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# Multi-cycle recycled PE heavy duty sacks

 <p>Integrates tracing technology to track content</p>	 <p>Contains up to <b>37%</b> recycled PE heavy duty sacks film</p>	 <p>Maintains packaging integrity and performance</p>
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## Challenge:

Create multi-cycle recycled heavy duty sacks without compromising performance.

As part of its commitment to helping customers create sustainable solutions, ExxonMobil wanted to develop a solution for form, fill and seal (FFS) heavy duty sacks (HDS) that would include multi-cycle recycled polyethylene (PE) from HDS film without compromising performance.

Using **Exceed XP™ performance PE polymers**, heavy duty sacks can now be made that include multi-cycle recycled HDS film - without compromising packaging integrity and performance.

- Maintain packaging integrity and performance
- Use up to 37% recycled PE HDS film
- Integrate tracing technology to track PE HDS film

A collaboration between ExxonMobil, a leading global supplier of performance PE polymers, and **Reifenhäuser**, a leading manufacturer of converting technology, has developed a solution for multi-cycle recycling of heavy duty sacks within the same value-in-chain loop.

## Solution:

Incorporates up to 37% recycled HDS tracked content and maintains packaging integrity

### Contains up to 37% recycled heavy duty sack film

Combining up to 37% recycled PE from HDS using Exceed™ XP performance PE polymers, the solution maintains the package integrity and performance, even when multi-cycle recycled PE is used. Film formulations with tracking technology can be tailored to deliver defined properties that meet the needs of specific HDS applications.

### Integrates tracing technology to track film content

The solution utilizes integrated tracing technology from Reifenhäuser that identifies and tracks the original film formulation and recycled materials. Because the original film structure is known, a new structure that includes both recycled PE and virgin performance PE can be formulated to deliver the required quality and performance. Only recycled PE that can be identified using this tracing technology is used to make new HDS, helping to ensure quality.



# Results:

A sustainable solution, which uses recycled PE HDS film and virgin performance PE polymers, and maintains the performance properties of new PE HDS - even when fourth-cycle recycled PE HDS film is included in the formulation.

## Maintains packaging integrity and performance

Exceed XP performance PE and ExxonMobil™ HDPE allow the properties of the film to be retained while delivering high-efficiency processing, even when recycled content is added to the formulation. This includes step-out stiffness, toughness and sealing properties.

Tests have proven that the multi-cycle recyclable solution is well-suited for medium and heavy duty sacks.

## Provides easy processing

The Reifenhäuser Evolution 5-layer blown film converting technology enables melt temperatures to be lowered by as much as 20°C which, combined with a compact die head, makes processing easy. The “take-off” system lowers the risk of thick film blocking and edge breakage.

A 5-layer HDS film, including recycled PE in the core and Exceed XP in the skin layers, delivers:

- **Stiffness**
- **Toughness** - dart, tear and puncture through multiple cycles
- **Processing and ability to machine**

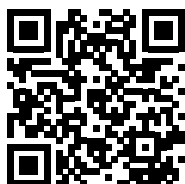
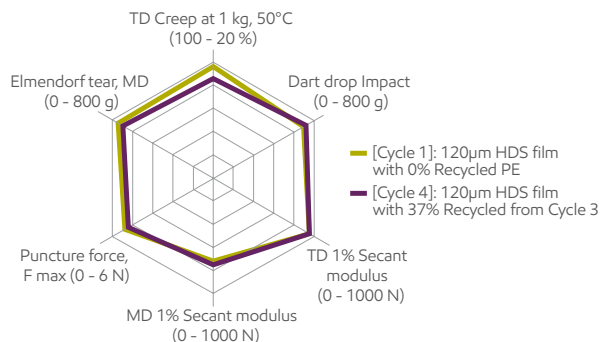
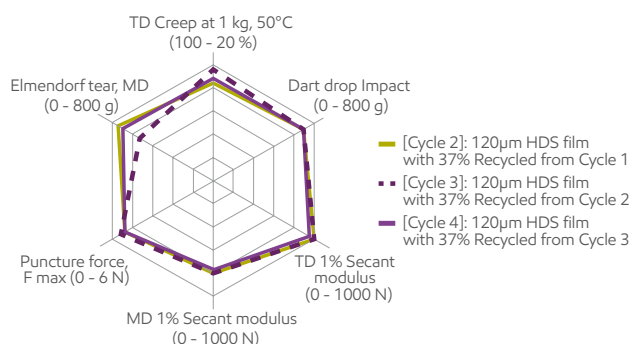


Figure 1: Selected film performance data for PE HDS [Cycle 1], containing virgin performance PE polymers; and PE HDS [Cycle 4], containing virgin performance PE polymers and up to 37% multi-cycle recycled PE HDS film content.



All data from tests performed by or on behalf of ExxonMobil.

Figure 2: Selected film performance data for PE HDS Cycles 2, 3 and 4 containing virgin PE performance PE polymers and up to 37% recycled PE HDS film content.



All data from tests performed by or on behalf of ExxonMobil.

	HDS - Cycle 1	HDS - Cycles 2, 3, 4
	Virgin performance	Virgin performance PE with up to 37% recycled PE HDS content
Layers	5-Layer / 120 micron	5-Layer / 120 micron
A	Exceed XP 8318 Enable 2005	Exceed XP 8318 ExxonMobil HDPE
B	Exceed XP 8318 Enable 2005 ExxonMobil HDPE White MB	Exceed XP 8318 ExxonMobil HDPE White MB
C	Exceed 1018 ExxonMobil HDPE	Recycled PE sacks from previous cycle
B	Exceed XP 8318 Enable 2005 ExxonMobil HDPE White MB	Exceed XP 8318 ExxonMobil HDPE White MB
A	Exceed XP 8318 Enable 2005	Exceed XP 8318 ExxonMobil HDPE

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