ExxonMobil

Value-added agriculture films

Energy lives here™

Exceed™ and Enable™ performance polymers can be used to deliver more sustainable films that reduce cost and enhance performance for a range of agricultural applications including polyethylene (PE) and ethylene vinyl acetate (EVA) greenhouse films, tunnel films and mulch films.

Delivered attributes	Derived benefits & potential value
Downgauging 20% to 30%	Raw material savings Lower film inventory Lower logistics costs Lower unit covering cost
Improved toughness	Reduced film damage during extreme weather conditions Reduced film damage during film installation Potentially longer film life Reduce or eliminate LDPE Easy collection after use
Enhanced film optical properties	Faster temperature rise in greenhouse Increase land productivity Lengthen growing season
Excellent processability	Maintained extrudability and bubble stability Easy transition Reduced transition time and machine down-time Possible energy saving Worry-free, long-term production

Pure Enable™ performance polymer-based greenhouse films

Provide significant improvements in MD tear, dart and puncture resistance, and a better total light transmission with less material.

Figure 1: Selected film property data for Enable formulated film and the reference film

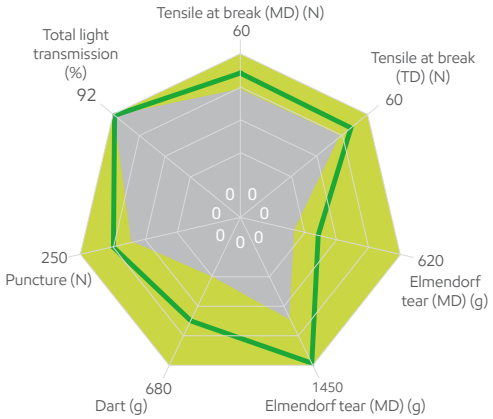


Table 1: Product data for Enable formulated film and the reference film

	Pure Enable solution (80µm)*	Enable / LDPE blend solution (80µm)	C4-LLDPE Ref (100µm)
Layer ratio	1 / 1 / 1	1 / 1 / 1	1 / 1 / 1
Skin layer	Enable 2010	Enable 2010 LDPE (0.33MI, 0.922 density)	C4-LLDPE (1.0MI, 0.918 density) LDPE (0.33MI, 0.922 density)
Core layer	Enable 2005	Enable 2005 LDPE (0.33MI, 0.922 density)	C4-LLDPE (1.0MI, 0.918 density) LDPE (0.33MI, 0.922 density)
Outer layer	Enable 2010	Enable 2010 LDPE (0.33MI, 0.922 density)	C4-LLDPE (1.0MI, 0.918 density) LDPE (0.33MI, 0.922 density)

* Suitable BUR for pure Enable solution is ≤ 2.0 and suitable thickness is ≤ 100 µm

According to the China Agricultural Film Association (CAFA) report, the weatherability of Exceed™ performance polymer-based film and Enable film is better when compared to film made with conventional LLDPE resin. Exceed and Enable are qualified to be used in agriculture film due to their superior optical, mechanical and aging properties.

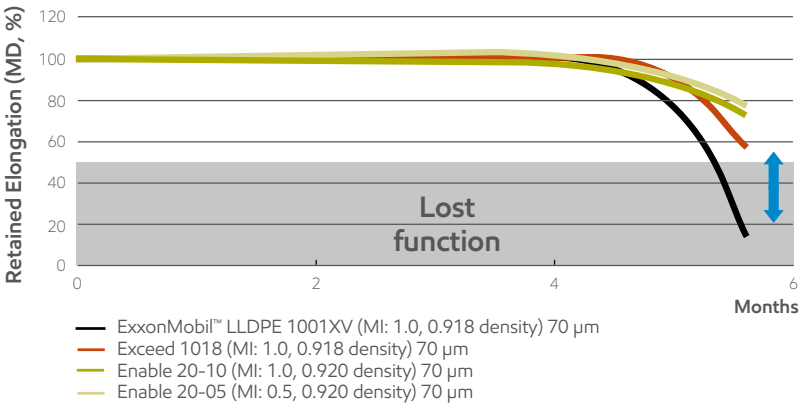
Additional solutions

ExxonMobil Chemical has also developed solutions for other agricultural film applications including:

- EVA greenhouse film
- Coated PE greenhouse film
- Tunnel film
- Mulch film

We would be delighted to work with you to create an optimized formulation that meets your specific application needs.

Figure 2: Field aging tests show that weatherability is improved when using Exceed film and Enable film when compared with conventional LLDPE film



Data from tests performed by or on behalf of ExxonMobil

Test	Based on test method
MI (Melt Index)	ASTM D-1238
Density	ASTM D-4703 / D-1505
Tensile at break	ASTM D-882
Elongation at break	ASTM D-882
1% secant modulus	ASTM D-882
Elmendorf tear	ASTM D-1922

Test	Based on test method
Dart impact	ASTM D-1709
Puncture resistance	ExxonMobil method
Total light transmission rate	ExxonMobil method
Lab accelerate aging	ExxonMobil method
Field aging test	ExxonMobil method

Contact us for more information:
exxonmobilchemical.com/pe

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