New Co-Polyester with sparkling transparency and high heat resistance
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Introducing Akestra™

- Improve value of R-PET
- Safe
- Improved capital utilization
- Material reduction
- Unique properties
- Appealing
About Perstorp

- World leader in several sectors of the specialty chemicals market
- Pioneer in formalin chemistry, plastics and surface materials
- Perstorp was formed in 1881, over 130 years of winning formulas
- Annual turnover of 1.2 billion EUR
- 1,400 employees in 22 countries
- Production plants in Europe, Asia and North America
- Headquarter in Malmö in Sweden
Introducing Akestra™

{ superior performances }

Synergies in a joint launch of Akestra™

Akestra™ is produced by MGC and brought to Europe by Perstorp

Intention to scale up production in Europe
Introducing Akestra™

• Sparkling and glass like
• Heat resistant
• Utilizing existing PET production line
• Sustainable
• Safe
• Appealing

Application areas

- Thin wall
- Hot fill, rigid
- Durable transparent
- High barrier film
- Foams
- Additive for other polyesters

Akestra™ is compliant for food contact use in EU as all monomers are included in regulation (EU) 10/2011
## Akestra™ Properties

<table>
<thead>
<tr>
<th></th>
<th>Akestra™ 90</th>
<th>Akestra™ 100</th>
<th>Akestra™ 110</th>
<th>PET</th>
<th>PETG</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tg (°C)</td>
<td>95</td>
<td>100</td>
<td>110</td>
<td>82</td>
<td>83</td>
</tr>
<tr>
<td>HDT (0.45 Mpa) (°C)</td>
<td>81</td>
<td>86</td>
<td>96</td>
<td>70</td>
<td>70</td>
</tr>
<tr>
<td>Total transmittance (%)</td>
<td>91</td>
<td>91</td>
<td>91</td>
<td>91</td>
<td>91</td>
</tr>
<tr>
<td>Haze (3.2 mm) (%)</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>5</td>
<td>1</td>
</tr>
<tr>
<td>Density (g/cm³)</td>
<td>1.28</td>
<td>1.27</td>
<td>1.24</td>
<td>1.34</td>
<td>1.27</td>
</tr>
<tr>
<td>Tensile strength (MPa)</td>
<td>54</td>
<td>55</td>
<td>56</td>
<td>50</td>
<td>50</td>
</tr>
<tr>
<td>Flexural strength (MPa)</td>
<td>89</td>
<td>90</td>
<td>90</td>
<td>80</td>
<td>70</td>
</tr>
<tr>
<td>Flexural modulus (GPa)</td>
<td>2.5</td>
<td>9.0</td>
<td>90</td>
<td>80</td>
<td>70</td>
</tr>
<tr>
<td>Elongation at Break (%)</td>
<td>220</td>
<td>200</td>
<td>140</td>
<td>200</td>
<td>130</td>
</tr>
<tr>
<td>OTR (23°C, 60% RH) (cc • mm/m²/day/atm)</td>
<td>6</td>
<td>8.7</td>
<td>9.3</td>
<td>3.3</td>
<td>-</td>
</tr>
<tr>
<td>WVTR (40°C, 90% RH) (g • mm/m²/day)</td>
<td>4</td>
<td>3.8</td>
<td>4.5</td>
<td>-</td>
<td>-</td>
</tr>
</tbody>
</table>

- Superior heat resistance to PS
- PC and PMMA transparency
- PC rigidity
- Superior impact resistance to PS
- PET barrier properties
- PET-G chemical resistance
Co-extrusion

For superior performance & Improved sustainability

Translucent and heat resistance to 80-85°C

Utilizing existing PET production line
**Akestra™**
Clearly the way ahead in heat resistant packaging

<table>
<thead>
<tr>
<th>Convertor</th>
<th>Utilize existing PET co-extrusion lines</th>
<th>No investment required</th>
<th>Become more innovative</th>
<th>Unique heat resistant material</th>
</tr>
</thead>
<tbody>
<tr>
<td>Brand owner, retailer</td>
<td>Safe</td>
<td>Sustainable</td>
<td>Appealing, Shelf stand out</td>
<td>Gives a high quality image of your brand</td>
</tr>
<tr>
<td>Consumer</td>
<td>Keeps the food crisp and fresh</td>
<td>Crystal clear for easier selection</td>
<td>Appealing packaging</td>
<td>Environmental friendly choice</td>
</tr>
</tbody>
</table>
Processing of Akestra™

Akestra™ suitability

- Co-Extrusion
- Cast sheet extrusion
- Injection molding
- Blown film extrusion
- Extrusion blow molding
- Injection stretch blow molding

Processing Akestra™

- Cost effective
- Sustainable
- Innovative
- Easy
Akestra™ in foamed sheets

- Akestra™ adds excellent melt strength to PET foam
- Increasing number of closed cells
- Lighter foam with maintained mechanical properties
- Finer cells enhancing the visual appeal
Akestra™
Clearly the way ahead in heat resistant packaging

**Winning properties**
- Sparkling transparency
- Appealing packaging
- High heat resistance
- Safe

**Formed to Perform**
- Diverse and easy processing
- Use existing PET production lines
- Co-extrusion with PET

**A clear winner**
- Brand security
- Shelf stand out
- Premium feel
- Sustainable
Contact us for further information

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david.engberg@perstorp.com