

Put It to the Test

Since the 1940's, the American Petroleum Institute (API) has been developing and publishing engine oil standards to protect new and existing engine technologies, ensure proper testing procedures to measure oil performance and meet government regulations. The latest proposed category (PC-11) which has been divided into two categories, CK-4 and FA-4, is driven by the development of next-generation engines. To meet goals for fuel economy improvements and reduction in emissions, future engines will run at hotter operating temperatures and require engine oils to withstand more severe conditions.

CK-4 oils are a direct replacement for current CJ-4 engine oils and are backwards compatible. They are available in SAE 15W-40, 5W-40 and 10W-30 grades. FA-4 oils are offered in lower viscosity grades (SAE 10W-30 and 5W-30) and are primarily designed to improve fuel economy. One key difference between the two categories is the High Temperature High Shear (HTHS) viscosity.

Most of us are familiar with kinematic viscosity tests. Kinematic viscosity tests are like evaluating the difference between pouring water, syrup or molasses. We don't want engine oil that pours like water, but we don't want one that pumps as slow as molasses either. But the HTHS viscosity test is different. It measures a lubricant's viscosity in an environment similar to an actual engine operation where the oil particles are deformed, stretched and sheared.

The HTHS test findings are more relevant to wear on bearings, camshafts, pistons and liners. Under mechanical and thermal stress, viscosity modifying additives (polymers) shear down causing the oil's viscosity to decrease. Test results are designed to ensure that oils do not shear down at operating temperatures and that the oil film strength is sufficient to minimize wear.

The focus on lower viscosity oils is gaining momentum. The popularity of SAE 10W-30 lubricants is projected to grow rapidly. Millions of miles of testing have been performed to ensure that additive packages, viscosity-modifying polymers and base oils demonstrate proof of performance under real-world conditions.

So what do you really need to know? 1) CK-4 heavy duty oils perform better than CJ-4 oils, are backwards compatible and can replace CJ-4 engine oils. Make the change as soon as your current supply of CJ-4 oil is depleted. 2) Consider using lower-viscosity, FA-4 diesel engine oils only when your engine's OEM recommends their use.

Contact your local FS energy sales specialist for additional details.

