

LUBE

TECHNI-GRAM



FROM :

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NEW APPROACH TO COLD FLOW TREATMENT OF DIESEL FUELS

Within the trucking and heavy equipment industries, one fact is certain...today's diesel fuel needs help! It's hard to imagine, but common cold weather performance problems associated with diesel fuels can bring equipment to a dead stand-still in as little as 1 ½ minutes. Modern refinery fuel blends rarely provide satisfactory severe cold weather performance. They typically thicken at lower temperatures, thereby plugging fuel filters (cold filter plugging) and fuel delivery systems, making cold weather starting difficult or impossible.

Fuel gelling is the problem. With cold weather fast approaching, many owner/operators of trucking and mobile equipment are going to find themselves losing money while they are virtually out of business due to "cold weather downtime." Cold temperature flow problems in middle distillate fuels are caused by wax. As the temperature drops, typical diesel, burner, and other middle distillate fuels begin to gel. Wax crystals begin to form in typical fuels around 20° F. (-7°C.) and below. As little as 2 to 3 percent concentration of these wax crystals is all that is required to form a crystalline lattice which then flows through the fuel system until it reaches an obstruction (normally the fuel filter) and plugs it. While some refiners do "winterize" their fuels in an attempt to improve cold weather performance, most of the time it is simply not enough for those users who must operate in severe cold. And, those refiners who do treat their fuel, normally treat it only in the winter months. So, bulk fuel stocks purchased and stored in the summer or fall, but used in the winter, offer no low temperature protection.

One Solution. One of the common solutions to winterizing diesel fuels is to blend No. 1 diesel stock with No. 2. The blends range anywhere from 10% to up to 50% of No. 1, fuel depending upon temperatures. The logic behind this is that No. 1 is a purer fuel with a lower concentration of wax. The disadvantage of this approach is that it raises the cost of the fuel and lowers performance, because No. 1 diesel fuel does not have the power output of a No. 2 diesel fuel since wax is a storehouse of power and contributes heat and energy to the combustion. The rule of thumb used in the industry is that for every 10% of blend of No. 1 fuel, there is a 1% loss in power. So a typical 30% blend yields a 3% loss of power. Along with that loss of power comes the higher abrasive characteristics of No. 1 fuel, which, of course, results in additional wear in fuel pumps and injectors.

Customers have a choice. Now, thanks to *Winter Formula* SWEPCO 501 Premium Diesel Fuel Improver, customers can tailor their fuel to their needs all year long without the costs and disadvantages of blending fuels. SWEPCO 501 Premium Diesel Fuel Improver is proven to eliminate problems associated with typical untreated diesel fuels such as fuel injector deposits and poor ignition quality. Now, the state-of-the-art chemistry found in *Winter Formula* SWEPCO 501 Premium Diesel Fuel Improver allows customers to also eliminate fuel filter plugging and fuel gelling.



... to keep it running

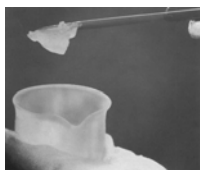
Winter Formula SWEPCO 501 contains wax crystal modifiers that alter the size and shape of the small wax crystals into compact needle-shaped prisms, which prevent the fuel from gelling. Even though the fuel contains beneficial wax, it will still flow if crystal growth is prevented. Effectiveness of **Winter Formula** SWEPCO 501 Premium Diesel Fuel Improver depends entirely on the individual fuel blend being treated, but satisfactory performance is typically extended to -10° F to -20° F when used at the labeled treat rate (1:1000 for drums, pails and cases of quarts/ 1:500 for cases of 12-ounce bottles). For severe temperatures, the treat ratio can be doubled, (1:500 for drums, pails and cases of quarts/ 1:250 for cases of 12-ounce bottles) to provide performance from -20° F to -40° F. **Winter Formula** SWEPCO 501 also helps prevent the formation of ice in fuel lines and tanks, which have become contaminated with water. Remember: SWEPCO 501 **Winter Formula** must be added to the fuel and thoroughly blended at temperatures well above the temperatures where problems may begin. Ice begins to form in most fuels around 32° F (0° C). So fuel should be treated before temperatures reach 32° F. (0° C).

WINTER PERFORMANCE

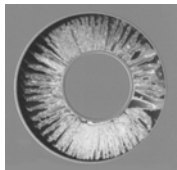
- Improved cold fuel flow and filterability.
- Boosts cetane number (ignition quality) for faster cold starting, quicker warm-ups, and full power strokes.
- Lowers cold fuel filter plugging temperature.
- Minimizes cold weather misfiring
- Smooths fuel combustion processes, which reduces engine noise and possible over pressure damage to piston rings and rod bearings.
- Minimizes horsepower robbing combustion chamber and injector deposits thereby permitting maximum fuel economy.
- Stabilizes and inhibits fuel to prevent deterioration during storage, plus limits rust and corrosion of tanks and fuel system components.
- Helps control smoking and significantly reduces levels of hydrocarbon, carbon monoxide, nitrogen oxide, and other emissions.

CUSTOMER BENEFITS

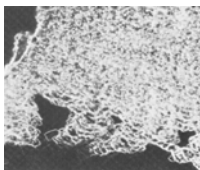
- Less “out of service” time due to clogged filters resulting in fewer tow-in calls.
- Eliminates or reduces the need for blending costly, less energy efficient No. 1 diesel fuel or kerosene into No. 2 diesel fuel during winter months.
- Increases injector and injector pump life and reduces repairs.
- Reduces fuel filter replacement.
- Reduces fuel consumption in over-the-road or off-the-road diesel equipment by keeping injectors and upper cylinder areas clean and working at maximum efficiency. Increases horsepower output...more power from each gallon of fuel.



This is how gelled fuel looks.



Untreated fuel plugged this filter solid in 1 ½ minutes @ -4° F.



Wax crystal lattice can restrict fuel flow.



Treated fuel with flowable modified crystals.