



Exceed™ Stiff+

Extend the limits of stiffness and toughness of heavy duty sacks for industrial and agricultural packaging with Exceed™ Stiff+ performance polyethylene

Creating stiffer, tougher, more durable flexible packaging often requires multiple resins, more blending, more layers and sacrifices in conversion efficiency. What if your resin did more? Exceed Stiff+ PE grades deliver simplicity without compromise. Now you can get high performance with easy processing and achieve a better balance of toughness and stiffness with less blending.



Exceed Stiff+ PE resins significantly improve the performance and durability of heavy duty bags used to package agricultural and industrial goods such as soil, gravel, and fertilizer. By delivering exceptional combinations of stiffness and toughness, Exceed Stiff+ grades reduce the need for HDPE and promote performance PE-rich functional layers that boost durability without as much blending.

Beneficial attributes

- Reduce and redistribute HDPE to create tougher functional layers
- Deliver premium MD tear without compromising dart drop impact or stiffness
- Enhance stiffness to facilitate upright display

Value

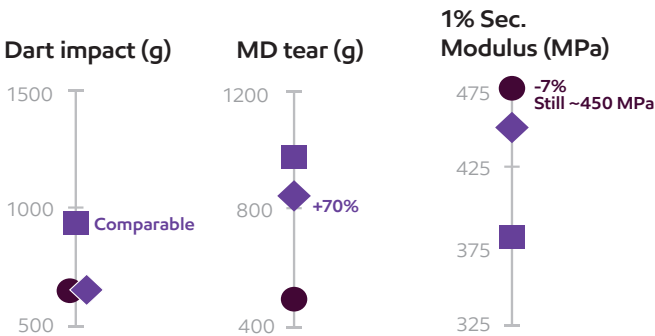
- Simpler formulations reduce operational scrap/waste
- Tougher, more tear-resistant packaging
- Higher performance without compromise

Exceed Stiff+ performance polyethylene creates a better balance of stiffness and toughness in heavy duty sacks used to package industrial and agricultural products.

25 kg industrial and agricultural bags

The first design holds up to ~25 kg of items and is typically gusseted and palletized. These sacks demand high dart drop impact, MD tear and stiffness to facilitate upright display and minimize gauge.

Using Exceed™ Stiff+ m 0926.ML resins to replace lean HDPE blends delivers comparable dart drop impact, an ~70% increase in MD tear, and only a slight decrease in stiffness, which remains high at ~450 MPa; this is a better balance of performance. Even higher MD tear is possible if some sacrifice in stiffness is permissible.



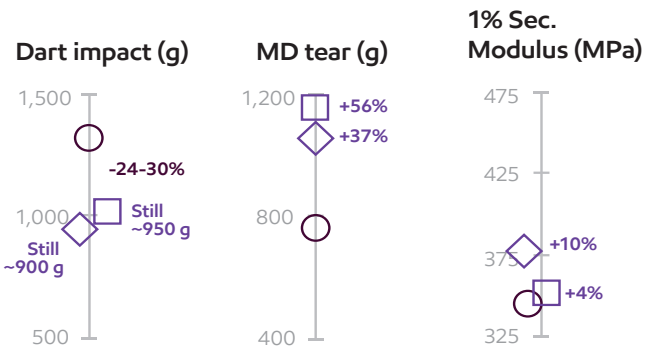
	● Exceed™ Tough+ 40% HD*: 100µm Reference 1	◆ Exceed Stiff+ 21% HD*: 100µm Solution 1	■ Exceed Stiff+ 10% HD*: 100µm Solution 2
Ratio	1 / 3 / 1	1 / 3 / 1	1 / 2 / 1
Skins	88% Exceed Tough+ m 0518 10% HDPE	98% Exceed Stiff+ m 0926.ML	98% Exceed Stiff+ m 0926.ML
Core	32% Exceed Tough+ m 0518 60% HDPE	57% Exceed Stiff+ m 0926.ML 35% HDPE	72% Exceed Stiff+ m 0926.ML 20% HDPE

* HDPE = 0.952 g/cm³, 0.68 g/10 min MI @ 190°C, 5kg.

Up to 50 kg industrial and agricultural fertilizer-type bags

Larger pillow-style bags are also used in agriculture and can range up to 50 kg in mass. These non-gusseted sacks are often handled roughly during distribution and use on farms, so higher dart and tear resistance are required. These structures are often 140 to 200µm in gauge, but we produced these bags at 100µm solely to illustrate the performance improvements that are possible.

Using Exceed Stiff+ m 0926.ML resins in the core instead of a lean HDPE blend delivers an acceptable decrease in dart offset by an even larger increase in MD tear and incremental improvement in stiffness; this also represents a better balance of performance.



	○ Exceed Tough+ 20% HD*: 100µm Reference 2	◆ Exceed Stiff+ 10% HD*: 100µm Solution 2	■ Exceed Stiff+ 6% HD*: 100µm Solution 3
Ratio	1 / 3 / 1	1 / 2 / 1	1 / 3 / 1
Skins	88% Exceed Tough+ m 0518 10% HDPE	98% Exceed Stiff+ m 0926.ML	98% Exceed™ Stiff+ m 0820.ML
Core	65% Exceed Tough+ m 0518 27% HDPE	72% Exceed Stiff+ m 0926.ML 20% HDPE	82% Exceed Stiff+ m 0926.ML 10% HDPE

* HDPE = 0.952 g/cm³, 0.68 g/10 min MI @ 190°C, 5kg.

Data from tests performed by or on behalf of ExxonMobil. MAC202007.0106.02 and 03 / R2111-005585.

Grade	Melt index (g/10 min)	Density (g/cm ³)	Slip / anti-block
Exceed Stiff+ m 0820.ML	0.80	0.920	No
Exceed Stiff+ m 0926.ML	0.85	0.926	No

Test item	Test method
MI (Melt Index)	ExxonMobil test method following principles of ASTM D-1238 or supplier datasheet
Density	ExxonMobil test method following principles of ASTM D-4703 and ASTM D-1505 or supplier datasheet
Dart drop impact resistance by free falling dart	ExxonMobil test method following principles of ASTM D-1709
Elmendorf tear strength	ASTM D-1922-15
Tensile properties on film	ExxonMobil test method following principles of ASTM D-882-18

Contact us for more information: [exxonmobilchemical.com/pe](https://www.exxonmobilchemical.com/pe)

ExxonMobil
Signature Polymers

Bring your impossible



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What's new: ExxonMobil Signature Polymers

All our polymers are now positioned under a single portfolio brand: 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™ S 9243ML	Exceed™ Stiff+ m 0926.ML
Exceed S 9272ML	Exceed Stiff+ m 0820.ML
Exceed™ XP 8358	Exceed™ Tough+ m 0518

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)