

Tailored solutions for power pre-stretch applications

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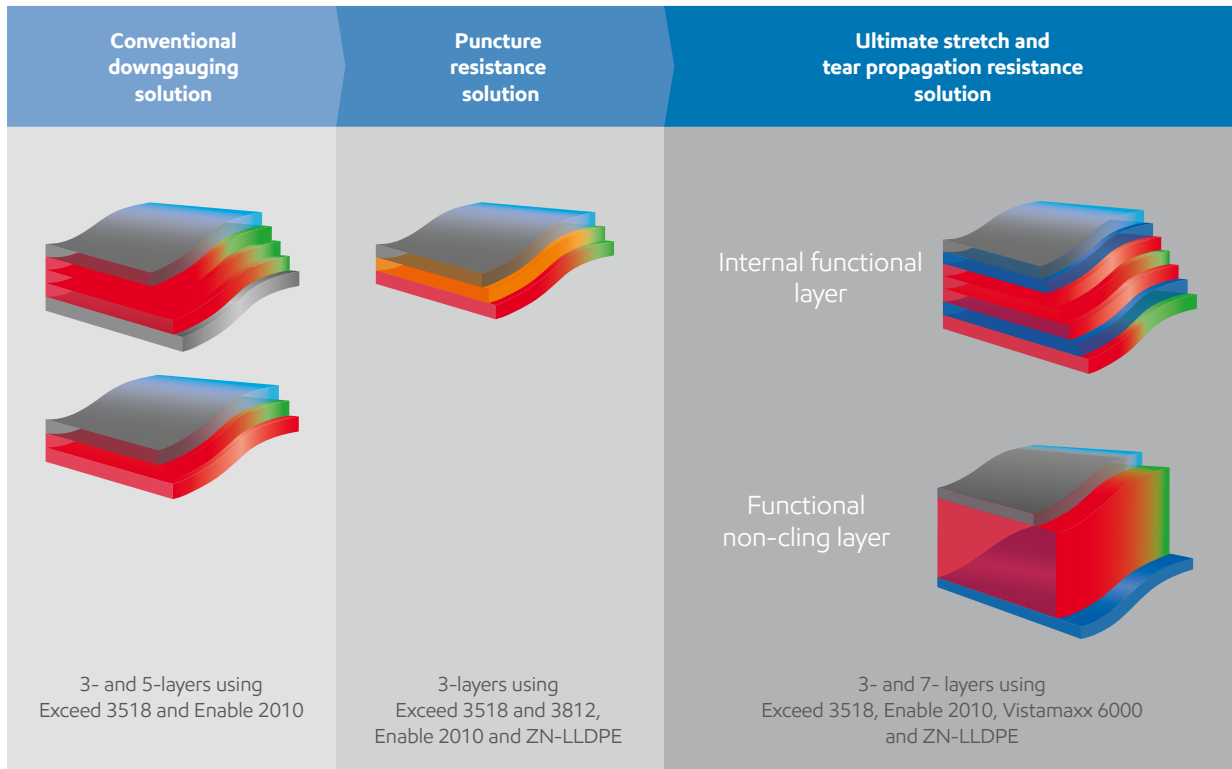


Power pre-stretch pallet packaging films made with Exceed™, Enable™, and Vistamaxx™ performance polymers deliver outstanding pre-stretch and toughness, while providing opportunities for downgauging. This allows highly efficient pallet wrapping for the safe and secure packaging and protection of goods at reduced cost.

Delivered attributes	Derived benefits & potential value
Outstanding toughness through tensile strength, puncture resistance and tear propagation	<ul style="list-style-type: none"> ▪ Downgauging opportunities and reduced material use ▪ Fewer damaged products for less waste and lower costs ▪ Efficient pallet wrapping
Improved ultimate stretch and maximized holding force	<ul style="list-style-type: none"> ▪ Efficient pallet wrapping for load stability and safe, secure shipment of goods ▪ Low film weight per pallet
Optimized cling and unwinding force	<ul style="list-style-type: none"> ▪ Efficient pallet wrapping and load stability
Enhanced processing	<ul style="list-style-type: none"> ▪ Optimized production at high line speeds ▪ High output ▪ Web stability for cast stretch films

Power pre-stretch packaging film solutions

Converters can tailor power pre-stretch wrap films to meet the needs of the application using Exceed™, Enable™, and Vistamaxx™ performance polymers. They allow the fabrication of 3- and 5-layer, or 7-, 9- or even nano-layer power pre-stretch film solutions. The greater the number of film layers, the greater the options for tailoring functionality.



■ Exceed 3518 ■ Exceed 3812 ■ Enable 2010 ■ Vistamaxx 6000 ■ Vistamaxx cling agent ■ ZN-LLDPE

The processing and performance of power pre-stretch films can be tailored and enhanced using Exceed™, Enable™ and Vistamaxx™ performance polymers. Highly effective power pre-stretch films can be created that deliver reliable pallet wrapping with cost and sustainability benefits that create value along the value chain.

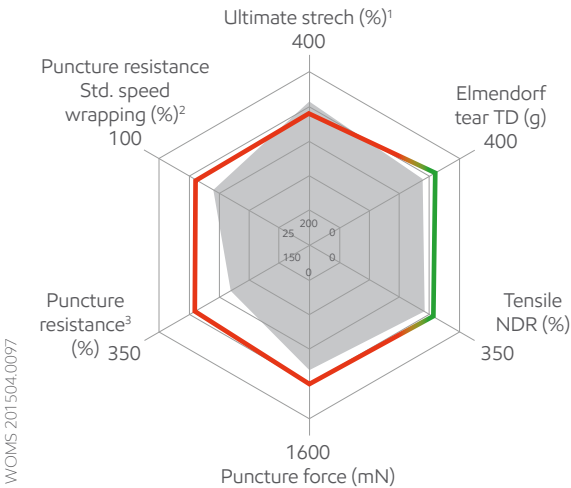
Highly-effective film

Films with high holding force, combined with efficient cling and outstanding tear propagation resistance, results in improved load stability and fewer product returns.

Highly reliable wrapping

Films with excellent pre-stretch performance combined with excellent puncture and tear propagation resistance.

Thin gauge film optimized for puncture resistance



1. It is measured by Highlight Instrument, and this data is to be used only as comparative data.
2. It is measured by Lantech Q300XT wrapper at 300% pre-stretch, 15RPM and 12 wraps. It's the pre-stretch level (expressed in percentage) till which no holes are observed.
3. It is measured by Lantech Q300XT wrapper at 300% pre-stretch, 15RPM and 12 wraps. It's the tension (expressed in percentage) till which no holes at the puncture bars are observed.

Table 1: Thin gauge film optimized for puncture resistance

Layer ratio	Melt index (g/10 min)	Density (g/cm ³)	Exceed 3812 PPS formulation 15 µm			Reference 3-layer 15 µm		
			1	7,5	1,5	1	7,5	1,5
Exceed 3812	3.8	0.912	●					
Exceed 3518	3.5	0.918				●	●	
Enable 2010	1.0	0.920		●	●		●	●
Vistamaxx 6202	9.1	0.862	●				●	
ZN-LLDPE	2.0-3.2	0.918	●				●	

Exceed 3812 solution delivers:

- Improved puncture resistance
- Efficient pallet wrapping

Enhanced ultimate stretch and tear propagation resistance at thin gauge

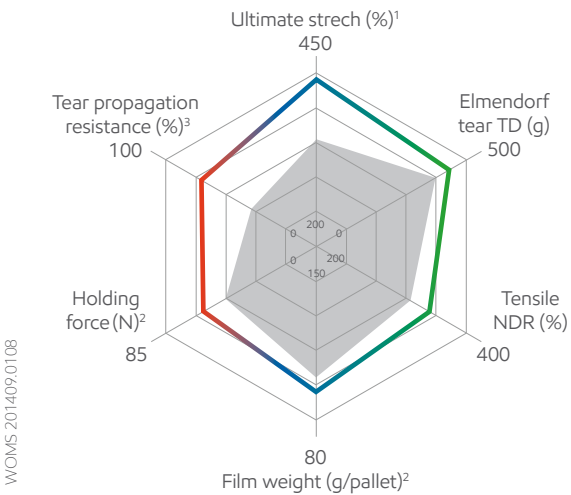


Table 2: Enhanced ultimate stretch and tear propagation resistance at thin gauge

Layer ratio	Melt index (g/10 min)	Density (g/cm ³)	Vistamaxx 6000 based PPS formulation 17 µm					Market references 17 µm
			1	0.75	1.6	3.3	1.6	0.75
Exceed 3518	3.5	0.918			●	●	●	●
Enable 2010	1.0	0.920				●		●
Vistamaxx 6000	3.7	0.889	●				●	
Vistamaxx 6202	9.1	0.862	●					
ZN-LLDPE	2.0-3.2	0.918	●					
LLDPE	-	-						●

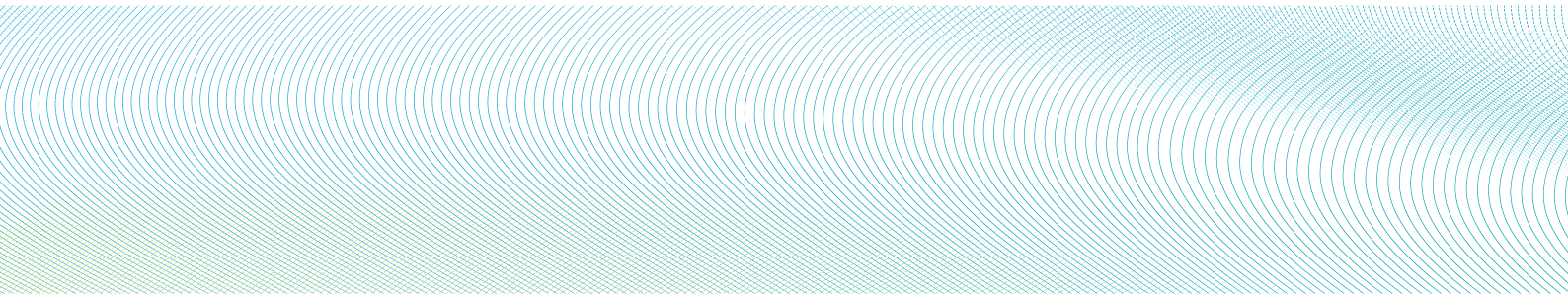
Vistamaxx 6000 as the functional layer solution delivers:

- Reduced film costs
- Less damaged goods
- Top level pallet wrapping

1. It is measured by Highlight Instrument, and this data is to be used only as comparative data.
2. It is measured by Lantech Q300XT wrapper at 300% pre-stretch, 15RPM and 12 wraps. Holding force and film weight values are reported at the tension in which no holes at the puncture bars neither tear propagation is observed.
3. It is measured by Lantech Q300XT wrapper at 300% pre-stretch, 15RPM and 12 wraps. It's the tension (expressed in percentage) till which no tear propagation is observed.

Test	Test method
Melt Index	ASTM D 1238
Density	ASTM D 1505
Elmendorf Tear	ASTM D 1922-09
Tensile NDR	ASTM D 882
Puncture Force	CEN 14477

Some of the properties are measured during wrapping trials and on the Highlight instrument.



Grade	Melt index 190°C, 2.16 kg (g/10 min)	Density (g/cm ³)	Distinguishing features
Exceed 3518	3.5	0.918	Toughness and maximized holding force at high stretch ratio
Exceed 3812	3.8	0.912	Optimized puncture resistance for a tougher film
Enable 2010	1.0	0.920	Toughness and maximized holding force
Vistamaxx 6000	3.7	0.889	Improved ultimate stretch and tear propagation Enhanced processing and film performance
Vistamaxx 6202	9.1	0.862	Vistamaxx cling agent

Reduce film costs and deliver efficient pallet wrapping with stretch wrap film. For both packaging and protection, stretch wrap provides safe and secure shipment of loads.

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