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|-------------------|---------------|--|------------------|
| LABEL INFORMATION | BRAND NAME |   | ON TOP SYNTHETIC |
| | SUPPLIER | | ON TOP OIL CORP. |
| | SAE VIS GRADE | | 5W30 |
| | SERVICE CLASS | | SM CF A3/B4 |
| | TYPE OF OIL | | SYNTHETIC |
| IOM ID | REPORT YEAR | 2009 | |
| | REPORT NO | EO9404 | |

| | | Method | Function/Significance | API/ILSAC Specs | |
|---|--|-------------|--|--|--------|
| ELEMENTAL ANALYSIS (Parts Per Million) | Antimony (Sb) | ASTM D4951 | Anti-Wear, Extreme Pressure | | 1 |
| | Barium (Ba) | | Anti-Wear, Extreme Pressure | | 0 |
| | Boron (B) | | Anti-Wear, Detergent | | 9 |
| | Calcium (Ca) | | Anti-Acid Corrosion | | 2,514 |
| | Copper (Cu) | | Anti-Oxidation, Anti-Wear | | 0 |
| | Magnesium (Mg) | | Anti-Acid Corrosion | | 7 |
| | Molybdenum (Mo) | | Anti-Friction | | 800 |
| | Phosphorus (P) | | Anti-Wear, Anti-Oxidation | Between 600-800 PPM ** | 1,117 |
| | Silicon (Si) | | Anti-Foam (less than 20 PPM) | | 20 |
| | Sodium (Na) | | Incidental with some additives | | 34 |
| | Titanium (Ti) | | Anti-Wear | | 0 |
| | Tin (Sn) | | | | 0 |
| | Zinc (Zn) | | Anti-Wear, Extreme Pressure | | 1,283 |
| OTHER BENCH TEST PERFORMANCE MEASURES | Kinematic Vis. at 40°C (cSt) | ASTM D445 | Used to calculate Viscosity Index | | 60.05 |
| | Kinematic Vis. at 100°C (cSt) | ASTM D445 | Ability to stay in grade at high temp. | See J300 SAE Grade Specification Chart Below | 10.63 |
| | Viscosity Index | ASTM D445 | Rate of change of viscosity with temp. change (higher is better) | | 169 |
| | Starting Vis. - CCS Vis. (cP @ _°C) | ASTM D5293 | Cold temp. startability, important for diesel engines (lower is better) | See J300 SAE Grade Dependent Chart Below | 4,230 |
| | Pumping Vis.- TP1 (cP) | ASTM D3829 | Ability to lubricate after starting in cold conditions (lower is better) | Less than 60,000 centipoise | 10,700 |
| | Operating Vis. - HTHS 150°C (cP) | ASTM D4683 | Ability to lubricate at engine operating temperatures (higher is better) | See J300 SAE Grade Specification Chart Below | 3.36 |
| | Gelation Index | ASTM D5133 | Tendency to form gelled structure at temps less than 0°C (lower is better) | 12 maximum | 6.2 |
| | Volatility - Noack (%) | ASTM D5800 | Oil loss (volatility) during engine operation (lower is better) | 15% maximum* | 7.66 |
| | Shear Stability - Overall Viscosity Loss (%) | SAVLAB OVL | Ability to avoid loss of original viscosity level during engine use (lower % = better viscosity retention) | | 10.3 |
| | Oxidation Resistance - TFOUT (Minutes) | ASTM D4742 | Ability to minimize carbon deposits and sludge (longer run time is better) | | 500 |
| | Acid Resistance - TBN (Mg Koh/G) | ASTM D2896 | Ability to neutralize harmful acids. Avg. is 6-12 mg/g* (higher is better) | | 10.14 |
| | Fuel Efficiency Index | SAVLAB VFEI | Main fuel efficiency effect, based on viscosity (higher index is better) | | 44.31 |
| | Flash Point (°C) | ASTM D92 | Relevant for used oil analysis baseline. (higher is better) | 200°C minimum | 246 |
| | Phosphorus Emission Index | SAVLAB PEI | Indicator of catalyst contaminating phosphorus compounds in volatilized oil. (lower index is better) | | 12.5 |

NOTES

SAE J300 Viscosity Grade Specification Charts

*ACEA - TBN ranges from >6 to >12 dependent on application.
ACEA - Noack Volatility maximum is 13% for most sequences.

** Phosphorus limits per latest API service class for gasoline engines.

| Grade | CCS maximum | | TP1 maximum | Grade | KV at 100°C | | HTHS 150°C minimum |
|-------|-----------------|--|-----------------|-------|-------------|---------|--------------------|
| | | | | | minimum | maximum | |
| 0W | 6,200 cP @ -35 | | 60,000 cP @ -40 | 20 | 5.6 | <9.3 | 2.6 |
| 5W | 6,600 cP @ -30 | | 60,000 cP @ -35 | 30 | 9.3 | <12.5 | 2.9 |
| 10W | 7,000 cP @ -25 | | 60,000 cP @ -30 | 40 | 12.5 | <16.3 | 2.9 LD & 3.7 HD |
| 15W | 7,000 cP @ -20 | | 60,000 cP @ -25 | 50 | 16.3 | <21.9 | 3.7 |
| 2W0 | 9,500 cP @ -15 | | 60,000 cP @ -20 | 60 | 21.9 | <26.1 | 3.7 |
| 25W | 13,000 cP @ -10 | | 60,000 cP @ -15 | | | | |

*LD = Light Duty (0W40, 5W40 & 10W40)
*HD = Heavy Duty (15W40, 20W40, 25W40 & 40)