



Microbiologically Influenced Corrosion

The U.S. Environmental Protection Agency (EPA) has released the results of a 2015 study on the ultra-low sulfur diesel (ULSD) fuel conducted to attempt to determine what is causing the corrosion fouling issues associated with ULSD USTs.

Although the EPA acknowledges from the beginning of its study that this research is still too limited to determine a definitive cause for accelerated microbial growth, it does confirm that, "MIC [microbiologically influenced corrosion] is likely playing a major role in the corrosive environments in USTs storing diesel."



Tips For Limiting Corrosion:

Particulates and water content in the fuel is the strongest possible predictors of corrosion

- Regularly monitor and remove any water present in the UST
- Filter fuel for water and particulates before it is delivered into the UST or recirculate and filter water and particulates while it is stored
- Add nitrogen generating equipment to limit an oxygen rich atmosphere inside tanks
- Use liquid corrosion inhibitor additives or other corrosion inhibitors, including filming amines
- Use biocides to kill or other fuel treatments to disrupt existing microbial colonies or prevent future MIC

Accelerated corrosion occurrences primarily in submersible turbine pumps, drop tubes, sensor probes and dispenser components. Corrosion occurring in systems storing and dispensing ULSD is likely due to the dispersal of acetic acid throughout USTs. The acetic acid is likely produced by bacteria feeding on low levels of ethanol contamination. Dispersed into the humid vapor space by the higher vapor pressure and by disturbances



during fuel deliveries, acetic acid is deposited throughout the UST system. This results in a cycle of wetting and drying of the equipment which concentrates the acetic acid on metallic equipment causing severe and rapid corrosion. Contamination may be occurring in pipelines, terminal systems, cargo tank compartments or manifold vent systems.



As a site owner, be aware of:

- Corrosion of metal components in UST systems storing diesel appears to be common.
- Many owners are likely not aware of corrosion in their diesel UST systems.
- The corrosion is geographically widespread, affects UST systems with steel tanks and with fiberglass tanks, and poses a risk to most internal metal components.
- Ethanol was present in 90 percent of 42 samples, suggesting that cross-contamination of diesel fuel with ethanol is likely the norm, not the exception.
- The quality of diesel fuel stored in USTs was mixed.
- Particulates and water content in the fuel were closest to being statistically significant predictive factors for metal corrosion, but connection cannot be discerned.
- EPA recommends owners visually inspect USTs storing diesel as part of routine monitoring.

Dissolving plastics and creating deposits

Ethanol is an excellent solvent and drying agent that dissolves old gum and varnish deposits from the gas tank and fuel lines. However, it can also dissolve plastic and create deposits.



Ethanol and Water Don't Mix

Ethanol will absorb a small amount of moisture and stay in suspension within the gasoline for a while. However, the ethanol will only absorb up to $\frac{3}{4}$ of an ounce of water in a gallon of gas before it reaches its saturation point. Once the ethanol has absorbed enough moisture to reach its saturation point, phase separation occurs. Phase separation means the ethanol and absorbed water drop to the bottom of the fuel container since it is heavier than the gas and oil, leaving the gasoline and oil mix to float on top of the tank. The result; piping and hanging hardware are ruined with rust and corrosion.

Upcoming Training Schedule:

- Veeder Root November 13-16
- Dispenser November 27–
 December 1
- Passport December 18-22

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