ExxonMobil
Signature Polymers

Article

Exxtra™ Seal

ExxonMobil Signature Polymers for new value-added extrusion coating and lamination solutions

Extrusion coating and lamination on various substrates such as board, paper, flexible films and HDPE woven fabrics, impart properties that prove beneficial for diverse end use applications. Extrusion coating and lamination also contribute towards decreasing the permeability of liquids, improved adhesion strength, sealing and toughness. Traditionally, LDPE and butene based LLDPE copolymers have been used as the material of choice.

ExxonMobil introduces Exxtra™ Seal m 15018XC and Exxtra™ Seal m 19018XC performance polymers based solutions for extrusion coating and lamination, delivering enhanced toughness and sealing performance. Further, ExxonMobil's robust supply chain ensures consistent supply of these resins in various regions globally.

LDPE supply shortfall

In 2020, LDPE demand in India was estimated at 889kt & forecasted to grow at 4.6% CAGR (Compound Annual Growth Rate) for the next 5 years until 2025. With current domestic manufacturing capacity for LDPE slated at 605kT & no new capacity additions anticipated the dependence on global suppliers is bound to increase. Further pace of new capacity additions in global production of LDPE is estimated at 3.3%, much lower than growth forecasted for LDPE demand in India. (Source: Townsend 2019 PE report)

Exxtra Seal performance polymers

Exxtra Seal performance polymers are ethylene 1-hexene copolymers designed to deliver superior mechanical and sealing performance for highly demanding end-use applications, compared to conventional LDPE & LLDPE resins. Two resins in the portfolio, Exxtra Seal m 15018XC and Exxtra Seal m 19018XC, that are new to the Indian market are tailor-made for extrusion coating and lamination on different substrates like board, paper, flexible films and HDPE woven fabrics. They offer the following benefits:

- Outstanding sealing properties, especially lower sealing temperature
- Broad hot tack window
- Improved adhesion strength at lower melt temperature
- Opportunities to downgauge the coating thickness
- Easy processability with minimum blending of LDPE
- Good organoleptics
- Global availability

Compared to conventional LDPE & LLDPE, using Exxtra Seal performance polymers provides superior performance for better product integrity and less failure-in-use, while helping ease the pressure caused by LDPE shortages and price variations.

Pond liner

Paper cup coating

Tarpaulin

Performance tests

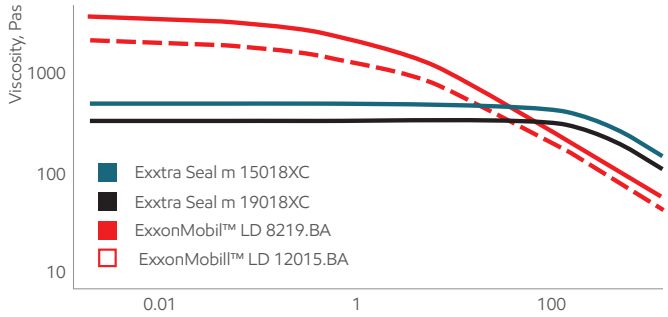
Exxtra™ Seal m 15018XC and Exxtra™ Seal m 19018XC are dedicated for extrusion coating and lamination processes. The table below lists the ExxonMobil PE polymers commonly used in the extrusion coating and lamination process.

Resin	MI (g/10 min)*	Density (g/cc)*
Exxtra Seal m 15018XC	15	0.918
Exxtra Seal m 19018XC	19	0.918
ExxonMobil™ LD 8219.BA	8.2	0.919
ExxonMobil™ LD 12015.BA	12	0.915

*Data from tests performed by or on behalf of ExxonMobil

The rheological behavior (see Figure 1) of Exxtra Seal m 15018XC and Exxtra Seal m 19018XC performance polymers helps make them easy to process. Offering increased draw down, these polymers allow line speeds to be increased, while maintaining product quality and consistency. These polymers also offer coating possibilities for weights as low as 5 gsm with line speeds varying from 50 m/min to 300 m/min. Exxtra Seal m 19018XC is the preferred resin for lower coating thickness at higher line speeds. Exxtra Seal m 15018XC and Exxtra Seal m 19018XC can create opportunities for downgauging which translates into potential cost savings, while delivering superior performance. It is recommended that these resins are used with a blend of up to 30% LDPE ExxonMobil™ LD 8219.BA/ LD 12015.BA or any equivalent LDPE to control the neck-in.

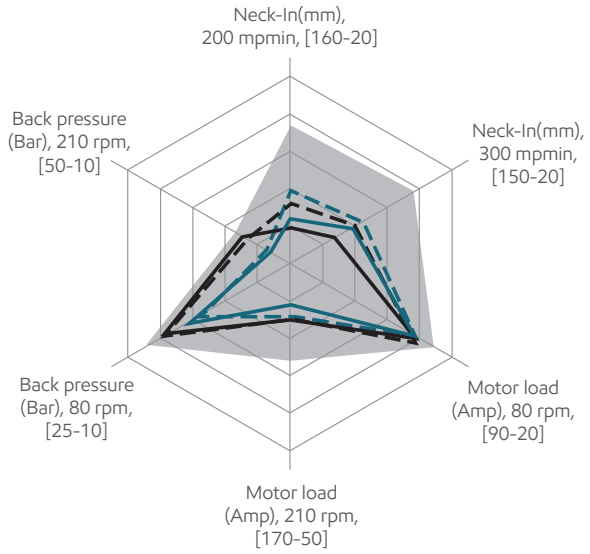
Figure 1: Viscosity curve at 190°C**



**Data from tests performed by or on behalf of ExxonMobil

Figure 2 shows that Exxtra Seal m 15018XC blended with LDPE delivers lower neck-in. Exxtra Seal m 19018XC blended with LDPE allows lower motor load and back pressure.

Figure 2: Process-ability at 320°C***



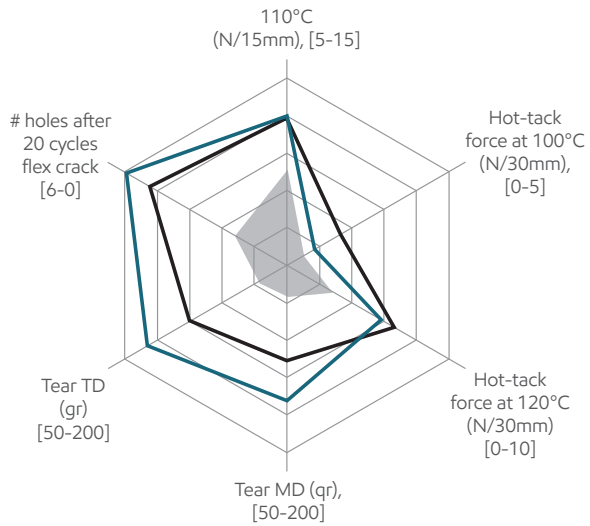
Polymers tested in mono extrusion coating, on a 3.5 inch extruder designed for the extrusion coating process, at 320°C set temperature.

Reference 100% LDPE ExxonMobil™ LD 8219.BA	80% Exxtra Seal m 15018XC performance polymer 20% LDPE ExxonMobil™ LD 8219.BA	80% Exxtra Seal m 15018XC performance polymer 20% LDPE ExxonMobil™ LD 12015.BA	80% Exxtra Seal m 19018XC performance polymer 20% LDPE ExxonMobil™ LD 8219.BA	80% Exxtra Seal m 19018XC performance polymer 20% LDPE ExxonMobil™ LD 12015.BA

*** Data from tests performed by or on behalf of ExxonMobil

As can be seen in Figure 3, ExxonMobil Signature Polymer PE rich blends outperform LDPE in sealing and mechanical performance. The spider chart represents the properties of a mono extrusion coating on 70 gsm kraft paper under standard conditions, with a line speed of 100 m/min and a set temperature of 320°C (608°F). The reference polymer is ExxonMobil™ LD 8219.BA or other equivalent LDPE resins commonly used in the market. With a higher seal strength and broad hot tack plateau contributing to a broad operating window, Exxtra™ Seal m 15018XC and Exxtra™ Seal m 19018XC are outstanding sealants. In terms of tear and flex crack resistance, they also outperform the reference resins.

Figure 3: Sealing and mechanical performance***



Structures produced on EM pilot extrusion coating line 25 gsm polymer coated onto 70 gsm Kraft paper at 320°C set temp.

Reference	**Solution 1**	**Solution 2**
100% LDPE ExxonMobil™ LD 8219.BA	80% Exxtra Seal m 15018XC performance polymer 20% ExxonMobil™ LD 12015	80% Exxtra Seal m 19018XC performance polymer 20% ExxonMobil™ LD 12015

*** Data from tests performed by or on behalf of ExxonMobil

About ExxonMobil product solutions:

ExxonMobil Product Solutions is one of the largest chemical manufacturers in the world. Our unique portfolio of commodity and specialty businesses generates annual sales of nearly 25 million tons of prime products.

About ExxonMobil polyethylene:

With products that deliver critical properties such as strength, durability and toughness, easier sealability, and outstanding optics, our leading-edge polyethylene formulations help create, protect and promote products throughout the packaging, agriculture, industrial, personal care and hygiene markets. From store shelves, to harvesting, to shipping, to the factory, our products help reduce risk of waste, breakage and spoilage across the value chain.

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. The composition of the products are unchanged, it is only the names that updated. We will be making these modifications over the next few months, through mid 2025, 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 will be changed in this document:

Legacy Commercial Name	New Commercial Name
Exceed™ 0015XC	Exxtra™ Seal m 15018XC
Exceed™ 0019XC	Exxtra™ Seal m 19018XC
ExxonMobil™ LDPE LD258	ExxonMobil™ LD 8219.BA
ExxonMobil™ LDPE LD259	ExxonMobil™ LD 12015.BA

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