Technical Data Sheet

**TYPE:** Estane® ZHF 78AT3 is a Soft, Polyether based, NHFR Thermoplastic Polyurethane (TPU) Compound

**Description:** Non-Halogenated flame retardant compound

**Uses:** Wire and cable and general extrusion where flame retardant properties are required

### Physical Properties

<table>
<thead>
<tr>
<th>Property</th>
<th>Value (Metric)</th>
<th>Unit</th>
<th>Test Method</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hardness( 3 second )</td>
<td>78</td>
<td>Shore A</td>
<td>ISO 868</td>
</tr>
<tr>
<td>Specific Gravity</td>
<td>1.12</td>
<td>g/mm³</td>
<td>ISO 2781</td>
</tr>
<tr>
<td>Tensile strength</td>
<td>24.1</td>
<td>Mpa</td>
<td>ISO 527</td>
</tr>
<tr>
<td>Elongation at break</td>
<td>670</td>
<td>%</td>
<td>ISO 527</td>
</tr>
<tr>
<td>Modulus at 100% Elongation</td>
<td>4.5</td>
<td>Mpa</td>
<td>ISO 527</td>
</tr>
<tr>
<td>Modulus at 300 % Elongation</td>
<td>7.5</td>
<td>Mpa</td>
<td>ISO 527</td>
</tr>
<tr>
<td>Tear strength( Die C ) Nicked</td>
<td>62.1</td>
<td>KN/m</td>
<td>ISO 34-1B</td>
</tr>
<tr>
<td>Tear strength( Die C ) Without Nick</td>
<td>85.2</td>
<td>KN/m</td>
<td>ISO 34-1B</td>
</tr>
</tbody>
</table>

- Prior to testing samples were conditioned at 23°C for 48 hours.
- Physical Property test is based on 2mm molded plaques.

Listed data above is a "typical data", and should/cannot be applied for specification purpose

### Application Specific Properties

<table>
<thead>
<tr>
<th>Property</th>
<th>Value (Metric)</th>
<th>Unit</th>
<th>Test Method</th>
</tr>
</thead>
<tbody>
<tr>
<td>UL Flame Rating</td>
<td>V-2</td>
<td>-</td>
<td>UL-94</td>
</tr>
</tbody>
</table>

**Materials Preparation:**

Prior to process, Estane ZHF 78AT3 must be dried under 105°C for 3 hours. It is recommended drying this materials in a dehumidifier, target dew point to be -30°C, preferable – 40°C

Depending on the process technique, the maximum moisture content is recommended < 0.02%.

**Process Condition:**

Estane ZHF 78AT3 is extruded on any conventional extruder equipped with a PVC, 3 stage or barrier type screw having an L/D ratio of 25:1 and a compression ratio of 3:1

*See reverse side for processing information.*
Recommended Starting Extrusion Temperature Profile:

<table>
<thead>
<tr>
<th></th>
<th>°C</th>
</tr>
</thead>
<tbody>
<tr>
<td>Zone 1</td>
<td>160</td>
</tr>
<tr>
<td>Zone 2</td>
<td>175</td>
</tr>
<tr>
<td>Zone 3</td>
<td>180</td>
</tr>
<tr>
<td>Zone 4</td>
<td>190</td>
</tr>
<tr>
<td>Adaptor</td>
<td>185</td>
</tr>
<tr>
<td>Die Zone 1</td>
<td>180</td>
</tr>
<tr>
<td>Die Zone 2</td>
<td>175</td>
</tr>
</tbody>
</table>

For further information refer to Lubrizol Advanced Materials processing guides.