



PERFORMANCE DIESEL, LLC
CHEMISTRY-DRIVEN PERFORMANCE

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Technical Topic WASA (Wax Anti-Settling Agents)

Today's ULSD diesel during winter is causing many more winter operational problems as the result of Heavy Wax Drop Out. The problem of Wax Drop Out has been associated with the increased processing of WCS (Western Canadian Select- Tar Sands Crude). Tar Sands crude is being pipelined from Alberta, Canada direct to Superior, WI and south to Chicago. For example, the BP Whiting Refinery invested 6 Billion dollars to process this heavy crude and the Exxon-Mobil and Citgo Refinery also are adding WCS to their crude slate. WCS today is selling at a discount of \$15-20/barrel but it wasn't that long ago when the discount was closely to \$40-50/barrel less than WTI (West Texas Intermediate).

The normal rule of thumb is the maximum reliable winter fuel operability was 20F below the fuels cloud point, but today with diesel fuel containing Tar Sands the reliable operability is closer to 10F below the fuels cloud point.

The solution to his major problem is to blend lots of No.1 or using a winter additive package that contains Terpolymers, Heavy Wax Modifiers (HWM) and WASA (Wax Anti-settling Agent). It is important to note that conventional EVA-Copolymers may claim wax anti-settling but this level of protection is minimal, as the majority of the heavy wax will drop out of the diesel during overnight and especially over the weekend. The most effective approach is to use a winter additive package that makes the claim of containing **WASA**. With WASA technology formulated as an integral part of the winter additive enables you to regain the 20degree delta below the fuels cloud point—without WASA, the fuels winter operability will not be 20F, but closer to 10F.

Our, Petroleum Laboratory, has the ability, to set-up a static test of glass jars of treated fuel treated with your winter additive and glass jars treated with our antigel additives formulated with WASA technology. The glass jars are stored at 10 degrees below the fuels cloud point and within 48 hours the jar treated with WASA is cloudy, with minimal wax drop out and the other glass jar with typical winter cold flow chemistry shows significant wax drop out. This heavy wax that has settled is picked up at start up and severely plugs the fuel filters preventing the equipment to start- GELLED. The bottom line is do not rely on CFPP laboratory results, unless using a winter additive that makes the specific claim of containing WASA.

An effective winter additive package must contain:

- Effective Terpolymer (three different polymers), much more advanced than an EVA-Copolymer (2 different polymers)
- Effective Heavy Was Modifiers (HWM)
- Effective Wax Antisetling Agents (WASA)
- Non-Alcohol Jet fuel type glycol ether deicer in sufficient levels to depress the freeze point of 100ppm of water down to -20F

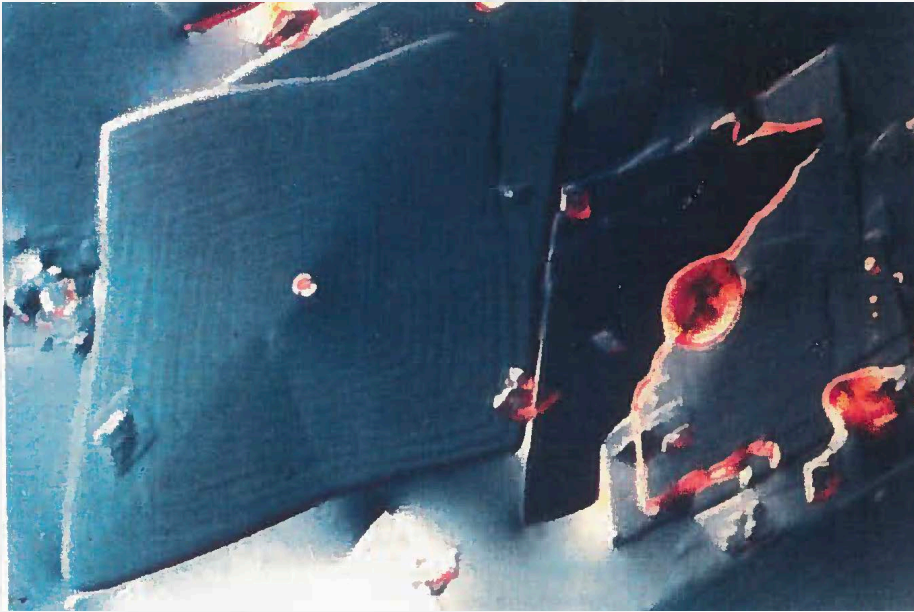


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Untreated Diesel Fuel



Treated Diesel Fuel

