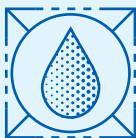




CITGO® CITGARD® 1000 Full Synthetic Heavy Duty Engine Oils

Formerly CITGO® CITGARD® SynDurance® Plus Synthetic Heavy Duty Engine Oils

OVERVIEW



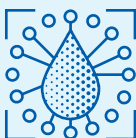
- Advanced fuel efficiency formula delivers maximum fuel economy, extreme cold temperature performance, and superior engine durability. A careful balance of synthetic base oil components and a shear stable viscosity modifier ensures that heavily loaded engine parts have protective oil films.
- Meet the performance requirements of newer engines operating at higher temperatures, with lower RPM, higher torque, and advanced combustion design.
- Field-tested for over a million miles with engine teardown inspections. The results indicate superior wear protection and oil consumption control, as compared to premium SAE 15W-40 viscosity grade oils.

FEATURES & BENEFITS



- Up to 4% fuel economy advantage over conventional SAE 15W-40 viscosity grade oils.
- Longer starter/battery life with reduced dependency on block heaters, resulting in lower energy costs.
- Up to 100% increase in oxidation protection compared to conventional CJ-4 engine oils (based on Volvo T-13 oxidation results). Always follow OEM recommendations when extending oil drain intervals.
- Reduced air entrainment in high-pressure fuel injection systems.
- Address the environmental challenge of reducing greenhouse gases and carbon footprint.

APPLICATIONS



Approved for equipment requiring:
 API CK-4, CJ-4, CI-4 Plus, CI-4, CH-4/SN (SN applies to 5W-40 only)
 Cummins CES 20086
 Detroit Diesel DFS 93K222
 Volvo/Mack/Renault – VDS-4.5/EOS-4.5/RLD-3
 Ford WSS-M2C171-F1

Recommended for equipment requiring:
 Caterpillar ECF-3
 Mercedes 228.31
 Paccar
 Navistar
 MAN M3575
 Allison TES 439 (5W-40 only)

PROPERTIES

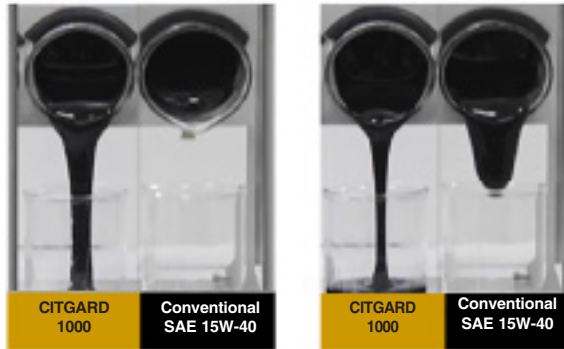


Typical Properties for CITGO CITGARD 1000 Full Synthetic Heavy Duty Engine Oils:

	5W-30	5W-40
Material Code	622676001	622677001
Gravity, ASTM D4052, °API	33.6	33.8
Pounds Per Gallon	7.14	7.14
Flash Point, COC, ASTM D92, °F (°C)	428 (220)	453 (234)
Viscosity ASTM D445		
cSt at 40°C	70	88
cSt at 100°C	11.3	14
Viscosity Index, ASTM D2270	156	163
CCS Vis, ASTM D5293, cP at °C	6,400@ -30° C	6,350 at -30°C
MRV Vis, ASTM D4684, cP at °C	21,970 at -35°C	30,060 at -35°C
MRV Yield Stress, ASTM D4684, Pa at °C	<35	<35
Pour Point ASTM D97, °F (°C)	-38°F (-39°C)	-44°F (-42°C)
TBN (Total Base No.), ASTM D2896	11	11
Color, ASTM D1500	L5.5	L5.5
NOACK Volatility, ASTM 05800, % Loss	11.5	11.9

Low Temperature Pumpability Comparison

How much wear occurs waiting on 15W-40?



3 seconds

7 seconds

Cold box testing at -22°F (-30°C) of used oil demonstrates the superior flow characteristics of CITGARD 1000 Full Synthetic 5W-40

Fuel Savings Advantage

Savings Category	Conventional 15W-40	CITGARD® 1000 5W-30	Savings*
Number of Units	100	100	
Annual Miles/Unit	100,000	100,000	
MPG	6.50	6.76	
Fuel Savings % Increase	None	4.00	
Fuel Cost	4.00	4.00	
Annual Unit Fuel Gallons	15,384	14,792	592
Annual Unit Fuel Cost	\$61,536	\$59,168	\$2,368
Fleet Annual Fuel Gallons	1,538,400	1,497,200	59,200
Total Savings			\$236,800

*Savings is example only—Individual fleet result will vary

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