possible today – through our innovative and reliable products, collaborative approach, technology leadership and support, and our unmatched global supply and resources. Why wait for tomorrow to advance your business today? Contact your ExxonMobil PE representative and begin experiencing tomorrow's performance today.

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