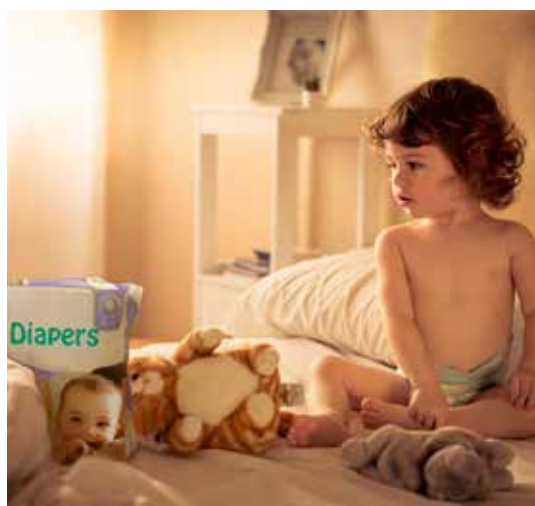


# Stiffer, tougher compression packaging solutions help brand owners deliver products securely

Energy lives here™



Enable™ 4002 performance polymer provides secondary packaging solutions with an outstanding combination of stiffness and toughness, optical properties and excellent machinability. The unique properties of this polymer allow the production of thinner, stronger compression packaging films, compared to existing market alternatives, ensuring product quality and integrity from packaging to the consumer.

## Suggested uses

Products requiring tight, secure and sustainable compression packaging such as:

- Baby diapers
- Adult incontinence products
- Feminine hygiene products
- Insulation bags

Melt index g/10 min	Density g/cm <sup>3</sup>	Melt flow ratio MI21/MI2
0.25	0.940	>60

Test methods based on: Melt index and Melt flow ratio - ASTM D1238;  
Density - ASTM D1505

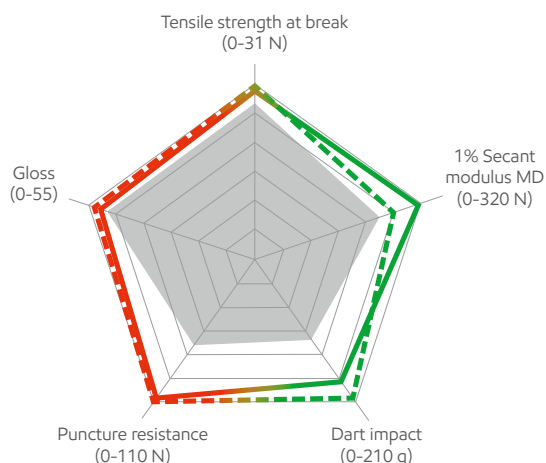
Delivered attributes	Derived benefits and potential value
High melt strength	<ul style="list-style-type: none"><li>• Bubble stability</li><li>• Increased output</li></ul>
Good stiffness / toughness balance	<ul style="list-style-type: none"><li>• Package integrity</li><li>• Downgauging</li></ul>
Enhanced optical properties	<ul style="list-style-type: none"><li>• Increased visibility in retail</li></ul>
High stiffness	<ul style="list-style-type: none"><li>• Simplified formulations</li><li>• Reduced creep</li></ul>

## Market comparisons

A 3-layer, 37 micron film which includes Enable™ 4002 performance polymer delivers the following benefits:

- Downgauging opportunities of up to 26% compared with a market reference film
- Improved toughness, stiffness and optical properties
- Simplified formulation by displacing HDPE

**Figure 1:** Selected properties of a 37 micron Enable 4002 formulated film versus a commercial 50 micron LDPE/LLDPE/HDPE reference film.



MAC 201004.0184  
MAC201306.0326

## Packaging integrity for optimum product security

By using Enable 4002 in your formulation you can now produce thin film gauges that were not possible previously, while maintaining or improving package performance. With this polymer, compression packaging films can be fabricated that offer improved stiffness and tensile strength compared to conventional 3-layer market alternatives. You can create thinner, stronger secondary packaging films that ensure your products are tightly packaged and secure.

## High clarity for shelf appeal and vibrant graphics

Manufacturers can now produce compression packaging films with greatly improved optical properties. The high clarity and gloss offered by Enable 4002 allows brand owners to create dazzling retail-ready graphics that promote their brands in-store.

## Cost optimization

Enable 4002 provides excellent processability for consistent film production, high-speed operations and high output. Value can be achieved across the value chain through downgauging and performance improvements, compared to conventional HDPE blown films. Manufacturers will benefit from lower resin and energy consumption in package creation as a result of these downgauging opportunities. Less manufacturing and post-consumer waste can be realized because of high integrity compression packaging.

**Table 1: Product data for Enable 4002 formulated films and the reference film.**

	Melt index (g/10 min)	Density (g/cm <sup>3</sup> )	High stiffness 37 µm film			High toughness 37 µm film			Reference coextruded 3-layer 50 µm film		
Layer ratio			1	3	1	1	3	1	1	2	1
Enable 4002	0.25	0.940		●			●				
Enable 2705	0.5	0.927	●		●						
Enable 2005	0.5	0.920				●		●			
Exceed 1018	1.0	0.918	●		●	●		●			
HDPE	0.15	0.952		●					●	●	●
LDPE	0.75	0.923							●		●
c8LLDPE	1.0	0.920							●		●
mMDPE										●	
White masterbatch				●			●			●	
Slip masterbatch				●			●		●	●	●
Antiblock masterbatch									●		●

Test methods based on: Tensile properties on film at room temperature - ASTM D882-02; Impact resistance by free-falling dart (method A and B) - ASTM D1709; Puncture resistance (old) - Instron EMC method; gloss 45°C - ASTM D2457

## In summary

If you're looking for thinner, stronger compression packaging film to help ensure bundled products stay exceptionally secure, from packaging to consumer, look no further than Enable 4002.

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