



Exceed™ XP performance PE

Innovative double bubble polyethylene-based shrink film solution offers excellent performance and improved recyclability* compared to multimaterial solutions



Improved
recyclability*



Exceptional
shelf appeal



Small and
soft corners



Excellent
shrink
performance

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

Improve the recyclability* of shrink films while maintaining shrink performance, softness and optics

Shantou Mingca Packing Material Co Ltd, a leading shrink film manufacturer based in China, wanted to improve the recyclability* of its shrink films. Shrink film can be used to package products in a variety of shapes, such as electronics, household and personal care products, medicines, food, books and magazines, plastic utensils, and toys.

“From raw material suppliers, film converters, to brand owners, the value chain has ambitious recyclability goals,” said Mr. Liu Kun, General Manager at Shantou Mingca Packing Material Co Ltd. “For Mingca, it is important that we develop a new shrink film structure that can be more easily mechanically recycled.”

The ultimate goal of Mingca was to create a polyethylene-based shrink film with improved recyclability*, which could help them address their customers’ needs.

Solution

Ultra-low density Exceed™ XP performance polyethylene can be used to create PE-based shrink film

After four years of collaboration, Mingca and ExxonMobil Asia Pacific Research & Development Co., Ltd (ExxonMobil), developed an innovative double bubble polyethylene-based shrink film (PEF) solution that incorporates ultra-low density Exceed XP performance polyethylene.

The traditional shrink film is a polyolefin-based solution (POF), and its typical co-extrusion structure is composed of PP/PE/PP. ExxonMobil provided Mingca with its new polyethylene-based shrink film formulation that incorporates Exceed XP PE resins. Starting from this formulation, Mingca made custom modifications to its lines to arrive at a polyethylene-based solution.

*The terms “recyclable” and “recyclability” are intended to refer to the potential for recyclability of packaging solutions designed and manufactured in accordance with recycling guidelines. Ultimate recyclability of packaging incorporating ExxonMobil’s performance PE resins will depend on a number of factors outside of ExxonMobil’s control including, but not limited to, availability of programs and facilities that collect and recycle plastic packaging within a given community. Any and all claims about the recyclability of packaging are the sole responsibility of the packaging manufacturer.

Results

Polyethylene-based shrink film solution that offers improved recyclability* while maintaining excellent performance

The solution’s polyethylene-based structure creates packaging that can be more easily mechanically recycled* than conventional multi-material POF solutions. The recyclability of the film structure has been third party validated and certified by TÜV Rheinland¹.

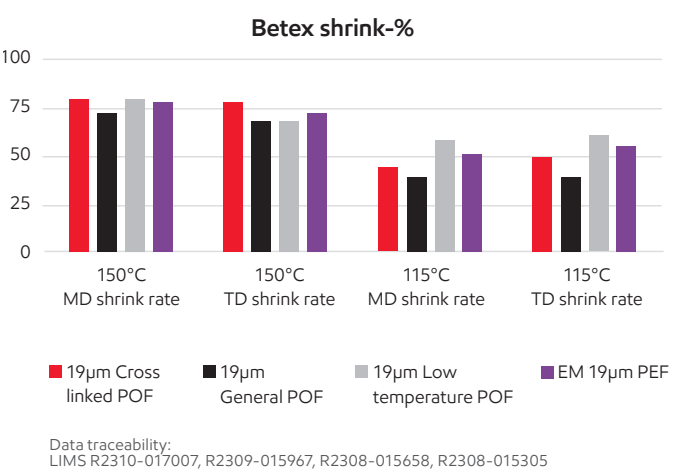
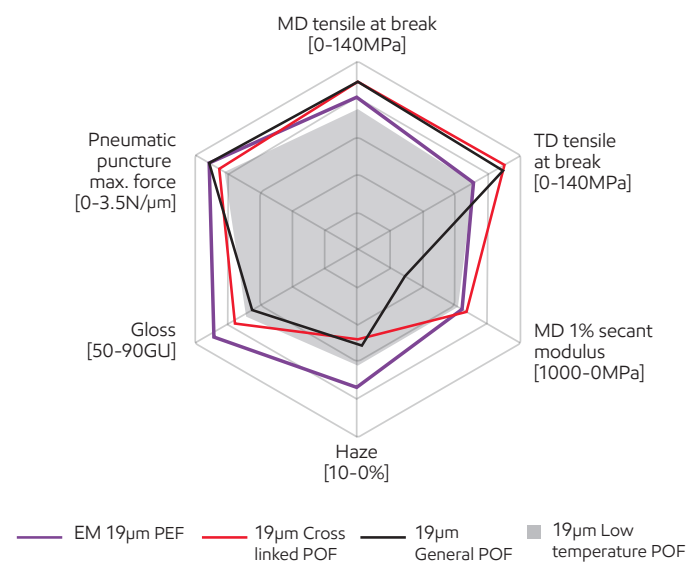
PEF shrink film can also enable exceptional “shelf appeal” for products (enabling the items contained inside the film to look attractive to consumers). In addition, the PEF solution can provide a snug fit with small and soft corners, further increasing appearance aesthetics.

- With haze as low as 2.8 percent and gloss up to 86 GU, the Exceed™ XP-based PEF demonstrated excellent optical properties.
- Exceed XP performance polyethylene delivered outstanding softness (1% secant modulus as low as 374 MPa), with tensile strength at MD/TD as high as 100 MPa.

PEF can shrink more than 70 percent upon heating and can enable excellent shrink performance at lower temperatures. Thanks to its low-temperature shrinkage capability, the new solution can offer potential cost savings due to the shrink tunnel consuming less energy than what is typically needed with conventional POF solutions².

“PEF is a game changer when it comes to the recyclability* of shrink films, bringing more end of life options to the packaging world,” said Mr. Liu Kun. “Similar to POF, the new PEF shrink film can be produced using double bubble technology. Brand owners can adopt the new solution under normal circumstances without upgrades or changes to their packaging lines.”

“Development of this PEF solution was driven by the growing desire for companies to deliver products in recyclable* packaging,” said Karen Chui, Polyethylene North Asia Market Development Manager, ExxonMobil. “At ExxonMobil, we believe it is essential to collaborate closely with value chain members to continue to introduce new solutions that can help meet evolving market needs.”



Test item	Test method
Tensile	ExxonMobil test method
Haze	ExxonMobil test method
Gloss	ExxonMobil test method
Betex shrinkage	ExxonMobil test method

*The terms “recyclable” and “recyclability” are intended to refer to the potential for recyclability of packaging solutions designed and manufactured in accordance with recycling guidelines. Ultimate recyclability of packaging incorporating ExxonMobil’s performance PE resins will depend on a number of factors outside of ExxonMobil’s control including, but not limited to, availability of programs and facilities that collect and recycle plastic packaging within a given community. Any and all claims about the recyclability of packaging are the sole responsibility of the packaging manufacturer.

1. Per DIN EN ISO 14021:2021-10
2. Based on calculation of Mingca Packaging

Contact us for more information: exxonmobilchemical.com/pe

ExxonMobil
Signature Polymers

Bring your impossible



©2024 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 Product Solutions" and "ExxonMobil" are each used for convenience, and may include any one or more of ExxonMobil Product Solutions Company, Exxon Mobil Corporation, or any affiliate either directly or indirectly stewarded.