

Stronger heavy duty sacks using eXtreme Performance films

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ExxonMobil's Exceed™ XP performance polymers provide a range of benefits that allow the fabrication of high-quality 3-layer heavy duty sack films. High package integrity, excellent sealing characteristics, enhanced machinability and outstanding operational efficiencies are all possible.

| Delivered attributes | Derived benefits & value |
|--|--|
| Enhanced toughness Elevated stiffness | <ul style="list-style-type: none">▪ High package integrity – for product protection that minimizes waste through the value chain▪ Potential to optimize film formulation solutions via linear blends /downgauging |
| Excellent creep resistance | <ul style="list-style-type: none">▪ Optimum stability even when stacked on each other or on pallets |
| Improved sealing properties | <ul style="list-style-type: none">▪ Enhanced sealing capability with excellent machinability▪ Fast bagging lines speeds |
| Outstanding optical properties | <ul style="list-style-type: none">▪ Outstanding aesthetics for product/brand recognition |
| High melt strength | <ul style="list-style-type: none">▪ Excellent processability – reliable operation and machinability▪ High lines speeds for high output without the need for processing aids |

When eXtreme Performance is required, films based on Exceed XP can perform under the very toughest conditions by offering:

- Dart impact improvements
- Superior creep resistance
- Significant downgauging opportunities

Exceed XP is ideal for a broad range of heavy duty sack film applications:

- Petrochemical or polymer product pellets
- Fertilizers
- Food products like rice
- Pet food product
- Building materials, such as cement pre-mix
- Gardening products

Innovation opportunities

Converters can use Exceed™ XP performance polymers to create innovative heavy duty sack solutions. Enabling the toughness, sealing capabilities, stiffness, and creep resistance of the film to be tailored to meet the applications' needs, each polymer offers specific attributes.

- **Exceed XP** – when eXtreme Performance matters – offers an unrivaled property combination of extreme toughness and stiffness, elevated sealing capabilities and enhanced processability.

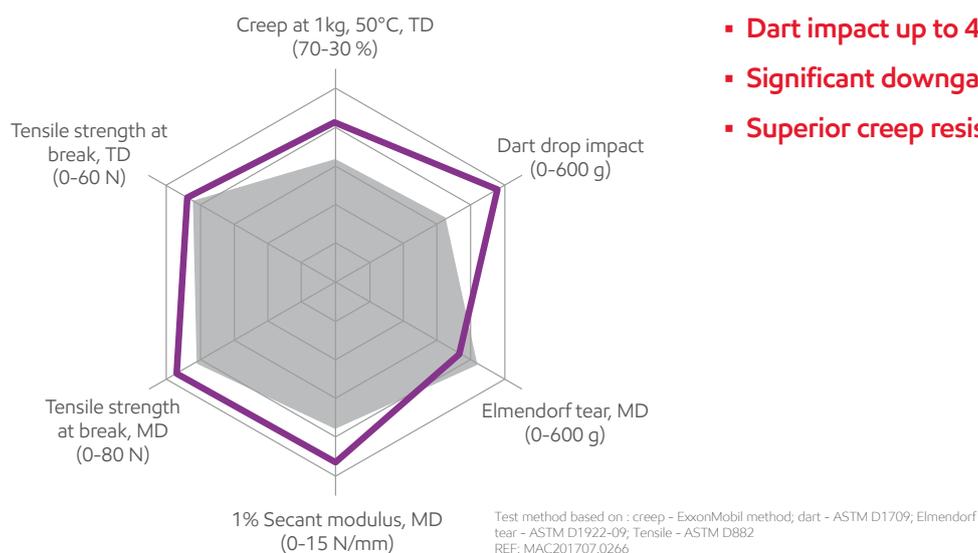
High package integrity across the value chain

Heavy duty sacks films made with Exceed XP deliver high package integrity, helping to prevent damage from the moment the sacks are being filled to when the products are used. They can endure dynamic and impact loadings which

Exceed™ XP performance polymers – 3-layer, 100-micron solution

A 3-layer, 100-micron Exceed XP-based film can increase dart impact by more than 45%, reduces creep by 16% and provides downgauging potential of about 9% compared to a 3-layer, 110-micron market reference film (C8LL >55%-based solution).

Figure 1: Extreme performance 3-layer solution – 100 µm



- **Dart impact up to 45%**
- **Significant downgauging potential**
- **Superior creep resistance**

Table 1: Extreme performance 3-layer solution – 100 µm

| | Melt index (g/10 min) | Density (g/cm ³) | Exceed XP 3-layer 100 µm film | Reference 110 µm film |
|------------------------|-----------------------|------------------------------|-------------------------------|-----------------------|
| Exceed XP 8358 | 0.5 | 0.918 | ● | |
| C8-LLDPE | 1.0 | 0.918 | | ● |
| HDPE | 11 (21.6 kg) | 0.951 | ● | ● |
| LDPE | 0.33 | 0.916 | | ● |
| White masterbatch | - | - | ● | ● |
| Anti-block masterbatch | - | - | ● | ● |

Exceed™ XP performance polymers – when eXtreme Performance matters.

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may cause stress and ruptures during filling, transportation, storage and use.

The sacks are capable of withstanding rough handling and storage conditions in various environments and climates. The creep resistance of the sacks provides optimum stability when stacked or left on pallets, helping to prevent toppling and improve safety.

Enhanced processability and lower system costs

Enhanced sealability with excellent machinability enables fast bagging line speeds for high output.

Reduced system costs are possible through downgauging opportunities that use less material, while sack integrity is maintained.

Tougher films result in less damage to heavy duty sacks and less waste.