

Overview of SFR's New Tungsten Synthetic Fortifier Technology

Engine oils function under severe oxidation conditions operating constantly at elevated temperatures. The oxidative breakdown of the engine oil creates sludge and deposits, deteriorates the viscosity of the oil, which produces acidic bodies that corrode engine parts. To fight the effects of oxidation, engine oils are formulated with antioxidants, which include: Phenols, amines, zinc dithiophosphates (ZDDP), sulfurized hydrocarbons, metal and ashless dithiocarbamates, and organo-molybdenum compounds. Alkylated diphenylamines and ZDDP's are the main source of antiwear protection for engine oils.

However, the use of ZDDP' in engine oil is declining almost entirely due to the poisoning effect of phosphorus on exhaust after-treatment catalyst. In addition sulfur levels in engine oils are also in decline due to the effect of sulfated ash on exhaust after-treatments. Thus, a need has existed for effective antioxidant chemistry that can reduce or eliminate the need for phosphorus and sulfur containing antioxidants and antiwear additives.

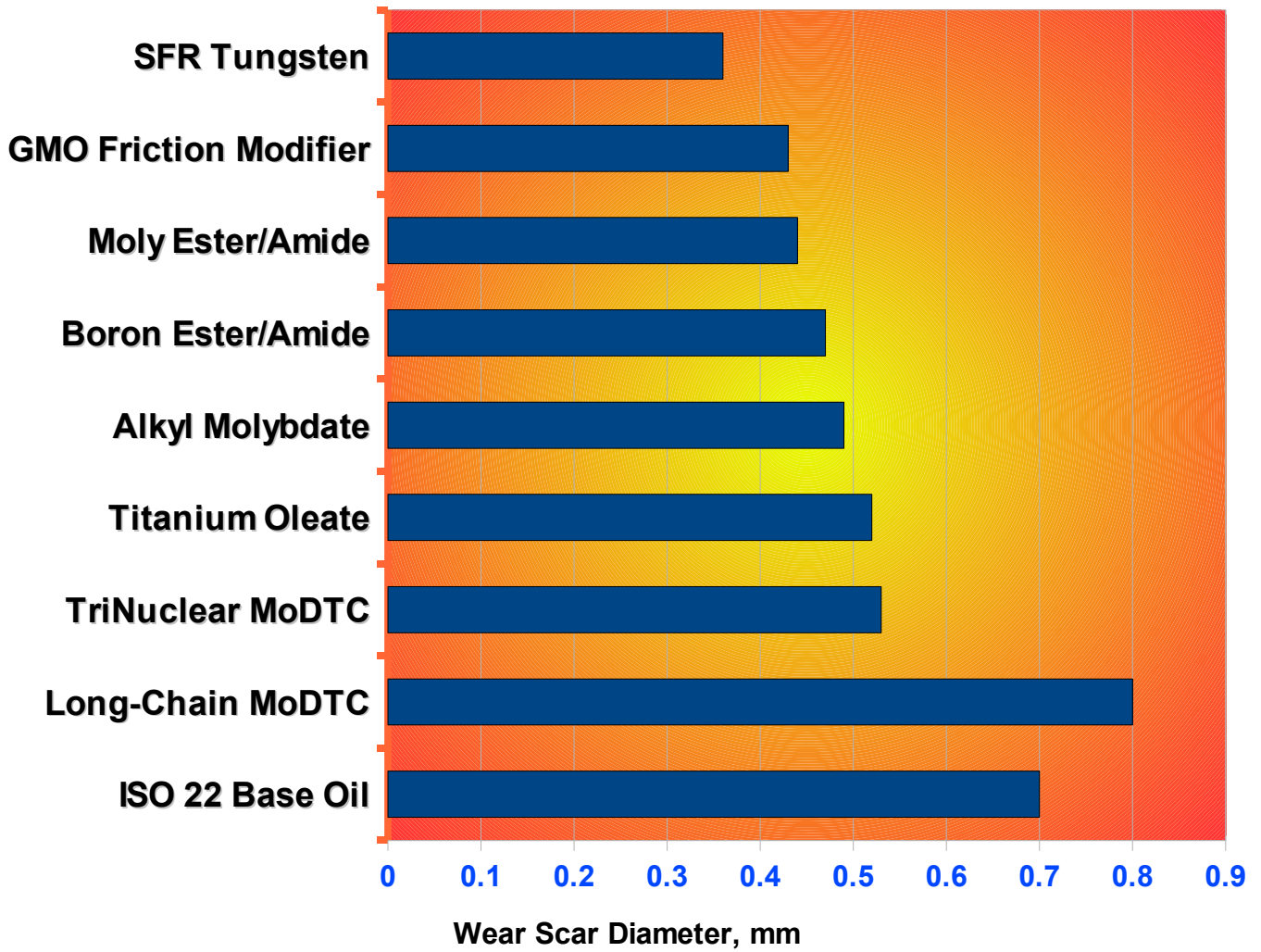
By using secondary diarylamine antioxidants and organo-tungsten compounds one can significantly improve anti-oxidation performance to lubricating oil compositions. The tungstate acts synergistically with the anti-oxidants providing oxidation control much improved over that provided by either of the components separately.

SFR's synthetic fortifiers contain organo-tungsten with special alkylated diphenylamines for deposit control at elevated temperatures, which improves oxidation stability and drain intervals. In addition, it will not effect seals and has a very low friction coefficient to reduce wear significantly in a lubricant such as motor oil. Testing has revealed tungsten has excellent anti-wear properties over molybdenum (moly) and being a transition metal actually bonds with iron to form a smoother service. An examination of the tungsten on the surface of the tested parts showed there is more than just a deposit of the additive onto the steel or iron surface. The tungsten has, in fact, become incorporated into the iron oxide of the steel surface.

The tungsten fortifier is also synergistic with SFR's extreme pressure technology to provide dual protection against wear. This represents a significant improvement in SFR's synthetic product line, which include: Gaszol for all gasoline engines, D-Sol for all diesel engines, Gearzol for all gear Boxes, H-Zol for all hydraulic systems, and Comprezol for all compressors.

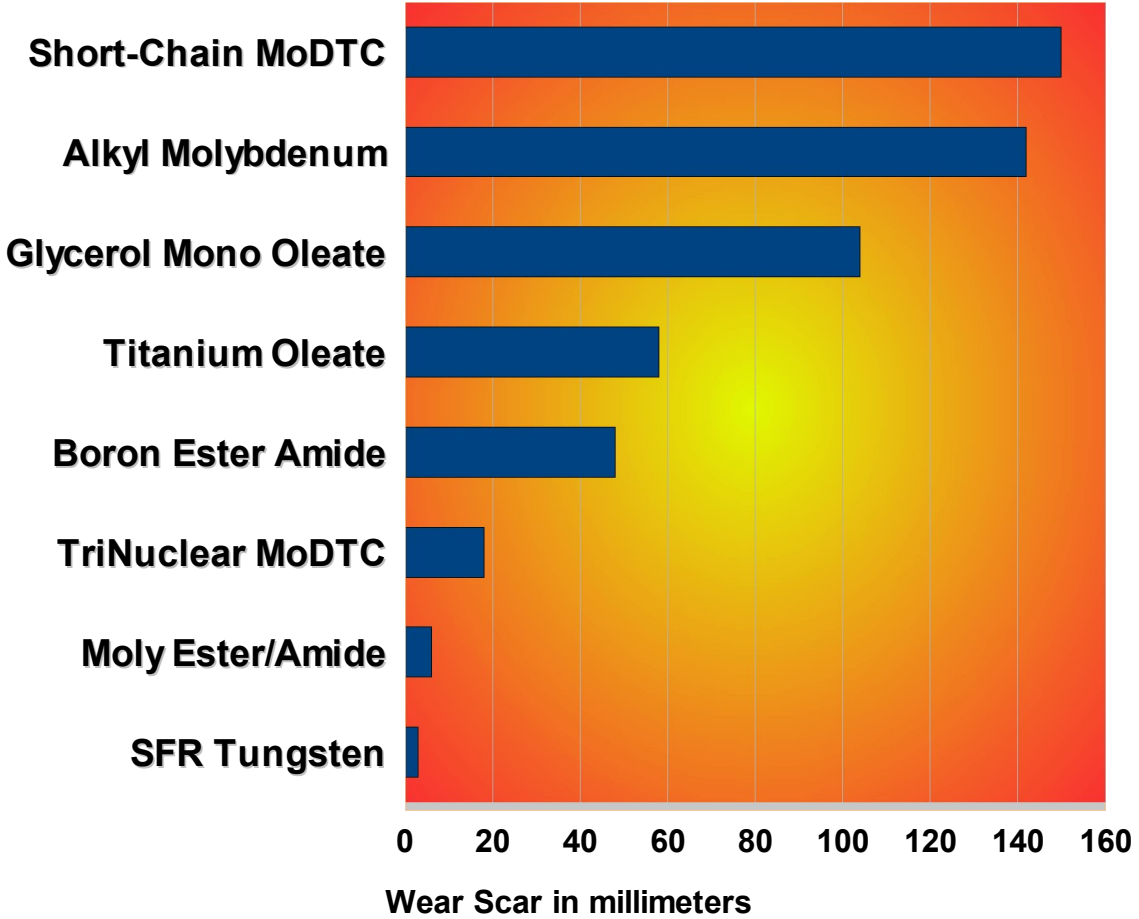
Anti-Wear Performance

Four Ball Wear 1800 rpm, 54 ° C., 1 hr. @ 20 kgf 50 ppm metal



Anti-Wear ASTM D2670

ISO 22 Base Oil; 500 lbs. Load; 1 hr



SFR Synthetic Series Features and Benefits

- Improved Detergency and Dispersancy for protection against sludge
(Cleaner engine reduces wear and deposits)
- Friction Modifier for improved mileage and fuel economy
(More miles per gallon of fuel)
- Friction Co-efficient for less wear in hydrodynamic conditions
(Less Friction on cylinder liners and pistons-Longer lasting Engine)
- Extreme pressure additives for reduced wear in boundary conditions
(Less Friction on valve train, valve lifters, push rods, valve stem tips, and parts of the rocker arms-Longer lasting Engine)
- Extended Oxidation performance for longer drain interval
(More miles between oil changes)
- Better performance during higher heat conditions
(Less thermal breakdown during towing and extreme heat)
- Compatible with new catalytic systems
(Safe for all catalytic emission systems)

The new SFR Synthetic Series is formulated in ProTecta and SFR-Gaszol, D-Sol, Gearzol, Comprezol, and H-Zol products. This is the most complex formula ever created by SFR. It is based on the patented technology of Tungsten, which reduces wear over metals such as Molybdenum (moly) and Titanium.