Product Description

Adflex KS 311 P is a reactor TPO (thermoplastic polyolefin) manufactured using LyondellBasell's proprietary Catalloy process technology. It is suitable for extrusion as well as injection molding and blow molding applications, including mechanical and decorative automotive parts requiring elastomeric type properties, like molded-in color automotive exterior components. The product is used by our customers for applications with paintable and weatherable requirements, such as injection molded fascias, claddings, bumper covers, body panels, step pads, and air deflectors. It is also used as a component in compounded materials for a wide range of industrial applications. The grade is available in natural pellet form.

Regulatory Status

For regulatory compliance information, see Adflex KS 311 P Product Stewardship Bulletin (PSB) and Safety Data Sheet (SDS).

<table>
<thead>
<tr>
<th>Status</th>
<th>Commercial: Active</th>
</tr>
</thead>
<tbody>
<tr>
<td>Availability</td>
<td>Africa-Middle East; Asia-Pacific; Australia and New Zealand; North America; South &amp; Central America</td>
</tr>
<tr>
<td>Application</td>
<td>Exterior Automotive Applications; Single Ply Roofing; Specialty Film; Stationery Film</td>
</tr>
<tr>
<td>Market</td>
<td>Automotive; Compounding; Industrial, Building &amp; Construction</td>
</tr>
<tr>
<td>Processing Method</td>
<td>Cast Film; Compounding; Extrusion Blow Molding; Injection Molding</td>
</tr>
<tr>
<td>Attribute</td>
<td>Good Colorability; Good Flexibility; Good Moldability; Good Processability; Good Surface Finish; Low Temperature Impact Resistance</td>
</tr>
</tbody>
</table>

### Typical Properties

<table>
<thead>
<tr>
<th>Physical</th>
<th>Nominal Value</th>
<th>Units</th>
<th>Test Method</th>
</tr>
</thead>
<tbody>
<tr>
<td>Melt Flow Rate, (230 °C/2.16 kg)</td>
<td>9.5</td>
<td>g/10 min</td>
<td>ISO 1133-1</td>
</tr>
<tr>
<td>Density, (23 °C, Method A)</td>
<td>0.89</td>
<td>g/cm³</td>
<td>ISO 1183-1</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Mechanical</th>
<th>Nominal Value</th>
<th>Units</th>
<th>Test Method</th>
</tr>
</thead>
<tbody>
<tr>
<td>Flexural Modulus</td>
<td>530</td>
<td>MPa</td>
<td>ISO 178</td>
</tr>
<tr>
<td>Tear Strength</td>
<td>103</td>
<td>kN/m</td>
<td>ASTM D624</td>
</tr>
<tr>
<td>Tensile Stress at Break</td>
<td>15</td>
<td>MPa</td>
<td>ISO 527-1, -2</td>
</tr>
<tr>
<td>Tensile Stress at Yield</td>
<td>14</td>
<td>MPa</td>
<td>ISO 527-1, -2</td>
</tr>
<tr>
<td>Tensile Strain at Break</td>
<td>800</td>
<td>%</td>
<td>ISO 527-1, -2</td>
</tr>
<tr>
<td>Tensile Strain at Yield</td>
<td>14</td>
<td>%</td>
<td>ISO 527-1, -2</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Impact</th>
<th>Nominal Value</th>
<th>Units</th>
<th>Test Method</th>
</tr>
</thead>
<tbody>
<tr>
<td>Charpy Impact Strength - Notched</td>
<td>59</td>
<td>kJ/m²</td>
<td>ISO 179</td>
</tr>
<tr>
<td>(23 °C)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Note: Failure Mode - Partial Break</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(-20 °C)</td>
<td>4.1</td>
<td>kJ/m²</td>
<td>ISO 179</td>
</tr>
<tr>
<td>Note: Failure Mode - Partial Break</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(-40 °C)</td>
<td>1.4</td>
<td>kJ/m²</td>
<td>ISO 179</td>
</tr>
<tr>
<td>Note: Failure Mode - Complete Break</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Multi-axial Impact Strength</td>
<td>14 J</td>
<td>ASTM D3763</td>
<td></td>
</tr>
<tr>
<td>-------------------------------------------------</td>
<td>------</td>
<td>------------</td>
<td></td>
</tr>
<tr>
<td>(23 °C, 2.2 m/s, 3.2 mm plaque)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Note: Failure Mode - Ductile</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(-40°C, 6.6 m/s, 3.2 mm plaque)</td>
<td>26 J</td>
<td>ASTM D3763</td>
<td></td>
</tr>
<tr>
<td>Note: Failure Mode - Ductile</td>
<td></td>
<td></td>
<td></td>
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<table>
<thead>
<tr>
<th>Hardness</th>
<th>46</th>
<th>ISO 868</th>
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</thead>
<tbody>
<tr>
<td>Shore Hardness, (Shore D, 15 sec)</td>
<td></td>
<td></td>
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<table>
<thead>
<tr>
<th>Thermal</th>
<th></th>
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<tbody>
<tr>
<td>Vicat Softening Temperature, (A50)</td>
<td>112 °C</td>
<td>ISO 306</td>
</tr>
<tr>
<td>Heat Deflection Temperature B, (0.45 MPa, Unannealed)</td>
<td>53 °C</td>
<td>ISO 75B-1, -2</td>
</tr>
<tr>
<td>DSC Melting Point</td>
<td>142 °C</td>
<td>ISO 11357-3</td>
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<table>
<thead>
<tr>
<th>Optical</th>
<th></th>
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</thead>
<tbody>
<tr>
<td>Haze, (45 mil)</td>
<td>82 %</td>
<td>ASTM D1003</td>
</tr>
<tr>
<td>Gloss, (60°, 45 mil)</td>
<td>76</td>
<td>ASTM D2457</td>
</tr>
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</table>

<table>
<thead>
<tr>
<th>Additional Information</th>
<th></th>
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</tr>
</thead>
<tbody>
<tr>
<td>Mold Shrinkage</td>
<td></td>
<td>ISO 294-4</td>
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</tbody>
</table>

**Notes**

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

**Automotive Specifications**

- FCA MS-DC243 Type B CPN 3689
- GM GMP.E/P.023

**Processing Techniques**

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

**Company Information**

For further information regarding the LyondellBasell company, please visit [http://www.lyb.com/](http://www.lyb.com/).

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