



Energy lives here



## Recyclable\* 100% polyethylene laminated pouch with excellent stiffness and optical properties



Single polymer packaging structure for a sustainable solution



100% PE laminated pouch can be recycled\*



High stiffness



Excellent optical properties

### Challenge:

Single polymer packaging structure with high stiffness and excellent optical properties.

Conventional laminated structures, often comprising a mix of materials such as polyethylene and PET, PA, EVOH or OPP can be challenging to recycle, due to difficulties separating the materials. Packaging made from a single polymer structure is easier to recycle, where programs and facilities to collect and recycle plastic films exist.

As part of its commitment to helping customers create sustainable solutions, ExxonMobil wanted to develop 100% polyethylene (PE) pouches that can be recycled to create new pouches.

### Solution:

Performance PE polymers and EVO Ultra Stretch technology.

A collaboration between ExxonMobil and Reifenhäuser has developed a PE substrate that offers high stiffness with excellent optical properties for 100% PE laminated pouches.

**Exceed™ XP, Exceed™ and Enable™ performance PE polymers**, in combination with EVO Ultra Stretch machine direction orientation (MDO) technology from **Reifenhäuser**, boosts optical as well as stiffness properties, allowing non-PE substrates to be replaced in laminated packaging.

Processing ExxonMobil's performance PE polymers on MDO technology enhances both tensile modulus and optical properties significantly, while delivering outstanding MDO processability. The MDO positioning in the haul-off unit is a key factor in the production of an

\* Recyclable in communities that have programs in place to collect and recycle plastic film

oriented PE film, as it allows the plastic to be stretched using initial heat on the four to six-fold extent for a much higher process stability and lower shrink values due to the longer cooling path.

## Results:

**100% PE film with excellent optical properties and stiffness for a recyclable pouch.**

Exceed™ XP, Exceed™ and Enable™ performance PE polymers allow the fabrication of 100% PE laminated films that are easily recyclable where programs and facilities to collect and recycle plastic films exist. They are well-suited for general purpose primary packaging like food, pet food and non-food pouches because they deliver:



### Optical properties

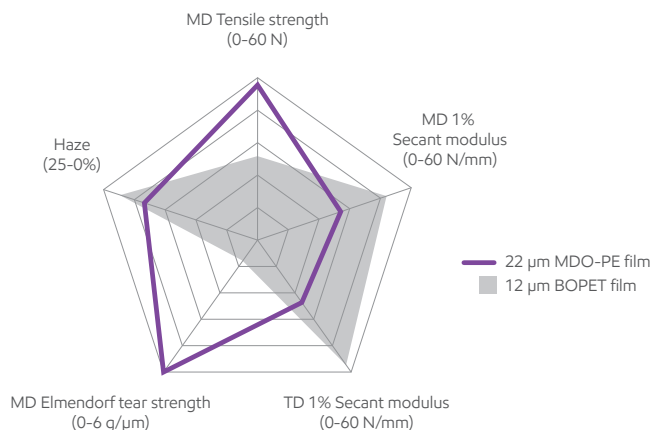
comparable to non-PE substrates.



### Stiffness properties

suitable for flexo and rotogravure printing.

**MDO-blown processing to replace non-PE substrates with highly oriented PE film that offers outstanding optical and stiffness properties.**



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

### Oriented PE film formulation

22 µm 5-layer MDO-PE substrate, MDO ratio=6	
Skin layers	Medium density Enable (>70%)
Sub-skin layers	Exceed 1327MA + ExxonMobil HDPE
Core layer	Exceed XP 8784ML

Recommended Performance PE		
Grade name	Density (g/cm <sup>3</sup> )	Melt index (g/10 min)
Exceed XP 8784ML	0.914	0.80
Exceed 1327MA	0.927	1.3
Enable 4009MC	0.940	0.90
Enable 4002MC	0.940	0.25
ExxonMobil HDPE HTA108	0.961	0.70



©2019 ExxonMobil. ExxonMobil, the ExxonMobil logo, the interlocking "X" device and other product or service names used herein are trademarks of ExxonMobil, unless indicated otherwise. This document may not be distributed, displayed, copied or altered without ExxonMobil's prior written authorization. To the extent ExxonMobil authorizes distributing, displaying and/or copying of this document, the user may do so only if the document is unaltered and complete, including all of its headers, footers, disclaimers and other information. You may not copy this document to or reproduce it in whole or in part on a website. ExxonMobil does not guarantee the typical (or other) values. Any data included herein is based upon analysis of representative samples and not the actual product shipped. The information in this document relates only to the named product or materials when not in combination with any other product or materials. We based the information on data believed to be reliable on the date compiled, but we do not represent, warrant, or otherwise guarantee, expressly or impliedly, the merchantability, fitness for a particular purpose, freedom from patent infringement, suitability, accuracy, reliability, or completeness of this information or the products, materials or processes described. The user is solely responsible for all determinations regarding any use of material or product and any process in its territories of interest. We expressly disclaim liability for any loss, damage or injury directly or indirectly suffered or incurred as a result of or related to anyone using or relying on any of the information in this document. This document is not an endorsement of any non-ExxonMobil product or process, and we expressly disclaim any contrary implication. The terms "we," "our," "ExxonMobil Chemical" and "ExxonMobil" are each used for convenience, and may include any one or more of ExxonMobil Chemical Company, Exxon Mobil Corporation, or any affiliate either directly or indirectly stewarded.

Contact us for more information:  
[exxonmobilchemical.com/SUP](http://exxonmobilchemical.com/SUP)

**ExxonMobil**

Energy lives here™