Technical Data Sheet

Toppyl PB 8220M

Polybutene-1

Product Description
Polybutene-1 (PB-1) grade Toppyl PB 8220M is a random copolymer of butene-1 with medium ethylene content.

This grade is highly compatible with polypropylene due to its similar molecular structure, and it is used to modify the sealing behavior of PP based films: a typical example is its use to reduce the seal initiation temperature of BOPP sealing layers.

The relatively slow kinetics of crystallization allow an excellent wetting behavior. Toppyl PB 8220M highly shear-sensitive flow behavior means that it remains easily dispersible also in even more incompatible polymers like thermoplastic elastomers.

Toppyl PB 8220M can also be used in seal-peel application. Compared with Toppyl PB 8640M or Toppyl PB 8340M, in blown film seal-peel Toppyl PB 8220M provides better optical properties (haze and clarity) but with narrow sealing window.

Regulatory Status
For regulatory compliance information, see Toppyl PB 8220M Product Stewardship Bulletin (PSB) and Safety Data Sheet (SDS).

This grade is not intended for medical and pharmaceutical applications.

Status
Commercial: Active

Availability
Africa-Middle East; Asia-Pacific; Australia and New Zealand; Europe; North America; South & Central America

Application
Bags & Pouches; Food Packaging Film; Lamination Film; Peelable Film; Secondary Packaging; Specialty Film

Market
Flexible Packaging; Rigid Packaging

Processing Method
Blown Film; BOPP; Cast Film

Attribute
Good Heat Seal; Good Optical Properties; Good Organoleptic Properties; Good Processability

Typical Properties

<table>
<thead>
<tr>
<th>Nominal Value</th>
<th>Units</th>
<th>Test Method</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Physical</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Melt Flow Rate</td>
<td></td>
<td></td>
</tr>
<tr>
<td>(230 °C/2.16 kg)</td>
<td>7.5</td>
<td>g/10 min</td>
</tr>
<tr>
<td>(190 °C/2.16 kg)</td>
<td>2.5</td>
<td>g/10 min</td>
</tr>
<tr>
<td>(190 °C/10.0 kg)</td>
<td>46</td>
<td>g/10 min</td>
</tr>
<tr>
<td>Density</td>
<td>0.901</td>
<td>g/cm³</td>
</tr>
<tr>
<td><strong>Mechanical</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Flexural Modulus</td>
<td>140</td>
<td>MPa</td>
</tr>
<tr>
<td>Tensile Strength at Break</td>
<td>32</td>
<td>MPa</td>
</tr>
<tr>
<td>Tensile Elongation at Break</td>
<td>300</td>
<td>%</td>
</tr>
</tbody>
</table>

Thermal
Notes

Mechanical properties are measured on specimens conditioned for 10 days at 23°C

These are typical property values not to be construed as specification limits.

Processing Techniques

Recommended processing temperatures: 150 °C to 220 °C.

In cases where higher temperatures are required, please contact your appropriate technical contact for support.

Specific recommendations for resin type and processing conditions can only be made when the end use, required properties and fabrication equipment are known.

Further Information

Health and Safety:

The resin is manufactured to the highest standards, but special requirements apply to certain applications such as food end-use contact and direct medical use. For specific information on regulatory compliance contact your local representative.

Workers should be protected from the possibility of skin or eye contact with molten polymer. Safety glasses are suggested as a minimal precaution to prevent mechanical or thermal injury to the eyes.

Molten polymer may be degraded if it is exposed to air during any of the processing and off-line operations. The products of degradation may have an unpleasant odor. In higher concentrations they may cause irritation of the mucus membranes. Fabrication areas should be ventilated to carry away fumes or vapours. Legislation on the control of emissions and pollution prevention should be observed.

The resin will burn when supplied with excess heat and oxygen. It should be handled and stored away from contact with direct flames and/or ignition sources. While burning, the resin contributes high heat and may generate a dense black smoke.

Recycled resins may have previously been used as packaging for, or may have otherwise been in contact with, hazardous goods. Converters are responsible for taking all necessary precautions to ensure that recycled resins are safe for continued use.

For further information about safety in handling and processing please refer to the Safety Data Sheet.

Conveying:

Conveying equipment should be designed to prevent production and accumulation of fines and dust particles that are contained in polymer resins. These particles can under certain conditions pose an explosion hazard. Conveying systems should be grounded, equipped with adequate filters and regularly inspected for leaks.

### Melting Temperature

<table>
<thead>
<tr>
<th></th>
<th>Tm1</th>
<th>97 °C</th>
<th>ISO 11357-3</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Tm2</td>
<td>85 °C</td>
<td>ISO 11357-3</td>
</tr>
</tbody>
</table>

Tm2 corresponds with the melting point of crystalline form 2 which is measured immediately after solidification. Tm2 corresponds with the melting point available for each batch on the Certificate of Analysis (COA).
Storage:
The resin is packed in 25 kg bags, octabins or bulk containers protecting it from contamination. If it is stored under certain conditions, i.e. if there are large fluctuations in ambient temperature and the atmospheric humidity is high, moisture may condense inside the packaging. Under these circumstances, it is recommended to dry the resin before use. Unfavorable storage conditions may also intensify the resin's slight characteristic odor.

Resin should be protected from direct sunlight, temperatures above 40°C and high atmospheric humidity during storage. Higher storage temperatures may reduce the storage time.

The information submitted is based on our current knowledge and experience. In view of the many factors that may affect processing and application, these data do not relieve processors of the responsibility of carrying out their own tests and experiments; neither do they imply any legally binding assurance of certain properties or of suitability for a specific purpose. This information does not remove the obligation of the customer to inspect the material on arrival and notify us of any faults immediately. It is the responsibility of those to whom we supply our products to ensure that any proprietary rights and existing laws and legislation are observed.

Company Information
For further information regarding the LyondellBasell company, please visit http://www.lyb.com/.

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