

Lubricity – Fuel Right® and Wear Scar Diameter

We say on our labels that Fuel Right “restores lubricity in ULSD.” Those who test Fuel Right-treated ULSD in the standard ASTM test known as the “HFRR” (high frequency reciprocating rig) method, however, may observe that the reported wear scar diameter is essentially the same with or without Fuel Right treatment. How, then, can we claim lubricity? The answer lies in the nature of Fuel Right and the nature of the HFRR test method.

That test consists of placing a hardened steel ball against a hardened steel disk with a load applied to create a certain force between the two. The fuel sample being tested is poured into a cup that contains these steel samples, and a motor is turned on to force the ball to rub back and forth at a certain rate over a certain distance for 90 minutes. The ball is then removed and looked at under a microscope, and the width and length of the tiny “wear scar” measured. The average of these two dimensions is reported as the “wear scar diameter.” The premise is that the smaller the scar, the less wear has occurred – and the better the lubricity of the fuel sample.

When Intertek Labs, a large and respected independent testing laboratory, ran the HFRR test on ULSD with and without Fuel Right treatment, they did observe that the diameter of the wear scar was not reduced with Fuel Right treatment. What the lab supervisor also noticed, however, was that, whereas the wear pattern on the untreated ULSD was a typical, deep wear pattern, the fuel treated with Fuel Right produced what he described as a “ghost” pattern with very little metal loss. He also observed that, based we assume on the sound occurring during the test, nearly all of the wear with Fuel Right occurred during the first several minutes of the test. This is presumed to result from the fact that Fuel Right lays down a film on the metal surfaces, and that film acts to improve lubricity and reduce metal wear – and it apparently takes several minutes for that film to occur.

Further testing revealed that Fuel Right used in combination with conventional lubricity additives produces HFRR test results much better than with the conventional additive alone. Based on this knowledge we developed Fuel Right “Lube” that combines the two chemistries. Fuel Right Lube is available in various levels of HFRR lubricity depending on the needs of the user. As of this writing (April, 2010) the Lube versions of Fuel Right are available only in drums, totes or tank trucks.

Keep in mind, however, that, if reduced metal wear and extended equipment life is your only concern, standard Fuel Right is your most cost-effective solution.