

Exceed™ Tough+

Exceed™ Flow

Exceed™ Stiff+

ExxonMobil™ LD

MSK creates high-performance shrink-pass-through film solutions incorporating up to 70% recycled* PE content



Incorporates recycled* PE content



Good transverse direction shrinkage



Easy processability

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

MSK is a German equipment manufacturer well known internationally for its sophisticated industrial packaging lines, logistics systems and pallet handling solutions.

The MSK Flowtech system—a high speed, fully automated shrink-pass-through packaging system — is commonly used to package and protect appliances, large format paper, cardboard and building materials for storage and transportation. For appliance packaging for instance, the machine can wrap up to 400 products an hour.

One of the key benefits of the Flowtech machines is their enablement to use thinner films, lower quantities of film and even films incorporating recycled* content. Towards that goal, MSK has been pushing the envelope in developing thinner shrink films and films that incorporate recycled* PE content.

Stretch hood and shrink packaging films for industrial applications such as the packaging of beverages, building materials and appliances have some of the most stringent performance requirements of any packaging film.

They must stand up to the test of protecting and bearing heavy loads and big formats without puncturing or giving way. The concern with using recycled content in these films is the anticipated loss of mechanical strength.

Counting on its long history of partnership with ExxonMobil, MSK collaborated with ExxonMobil on the latest shrink film solution for their shrink-pass-through systems, with the requirements that the solution:

- include recycled* PE content without compromising mechanical performance
- offer broader sealing operating window
- must be easy to process on their high speed shrink pass-through system.

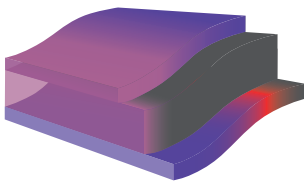
* Recyclable in the few communities with programs and facilities in place to collect and recycle plastic film

Solution

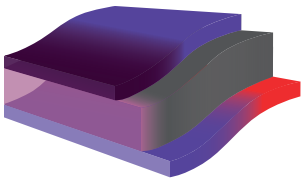
The MSK and ExxonMobil teams collaborated to test three formulations — two of which incorporated 50% recycled* PE content and one that incorporated 70% recycled* PE content.

The lead solution is a low density Exceed™ Tough+ m 0211 metallocene polyethylene formulation. It offers a combination of attributes such as excellent sealing operating window, excellent shrinkage in transverse direction and it allows the incorporation of up to 70% recycled* PE content without compromising mechanical performance. The high performance shrink films produced are easy to process on a shrink pass-through system.

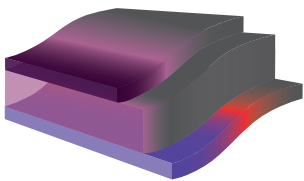
50% recycled* PE
50 µm reference



50% recycled* PE
50 µm solution with
Exceed Tough+ m 0211



70% recycled* PE
50 µm solution with
Exceed Tough+ m 0211

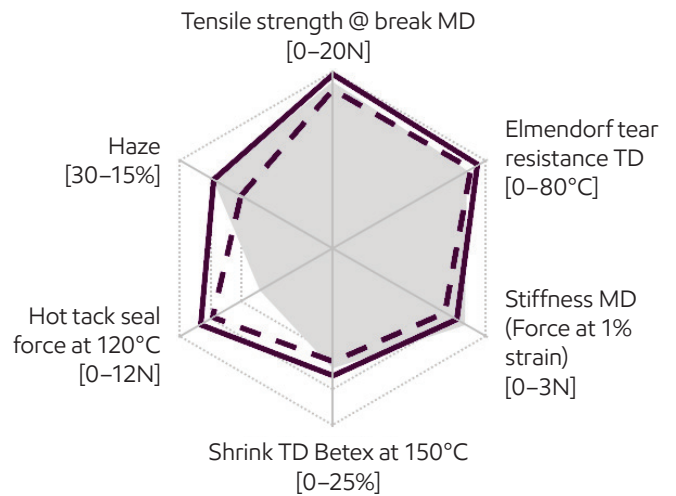


- Exceed™ Flow m 0327
- Exceed™ Stiff+ m 0238
- Exceed Tough+ m 0211
- Recycled PE
- ExxonMobil LD 03322

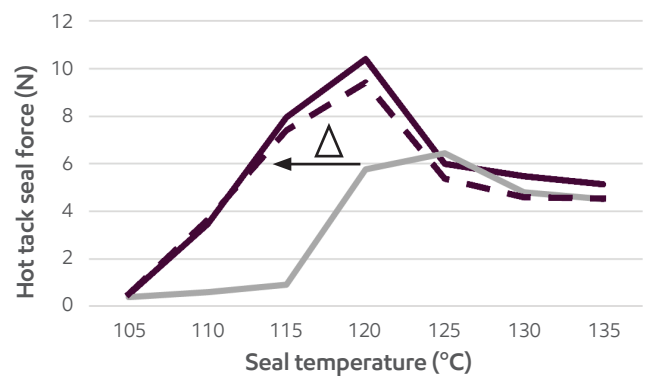
Key benefits and value of the solution:

- Potential to incorporate high recycled* PE content of up to 70% without compromising transverse direction shrinkage or mechanical performance
- Potential to reduce energy consumption due to broader sealing operating window
- Enabling of high line speeds

Excellent mechanical properties for Exceed Tough+ with recycled* PE content



Broader sealing operating window for Exceed Tough+ with recycled* PE content



- 50% recycled* PE content
- 50% recycled* PE solution with Exceed Tough+ m 0211
- 70% recycled* PE solution with Exceed Tough+ m 0211
- △ change in temperature of the sealing operating window

Data traceability:
 50% recycled* PE content — B2110-000029425
 50% recycled* PE solution with Exceed Tough+ m 0211 — B2110-000029424
 70% recycled* PE solution with Exceed Tough+ m 0211 — B2110-000029426

Polymer properties	Exceed™ Tough+ m 0211	Exceed™ Stiff+ m 0238	LD 03322
Melt index (g/10 min)	0.20	0.25	0.33
Density (g/cm ³)	0.911	0.938	0.922

Recycle type: rLDPE

Test item	Test method
Tensile properties	ExxonMobil method
Elmendorf tear	Based on ASTM D1922
Betex shrink	ExxonMobil method
Hot tack	ExxonMobil method
Haze	Based on ASTM D1003
Melt index	Based on ASTM D1238
Density	Based on ASTM D792A

Contact us for more information: [exxonmobilchemical.com/pe](https://www.exxonmobilchemical.com/pe)

ExxonMobil
Signature Polymers

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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. We will be making these modifications over the next six months so you will see both old and new grade names highlighted during that time.

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

Legacy commercial name	New commercial name
Enable™ 2703	Exceed™ Flow m 0327
Enable 4002	Exceed™ Stiff+ m 0238
Exceed™ XP 7021	Exceed™ Tough+ m 0211
ExxonMobil™ LDPE LD 165	ExxonMobil™ LD 03322

Some of our existing Exceed, Achieve, Paxon and premium PP/HD grades have moved to Exceed brand; most existing Enable grades have moved to Exceed Flow[+]; most of our existing Exceed XP grades have moved to Exceed Tough[+]; most of our existing Exceed S grades have moved to Exceed Stiff[+]. More details here https://www.exxonmobilchemical.com/en/brands/signature-polymers/exceed_high_performance_polymers or contact your ExxonMobil representative to know more.

Want to see what's changed in our portfolio? Go to [exxonmobilchemical.com/sptransform](https://www.exxonmobilchemical.com/sptransform)