ADVANTAGE HYVOLT II ELECTRICAL INSULATING OIL

OVERVIEW

ADVANTAGE HYVOLT II is an electrical insulating naphthenic oil that meets the ASTM D-3487 specification for inhibited oils. Its very low pour point, excellent electrical properties and high level of oxidation stability makes ADVANTAGE HYVOLT II ideal for the demanding requirements of today’s leading transformer manufacturers.

FEATURES & BENEFITS

ADVANTAGE HYVOLT II has very high dielectric strength that exceeds most international requirements and excellent oxidation stability to reduce sludge and acid formation. Its inherent low pour point gives ADVANTAGE HYVOLT II excellent cooling properties and it can be readily mixed with similar ASTM D-3487 oils.

APPLICATIONS

ADVANTAGE HYVOLT II is designed for use in any electrical application requiring an ASTM D-3487 Type II insulated oil.

SPECIFICATIONS

ASTM D-3487

TYPICAL PROPERTIES

<table>
<thead>
<tr>
<th>TEST DESCRIPTION</th>
<th>TEST METHOD</th>
<th>SPECIFICATIONS</th>
<th>MARKETING VALUES</th>
</tr>
</thead>
<tbody>
<tr>
<td>PRODUCT CODE 101</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Viscosity, sus at 378°C</td>
<td>ASTM D 445</td>
<td>66.0 59.2</td>
<td></td>
</tr>
<tr>
<td>Viscosity, SUS at 98.9°C</td>
<td>ASTM D 445</td>
<td>36.0 34.0</td>
<td></td>
</tr>
<tr>
<td>Viscosity, cSt at 80°C</td>
<td>ASTM D 445</td>
<td>76.0 64.2</td>
<td></td>
</tr>
<tr>
<td>Viscosity, cSt at 40°C</td>
<td>ASTM D 341</td>
<td>1.2 9.3</td>
<td></td>
</tr>
<tr>
<td>Viscosity, cSt at 100°C</td>
<td>ASTM D 341</td>
<td>3.0 2.3</td>
<td></td>
</tr>
<tr>
<td>Specific Gravity, 156°C</td>
<td>ASTM D 4052</td>
<td>0.910 0.8862</td>
<td></td>
</tr>
<tr>
<td>Flash Point, OCC, °C</td>
<td>ASTM D 92</td>
<td>145 155</td>
<td></td>
</tr>
<tr>
<td>Color, ASTM</td>
<td>ASTM D 6045</td>
<td>0.5 LO.5</td>
<td></td>
</tr>
<tr>
<td>Pour Point, °C</td>
<td>ASTM D 5949</td>
<td>-40 -64</td>
<td></td>
</tr>
<tr>
<td>Aniline Point, °C</td>
<td>ASTM D 611</td>
<td>63.0 84.0</td>
<td></td>
</tr>
<tr>
<td>Interfacial Tension, 25°C, dynes, cm</td>
<td>ASTM D 971</td>
<td>40 51</td>
<td></td>
</tr>
<tr>
<td>Visual Examination</td>
<td>ASTM D 1524</td>
<td>Clear &amp; Bright</td>
<td>Clear &amp; Bright</td>
</tr>
</tbody>
</table>

Dielectric Properties

- Dielectric Breakdown at 60 Hz, Disk electrodes, kV
  - ASTM D 877 30 40

Electrical Properties

- Power Factor at 60 Hz, 25°C, %
  - ASTM D 924 0.05 0.005
- Power Factor at 60 Hz, 100°C, %
  - ASTM D 924 0.30 0.075
- Gassing Tendency, plL/min
  - ASTM D 2300 30 12

Chemical Properties

- Oxidation Stability
  - 72 hr: Sludge, % by mass
    - ASTM D 2112 0.1 <0.01
  - 164 hr: Sludge, % by mass
    - ASTM D 2112 0.2 <0.01
- Total Acid Number, mg KOH/g
  - ASTM D 2112 0.3 <0.01
- Total Acid Number, mg KOH/g
  - ASTM D 2112 0.2 <0.01
- Oxidation Stability (Rotating Bomb Test), minutes
  - ASTM D 2668 0.15 0.30 0.26
- Corrosive Sulfur
  - ASTM D 1275 (B) Noncorrosive
  - ASTM D 1533 35 9
- Water Content, ppm
  - ASTM D 974 0.03 <0.01
- Neutralization Number, mg KOH/g
  - ASTM D 4059 Not detected
- PCB Content, ppm
  - ASTM E 1687 PASS

Health and Safety Properties (not an ASTM D 3487 requirement)

- Polycyclic Aromatic Compounds, lwt%
  - IP 346 3 <3
- Modified Ames Assay
  - ASTM E 1687 PASS
- FDA Regulation
  - 21 CFR 178.362 (C ) PASS