**Excell**ent shelf appearance and toughness in an all-PE pillow pouch for FFS lines

Heat seal temperature windows represent a well-known challenge for all-PE packaging. How to get strong seal strength, no shrinkage on the surface, and achieve high packing speed on modern FFS lines – all at the same time?

By using Dow’s innovative asymmetric sealing technology, INNATE™ TF resin-produced BOPE film laminated with blown PE film (60-80µm) can meet the sealing window challenge. This success has enabled us to replace traditional PET//PE, BOPA//PE, BOPP/PE laminations in detergent powder, frozen food, and snack food pillow pouch applications.

INNATE™ TF Polyethylene Resins for Tenter Frame Biaxial

We call INNATE™ TF resins The Future of sustainable packaging. Why? Compared to traditional PE products, films made with INNATE™ TF resins:

- Achieve up to 80% less haze
- Have 2x the impact strength and tensile modulus
- Offer 3x the puncture resistance and tensile strength
- Allow dazzling optics for printing
- Are low-temperature resistant

Let’s talk about the future of your applications with INNATE™ TF resins.

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**Film properties comparison**

<table>
<thead>
<tr>
<th>Property</th>
<th>BOPA (15µm)</th>
<th>TF-BOPE (25µm)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Haze (%)</td>
<td>3.1</td>
<td>1.8</td>
</tr>
<tr>
<td>Dart impact – type A (g)</td>
<td>1.7</td>
<td>1.2</td>
</tr>
<tr>
<td>Guillo flex (cycles before pin hole appears)</td>
<td>3.5</td>
<td>2.5</td>
</tr>
<tr>
<td>TD tensile max. load (N)</td>
<td>540</td>
<td>340</td>
</tr>
<tr>
<td>MD tensile max. load (N)</td>
<td>24</td>
<td>15</td>
</tr>
<tr>
<td>Puncture load (N)</td>
<td>68</td>
<td>45</td>
</tr>
<tr>
<td>MD tear (gf)</td>
<td>9.4</td>
<td>6.1</td>
</tr>
<tr>
<td>Gloss</td>
<td>87</td>
<td>80</td>
</tr>
<tr>
<td>MD tensile stress (MPa)</td>
<td>1.2</td>
<td>0.8</td>
</tr>
<tr>
<td>Puncture energy (J)</td>
<td>0.5</td>
<td>0.4</td>
</tr>
</tbody>
</table>

**Lamination properties comparison**

<table>
<thead>
<tr>
<th>Property</th>
<th>BOPA (15µm) / PE (80µm)</th>
<th>TF-BOPE (20-25µm) / PE (80µm)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gloss</td>
<td>87</td>
<td>80</td>
</tr>
<tr>
<td>MD tensile stress (MPa)</td>
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</tr>
<tr>
<td>Puncture energy (J)</td>
<td>0.5</td>
<td>0.4</td>
</tr>
</tbody>
</table>

**Structure**

- BOPA (15µm) / PE (80µm)
- TF-BOPE (20-25µm) / PE (80µm)

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**Description**

**Recyclability**

- All-PE structure with excellent packaging performance

**Appearance**

- Excellent gloss, transparency, and haptics
- Matte surface option available
- Printability
- Touch and feel close to current PET lamination structure

**Abuse resistance**

- Superior film toughness
- Can pass stringent drop tests*
- Packaging integrity and reduced waste

**Packaging efficiency**

- Dow innovative asymmetric technology

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*Bag drop testing protocol: single bag repeated dropping (drop from 1.5m height, pouch bottom landed for 3 times, and pouch top landed for 3 times)
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