

LUBE

TECHNI-GRAM



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FUEL TREATMENTS FOR DIESEL FUEL STORAGE

For some years now it has become apparent that diesel fuels give evidence of being unstable when they are stored for any appreciable period of time. They darken and turn red to brown in color, form red to brown deposits in containers in which they are stored, cause corrosion in metal tanks or other metal containers in which they are stored and form mayonnaise like emulsions if they come in contact with water. In the refining process, steam is injected into distillation columns (equipment) to help distill and to prevent thermal degradation of petroleum products, so water in contact with diesel fuel is not uncommon. It is often found in the bottom of storage tanks.

Diesel degradation in storage has always been a problem, but one that continues to escalate. In today's market the military and commercial jet aircraft fuel is a high volume product for major oil companies (petroleum refiners). Demanding specifications are required for these products and this is as it should be. These aircraft fuels must be made from "straight distillate" petroleum fractions that are carefully refined to assure the utmost stability and have no tendency to degrade in storage as diesel fuels do. In so doing, about three fourths of the stable petroleum fractions that could be used for diesel fuel are preempted for use as jet aircraft fuels.

There is a way to meet the increasing needs of light end production...it is called Catalytic Cracking. In the catalytic process, long chain hydrocarbons that make up the heavy crude, are broken up into the shorter hydrocarbon molecules that are the light ends. These light ends can now be distilled into the various fuels that are categorized as light distillates...kerosene, No. 1 diesel, No. 2 diesel, and a few more. That's the good news. The bad news is this catalytic cracking fuel has a memory. In the aging process, these "broken" molecules tend to recombine and recreate the original long chains (Repolymerization). This process of aging can be a big problem in cracked fuel. As distillate fuels age, they oxidize, a process which leads to increased accumulations of gum and sludge. Pronounced color change is usually the first indication of aging, indicating a drop in both quality and marketability of the fuel.

Sludge is also a common contaminant in diesel fuel and it is formed during storage. It consists of emulsified fuel, water, asphaltens, and sediment. Sludge accumulation in tank bottoms can lead to filter strainer plugging and fouling of fuel preheaters. In addition, sediments in the form of dirt and rust add to the problems and further compromise the performance of the fuel.

Unfortunately, the need for fuel cleaning and analysis have become very commonplace in maintenance operations that require storage of diesel fuel. Diesel fuel stored without the addition of an appropriate stabilizer that contains an anti-oxidant and corrosion inhibitor will oxidize and deteriorate with age. This



... to keep it running

process leads to increased accumulations of gum and sludge, bacterial growth and other undesirable contaminants which eventually will require fuel “polishing” (a tedious and expensive filtration process conducted through portable filters) in order to ensure proper equipment performance.

The above mentioned factors can produce adverse effects in engine performance. Stored fuel decomposition may cause:

- Slow starts
- Power losses
- Total breakdowns
- Frequent injector & filter replacements
- Unnecessary overhauls

Stored Fuels Must Be Maintained For Emergencies

People have always stored fuel for standby power and emergencies. To operate effectively today an even greater number of businesses and services rely on technological advances in systems management. These systems often rely on a constant source of electrical power and assure this with standby generating equipment. Operations include hospitals, power plants, municipalities, airports and many more.

These operations cannot afford unexpected energy interruptions or failures and therefore, must have and maintain an adequate supply of *reliable* stored fuel.

Customers can avoid expensive headaches by treating their fuel with **SWEPCO 501 Premium Diesel Fuel Improver**. Fuel treated with SWEPCO 501 remains stable because special ingredients retard the oxidation process; and, as a biostatic compound, it prevents the infestation of microbial growth. This protection makes SWEPCO 501 ideal for treatment of stored and back-up fuel supplies which are held for lengthy periods of time.

ASTM D2274 Fuel Stability Results for SWEPCO 501

Oxidation of diesel fuel can cause the formation of gums which can both increase the formation of deposits and increase the chance of filter plugging. In this test, oxygen is bubbled through a treated diesel fuel at a rate of 3 liter/hour for a total of 16 hours. The performance criteria measures the amount of insolubles and the fuel color change. SWEPCO 501 provided excellent stability as illustrated by a 80% reduction in fuel insolubles and no change in fuel color.

SWEPCO 501 Premium Diesel Fuel Improver improves the quality and combustion characteristics of any distillate fuel and helps customers minimize fuel system maintenance costs, maximize power output and insure efficient, economical operation of diesel engines. While SWEPCO 501’s effective detergent and dispersant chemistry helps keep injectors, plungers, filters, screens and other critical diesel engine fuel system components clean, the oxidation inhibitors and storage stabilizers used in the formulation of SWEPCO 501 protect against oxidation and the accumulation of gum, sludge and bacterial growth (Note: SWEPCO 501 prevents infestation of bacterial growth, but fuel must be treated with SWEPCO 501 before healthy colonies of micro-organisms are formed).