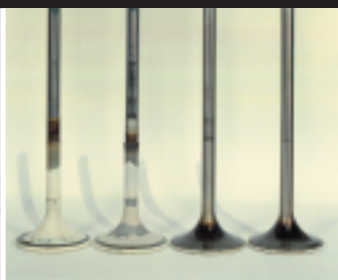
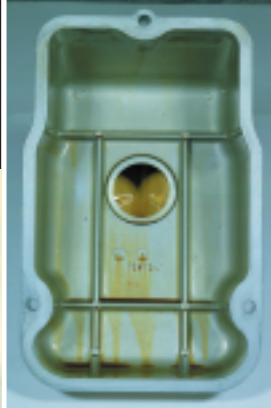




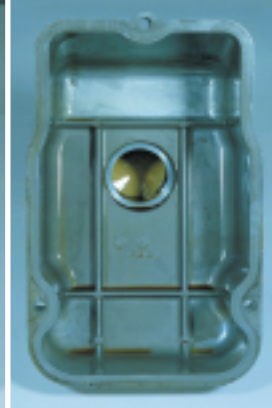
Valves using competitive brand



HC El Mar LA4 7,124 hours



Top deck cover after using competitive brand



Top deck cover after using HC El Mar LA4



Using competitive product



Using HC El Mar LA4

HYDROCLEAR® El Mar® LA4 Natural Gas Engine Oil Shines in Tough Field Evaluation

Call it a duel in the sun – a 7,000-hour field test in the South Texas sun is a pretty good way to determine if a lubricant will perform as promised. And from December 1999 to September 2000 HYDROCLEAR® El Mar LA4® natural gas engine oil more than kept its promises. In fact, it outperformed a formidable competitor at all inspection points.

The test was run at a CDM Resource Management, Ltd. location in Refugio, Texas. CDM is a contract compression service company that works for pipeline and oil companies installing and maintaining natural gas engines throughout the southwestern United States. Two identically configured Caterpillar G3600 Series high-speed, four-cycle gas engines sitting side by side were selected. These are lean-burning, highly turbocharged G3606 natural gas engines capable of delivering 1665 horsepower.

One was filled with HYDROCLEAR El Mar LA4 brand natural gas engine oil and the other with a competitive lubricant product that has been successful in numerous Cat G3600 series applications. The engines were then run for more than 295 days with no oil change. Each engine consumed slightly more than 2½ gallons of oil per day under average operating conditions that included oil and water temperatures of 190° F and 180° F respectively, oil filter differentials in the 0 to 0.9 psi range and at horsepower and torque loads of 99 to 100% daily.

Kendall Moreland, vice president of operations for CDM Resource Management said, "The Conoco product was very impressive in our engines. I've been working with engines like this for 20 years and the visual inspection is an important part of any trial evaluation. When we looked at the engine parts from the Conoco lubricated engine, it looked very good. There was no doubt that they were easily going to meet the Cat standards."

Valve guides are a critical area on the Cat G3600 because they are exposed to higher heat than in many gas engines. Deposits can build in the valve guides and cause the valves to stick, thus resulting in catastrophic failures. Valve guide inspections of both engines reveal fewer deposits on the valve guides of the engine using HYDROCLEAR El Mar product.

In an analysis of the used oil after the test, Conoco HYDROCLEAR El Mar LA4 natural gas engine oil proves to be the more stable lubricant. Using the important measure of viscosity increase over the test period, analysis showed that the competitive lubricant viscosity increased 125 percent more than the Conoco product. El Mar LA4 viscosity increased 7.91% over original viscosity, but the competitive engine oil shot up 17.9%. And in oxidation analysis, Conoco wins again showing 77% fewer absorbance units per centimeter than the competitive fluid at maximum levels.

"We take an oil sample about every 1000 hours," stated John Dippel, operations technician for CDM in Refugio, Texas. "And you could

tell by the color of the Conoco product that it was cleaner. That means the HYDROCLEAR additive package is working." In fact in the examination of sludge deposits at the end of the test, which rates performance on a ten-point merit scale, Conoco's natural gas engine oil received 9.91 merits out of the possible ten. This score means virtually no sludge deposits were found. The product was almost as good as new and showed very little effects of oxidation after 7100 hours in these high-powered engines.

Conoco HYDROCLEAR El Mar LA4 engine oil also shined when hard piston deposits were measured upon completion of the test. The standard test uses demerits to measure hard deposits. Fewer demerits mean fewer deposits on the pistons, and reduced deposits are an important factor in extending engine life. In this 7000-hour test, the pistons in the engine lubricated by Conoco received only 55.68 demerits while the pistons in the competitive engine were given 70.42 demerits. This is approximately 25% more piston deposits in the engine lubricated by the competitor.

Jerry Blackmon, operations superintendent for CDM in South Texas commented on the condition of the hot side of the turbocharger in the engine lubricated by the HYDROCLEAR El Mar LA4 brand. "The Conoco engine produced less residue on the turbocharger. This is important to us because build up on the turbo fans causes them to become out of balance. That means we lose seals and airflow is reduced. Eventually bearings will burn out and that is a \$40,000 maintenance bill that we'd rather avoid."

Technical services representatives presented the results of the CDM test to Caterpillar in March of 2001. While the company will not endorse or approve a lubricant, Caterpillar has determined that Conoco HYDROCLEAR El Mar LA4 natural gas engine oil successfully completed the 7,000-hour field test protocol in a Caterpillar 3600 series engine. CDM Vice President Kendall Moreland agrees, "There is no doubt that the Conoco product meets, and possibly exceeds, the Cat standards."

