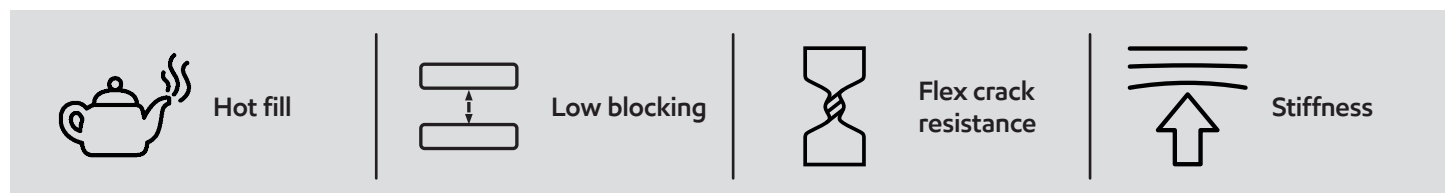




Exceed™ Stiff+

Increase efficiency and durability of hot-filled bag-in-box packaging with Exceed™ Stiff+ performance polyethylene

Creating tougher, more durable flexible packaging often requires sacrifices in conversion efficiency. What if your resin did more? Exceed Stiff+ resins deliver simplicity without compromise. Now you can get high performance with easy processing and an exceptional balance of stiffness and toughness in each Exceed Stiff+ grade.



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.

Bag-in-box bladders made of Exceed Stiff+ performance PE resins are ideal for hot-filled liquids and sterile sauce applications. Using Exceed Stiff+ m 0820.ML resin in the skins delivers outstanding toughness, further increases flex crack resistance, and prevents film-to-film blocking that creates failure initiation sites in multi-wall bladders. The overall result is a much more robust, durable package. The additional heat-resistance afforded by skins using Exceed Stiff+ m 0820 PE should enable packages to be filled with hotter liquids too, contributing to faster overall food processing and packaging times.

Beneficial attributes

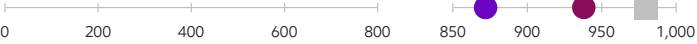
- High puncture, seal strength, and dart drop impact enhance toughness
- Outstanding flex crack resistance enhances durability
- High SIT helps reduce film-to-film blocking

Value

- Premium package durability to reduce failures, complaints and refunds
- Faster filling operations through less block-prone and more heat-resistant bags

The key performance data of a typical 50 µm, 3-layer coex film made of various polyethylenes is shown below and highlights the toughness that is possible when Exceed™ Stiff+ m 0820.ML performance PE is used in the skins and Exceed™ Tough+ m 0814.ML resin is used in the core. In addition to the high dart impact and needle puncture values, a significant decrease in the number of flex-induced holes is achieved. Even better, the structure based on Exceed Stiff+ PE exhibits a higher seal initiation temperature (SIT), which should help prevent film-to-film blocking when the bladder walls contact one another during filling with hot liquid. The overall result is a much more durable package that resists failure and offers increased hot-fill capability.

Dart impact (g)



Needle puncture - force at break (N)

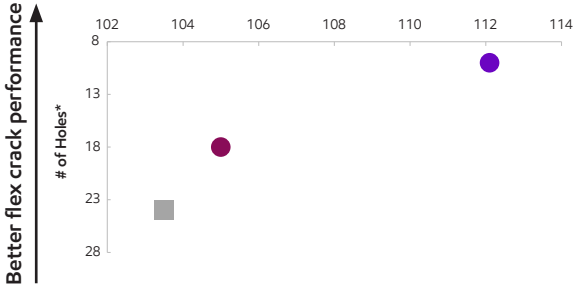


	C8 mLL skins: 50 µm	Exceed reference 50 µm	Exceed Stiff+ 50 µm
Ratio	50 µm 1 / 2 / 1		
Skins ¹	mLL C8 (0.85; 0.920)	Exceed™ m 1018	Exceed Stiff+ m 0820.ML
Core ²	mLL C8 (1.0; 0.916)	Exceed Tough+ m 0814.ML	Exceed Tough+ m 0814.ML

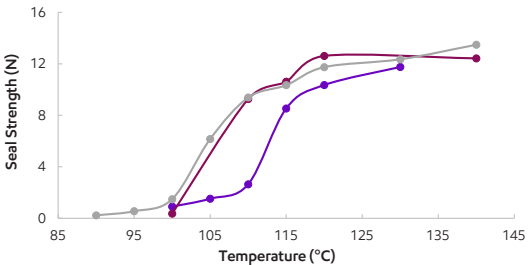
1. Skins contain 1% slip + 1.5% anti-block
2. Core contains 1% slip

Grade	Melt index (g/10 min)	Density (g/cm³)	Slip / anti-block
Exceed Stiff+ m 0820.ML	0.80	0.920	No
Exceed Tough+ m 0814.ML	0.80	0.914	No

Less sticky / less prone to blocking



*Number of holes after 10,000 cycles



Test item	Test method
Melt Index (MI)	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
Needle puncture	ExxonMobil test method following principles of ISO CEN 14477-04
Heat seal force	ExxonMobil test method following principles of ASTM F-88-15
Leak detection via die penetration	ExxonMobil test method

Data from tests performed by or on behalf of ExxonMobil.

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 and their business goals.