



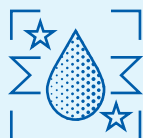
CITGO® CITGARD® 600 Engine Oils

OVERVIEW



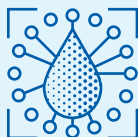
- Superior technology to protect low-emission engines equipped with exhaust after-treatment systems and other new design features.
- High-performance formulations specifically engineered for modern engine designs and operating conditions that impose increased stress on engine oil -- an excellent choice for equipment owners needing longer engine and oil service life.
- Meet API CK-4 heavy duty requirements and major diesel engine manufacturer performance requirements.

FEATURES & BENEFITS



- Formulated to reduce oil aeration in modern engines with high-pressure fuel injection.
- Protects against viscosity breakdown resulting from high-contact timing gears.
- Double the oxidation protection of API CJ-4 engine oils on the Volvo T-13 oxidation test.
- Maintains a state-of-the-art wear control barrier in heavily loaded engine components.
- Provides advanced soot control with SootArrest™ soot dispersant chemistry.
- Extends diesel particulate filter (DPF) life by maintaining excellent cylinder condition.
- SAE 10W-30 grade improves fuel economy and cold cranking lubrication.
- Provides multiple cost-saving benefits when combined with the CITGO LubeAlert™ oil analysis program.

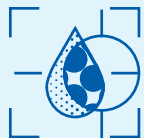
APPLICATIONS



- Recommended for use in heavy duty service in commercial trucks, agricultural equipment, construction equipment, stationary engines, and other diesel-fueled engine applications including Caterpillar (ECF-3), Paccar and Navistar.
- Approved for equipment requiring:

API CK-4, CJ-4, CI-4 PLUS, CI-4, CH-4/SN	Ford WSS-M2C171-F1
(SN for 15W-40 grade only)	Cummins CES 20086
Volvo/Mack/Renault - VDS-4.5/EOS-4.5/RLD-3	Detroit Diesel 93K222

PROPERTIES



Typical Properties for CITGO CITGARD 600 Engine Oils:

SAE Grade	15W-40	10W-30
Material Code	622615001	622613001
Gravity, ASTM D4052, °API	30.8	31.5
Density, lb/gal	7.28	7.25
Flash Point ASTM D92 (COC), °F (°C)	455 (235)	435 (224)
Viscosity ASTM D445		
cSt at 40°C	114.9	82
cSt at 100°C	15.7	12.0
Viscosity Index, ASTM D2270	145	141
HTHS Rate Viscosity at 150°C, ASTM D4683, cP	4.1	3.5
CCS Viscosity, ASTM D5293, cP	4,860 at -20°C	6,250 at -25°C
MRV Pumpability, ASTM D4684, cP	18,800 at -25°C	23,500 at -30°C
MRV Yield Stress, ASTM D4684	<35 at -25°C	<35 at -30°C
Pour Point ASTM D97, °F (°C)	-33 (-36)	-38 (-39)
Color, ASTM D1500	L4.0	L3.0
Sulfated Ash, ASTM D874, m%	1.0	1.0
Total Base Number, ASTM D2896, mg KOH/g	9.2	10

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