



TECHNICAL DATA

102 Barton Street, St. Louis, Missouri 63104

In-State (314) 865-4100/Out of State 800-325-9962/Fax (314) 865-4107 <http://www.schaefferoil.com>

8012 ADVANCED EUROPEAN PERFORMANCE HEAVY DUTY DIESEL ENGINE OIL SAE 5W-30 API CJ-4/SN and ACEA E6/E7/E9

Advanced European Performance Heavy Duty Diesel Engine Oil SAE 5W-30 is an Ultra High Performance (UHPD), low ash, heavy-duty diesel engine oil combines exceptional protection and durability for modern low emission engines with exceptional fuel economy, green-house gas emission reduction, emissions system protection and extended drain capability. Advanced European Performance Heavy Duty Diesel Engine Oil SAE 5W-30 is designed for use in a wide array of diesel powered commercial vehicles. It is particularly suitable for use in EPA 2007 and EPA 2010, Euro V and Euro VI low emission compliant engines that utilize Exhaust Gas Recirculation (EGR) and exhaust after-treatment devices such as diesel particulate filters (DPFs) with or without diesel oxidation catalysts (DOCs) and Selective Catalytic Reduction (SCR). Advanced European Performance Heavy Duty Diesel Engine Oil SAE 5W-30 can also be used in both on-highway and off-highway diesel powered engines that are used in industries such as transportation, mining, construction and agriculture. Advanced European Performance Heavy Duty Diesel Engine Oil SAE 5W-30 offers up to a 3.3% improvement in fuel economy in US Class 6 to 8 and a 1.3% fuel economy improvement in European long haul operations when compared to SAE 15W-40 engine oil.

Advanced European Performance Heavy Duty Diesel Engine Oil SAE 5W-30 can be used in vocational and light duty mixed fleet applications where a mix of diesel and gasoline engine applications occurs.

Advanced European Performance Heavy Duty Diesel Engine Oil SAE 5W-30 is blended from a unique combination of select synthetic base fluids to provide the following benefits:

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 with extended oil drain capability and intervals.**

Advanced European Performance Heavy Duty Diesel Engine Oil SAE 5W-30 contains a highly balanced proprietary heavy-duty diesel additive technology and a highly shear stable viscosity index improver which provides these ground breaking performance benefits in the following areas:

1. **Excellent wear and deposit control protection with superior thermal and oxidative stability.**
2. **A patented novel zinc anti-wear additive system to minimize volatility and chemical breakdown and provide maximum, long lasting anti-wear performance and exhaust after-treatment protection.**
3. **Superior soot busting capabilities to prevent soot build-up and agglomeration.**
4. **Exceptional thermal stability, for outstanding performance at high engine operating temperatures.**

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5. Excellent TBN retention and reserve, coupled with excellent TAN suppression control for effective acid neutralization throughout the entire oil drain interval.
6. Excellent protection against acidic corrosion of vital components.
7. Excellent soot dispersancy for protection against soot overloading, viscosity increase due to soot thickening and soot abrasive wear.
8. Enhanced detergency for high temperature piston cleanliness, protection against bore polishing and scuffing and increased engine cleanliness.
9. Excellent protection against low temperature sludge build-up and high temperature deposits.
10. Reduced high temperature carbon build-up – both in single and two-piece pistons.
11. Exceptional ring and liner wear protection to improve oil consumption control.
12. Excellent shear stability for stay-in-grade performance throughout the oil drain interval.
13. Excellent cold weather start-ability and pumpability for better cold temperature starts.
14. Excellent anti-foaming properties to protect against aeration and foaming.
15. Superior low volatility characteristics to control oil consumption.
16. Longer filter life especially at high soot levels for better engine protection.
17. Excellent high temperature/high shear performance to provide excellent oil film thickness and engine protection at high operating temperatures and shear rates.
18. Exceptional valve-train wear protection especially during high soot conditions.
19. Excellent resistance to corrosion and corrosive and abrasive wear
20. Excellent gasket and seal life.
21. Prolonged after-treatment (DPF and DOC) life.
22. Improved fuel economy and longer drain intervals for lower overall maintenance costs.
23. Increased engine life especially for older model engines and reduced maintenance costs due to downtime.
24. Improved engine durability and reliability.

Advanced European Performance Heavy Duty Diesel Engine Oil SAE 5W-30 also contains 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 and 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**

Advanced European Performance Heavy Duty Diesel Engine Oil SAE 5W-30 meets and exceeds the following manufacturers' specifications and requirements: API CJ-4/SN; ACEA E6-12; ACEA E7-12; ACEA E9-12; Mercedes-Benz MB 228.31; Mercedes-Benz MB 228.51; MAN 3271-1, MAN 3477; MAN 3677; MTU 3.1; Renault Truck RXD; Renault Truck RGD; Renault Truck RLD/RLD-2, Renault Truck RLD-3; Deutz DQC IV-10LA; JASO DH-2; Cat ECF-3; Cummins CES 20081; Detroit Diesel DDC Power Guard 93K218; Mack EO-O Premium Plus-07; Volvo VDS-4; Volvo CNG

TYPICAL PROPERTIES

SAE Grade	5W-30
Specific Gravity @ 60°F (15.6°C)	0.854
Pounds Per U.S. Gal @ 60°F (15.6°C)	7.11
Viscosity @ 40°C, cSt ASTM D-445	70
Viscosity @ 100°C, cSt ASTM D-445	11.5-12.4
CCS Viscosity, cP @ -30°C ASTM D-5293	6,090
Mini Rotary Viscosity TP-1, cP @ -35°C	16,300
High Temperature High Shear Viscosity, cP @ 302°F (150°C)	3.5
Viscosity Index ASTM D-2270	165
Flash Point °F (°C) ASTM D-92	439° (226°)
Pour Point °F (°C) ASTM D-97	-44° (-42°)
Sulfated Ash Content % Wt. (ASTM D-874)	0.99%
Total Base Number (ASTM D-2896)	10
Total Acid Number (ASTM D-664)	2.20
NOACK Volatility (ASTM D-5800)	
% Evaporative Loss	11.5%
Shear Stability % Viscosity Loss @ 90 Passes ASTM D-7109	3.5%
Foam Test Option A ASTM D-892	
Sequence I	0/0
Sequence II	0/0
Sequence III	0/0
High Temperature Foam Test (ASTM D-6082 Option A)	10/0
Sequence IIIG % viscosity increase @ 40°C EOT	
	103.5%
MHT-4 TEOST ASTM D-7097	
Deposit wt., mg	9.9
High Temperature Corrosion Bench Test ASTM D-6594	
Copper, ppm	14
Lead, ppm	61
Tin, ppm	0
Copper Strip Rating	1B
Zinc, ppm (ICP)	740 to 900
Phosphorous, ppm	800
Sulfur % wt.	0.27