VANLUBE™ W-324
Tungsten Lubricant Additive
Antiwear Agent
Antioxidant

Typical Properties
Phsyical State: Liquid
Density at 25°C, Mg/m³: 1.06
Flash Point, PMCC, °C: 175
Nitrogen Content, %: 0.5-2.1
Tungsten Content, %: 13-16
Viscosity @ 40°C, mm²/s: 177-269

VANLUBE W-324 Lubricant Additive is an organotungstate which is soluble in petroleum and synthetic lubricants. It is an effective general purpose, sulfur and phosphorus free antioxidant and antiwear agent for a wide range of automotive and industrial lubricants.

VANLUBE W-324 is most effective at elevated temperatures and extends the life of conventional antioxidants, antiwear additives, and corrosion inhibitors in oxidatively stressed oils.

Oxidative Stability

VANLUBE W-324 provides superior overall oxidative stability to this fully formulated 5W-30 oil. Oxidation is monitored by the increase in oxidative decomposition products via FTIR. The VANLUBE W-324 treated oil at 72 hours is equivalent to the 5W-30 base formulation at 7 hours.

Wear Retention After Aging

VANLUBE W-324 protects primary wear additives from oxidation so they last longer. Even with aging, this fully formulated 5W-30 motor oil treated with VANLUBE W-324, maintains 100% wear retention.
HCTBT® Corrosion TEST
*165°C, 0-72h; 750 ppm W
ICP Analysis

**VANLUBE™ W-324** Tungsten Lubricant Additive provides superior lead corrosion protection to this fully formulated 5W-30 oil. The oil with **VANLUBE™ W-324** resists Pb corrosion almost twice as long as the base formulation.

**VANLUBE™ W-324** provides superior copper corrosion protection to this fully formulated 5W-30 oil. The oil with **VANLUBE™ W-324** resists Cu corrosion almost twice as long as the base formulation.

**VANLUBE W-324** is more deposit resistant than molybdenum containing additives.

**ASTM D6335: TEOST® 33C**
700 ppm W or Mo
*Base formulation has no Significant Mo Content

**VANLUBE W-324** resists deposit formation more effectively than molybdenum when exposed to high temperatures.
VANLUBE™ W-324 Tungsten Lubricant Additive is an effective antiwear agent at very low concentrations.

**ASTM 4172**: Four Ball Wear

*1800 rpm; 54°C; 1 h. @ 20 kgf
50 ppm metal where applicable
% = Weight Percent of Additive

In the Four Ball Wear test, **VANLUBE W-324** provides excellent antiwear protection with only 50 ppm of tungsten, and at half the charged weight of its nearest competitor.

**VANLUBE W-324** has a higher activation temperature than molybdenum for friction modification.

**SRV® Friction Test**

Ball on Disc; 4N; 20 Hz; 10 min @ X °C followed by 5 min hold
Base= ISO 32 Group II with: ADPA (1%), ZDDP (600ppm P), and Dispersant (3.9%), 700ppm Tungsten from **VANLUBE W-324**

**VANLUBE W-324** activates at elevated temperatures to provide friction modification.

**VANLUBE W-324** can be added to motorcycle oil without impairing transmission performance.

<table>
<thead>
<tr>
<th>Test Parameters</th>
<th>MA-1 Specs</th>
<th>Commercial Oil</th>
<th>Oil + <strong>VANLUBE™ W-324</strong> (100 ppm W)</th>
</tr>
</thead>
<tbody>
<tr>
<td>DFI Short shift, not too slow or abrupt</td>
<td>≥1.45 to ≤1.80</td>
<td>1.62</td>
<td>1.65</td>
</tr>
<tr>
<td>SFI Clutch holding power during acceleration</td>
<td>≥1.15 to ≤1.70</td>
<td>1.55</td>
<td>1.50</td>
</tr>
<tr>
<td>STI Clutch holding power during de-acceleration</td>
<td>≥1.55 to ≤1.90</td>
<td>1.67</td>
<td>1.62</td>
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</tbody>
</table>

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