Fluon® ETFE C88AXMP-HT

Resins for Improved Stress Crack Resistance and Thermal Stability
Reinventing ETFE Resins

- Benefits of Fluon ETFE
- What is C88AXMP-HT?
- Independent Testing
- Comparison to Standard
- Current and Potential Applications
- Color Concentrates
- Commercial Status
Benefits of Fluon ETFE Resins

- Engine Wiring
- Transmission Wiring
- Under-hood Wiring
- Fiber Optic Cables

- Excellent chemical and thermal resistance
- Low flame characteristics
- Outstanding weatherability
- Good mechanical and tear strength
What is C88AXMP-HT?

- Fluon ETFE has been used in automotive cables for many years
- New LV112 Specification (German OEM standard) increased test temperature
- HT developed to match new requirement
- High MFR for high line speed and greater efficiency
- Improved stress crack
- Improved flex fatigue
- 26,500 cycles (standard ETFE = 16,400)
- Performance confirmed by independent laboratory, EDAG
All thermal related tests to LV112 Temperature Class E & F protocols

- Cable sizes to cover full range of typical auto cables
- 3000 hours at 200 °C
- Thermal overload: 250 °C for 6 hours
- Short-term heat aging: 225 °C for 240 hours
- Stress crack at 220 °C
- Low-temp bending at -40 °C
- Insulation shrink-back under heating
## EDAG Results

<table>
<thead>
<tr>
<th>Cable Size (mm²)</th>
<th>Test</th>
<th>0.35</th>
<th>0.5</th>
<th>0.75</th>
<th>2.5</th>
<th>4</th>
<th>10</th>
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</thead>
<tbody>
<tr>
<td></td>
<td>Stress Test 225 °C</td>
<td>Pass</td>
<td>Pass</td>
<td>Pass</td>
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<tr>
<td></td>
<td>Thermal Overload 250 °C</td>
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<tr>
<td></td>
<td>Short-Term Age 240 Hrs</td>
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<td>Pass</td>
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<tr>
<td></td>
<td>Long-Term Heat Age 3000 Hrs</td>
<td>Pass</td>
<td>Pass</td>
<td>Pass</td>
<td>Pass</td>
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<tr>
<td></td>
<td>Cold Winding -40 °C</td>
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<td>Pass</td>
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<tr>
<td></td>
<td>Insulation Shrinkage Under Heat</td>
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<td>Pass</td>
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<td>Pass</td>
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## Comparison of Standard ETFE vs. HT

<table>
<thead>
<tr>
<th>Property</th>
<th>Standard ETFE</th>
<th>HT ETFE</th>
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</thead>
<tbody>
<tr>
<td>MFR (g/10 min)</td>
<td>24–43</td>
<td>23–35</td>
</tr>
<tr>
<td>Melting Point (°C)</td>
<td>260</td>
<td>254</td>
</tr>
<tr>
<td>Density</td>
<td>1.74</td>
<td>1.74</td>
</tr>
<tr>
<td>Tensile Strength (mPa)</td>
<td>52</td>
<td>52</td>
</tr>
<tr>
<td>Tensile Elongation (%)</td>
<td>495</td>
<td>550</td>
</tr>
<tr>
<td>Abrasion (cycles)</td>
<td>18,000</td>
<td>17,000</td>
</tr>
<tr>
<td>MIT (cycles)</td>
<td>16,400</td>
<td><strong>26,500</strong></td>
</tr>
</tbody>
</table>
HT Color Concentrates

- Full range of colors based on HT grade made by AGC
- Improved thermal stability helps compounding process
- Shows improved performance when used alongside HT*

* When compared with standard ETFE color concentrates
Current and Potential Applications

• Automotive wire & cable
• Ultrathin lightweight wiring (FLUR)
• Industrial wire & cable
• Underfloor heating cables
• New developments
• Compounding (antistatic)
• Fuel hose

Your Dreams, Our Challenge
Commercial Status of C88AXMP-HT

- Samples available
- Customer approvals obtained
- Commercial launch in March 2016