Polylactic acid (PLA) is currently the most important biopolymer for producing biobased/biodegradable transparent films. The material is highly transparent, has an appealing gloss and biodegrades under typical industrial composting conditions. Nevertheless, current mechanical and processing properties of PLA are still hampering replacement of bulk thermoplasts. For many applications, the loud “metallic” crackling sound of PLA films is problematic. With VINNEX® 8880, WACKER offers a novel modifier that can considerably improve PLA performance and its noise profile, making it a better substitute for conventional plastics.

**VINNEX® 8880 Improves Mechanical Properties**

One of the major drawbacks of PLA is its brittleness. Addition of 20 – 40% VINNEX® 8880 considerably reduces the E-modules and improves the impact strength. Therefore, PLA/VINNEX® 8880 blends perform much better in most packaging film applications. Furthermore, depending on the concentration, the processing temperature is reduced by 10 °C to 30 °C.

**VINNEX® 8880 Reduces the Noise of PLA Films**

Conventional PLA films have a loud “metallic” crackling sound that is undesired for most packaging applications. Addition of VINNEX® 8880 increases flexibility of the material and therefore considerably reduces this noise. To further improve the properties, WACKER has developed a 3-layer cast film in an A-B-A structure to further improve the film properties. The film contains a high VINNEX® 8880 content in the middle layer (B layer), and pure PLA in the outer layers (A layers). The noise of this film is further reduced (comparable or less than PET). The effect is maintained even after stretching (biaxially oriented films).

**Properties of VINNEX® 8880**

<table>
<thead>
<tr>
<th>Property</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Composition</td>
<td>Vinyl acetate – vinyl laurate copolymer</td>
</tr>
<tr>
<td>Form</td>
<td>Pellets</td>
</tr>
<tr>
<td>Tg [°C]</td>
<td>21</td>
</tr>
<tr>
<td>Density [kg/m³]</td>
<td>1,120</td>
</tr>
<tr>
<td>Bulk density [kg/m³]</td>
<td>700 – 800</td>
</tr>
<tr>
<td>MFR melt index* [ccm/10 min]</td>
<td>46.6</td>
</tr>
<tr>
<td>Use level [%]</td>
<td>10 – 40</td>
</tr>
</tbody>
</table>

Tg = Glass transition temperature  
* MFR melt index measured at 100 °C / 2.16 kg / 2 mm

**3-Layer Cast Film with PLA/VINNEX® 8880**

Before stretching  
After stretching
CREATING TOMORROW’S SOLUTIONS

At a Glance: Advantages of VINNEX® 8880

- Recommended for cast and blown film extrusion
- Reduced E-modulus and increased impact strength
- Reduced “metallic” crackling noise
- Improved film sealing properties
- Films can be stretched (biaxially oriented films)
- Transparency and gloss is maintained
- Gas permeability is maintained
- Biodegradability is maintained

VINNEX® 8880 Improves Sealability
Sealing of conventional PLA films is difficult and results in weak seal bond strength. Addition of VINNEX® 8880 can improve sealability both in heat sealing and ultrasonic sealing on various substrates.

VINNEX® 8880 Maintains Transparency
A major advantage of PLA, especially in packaging film applications, is its high transparency and appealing gloss. Addition of VINNEX® 8880 keeps these properties largely unchanged.

VINNEX® 8880 Maintains Permeability
PLA has unique permeability properties for CO₂, O₂ and water vapor which makes it particularly interesting as a functional packing film for fresh fruit, vegetables and bread. PLA/VINNEX® 8880 blends have considerably improved mechanical properties, leaving permeability properties largely unchanged.

VINNEX® Maintains Biodegradability
Various blends of biopolymers with VINNEX® have already passed the industrial composting test (ISO 14855 of EN 13432). As for every bioplastic compound, biodegradation is largely dependent on the respective formulation and has to be determined case by case. For more detailed information, please refer to our technical service.

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