ExxonMobil

Increase throughput and durability of heavy duty sack (HDS) film with Exceed™ S performance polyethylene

Creating tougher, thinner heavy duty sacks (HDS) often requires sacrifices in conversion efficiency. What if your resin did more? Exceed S resins deliver simplicity as well as high performance, easy processing and an exceptional balance of stiffness and toughness.

Downgauging opportunity | **High output** | **Good bag drop performance** | **Stiffness**

Heavy duty sacks made of Exceed S PE offer opportunities for downgauging and increased throughput. Exceed S resins deliver an outstanding balance of toughness and stiffness that can help create robust, durable packaging at a thinner gauge. In addition, by delivering exceptional processability, Exceed S PE grades can reduce the overall melt pressure in the extruder, offering the potential for increased productivity and lower energy consumption. Exceed S performance PE resins offer extreme performance for brand owners and easy processing for convertors.

Beneficial attributes

- Impressive balance between toughness and stiffness
- Easy processing without compromising performance

Value

- Downgauging potential to as thin as 105 µm
- Potential for increased production efficiency and cost savings from lower energy consumption
- Outstanding package integrity: creep resistance, bag drop performance

Downgauging is important for those in the HDS industry. However, there are concerns about the effect of downgauging on performance and production output. HDS suppliers are pursuing PE grades that provide improved processability and outstanding mechanical performance. As shown below, when compared to Exceed™ 1018 performance polyethylene, Exceed™ S 9272ML and Exceed S 9243ML performance polyethylene deliver ~15% melt pressure decrease and a 25-40% improvement in maximum output. With new Exceed S resins, there are opportunities to improve output by 10-15% for HDS formulations at the same gauge.

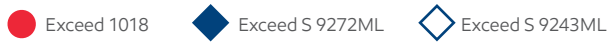
Single extruder possible maximum output (65 mm screw)

Melt pressure

R2108-004591-002
MAC201412.0023

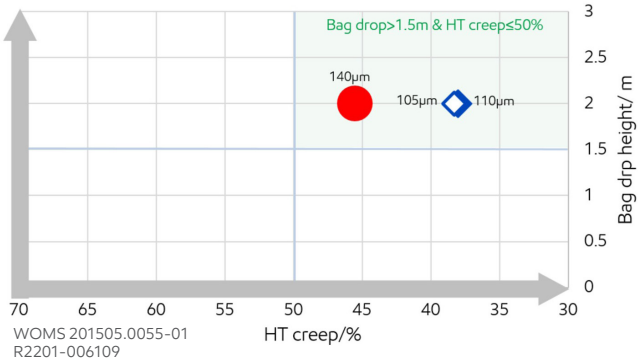
HDS solutions using Exceed S resins achieved 21% to 25% downgauge versus market reference, with total film thickness downgauged from 140 µm to 110 µm and 105 µm respectively. The single use of Exceed S 9272ML resins or in combination with Exceed S 9243ML resins in film formulations, have maintained the robust toughness and enhanced film stiffness even with significant downgauging. More importantly, solutions using Exceed S resins also fully passed a 2m bag drop test which assesses the level of protection against falls and collisions in complex transportation environments.

Data from tests performed by or on behalf of ExxonMobil.



- The processing test is conducted on a 65 mm Alpine blown film line with 160 mm die diameter, 1.5 mm die gap and a 2.5:1 blow-up ratio;
- Melt pressure was tested based on 120 kg/hr output;
- Maximum output is defined as the output when the film thickness variation indicator $2\sigma \leq 10\%$.

HT creep & bag drop performance



WOMS 201505.0055-01
R2201-006109
R2112-005880

	Exceed 1018: 140µm	**Exceed S 9272ML based:** 110µm	**Exceed S 9272ML & Exceed S 9243ML based:** 105µm
Ratio	1 / 2 / 1	1 / 2 / 1	1 / 3 / 1
Skins[1]	Exceed 1018 + LDPE	Exceed S 9272ML	Exceed S 9272ML
Core[2]	C4 LLDPE + HDPE	Exceed S 9272ML + HDPE	Exceed S 9243ML + HDPE

1. Skins contain 1.5% anti-block
2. Core of 5% white masterbatch

Grade	Melt index (g/10 min)	Density (g/cm³)	Slip/anti-block
Exceed S 9272ML	0.80	0.920	No
Exceed S 9243ML	0.85	0.926	No
Exceed 1018	1.0	0.918	No

Test item	Test based on
MI (Melt Index: 190°C @ 2.16 kg)	ASTM D-1238
Density	ASTM D-4703 / ASTM D-1505
Dart drop impact resistance by free falling dart	ExxonMobil test method
Tensile test	ExxonMobil test method
Hot temperature creep resistance	ExxonMobil test method

Why ExxonMobil PE? Why today?

tomorrow's **performance** today

What some might view as solutions that will only happen in the future, ExxonMobil PE is making possible today – through our innovative and reliable products, collaborative approach, technology leadership and support, and our unmatched global supply and resources. Learn more about how we're helping our customers create solutions with sustainability benefits. Why wait for tomorrow to advance your business today? Contact your ExxonMobil PE representative and begin experiencing tomorrow's performance today in your industrial resin heavy duty sack films.

Contact us for more information:
exxonmobilchemical.com/pe

E0422-563E15

ExxonMobil