ExxonMobil
Signature Polymers

Case study

Exceed™ Tough+

Creating ultra-thin hygiene compression packaging films with sustainability benefits that deliver excellent performance

- Reduced film thickness
- Incorporates up to 35% PCR content
- High packaging speed
- Excellent package integrity

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

To create a hygiene compression package incorporating post consumer recycled (PCR) content without compromising the film processability or the overall performance of the package

In response to consumer preferences and brand owner commitments, many converters are facing the challenge of developing hygiene compression packaging films with sustainability benefits such as downgauging, incorporation of recycled content, and design for recyclability. Examples of these benefits can be demonstrated with monomaterial polyethylene (PE) solutions that can be recycled* and that require a reduced amount of virgin PE material because of a reduction in film thickness and/or the incorporation of PCR content. The challenge lies in achieving these goals while maintaining the film machinability and package performance.

Solution

Design of two recyclable* solutions with reduced film thickness and/or the incorporation of up to 35% PCR content

A thorough collaboration throughout the full value chain has led to the development of two monomaterial PE film solutions, using Exceed™ Tough+ m 0518 metallocene polyethylene. In ExxonMobil's formulation, the use of Exceed Tough+ m 0518 helps enhance the production of films with remarkable toughness and puncture resistance. When combined with ExxonMobil™ HD 6207FL polymers, it results in high stiffness and excellent creep resistance, ensuring that the package maintains its dimensional stability throughout and after the packaging process. Minor additions of ExxonMobil™ LD 07523 polymers can be employed to adjust processability and optical features. By leveraging just three PE grades, it is possible to reduce the film thickness and/or incorporate up to 35% PCR content while still meeting performance and processability requirements. The films were made on lines located in an ExxonMobil facility.

*Recyclable in the few communities with programs and facilities in place that collect and recycle the resulting product.

OPTIMA

BW Converting
Change for the better
Hudson-Sharp

Polymer production — ExxonMobil

Film production — ExxonMobil

Film conversion — BW Converting, Hudson-Sharp

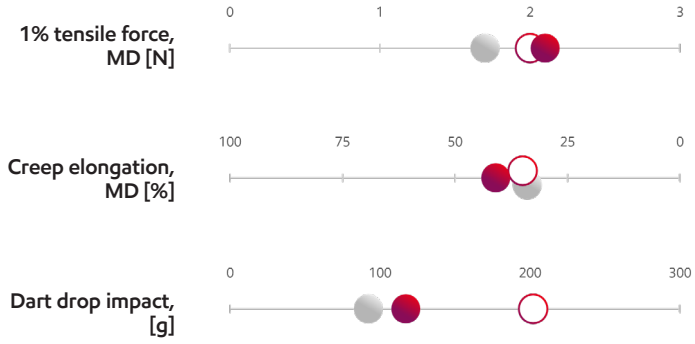
Bagging operation — OPTIMA

The films were then converted on Hudson-Sharp's Apollo wicket machine. The wicketer is ideally suited for monomaterial PE films, which may or may not incorporate recycled content, even at very thin gauges. Thanks to the excellent sealability and easy side cutting/punching provided by ExxonMobil's two PE film formulations, high machine output can be achieved. Customers can continue to benefit from fast changeovers, while achieving high output speeds.

The package was subsequently formed and sealed using Optima's machinery, which is specifically calibrated to handle these materials while ensuring optimal performance and quality. The two PE films produced by ExxonMobil demonstrated easy machinability on Optima's equipment, exhibiting sufficient stiffness to prevent film elongation during handling and a good coefficient of friction for the grippers. These attributes are essential for maintaining the shape and functionality of the package, helping the products to be securely contained.

Results

The two PE film formulations are tailored to meet consumer expectations regarding packaging solutions with sustainability benefits such as downgauging and incorporation of PCR content, while also ensuring outstanding package integrity and visual appeal on the shelves. Using only three PE grades, the solutions help simplify logistics and optimize productivity. A seamless bagging operation at high speeds can be achieved without any operational changes to the end-user machine settings. Additionally, good printability and optical properties enable brand owners to promote their products in a highly effective way.



Market reference	ExxonMobil PE formulation: Virgin PE resins	ExxonMobil PE formulation: Incorporation of up to 35% recycled PE content
40 µm (3 layer)	30 µm (3 layer)	30 µm (3 layer)
	Exceed™ Tough+ m 0518 ExxonMobil™ HD 6207FL ExxonMobil™ LD 07523	Exceed Tough+ m 0518 ExxonMobil LD 07523 PCR PE content**

** PCR PE content: 0.958-0.965 g/cm³; 0.50-0.85 g/10min

Data from tests performed by or on behalf of ExxonMobil.

Test methods: tensile properties and creep resistance based on ExxonMobil method. Dart drop impact based on ASTM D-1709-16a. Film thickness as measured by ExxonMobil.

Data traceability: B2305-000113611, B2311-000135221, B2401-000141762

ExxonMobil Signature Polymers

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 their business goals.

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. Here's a quick overview of brands and grade names that have changed in this document:

Legacy Commercial Name	New Commercial Name
Exceed™ XP 8358	**Exceed™ Tough+ m 0518**
ExxonMobil™ HDPE HTA 108	**ExxonMobil™ HD 6207FL**
ExxonMobil™ LDPE LD 150	**ExxonMobil™ LD 07523**

Want to see what's changed in our portfolio? Go to exxonmobilchemical.com/sptransform