PP Plastomers & Elastomers For Flexible Packaging

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Technology Features

VERSIFY™ Plastomers and Elastomers are propylene/alpha-olefins copolymers with semi-crystalline isotactic propylene segments

• New family of catalysts generate a controlled and narrow molecular weight distribution, broad crystallinity distribution for improved performance and processability

• Unique comonomer distribution and molecular structure for new property combinations

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Unique Performance

Flexible materials with new combinations of:

• Clarity and high gloss
• Softness and elasticity
• Low heat seal temperatures \textit{and} broad heat seal window
• High toughness and sealability
• Ease of processing in wide range of fabrication methods
• Excellent adhesion to wide range of polyolefins
Physical Property Ranges

- Narrow Molecular Weight Distribution: MWD 2 - 3
- Melt Flow Rate: MFR 2 - 25 (measured @ 230 °C)
- Density: 0.859 - 0.888 g/cm³
- Glass Transition Temperature: -15 to -35 °C
- Melting Range: 50 - 135 °C
- Flexural Modulus: 10 - 400 MPa
Application Versatility

Wide range of application:
- BOPP film sealant
- CPP film sealant
- Sealant for up blown film
- Soft film (for food and specialty packaging)
- Tie layer or sealing layer for extrusion coating.
Fabrication Versatility

- Blown film
- Cast film
- Extrusion coating/lamination
- Injection molding
- Compounding
- Profile extrusion
- Calendering
Flexible Films: Food & Specialty

*Dart Drop Impact*

Outstanding impact properties for coextruded films.

35µ Cast film A/B/A (15%/70%/15%)
A = see X Axis
B = Homopolymer PP
Flexible Films: Food & Specialty

Puncture Resistance

Superior puncture resistance versus random copolymers.

35μ Cast film A/B/A (15%/70%/15%)
A = see X Axis
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Seal Performance

Temperature, C

Seal strength, N/15mm

- Random PP (3% C2)
- Plastomer-1
- Plastomer-2

35µ cast film A/B/A (15%/70%/15%)

High seal strength and low seal initial temperature

Seal initial temperature
Seal Through Corona Treatment

Maintain good seal strength and seal initial temperature after corona treatment.

- Plastomer-1
- Plastomer-1 treatment
- RCP PP
- RCP PP treatment
- Competitive PP
- Competitive PP treatment
Haze Performance

20micron BOPP film

Copolymer Sealant
Plastomer-2 Sealant

% Haze

0.95
1.0
1.05
1.1
1.15
1.2
1.25
Optical Performance

![Bar Chart](image)

- **Copolymer Sealant Plastomer-2 Sealant**
- **% 45 Degree Gloss**
- **20 micron BOPP film**
Extrusion Coating

**Adhesion with PP:**  
**PP Plastomers vs. LDPE**

<table>
<thead>
<tr>
<th></th>
<th>LDPE</th>
<th>Plastomer-3</th>
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<tbody>
<tr>
<td>adhesion strength: (lb)</td>
<td>0.248</td>
<td>4.225</td>
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PP Plastomers afford much higher bond strength to PP
Extrusion Coating

Hot tack lb/inch

![Graph showing the relationship between temperature (C) and average hot tack for LDPE and Plastomer-3.](image)

- **LDPE**
- **Plastomer-3**
Properties Summary of PP Plastomers & Elastomers

- Excellent seal performance
- Seal through corona treatment in BOPP and CPP film
- Excellent optical properties
- Excellent physical properties
- Fabrication versatility
THANK YOU!