High Performance Tie Layer Functionality
AMPLIFY™ TY Functional Polymers

A versatile portfolio of tie layer resins for multi-layer packaging
Leveraging Dow’s extensive knowledge and market position in the packaging industry, Dow’s AMPLIFY™ TY Functional Polymers product family combines a broad offering of tie layer resins into one comprehensive portfolio of proven and developmental products suited for diverse applications.

AMPLIFY™ TY Functional Polymers are designed to suit a broad range of adhesion requirements, production processes and end-use applications ranging from multi-layer films, bottles, sheets and tube structures. The portfolio includes concentrated and formulated resins for:

- Excellent adhesion to a variety of substrates:
  - Polyethylene (PE)
  - Polypropylene (PP)
  - Nylon (PA)
  - Ethylene Vinyl Alcohol (EVOH)
  - Polyethylene
  - Teraphthalate (PET)
  - Polystyrene (PS)
  - Ionomers

- Multiple production processes:
  - Blown film
  - Cast film
  - Retort
  - Shrink & deep draw
  - Thermoforming
  - Blow molding
  - Other

- Wide ranging end-use segments:
  - Food & Specialty
  - Packaging
  - Agricultural
  - Pharmaceuticals
  - Pipe
  - Flooring
  - Other
  - Industrial uses

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## Product Portfolio

<table>
<thead>
<tr>
<th>Product</th>
<th>MAH Graft Level</th>
<th>Density</th>
<th>MI</th>
<th>Base Polymer</th>
<th>Recommended Loading</th>
<th>Adhesion</th>
<th>Application</th>
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</thead>
<tbody>
<tr>
<td>AMPLIFY™ TY Functional Polymers – Concentrates</td>
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<tr>
<td>AMPLIFY™ TY 1052H</td>
<td>High</td>
<td>0.870</td>
<td>1.3</td>
<td>ULDPE</td>
<td>PA: 10-25% EVOH: 20-25% PP:PA or EVOH 40%</td>
<td>PE, PP, PA, EVOH</td>
<td>Flexible &amp; Rigid Retort</td>
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<td>2.0</td>
<td>HDPE</td>
<td>PA: 6-15% EVOH: 12-20%</td>
<td>PE, PA, EVOH</td>
<td>Flexible &amp; Rigid</td>
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<td>AMPLIFY™ TY 1056H</td>
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<td>12.0</td>
<td>HDPE</td>
<td>PE: 10-20%</td>
<td>PE, PA, Aluminum, Cellulose</td>
<td>Flexible &amp; Rigid</td>
</tr>
<tr>
<td>AMPLIFY™ TY 1057H</td>
<td>High</td>
<td>0.912</td>
<td>3.0</td>
<td>LLDPE</td>
<td>PA: 7-15% EVOH: 10-20%</td>
<td>PE, PA, EVOH</td>
<td>Flexible &amp; Rigid</td>
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<tr>
<td>AMPLIFY™ TY 1250H</td>
<td>High</td>
<td>0.920</td>
<td>0.6</td>
<td>LDPE</td>
<td>PA: 15-20% EVOH: 20-25%</td>
<td>PE, PA, EVOH</td>
<td>Flexible &amp; Rigid</td>
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<tr>
<td>AMPLIFY™ TY 1151</td>
<td>Medium</td>
<td>0.920</td>
<td>2.5</td>
<td>LLDPE</td>
<td>PA: 15-25% EVOH: 30-40%</td>
<td>PE, PA, EVOH</td>
<td>Flexible &amp; Rigid</td>
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<td>AMPLIFY™ TY Functional Polymers – PE Tie Layer Resins</td>
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<td>AMPLIFY™ TY 1251</td>
<td>Low</td>
<td>0.921</td>
<td>0.6</td>
<td>LDPE</td>
<td>100%</td>
<td>PE, PA, EVOH</td>
<td>Pipe Coating</td>
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<td>AMPLIFY™ TY 1351</td>
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<td>0.923</td>
<td>2.1</td>
<td>LLDPE</td>
<td>100%</td>
<td>PE, PA</td>
<td>Flexible</td>
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<td>AMPLIFY™ TY 1352</td>
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<td>0.922</td>
<td>1.0</td>
<td>LLDPE</td>
<td>100%</td>
<td>PE, PA, EVOH</td>
<td>Flexible</td>
</tr>
<tr>
<td>AMPLIFY™ TY 1353</td>
<td>Low</td>
<td>0.921</td>
<td>2.0</td>
<td>LLDPE</td>
<td>100%</td>
<td>PE, PA, EVOH</td>
<td>Flexible &amp; Rigid</td>
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<td>3.0</td>
<td>LLDPE</td>
<td>100%</td>
<td>PE, PA, EVOH</td>
<td>Flexible</td>
</tr>
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<td>AMPLIFY™ TY 1355</td>
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<td>0.920</td>
<td>6.0</td>
<td>LDPE</td>
<td>100%</td>
<td>PE, PA, EVOH</td>
<td>Extrusion Coating</td>
</tr>
<tr>
<td>AMPLIFY™ TY 1451</td>
<td>Low</td>
<td>0.910</td>
<td>1.7</td>
<td>LLDPE</td>
<td>100%</td>
<td>PE, PA, EVOH, Ionomer</td>
<td>Flexible &amp; Rigid</td>
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<td>AMPLIFY™ TY Functional Polymers – High Performance PP Tie Layer Resins</td>
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<tr>
<td>XUS 69109.00(1)</td>
<td>Low</td>
<td>0.910</td>
<td>3.5(4)</td>
<td>–</td>
<td>100%</td>
<td>PP, PE, PA, EVOH</td>
<td>Flexible &amp; Rigid Blown Film Retort</td>
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<tr>
<td>XUS 69110.00(1)</td>
<td>Low</td>
<td>0.910</td>
<td>5.5(4)</td>
<td>–</td>
<td>100%</td>
<td>PP, PE, PA, EVOH</td>
<td>Flexible &amp; Rigid Cast Film Retort</td>
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<td>AMPLIFY™ TY Functional Polymers – PET Tie Layer Resins</td>
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<tr>
<td>XZ 89892.00(1)</td>
<td>Low</td>
<td>0.912</td>
<td>2.0</td>
<td>–</td>
<td>100%</td>
<td>PET, PE, PP, PA, EVOH</td>
<td>Flexible &amp; Rigid</td>
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<tr>
<td>AMPLIFY™ TY 4351 (XZ 89893.00)</td>
<td>Low</td>
<td>0.917</td>
<td>7.5</td>
<td>–</td>
<td>100%</td>
<td>OPET, OPP, PE, PP, PA, EVOH</td>
<td>Flexible &amp; Rigid Cast Film</td>
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<tr>
<td>AMPLIFY™ TY 4751 (XUS 69106.01)</td>
<td>Medium</td>
<td>0.873</td>
<td>4.4</td>
<td>ULDPE</td>
<td>100%</td>
<td>PET, PE, PP, PA, EVOH</td>
<td>Flexible &amp; Rigid</td>
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<td></td>
<td></td>
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<tr>
<td>AMPLIFY™ TY 3351</td>
<td>Medium</td>
<td>0.940</td>
<td>5.0</td>
<td>–</td>
<td>100%</td>
<td>PS, PE, PA, EVOH</td>
<td>Rigid &amp; Semi-Rigid</td>
</tr>
<tr>
<td>AMPLIFY™ TY 3352*</td>
<td>Medium</td>
<td>0.940</td>
<td>5.0</td>
<td>–</td>
<td>100%</td>
<td>PS, PE, PA, EVOH</td>
<td>Rigid &amp; Semi-Rigid</td>
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<td>RETAIN™ TY Functional Polymers – Barrier Resin Compatibilization and Reactive Modification</td>
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<tr>
<td>RETAIN™ 3000</td>
<td>High</td>
<td>0.870</td>
<td>660</td>
<td>ULDPE</td>
<td>2-15%</td>
<td>PE, PP, PA, EVOH</td>
<td>Recycle compatibilizer for PA &amp; EVOH</td>
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</tbody>
</table>

Typical properties; not to be construed as specifications. Data based on Dow testing; test protocols and additional information available upon request. Some grades supplied out of other geographies.

OPET: Oriented PET
OPP: Oriented Polypropylene
*
Available in Europe only

(1) Developmental product of The Dow Chemical Company
(2) (g/cc) ASTM D 792
(3) (dg/min), 2.16 kg @ 190°C
(4) (dg/min), 2.16 kg @ 230°C
(TM) Trademark of The Dow Chemical Company (“Dow”) or an affiliated company of Dow
AMPLIFY™ TY Functional Polymers

Concentrates

AMPLIFY™ TY Functional Polymers concentrates are the result of our advanced anhydride grafting technology providing customers a highly flexible and customizable solution to meet their specific needs while also providing potential cost savings.

AMPLIFY™ TY Concentrates can be blended with standard polyolefins at a range from 5-40% depending on the desired adhesion level, rheology matching, performance optimization and processing technologies.

All of the AMPLIFY™ TY Concentrates are suitable for adhesion to PE, PA, EVOH and specific offerings exist for adhesion to PP, Ionomers and Aluminum.

<table>
<thead>
<tr>
<th>Product</th>
<th>MAH Graft Level</th>
<th>Density (g/cc)</th>
<th>MI (dg/min), 2.16 kg @ 190ºC</th>
<th>Recommended Loading</th>
<th>Adhesion</th>
</tr>
</thead>
<tbody>
<tr>
<td>AMPLIFY™ TY 1052H</td>
<td>High</td>
<td>0.870</td>
<td>1.3</td>
<td>PA: 10-25% EVOH: 20-25% PP-PA or EVOH 40%</td>
<td>PE, PP, PA, EVOH</td>
</tr>
<tr>
<td>AMPLIFY™ TY 1053H</td>
<td>High</td>
<td>0.965</td>
<td>2.0</td>
<td>PA: 6-15% EVOH: 12-20%</td>
<td>PE, PA, EVOH</td>
</tr>
<tr>
<td>AMPLIFY™ TY 1056H</td>
<td>High</td>
<td>0.950</td>
<td>12.0</td>
<td>PE: 5-20%</td>
<td>PE, PA, Aluminum, Cellulose</td>
</tr>
<tr>
<td>AMPLIFY™ TY 1057H</td>
<td>High</td>
<td>0.912</td>
<td>3.0</td>
<td>PA: 7-15% EVOH: 10-20%</td>
<td>PE, PA, EVOH</td>
</tr>
<tr>
<td>AMPLIFY™ TY 1250H</td>
<td>High</td>
<td>0.920</td>
<td>0.6</td>
<td>PA: 15-20% EVOH: 20-25%</td>
<td>PE, PA, EVOH</td>
</tr>
<tr>
<td>AMPLIFY™ TY 1151</td>
<td>Medium</td>
<td>0.920</td>
<td>2.5</td>
<td>PA: 15-25% EVOH: 30-40%</td>
<td>PE, PA, EVOH</td>
</tr>
</tbody>
</table>

Typical properties; not to be construed as specifications. Data based on Dow testing; test protocols and additional information available upon request.

Features and Benefits

• Customizable adhesion performance to meet specific application requirements
• Excellent adhesion to PE, PA and EVOH for enhanced packaging integrity
• Highly flexible solution enabling adjustment of the rheology to suit multi-layer conversion process requirements
• Cost-efficient solution: Savings can be achieved by consolidating tie layer resins (one fits all), reduced tie layer consumption by tailoring adhesion to specific structures, and lower cost compared to formulated commercial tie layers

Figure 1: Adhesion Performance to PA and EVOH – AMPLIFY™ TY Concentrates in PE-based structures
**PRODUCT FOCUS**

AMPLIFY™ TY 1052H Functional Polymer - Highly versatile concentrate for PE- and PP-based blends

AMPLIFY™ TY 1052H Functional Polymer can additionally be blended with PP, offering a highly versatile solution for use as a tie layer component in PP and PE barrier films for performance requirements in non-retort and retort applications.

Figure 2: Adhesion performance of AMPLIFY™ TY 1052H Functional Polymer blended 40/60% with PP

![Graph showing adhesion performance](image)

Typical properties; not to be construed as specifications. Data based on Dow testing; test protocols and additional information available upon request.
AMPLIFY™ TY Functional Polymers

**PE Tie Layer Formulated**

PE tie layer grades of AMPLIFY™ TY Functional Polymers are based on various polyethylenes including LLDPE, mLLDPE, LDPE and HDPEs and are designed for multi-layer films, bottles, sheets and tube structures made of PE and EVOH or PA.

**Features and Benefits**
- Excellent adhesion to EVOH and PA
- Excellent processability and a thermal stability equivalent to that of conventional polyolefins

### Table 2: Product Range and Physical Data, AMPLIFY™ TY Functional Polymers – PE Tie Layer Resins

<table>
<thead>
<tr>
<th>Product</th>
<th>MAH Graft Level</th>
<th>Density (g/cc)</th>
<th>MI(1)</th>
<th>Base Polymer</th>
<th>Adhesion</th>
<th>Conversion</th>
</tr>
</thead>
<tbody>
<tr>
<td>AMPLIFY™ TY 1251</td>
<td>Low</td>
<td>0.921</td>
<td>0.6</td>
<td>LDPE</td>
<td>PE, PA, EVOH</td>
<td>Composite Pipe</td>
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<tr>
<td>AMPLIFY™ TY 1351</td>
<td>Low</td>
<td>0.923</td>
<td>2.1</td>
<td>LLDPE</td>
<td>PE, PA</td>
<td>Blown &amp; Cast Film</td>
</tr>
<tr>
<td>AMPLIFY™ TY 1352</td>
<td>Low</td>
<td>0.922</td>
<td>1.0</td>
<td>LLDPE</td>
<td>PE, PA, EVOH</td>
<td>Blown Film</td>
</tr>
<tr>
<td>AMPLIFY™ TY 1353</td>
<td>Low</td>
<td>0.921</td>
<td>2.0</td>
<td>LLDPE</td>
<td>PE, PA, EVOH</td>
<td>Blown &amp; Cast Film</td>
</tr>
<tr>
<td>AMPLIFY™ TY 1354</td>
<td>Low</td>
<td>0.920</td>
<td>3.0</td>
<td>LLDPE</td>
<td>PE, PA, EVOH</td>
<td>Blown &amp; Cast Film</td>
</tr>
<tr>
<td>AMPLIFY™ TY 1355</td>
<td>Low</td>
<td>0.920</td>
<td>6.0</td>
<td>LDPE</td>
<td>PE, PA, EVOH</td>
<td>Extrusion Coating</td>
</tr>
<tr>
<td>AMPLIFY™ TY 1451</td>
<td>Low</td>
<td>0.910</td>
<td>1.7</td>
<td>LLDPE</td>
<td>PE, PA, EVOH, ionomer</td>
<td>Blown &amp; Cast Film</td>
</tr>
</tbody>
</table>

(1)Typical properties; not to be construed as specifications. Data based on Dow testing; test protocols and additional information available upon request.

**Figure 3:** Adhesion Performance to PA and EVOH – AMPLIFY™ TY Formulated Resins in PE-based structures

**PRODUCT FOCUS**

**AMPLIFY™ TY 1451 Functional Polymer – High Performance PE Tie Layer**

AMPLIFY™ TY 1451 Functional Polymer is a high performance tie PE tie layer grade for oriented film and thermoformed sheet applications, offering good adhesion even in the presence of anti-fog additives.

**Figure 4:** Adhesion Performance to Ionomers – AMPLIFY™ TY Resins

*Typical properties; not to be construed as specifications. Data based on Dow testing; test protocols and additional information available upon request.*
**AMPLIFY™ TY Functional Polymers**

**PET Tie Layer Formulated**

PET tie layer resins in the AMPLIFY™ TY Functional Polymers family are based on an ethylene copolymer and Dow’s advanced anhydride grafting technology. They are designed for oriented multi-layer films, sheets and extrusion coating composed of (O)PET and other adherents including PE, PP, EVOH and PA.

### Table 3: Product Range and Physical Data, AMPLIFY™ TY Functional Polymers – PET Tie Layer Resins

<table>
<thead>
<tr>
<th>Product</th>
<th>MAH Graft Level</th>
<th>Density (g/cc)</th>
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<th>Base Polymer</th>
<th>Adhesion</th>
<th>Conversion Technology</th>
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<tbody>
<tr>
<td>XZ 89892.00 (1)</td>
<td>Low</td>
<td>0.912</td>
<td>2.0</td>
<td>–</td>
<td>PET, PE, PP, PA, EVOH,</td>
<td>Blown Film</td>
</tr>
<tr>
<td>AMPLIFY™ TY 4351</td>
<td>Low</td>
<td>0.917</td>
<td>7.5</td>
<td>–</td>
<td>OPET, OPP, PE, PP, PA, EVOH</td>
<td>Extrusion Coating</td>
</tr>
<tr>
<td>AMPLIFY™ TY 4751</td>
<td>Medium</td>
<td>0.873</td>
<td>4.4</td>
<td>ULDPE</td>
<td>PET, PE, PA, EVOH</td>
<td>Cast Film</td>
</tr>
</tbody>
</table>

**Features and Benefits**

- Excellent adhesion to PE, PP, PET, PA, EVOH
- Excellent temperature stability that allows processing at elevated temperature up to 320°C
- Suitable for oriented film technology and thermoforming

**XZ 89892.00** (1) Experimental Functional Polymer offers excellent adhesion to PET and polyolefins in oriented blown film extrusion.

AMPLIFY™ TY 4351 Functional Polymer offers a very versatile extrusion coating adhesive providing excellent adhesion to aluminum foil, PE, PP, corona treated OPET and OPP – with or without Nitro Cellulose (NC) or polyurethane (PU) based printing inks. (Developmental grade: XZ 89893.00)(1)

AMPLIFY™ TY 4751 Functional Polymer provides outstanding adhesion to PET in cast film technology. (Developmental grade: XUS 69106.01)(1)

Typical properties; not to be construed as specifications. Data based on Dow testing; test protocols and additional information available upon request.

### Figure 5: Adhesion Performance – XZ 89892.00 (1) Experimental Functional Polymer

![Figure 5: Adhesion Performance – XZ 89892.00 (1) Experimental Functional Polymer](image)

Blown film: PET/Tie/PE/Tie/PA/Tie/PE 100 μm

Typical properties; not to be construed as specifications. Data based on Dow testing; test protocols and additional information available upon request.

### Figure 6: Adhesion Performance – AMPLIFY™ TY 4351 Functional Polymers

![Figure 6: Adhesion Performance – AMPLIFY™ TY 4351 Functional Polymers](image)

Coex-split: 7 g/m² tie and 23 g/m² sealant. Extruder set temperature: 320°C. Line speed 100 m/min

Typical properties; not to be construed as specifications. Data based on Dow testing; test protocols and additional information available upon request.

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(1) Developmental product of The Dow Chemical Company

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AMPLIFY™ TY Functional Polymers

High Performance PP Tie Layer for Retort Applications

A critical performance requirement for retort packaging is that the packaging needs to stay functional even when sterilized at higher temperature and for a shelf life of 18 months and more.

AMPLIFY™ TY Functional Polymers’ high performance PP tie layers are designed for multi-layer films, bottles or sheets composed of PP and EVOH or PA that require very high barrier and heat resistance. They are based on an advanced propylene polymer technology specially suited to these high performance retort applications.

**Features and Benefits**

- Excellent adhesion to polypropylene and polyethylene and to EVOH or PA
- Excellent processability equivalent to that of PP and a thermal stability up to 135°C for 45 minutes
- Excellent adhesion and optics before and after retort

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**Table 4:** Product Range and Physical Data, AMPLIFY™ TY Functional Polymers – High Performance PP Tie Layer Resins for Retort Applications

<table>
<thead>
<tr>
<th>Product</th>
<th>MAH Graft Level</th>
<th>Density (g/cc)</th>
<th>MI (dg/min), 2.16 kg @ 230°C</th>
<th>Adhesion</th>
<th>Conversion Technology</th>
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<tbody>
<tr>
<td>XUS 69109.00(1)</td>
<td>Low</td>
<td>0.910</td>
<td>3.5</td>
<td>PE, PP, PA, EVOH</td>
<td>Blown film</td>
</tr>
<tr>
<td>XUS 69110.00(1)</td>
<td>Low</td>
<td>0.910</td>
<td>5.5</td>
<td>PE, PP, PA, EVOH</td>
<td>Cast film</td>
</tr>
</tbody>
</table>

(1) Developmental product of The Dow Chemical Company

Typical properties; not to be construed as specifications. Data based on Dow testing; test protocols and additional information available upon request.

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**Figure 7:** Peel Strength to PA and EVOH – AMPLIFY™ TY Functional Polymers High Performance PP-tie layers

5-layer blown film PP/tie/PA or EVOH/tie/PP 100 micron

Typical properties; not to be construed as specifications. Data based on Dow testing; test protocols and additional information available upon request.
AMPLIFY™ TY Functional Polymers

PS Tie Layer

Both AMPLIFY™ TY 3351 and 3352 Functional Polymers are constructed on styrene-based polymer technology and designed for multi-layer sheet composed of polystyrene, polyethylene and EVOH or PA. AMPLIFY™ TY 3351 is designed to meet the needs of Dow’s North American, Latin American, and Asia-Pacific customers. AMPLIFY™ TY 3352 is designed to meet the unique needs of the European marketplace.

Features and Benefits

• Excellent adhesion to polystyrene and polyethylene and to EVOH or PA
• Excellent processability

Table 6: Product Range and Physical Data, AMPLIFY™ TY Functional Polymers – PS Tie Layer Resins

<table>
<thead>
<tr>
<th>Product</th>
<th>MAH Graft Level</th>
<th>Density (g/cc)</th>
<th>MI (dg/min), 2.16 kg @ 190°C</th>
<th>Adhesion</th>
<th>Conversion Technology</th>
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<tr>
<td>AMPLIFY™ TY 3351</td>
<td>Medium</td>
<td>0.940</td>
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<td>AMPLIFY™ TY 3352*</td>
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<td>0.940</td>
<td>5.0</td>
<td>PS, PE, PA, EVOH</td>
<td>Sheet extrusion</td>
</tr>
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</table>

Typical properties; not to be construed as specifications. Data based on Dow testing; test protocols and additional information available upon request.

AMPLIFY™ Functional Polymers

Pipe Tie Layer

AMPLIFY™ GR and TY Functional Polymers for pipe tie layers are designed as an adhesive for use in multi-layer pipe structures.

Features and Benefits

• Excellent processing characteristics with superior adhesion properties to barrier layers
• Excellent thermal stability at elevated temperature

Table 7: Product Range and Physical Data, AMPLIFY™ Functional Polymers – Pipe Tie Layer Resins

<table>
<thead>
<tr>
<th>Product</th>
<th>MAH Graft Level</th>
<th>Density (g/cc)</th>
<th>MI (dg/min), 2.16 kg @ 190°C</th>
<th>Adhesion</th>
<th>Conversion Technology</th>
</tr>
</thead>
<tbody>
<tr>
<td>AMPLIFY™ GR 380</td>
<td>Low</td>
<td>0.923</td>
<td>3.0</td>
<td>PE-RT or PEX, PA, EVOH</td>
<td>Pipe extrusion</td>
</tr>
<tr>
<td>AMPLIFY™ GR 388</td>
<td>Medium</td>
<td>0.900</td>
<td>1.3</td>
<td>PE-RT or PEX, Aluminum, PA, EVOH</td>
<td>Pipe extrusion</td>
</tr>
<tr>
<td>AMPLIFY™ TY 1251</td>
<td>Low</td>
<td>0.921</td>
<td>0.6</td>
<td>PE, PA, EVOH</td>
<td>Composite Pipe</td>
</tr>
</tbody>
</table>

Typical properties; not to be construed as specifications. Data based on Dow testing; test protocols and additional information available upon request.

*Available in Europe only

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As barrier film demand increases, so does barrier film scrap. Unlike PE-based film scrap, many converters desire being able to reuse post-industrial barrier film scrap without sacrificing optics or film properties. RETAIN™ Polymer Modifiers act as recycle compatibilizers providing an easy-to-use and truly innovative solution to this growing industry problem. The specific loading level for RETAIN™ polymers ranges from 2-15% depending on the percent of barrier material in the scrap and the amount of scrap converters desire to place back into the film structures. RETAIN™ polymers are intended to be blended post-pelletization and drying of the barrier film scrap. The first products in this new family of RETAIN™ Polymer Modifiers are coming to market now, and others are in the pipeline. Ask your Dow representative about options for trialing these new innovations. The benefits are many, including potential sustainability aspects and considerable cost savings.

### Features and Benefits
- Opportunity to make better use of recycle stream by avoiding land-fill and reducing portion of your prime polyolefin purchases
- Eliminate or reduce costs associated with collecting, packaging and selling scrap for little to no value
- Ability to demonstrate and promote commitment to sustainability

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**Figure 8:** Comparative optical properties of barrier film recycle streams

<table>
<thead>
<tr>
<th>Zebedee Clarity (%)</th>
<th>Clarity (%)</th>
<th>Gloss (% 45°)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Control PE Film</td>
<td>Film with Recycle No Compatibilizer</td>
<td>Film with Recycle 1:1 Ratio (Compatibilizer:PA)</td>
</tr>
</tbody>
</table>

2 mil films; DOWLEX™ 2056G/recycle stream with 30% PA6/DOWLEX™ 2056G (15:70:15)

Typical properties; not to be construed as specifications. Data based on Dow testing; test protocols and additional information available upon request.

**Figure 9:** Key physical properties retained for barrier film recycle streams

- Dart A (g)
- Elmendorf – CD (g)
- Elmendorf – MD (g)

2 mil films; DOWLEX™ 2056G/recycle stream with 30% PA6/DOWLEX™ 2056G (15:70:15)

Typical properties; not to be construed as specifications. Data based on Dow testing; test protocols and additional information available upon request.

**Figure 10:** Transmission Electron Microscopy

- No Compatibilizer
- Conventional Compatibilizer
- RETAIN™ Polymer Modifiers

二百微米

Typical properties; not to be construed as specifications. Data based on Dow testing; test protocols and additional information available upon request.

**Figure 11:** Optical Microscopy

- No Compatibilizer
- Conventional Compatibilizer
- RETAIN™ Polymer Modifiers

二百微米

Typical properties; not to be construed as specifications. Data based on Dow testing; test protocols and additional information available upon request.

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**Loading Level:**
- Recommend starting addition level at 1:1 ratio of compatibilizer to % barrier in scrap.
- Generally, a 2-15% compatibilizer loading is suggested

**Processing Conditions:**
- Drying of recycle stream is critical prior to reprocessing
- Extruder feed zone temperature 60-100°C
Pack Studios represents a new model for collaboration that is helping to accelerate the development of packaging solutions.

Built on the strength of existing Dow facilities and knowledge, and adding new capabilities and collaboration tools, Pack Studios offers customers around the world a distinctive opportunity to leverage Dow’s expertise, broad product portfolio and application testing capabilities, as well as the ability to access a global network of additional industry experts and resources.

Utilizing a variety of on-site commercial-scale blown and cast film fabrication lines, blow molding and thermoforming lines, packaging equipment and more, this powerful combination of collaboration and capabilities enables faster go-to-market timelines and a consistent pipeline of high performance products for Dow customers across the value chain.

Wherever innovative ideas are shared; wherever packaging needs are expressed; that’s where Pack Studios exists – poised to energize collaboration, innovation, and acceleration toward better packaging.

### AMPLIFY™ TY Functional Polymers

#### Non-Food Applications

AMPLIFY™ TY 1056H is designed as an adhesion promoter between metal, polyolefins, cellulose, PA, EVOH and other engineering resins in non-food applications.

<table>
<thead>
<tr>
<th>Product</th>
<th>MAH Graft Level</th>
<th>Density (g/cc)</th>
<th>MI (dg/min), 2.16 kg @ 190°C</th>
<th>Adhesion</th>
<th>Technology</th>
</tr>
</thead>
<tbody>
<tr>
<td>AMPLIFY™ TY 1056H</td>
<td>High</td>
<td>0.950</td>
<td>12.0</td>
<td>PE, PA, EVOH, Aluminum, Cellulose</td>
<td>Fiber extrusion</td>
</tr>
</tbody>
</table>

*Typical properties; not to be construed as specifications. Data based on Dow testing; test protocols and additional information available upon request.*

**Features and Benefits**

- Excellent compatibility with polar and non-polar blend partners
- Adhesion to PA, EVOH and cellulose
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Published November, 2014.

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