



Exceed™ Stiff+ Exxtra™ Seal Exceed™ HD

Innovative mono-PE frozen food packaging solution co-developed with LD PACK ensures excellent packaging integrity throughout storage and transportation

	Mono-material structure designed for recyclability*		Excellent package integrity after freezing		Outstanding needle puncture resistance		Balanced stiffness for shelf appeal
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Data and results presented herein apply specifically to the noted application under this case study. Your results may differ depending on factors such as operating conditions, equipment and materials used.

Challenge

In response to growing recyclability interest across the value chain, the development of mono-material solutions has emerged as a pivotal approach to help reconcile complex design challenges with the preservation of excellent mechanical performance. ExxonMobil, in collaboration with LD PACK, introduces an innovative MDO PE//PE solution. It offers a compelling mono-material design alternative to conventional BOPET//PE laminates.

Solution

Based on ExxonMobil Signature Polymers high performance polyethylene (including Exceed™ Stiff+, Exxtra™ Seal and Exceed™ HD) and powered by LD Pack's advanced converting technology, this solution can provide:

- Mono-PE structure designed for recyclability*.
- Balanced stiffness for shelf appeal.
- 100% bag drop survival rate under demanding conditions (-30°C @ 3m).
- Enhanced needle puncture resistance and low temperature tensile strength to accommodate wide products and storage conditions.

LD PACK, a well-known company in flexible packaging industry, is dedicated to advanced technology and innovation development. Mr. Zhang Fenghui (technical director at LD PACK) states that "the mono PE frozen food packaging solution represents a breakthrough in addressing critical industry needs. The positive market feedback underscores our commitment to develop solutions that harmonize functionality with design for recyclability*."

Results

MD (Machine Direction) force at 1% strain



Needle puncture energy (test from in to out)



MD tensile force at break under low temperature (-30°C)



Bag drop passing rate at 3m after frozen condition (-30°C), fill in 250g white masterbatch



- Reference BOPET 12µm//PE 88µm
- ExxonMobil MDO PE 25µm//PE 63µm

*Designed with features intended to support recyclability. Actual recyclability depends on factors such as local collection, sortation, and recycling infrastructure, as well as the condition and configuration of the package after use. However, access to facilities that accept and process plastic film is limited and not widely available.

Summary

The frozen food market is experiencing robust growth, driven by the advancement of cold chain logistics and the increasing consumer demand for convenient food options. Traditional laminates such as BOPET//PE are commonly used but can be difficult to recycle due to the multi-material structure.

In this context, the high-performance MDO PE//PE solution offers a promising pathway to unlock the potential of mono-PE solutions for frozen food packaging. ExxonMobil Signature Polymers is dedicated to advancing the industry together with our value chain partners.



Test item	Test method based on
Stiffness	ExxonMobil method
Needle puncture	ExxonMobil method
Low temperature tensile	ExxonMobil method
Bag drop	ExxonMobil method

Data from tests performed by or on behalf of ExxonMobil.
Traceability: LIMS R2507-028477

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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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