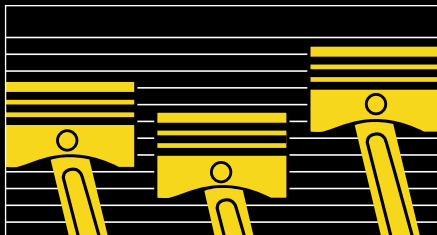


# Diesel Engine Oil

For Caterpillar® on-highway truck, earthmoving, commercial, and marine diesel engines

SAE 15W-40

SAE 10W-30



Developed, tested, and approved by Caterpillar, Cat Diesel Engine Oil (CH-4) ensures optimum life and performance in Cat® on-highway truck, earthmoving, commercial, and marine diesel engines.

## Recommended use

### Application

Cat DEO is preferred factory fill oil for new Cat machines and engines, as well as Cat dealer service shops. It is recommended for:

- Cat diesel engines (excluding 3600 and MaK), including 1999 low emission on-highway truck, earthmoving, commercial, and marine diesel engines.
- automotive gasoline engines that require the latest API SH or SJ Service Classification oils.
- OEM heavy-duty diesel engines, including 1999 low emission on-highway truck designs that recommended the use of API CH-4, CG-4/SJ Service Classification oils.

### Fuel compatibility

The CH-4 performance of Cat DEO provides protection for Cat engines operating on a higher range of % Fuel Sulfur:

Fuel Injection Method	% Fuel Sulfur
Direct Injection (DI)	0.05% to 1.20%
Precombustion (PC)	0.05% to 0.60%

### Information sources

We can help you determine the right oil for your Cat machines and engines or you can refer to your “Operation and Maintenance Manual” or service publications SEBU6385 (On-Highway Truck), SEBU6250 (Earthmoving Machine), and SEBU6251 (Commercial and Marine).

**Note:** Cat Fluids recommendations are now available on the Internet at: [www.CAT.com/Products/PartServ/Fluids/FluProd/index.htm](http://www.CAT.com/Products/PartServ/Fluids/FluProd/index.htm)

**Direct fuel injection**—if fuel sulfur exceeds 1.20%, shorten the oil change period based on S-O-S analysis results.

**Precombustion fuel injection**—if fuel sulfur exceeds 0.60%, shorten the oil change period based on S-O-S analysis results or use Cat DEO single-grade oil API CF with 13.5 TBN.

## Typical Characteristics\*

SAE Viscosity Grade	15W-40	10W-30**
EMA Recommended Guideline LRG-1		
API Service Classification		
Diesel	CH-4, CG-4, CF-4, CF-2, CF	CG-4, CF-4, CF
Gasoline	SJ	SH
OEM Specifications	Mack EO-M Detroit Diesel 7SE270 Cummins CES20071	
API Gravity at 16°C (ASTM D287)	27.9	28.9
Flash Point, °C (ASTM D92)	218	210
Pour Point, °C (ASTM D97)	-33	-33
Viscosity:		
cP @ - 15°C	3000	—
cP @ - 20°C	—	2840
cP @ - 25°C	25,000	—
cP @ - 30°C	—	19,500
cSt @ 40°C (ASTM D445)	120.7	73
cSt @ 100°C (ASTM D445)	15.5	11.0
HT/HS, CP @ 15°C	4.4	3.4
Viscosity Index (ASTM D567)	134	141
Zinc % Wt. (Spectro or AA)	.142	.142
Nitrogen % Wt.	.124	.113
Sulfate Ash (ASTM D567)	1.4	1.4
TBN (ASTM D2896)	12.2	11.8

\* The values shown are typical values and should not be used as quality control parameters to either accept or reject product. Specifications are subject to change without notice.

\*\* The 10W-30 version of Cat DEO is licensed as an API CG-4 oil. Cat DEO 10W-30 utilizes the same additive technology developed for the 15W-40 oil, however it is not licensed as API CH-4.

# Diesel Engine Oil

## Advanced formula for maximum performance and protection

Cat Diesel Engine Oil combines a high quality base stock with a proprietary, balanced additive system having a combination of metallic detergents, ashes dispersants and multi-purpose inhibitors. This oil assures superior control of oil thickening caused by soot buildup and high temperature oxidation, and provides outstanding resistance to varnish deposits and corrosion.

The multigrade characteristics of Cat DEO provide excellent cold-cranking capabilities and oil pumpability at low temperatures. Stay-in grade shear stability enables the oils to maintain viscosity in severe high temperature or extended drain service.

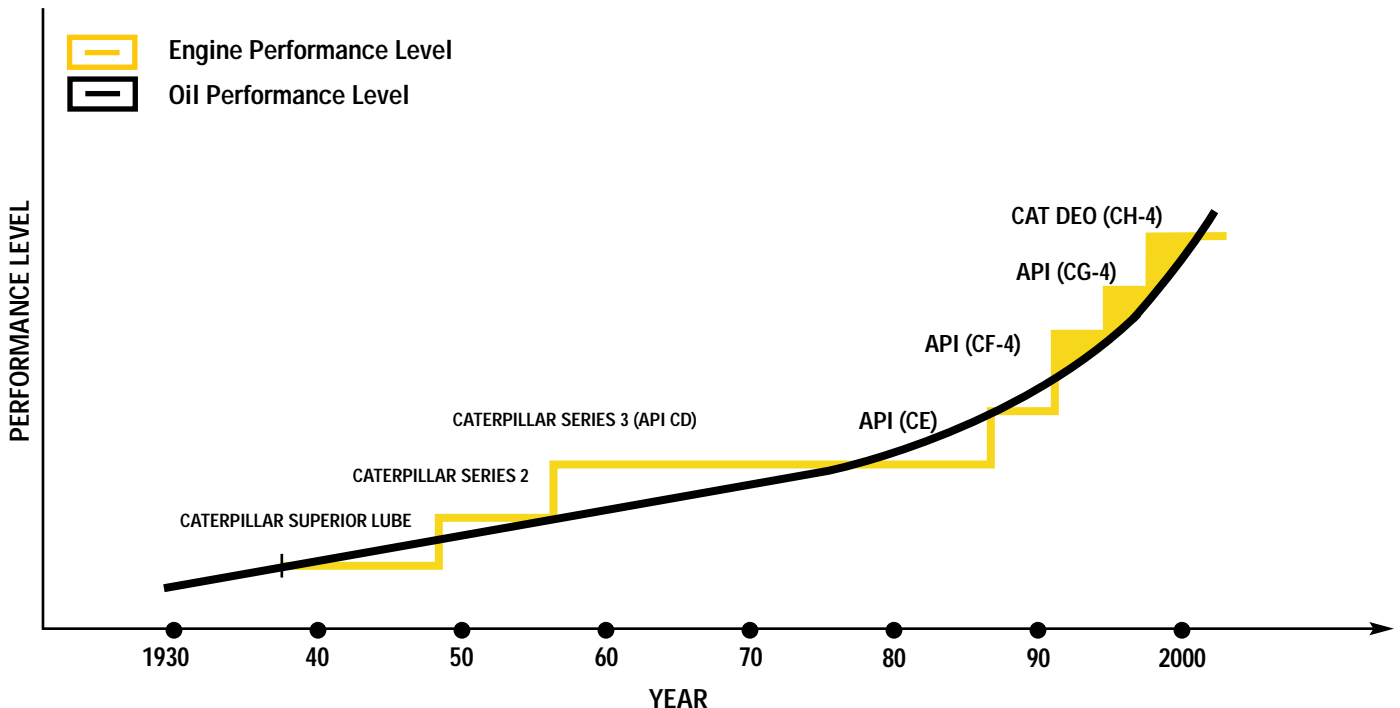
Cat DEO exceeds the API CH-4 service classification designed to satisfy the lubrication needs of the 1999 certified diesel engines in low emission on-highway applications. Such engines operate at higher temperatures, consume less oil and may have a tendency to build greater levels of soot and deposits. In addition Cat DEO provides outstanding performance under adverse conditions, particularly in HighTemperature/High-Shear (HT/HS) viscosity, and in alkalinity (TBN) retention.

## Cat DEO EXCEEDS industry standards

The American Petroleum Institute (API) CH-4 category defines a minimum engine performance level for commercial engine oils. Many companies develop two types of oil—"fighting grade" and "premium." Generally, fighting grade oils **just meet API CH-4** specifications, while premium oils **exceed them**. You need to make this distinction with your oil supplier when you make your decision to purchase oil. Unfortunately, there is no easy way to distinguish these two performance levels without conducting extensive field tests and used oil analysis on your engine, then comparing the results of the two oils.

Caterpillar has developed only **one** Diesel Engine Oil. **Cat DEO is a premium oil** that **greatly** exceeds the minimum requirements of API CH-4. The chart on the following page shows the additional tests, beyond the minimum CH-4 tests, Cat DEO must pass in order to provide optimum engine life and performance at the lowest possible owning and operating cost.

### CAT Engines and CAT Oil Performance History



Since its introduction in the late 80's, the Cat DEO formulation has changed many times to keep pace with new engine technology. You can be assured when you buy Cat DEO that the current formulation exceeds the latest engine oil requirements for Cat Engines.

**Cat DEO vs. Industry Tests**

Cat DEO and other commercial engine oils must pass standard industry tests to be classified as the proposed API CH-4 oils. Cat DEO oil, however, exceeds the proposed API CH-4 minimum performance requirements by passing **additional** multicylinder proprietary Cat engine tests. These tests better simulate actual field experience and provide additional confidence that Cat engine oil will provide optimum performance in Cat engines.

Performance Tests Parameter Evaluated	CAT DEO (CH-4)*	Commercial CH-4*
<p><b>CAT 3406E Multicylinder Engine Test</b> Piston deposits and oil control</p> <p><b>CAT 3500 Multicylinder Engine Test</b> Piston deposits and wear</p> <p><b>CAT C-12 Multicylinder Engine Test</b> Piston deposits, oil control, and wear</p> <p><b>CAT 1N SCOTE</b> Piston (one piece aluminum) deposits and oil control, .05% sulfur fuel</p>		
<p><b>CAT 1P SCOTE (NEW)</b> Piston (two-piece iron/aluminum) deposits and oil control, .05% sulfur fuel</p> <p><b>CAT 1K SCOTE</b> Piston (one piece aluminum) deposits and oil control, 0.4% sulfur fuel</p> <p><b>Mack T-9 (NEW)</b> Ring wear, cylinder liner wear and TBN depletion under high soot conditions</p> <p><b>Cummins M-11 (NEW)</b> Valve train wear; filter plugging and sludge under high soot conditions</p> <p><b>HEUI Engine Oil Aeration Test (NEW)</b></p> <p><b>GM6.5 L (Revised)</b> Valve-train wear; rolling pin wear in the cam followers under high soot conditions</p> <p><b>Mack T-8E (Revised)</b> Soot control</p> <p><b>Sequence IIIE (Revised)</b> Oil oxidation</p> <p><b>ASTM D5880 NOACK Volatility Test (Revised)</b> Resistance to excess oil consumption</p> <p><b>ASTM D892 Foam</b> Oil foaming resistance</p> <p><b>ASTM D3945 Shear Stability Test</b> Ability of VI improver to maintain control of viscosity</p> <p><b>Cummins Corrosion</b> Copper, lead and tin corrosion</p>		

\* Engine oil licensed as API CH-4, is automatically approved as API CG-4 and CF-4.

# Diesel Engine Oil

## Customer benefits

- **Soot Dispersancy** — Improved soot dispersancy maintains oil viscosity to enhance the flow of lubricant to vital engine parts. This additional dispersancy also reduces the chance of oil filters plugging under high soot conditions.
- **Oxidation Stability** — Increased oxidation stability reduces oil sludge and viscosity increases under high temperature conditions.
- **Valve Train Wear** — The highly loaded cam followers, rocker arms, and valve bridges are protected from scuffing and excessive wear; especially in applications with high soot loading.
- **Piston Deposits** — Improved piston deposit control for steel and aluminum pistons results in longer ring life and lower oil consumption.
- Provides excellent sludge and varnish control
- **Can be used in old and new engines** — Improved piston deposits, wear and oil control achieved for low emission. 1999 certified low emission engine designs will also apply to pre-1999 on and off-highway diesel engines.
- **Reduced fuel and oil consumption** compared to SAE 30 and SAE 40 viscosity engine oils.
- **Long filter life** — The high level of dispersancy keeps soot particles finely dispersed in the oil so that they pass through the engine and filter without harm. With reasonable oil drain periods, long filter change intervals are assured.
- **One oil for all machines/engines** — Mixed fleets can still use the same oil in all engines, both diesel and gasoline. Simplified inventory and dispensing systems save money.
- Excellent for use in hydraulic systems of all Caterpillar machines.

## Proper use for health and safety

According to toxicology information, Cat Diesel Engine Oil has little or no adverse effects if handled and used properly. No special precautions are suggested beyond attending to good personal hygiene and avoiding prolonged, repeated skin contact. For more information, refer to the “Material Safety Data Sheet” which is located on the internet at Caterpillar’s web site: <http://www.CAT.com/products/custserv/msds>. If internet access is not available, contact your Caterpillar dealer.

## Cat Diesel Engine Oil Part Numbers

Package Size	Part Numbers	
English	15W-40	10W-30
Bulk-GAL	155-6199	155-6198
55 GAL	3E9712	3E9708
5 GAL	3E9713	3E9709
1 GAL	3E9714	-
1 QRT	3E9715	3E9710

Metric	15W-40	10W-30
Bulk-L	8T9548	5P2586
1200 L	8C9811	8C9910
1000 L	3E9838	-
209 L	3E9839	-
208 L	3E9840	3E9707
205 L	3E9841	3E9711
200 L	3E9842	130-7055
60 L	121-4038	-
50 L	8C6733	-
25 L	3E9847	3E9843
20 L	3E9848	3E9844
19 L	3E9849	-
18 L	3E9900	-
5 L	3E9901	3E9845
4 L	3E9902	3E9846

## Fluid analysis for early detection

We recommend protecting your investment by using scheduled fluid analysis. Our S•O•S oil analysis program is the ultimate detection and diagnostic tool for your equipment, helping you head off potential problems before they can lead to major failures and costly unscheduled downtime.

## Cat DEO is a Caterpillar-designed “engine part”

Caterpillar “designs” and tests Cat Diesel Oil beyond the standards of The American Petroleum Institute to assure that it will provide the best protection and longest life for Caterpillar engines.