Halar® XPH-800
Thermal Aging Study
Thermal Aging Study of Halar® XPH-800

Halar® ECTFE is a partially fluorinated, semi-crystalline, melt-processable thermoplastic manufactured by Solvay Specialty Polymers at its ISO-certified plant in Orange, Texas. ECTFE is produced via the copolymerization of ethylene and chlorotrifluoroethylene monomers and has the following chemical formula:

\[
\begin{array}{c}
\text{F} \\
\text{C} \\
\text{F} \\
\text{Cl} \\
\text{C} \\
\text{F} \\
\text{H} \\
\text{C} \\
\text{H} \\
\text{C} \\
\text{H} \\
\end{array}
\]

1:1 alternating copolymer

This chemical structure gives Halar® ECTFE a unique combination of properties including excellent chemical resistance and a high thermal rating, thanks to the strength of its carbon-fluorine chemical bonds. It also has excellent mechanical properties as a result of the strong inter-chain interactions of hydrogen bonding.

Halar® XPH-800 delivers enhanced stress cracking performance due to chain structure modifications of the ECTFE polymer.

Tensile properties of Halar® XPH-800 thermally aged at 189 °C (372 °F)

![Tensile properties of Halar® XPH-800 thermally aged at 189 °C (372 °F)](image)

Tensile strength & elongation of thermally aged Halar® XPH-800*

<table>
<thead>
<tr>
<th>Units</th>
<th>0</th>
<th>7</th>
<th>30</th>
<th>60</th>
<th>90</th>
<th>120</th>
<th>150</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tensile strength at 23 °C (73 °F)</td>
<td>lbs/in²</td>
<td>7,033</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Tensile strength after aging at 189 °C (372 °F)</td>
<td>lbs/in²</td>
<td>5,730</td>
<td>5,243</td>
<td>5,622</td>
<td>5,568</td>
<td>5,049</td>
<td>4,874</td>
</tr>
<tr>
<td>Tensile strength after aging at 200 °C (392 °F)</td>
<td>lbs/in²</td>
<td>5,077</td>
<td>5,201</td>
<td>3,759</td>
<td>3,938</td>
<td>3,575</td>
<td>3,780</td>
</tr>
<tr>
<td>Elongation at 23 °C (73 °F)</td>
<td>%</td>
<td>267</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Elongation after aging at 189 °C (372 °F)</td>
<td>%</td>
<td>209</td>
<td>201</td>
<td>227</td>
<td>233</td>
<td>191</td>
<td>181</td>
</tr>
<tr>
<td>Elongation after aging at 200 °C (392 °F)</td>
<td>%</td>
<td>158</td>
<td>150</td>
<td>4</td>
<td>4</td>
<td>5</td>
<td>5</td>
</tr>
</tbody>
</table>

* Cable insulation was tested for the dry temperature rating of new materials (long-term aging test) according to UL 2556 and the material received a 180 °C (356 °F) rating.