ExxonMobil
Signature Polymers

Case Study


Exceed™ Tough+ Vistamaxx™

# New generation of stretch hood films with sustainability benefits that also maintain performance

- High stretchability and holding force
- High puncture resistance
- Incorporates recycled content
- Formulation simplification

## Challenge

Stretch hood film is the most innovative film amongst palletization methods and has the potential advantage of reduced energy consumption versus shrink films; no energy is required for the shrinking process.

How can we further contribute to a circular plastics economy by developing stretch hood films with sustainability benefits, while maintaining properties demanded by the application? This means incorporating some recyclate (or recycled plastic content) while keeping the integrity and strong mechanical performance required for these films in stretchability and puncture resistance.

**"The new 'tax on plastic' already implemented in several European countries (e.g. UK and Spain), and the growing need to increase recyclability of industrial films, are helping to accelerate the demand for stretch hood film based on a polyethylene (PE) formulation, that incorporate recycled content while avoiding the inclusion of EVA."**

Timm Strübbe, Product Manager Industrial Packaging Bischof+Klein®

ExxonMobil would like to thank Lachenmeier for their cooperation with the hooding trials.

## Solution

With proper selection of recyclate (PIR = Post Industrial Recycled content or PCR = Post Consumer Recycled content), a low-density Exceed™ Tough+ performance polymer-based formulation with Vistamaxx 6102 can help attain superior mechanical performance. Retained physical property performance improved end of life management options for the packaging film, helping to support a circular plastic economy. Hence, this solution can increase recyclability versus the reference EVA-based film.

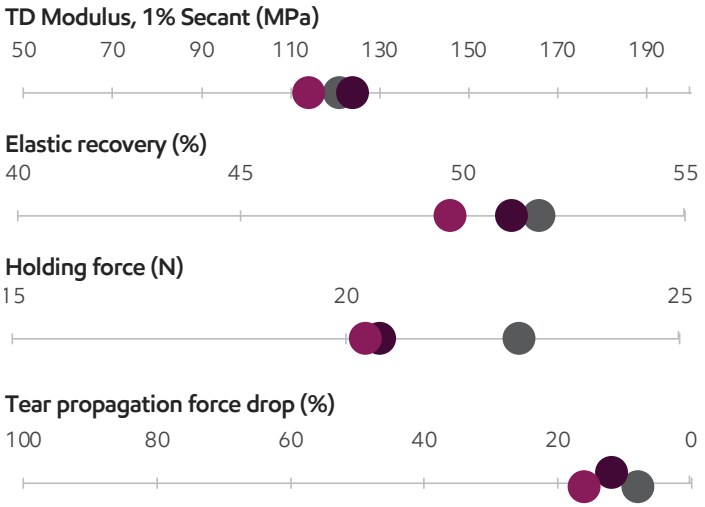
This approach to stretch hood formulation, based on Exceed™ Tough+ performance polyethylene has received interest from the market place, as upcoming legislation may require increased recyclability and incorporation of recycled PE to help lower virgin resin consumption. Film converter Bischof + Klein has developed stretch hood solutions adopting a similar approach for their film structure. Named SmartFlex®, these solutions can easily adapt to different stretch hooding equipments already available, which can help facilitate easy market adoption.

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

LACHENMEIER® A SIGNODE BRAND

Bischof+Klein®

| | ● EVA Reference 90µm 20/60/20 | ● 30% PCR#1* 90µm 15/70/15 | ● 30% PCR#2** 90µm 15/70/15 |
|---|---|---|---|
| Skins | Exceed m 1018 | Exceed Tough+ m 0512 | Exceed Tough+ m 0512 |
| Core | EVA | 43% PCR#1<br>33% Exceed Tough+ m 0211<br>24% Vistamaxx 6102 | 43% PCR#2<br>33% Exceed Tough+ m 0211<br>24% Vistamaxx 6102 |




(*) PCR#1: 0.922 ± 0.004 g/cm3; 2 ± 0.25 g/10min; lower gel level
(**) PCR#2: 0.920 ± 0.01 g/cm3; 1.95 ± 0.55 g/10min; higher gel level

The hooding trial has been in collaboration with Lachenmeier®, a brand of Signode.

## Result

Films based on Exceed Tough+ polymers can provide these benefits versus EVA reference film solutions:

- Designed for recyclability*: Allows formulation of PE-based film and avoids EVA in order to potentially benefit from existing recycling streams; helping to support a circular plastics economy.
- Allows for simple film formulation with the sustainability benefit of the incorporation of recycled content.
- High holding force for load stability.
- Comparable hooding performance versus industry reference formulation.
- Comparable tear resistance.

| Test item | Test method |
|---|---|
| Tensile properties | based on ExxonMobil test method |
| Stretch hood test TD (Elastic recovery) | based on ExxonMobil test method |
| Stretch hood test TD (Holding force) | based on ExxonMobil test method |
| Elmendorf tear resistance | based on ASTM D-1922 |
| Stretch hood test - MD tear propagation | based on ExxonMobil test method |
| Needle puncture | based on ExxonMobil test method |

Contact us for more information: **exxonmobilchemical.com/pe**

ExxonMobil Signature Polymers

**Bring your impossible**

# 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 |
|---|---|
| Exceed™ 1018 | Exceed m 1018 |
| Exceed™ XP 7052 | Exceed™ Tough+ m 0512 |
| Exceed XP 7021 | Exceed Tough+ m 0211 |

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**