



TECHNICAL DATA

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#9000 SUPREME 9000 SAE 5W-40

FULL SYNTHETIC ENGINE OIL CJ-4/CI-4/SM CI-4PLUS

Supreme 9000 SAE 5W-40 is a full synthetic premium quality heavy-duty engine oil that is specially formulated to extend engine life, while providing for extended drain capability and improved fuel economy benefits. Supreme 9000 SAE 5W-40 is recommended for use in all types of diesel engines operating on both less than 500 ppm and ultra low sulfur diesel fuel. Supreme 9000 SAE 5W-40 exceeds the current requirements for API CJ-4 and is particularly suitable for use in 2007 emission complaint engines that utilize heavy EGR and exhaust after-treatment devices such as diesel particulate filters (DPFs) with or without diesel oxidation catalysts (DOCs). Supreme 9000 SAE 5W-40 can also be used in low- emission certified diesel engines that are equipped with EGR, older non-EGR containing diesel engines, off-highway diesel engines that are powered by either high, low or ultra low sulfur diesel fuels, high performance gasoline engines and mixed fleet applications.

Supreme 9000 SAE 5W-40 is blended from a unique combination of select synthetic base fluids. This unique combination provides the Supreme 9000 SAE 5W-40 with the following advantages:

- 1. Superior Cold Cranking and Oil Pumpability at Low Temperatures.**
- 2. Exceptional Oxidative and Thermal Stability Especially at High Engine Operating Temperatures.**
- 3. Exceptional Low Volatility Characteristics to Control Oil Consumption.**
- 4. A High Viscosity Index.**
- 5. Improved Fuel Economy Benefits.**
- 6. Extended Oil Drain Capability and Intervals.**

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Today's low emission diesel engines generate higher amounts of soot and operate at higher operating temperatures than older diesel engines. In addition current tighter engine designs reduce oil consumption, resulting in less fresh oil make-up to replenish additives. The top piston rings are located higher bringing the oil film closer to the combustion chamber, thus exposing the engine oil to severe thermal stresses. All of these factors in addition to the use of heavy

EGR and exhaust after-treatment devices such as diesel particulate filters (DPFs) with or without diesel oxidation catalysts (DOCs) require the need for the engine oil to contain an advanced additive system that will enhance the engine oil's ability to protect against soot overloading, high temperature deposit formation, while providing TBN retention and extended drain capabilities.

Blended into the Supreme 9000's synthetic base stocks is a balanced proprietary heavy-duty diesel additive technology and a highly shear stable viscosity index improver. This combination provides Supreme 9000 SAE 5W-40 with the following performance benefits:

- 1. Excellent Wear and Deposit Control Protection.**
- 2. Superior Thermal and Oxidative stability.**
- 3. Superior Soot Busting Capabilities to Prevent Soot Build-up and Agglomeration.**
- 4. Exceptional Thermal Stability, for Outstanding Performance at High Engine Operating Temperatures.**
- 5. Excellent TBN Retention and Reserve for Effective Acid Neutralization throughout the Entire Oil Drain Interval.**
- 6. Excellent Protection Against Acidic Corrosion of Vital Components.**
- 7. Excellent Soot Dispersency for Protection Against Soot Overloading, Increases in Viscosity Due to Soot Thickening and Soot Abrasive Wear.**
- 8. Enhanced Detergency to Provide High Temperature Piston Cleanliness and Protection Against Bore Polishing and Scuffing.**
- 9. Increased Engine Cleanliness.**
- 10. Excellent Protection against Low Temperature Sludge Build-Up and High Temperature Deposits.**
- 11. Reduced High Temperature Carbon Build-Up – Both in Single and Two-Piece Pistons.**
- 12. Exceptional Ring and Liner Wear Protection That Results in Improved Oil Consumption Control.**
- 13. Excellent Shear Stability for Stay-In-Grade Performance throughout the Entire Oil Drain Interval.**

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- 14. Excellent Cold Weather Startability and Pumpability for Better Cold Temperature Starts.**
- 15. Excellent Anti-Foaming Properties to Protect Against Aeration and Foaming.**
- 16. Superior Low Volatility Characteristics to Control Oil Consumption.**
- 17. Longer Filter Life Especially at High Soot Levels for Better Engine Protection.**
- 18. Excellent High Temperature/High Shear Performance to Provide Excellent Oil Film Thickness and Engine Protection at High Operating Temperatures and Shear Rates.**
- 19. Exceptional Valve-Train Wear Protection Especially During High Soot Conditions.**
- 20. Excellent Resistance to Corrosion.**
- 21. Superb Resistance to Corrosive and Abrasive Wear**
- 22. Excellent Gasket and Seal Life.**
- 23. Prolonged After-treatment (DPF and DOC) Life.**
- 24. Improved Fuel Economy.**
- 25. Longer Drain Intervals for Lower Overall Maintenance Costs.**
- 26. Increased Engine Life Especially for Older Model Engines and Reduced Maintenance Costs Due to Downtime.**
- 27. Improved Engine Durability and Reliability.**

Further blended into these synthetic base fluids, the highly advanced proprietary performance additive package and shear stability viscosity index improver are two proven frictional modifiers, Micron Moly®, a liquid soluble type of Moly and Schaeffer Mfg's own proprietary additive Penetro® . These two proven frictional modifiers once plated form a long lasting slippery tenacious lubricant film, which prevents the metal surfaces from coming into contact with each other. By preventing metal-to-metal contact, damaging frictional wear is prevented from occurring. This prevention of metal-to-metal contact and reduction in wear results in:

- * Increased Fuel Economy.**
- * A Low Coefficient of Friction.**
- * Significantly Less Bearing, Ring, Piston, Cylinder and Valve-Train Wear.**
- * Increased Engine Efficiency.**
- * Increased Engine Durability.**
- * Increased Engine Life.**
- * Less Downtime.**
- * Reduced Maintenance**

Supreme 9000 SAE 5W-40 is formulated to meet and exceeds the following manufacturers' specifications and requirements: Military Specifications MIL-PRF-2104G and A-A-52306A, API Service Classifications CJ-4/CI-4/SM, CI-4 Plus Global Specification DHD-1, JASO DH-1 and DH-2, Mack EO-O Premium Plus-07, Caterpillar, Caterpillar ECF-1-a, ECF-2 ECF-3: Cummins CES 20081; Detroit Diesel 7SE 270, Detroit Diesel Power Guard Oil Specification 93K218, Detroit Diesel Series 2000/4000 Category 1 MTU Category Type II, Navistar, ACEA E7-10, ACEA E9-10, Duetz, Mercedes-Benz MB228.3, MB228.31, MB228.5, MB 229.1, MB229.3, MB229.5, Volvo VDS-4, MAN 271, MAN 3275, MTU Oil Category Type 2, Renault RDL-3 Scania LD-F and LDF-2, Inveco, DAF and Volkswagen 501.01, 505.00

TYPICAL PROPERTIES

SAE Grade	5W-40
Viscosity 40°C cSt (ASTM D-445)	85.50-89.00
Viscosity 100°C cSt (ASTM D-445)	13.50 –15.75
CCS Viscosity @ -20°C cP (ASTM D-5293)	2,565
CCS Viscosity @ -25°C cP (ASTM D-5293)	3,968
CCS Viscosity @ -30°C cP (ASTM D-5293)	4,311
High Temperature High Shear Viscosity 302°F/150°C Cp	4.5
Mini-rotary Viscosity-TP.1 @ -35°C cP (ASTM D-4684)	16,200
Mini-Rotary Viscosity @ -20°C, cP -180hr sooted oil sample (Mack T-11A ASTM D-6896)	5,100
Viscosity Index (ASTM D-2270)	159
Flash Point °F/°C (ASTM D-92)	440°/226.67°
Stable Pour Point °F/°C (FTM 7916 Method 203)	<-41°/<-42°
Sulfated Ash Content % Wt. (ASTM D-874)	1.0
Total Base Number (ASTM D-2896)	10
NOACK Volatility (ASTM D-5800)	
% Evaporation Loss @ 250°C	11%
Shear Stability % Viscosity Loss 90 Passes (ASTM D-7109)	9.67%
Foam Test (ASTM D-892 Option A)	
Sequence I	0/0
Sequence II	0/0
Sequence III	0/0
High Temperature Foam Test (ASTM D-6082 Option A)	0/0
MHT-4 TEOST (ASTM D-6335)	
Deposit Weight, mg	27.1
Engine Rusting Ball and Rust Test (ASTM D-6557)	
Average Grey Value	128
Sequence IIIG	
% Viscosity@ 40°C EOT	75%