

Tank Maintenance and Microbial Growth 2019

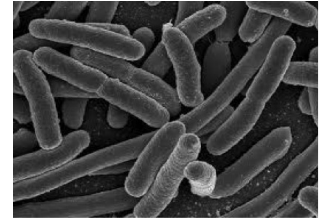


A well designed and executed tank maintenance program will help avoid issues caused by excessive buildup of moisture or water and prevent microbial born infestations. Modern fuels are more susceptible than ever to microbial growth (commonly called “bugs” or “algae”). Moisture-related issues that can lead to many other problems such as poor fuel quality, damage to storage tanks, and general operational issues.

What is microbial growth?

Microbial growth is caused by **bacteria** or **fungi** that are present in all fuel. When these microorganisms have the proper conditions, they thrive and can cause a wide range of issues in fuel storage tanks and vehicles.

For microbial growth to occur, a fuel/water interface must be present where the microbes can live and feast on the hydrocarbons present in the fuel. Once these conditions occur, the microbes can multiply very rapidly and begin creating waste. It is the waste that they create that produces the harmful elements that can damage fuel systems.



Tell Tale Signs

Common indicators that a microbial issue is occurring typically start with **slowed fuel flow caused by filter plugging**. When observed, filters often show a slimy goo that is causing the plugging. Sometimes contaminated fuel smells like rotten eggs, other times it can look completely “normal”.

There are many different types of microbial organisms and as a result, there is not a “golden rule” of what happens when a problem has occurred. When microbial growth occurs, it can be very frustrating to the end user because the equipment they are depending on might not function as needed.

Tank Maintenance Frequency

Proper tank maintenance can be instrumental to the prevention of microbial growth before it can be given a chance to occur. Typical tank maintenance programs include regular fuel sampling and quality testing, as well as, regular housekeeping measures and observation of tank monitoring systems.

Recommendations:

- 1) **Fuel storage tanks are sampled and tested at least twice a year**, often during the Fall and Spring seasons. Fuel testing programs allow us to keep track of moisture levels that are absorbed in fuel, monitor for possible tank bottoms that could start to form and keep watch for microbial growth that might be starting to fester.
- 2) **Proper housekeeping of storage tanks** and other fuel delivery infrastructure is also extremely important. Elevated moisture levels can result from a wide range of causes such as tank leaks, faulty gaskets or vents, seepage when opening fill tubes, condensation.
 - Regular inspection of fueling systems can identify weaknesses that could allow moisture to infiltrate tanks early on.
 - Proper housekeeping measures are a key prevention measure that allows us to identify issues before they become severe enough to cause an operational issue.

Tank Maintenance Protocol

- A) **Twice a year, take samples from tanks** and send them to a fuel testing facility for moisture content and microbial growth testing.
 - Samples should include both a bottom sample taken from a “bacon bomb” and a nozzle sample, and in some cases, a top, middle, and bottom sample might be the best plan
- B) At the same time samples are taken, treat tanks with a **biocide**. This will eliminate any microbial growth in tanks and also move to other vehicles or tanks that are fueled from these locations.
- C) If a sample results show an excessive amount of moisture, tanks should be **checked for water bottoms** and a combination of physical water removal and moisture control treatment can be used to alleviate excess water or moisture.
 - Fuel polishing systems can help in these cases to ensure that the fuel remaining in the system is free of contaminants
- D) There are also **tank maintenance additive packages** designed to help maintain tank cleanliness and fuel quality while in storage. These provide the following benefits:
 - Prevent oxidation to keep fuel fresh over long periods of storage
 - Moisture control to remove water
 - Detergents and dispersants to prevent buildup and formation of large contaminants
 - Corrosion inhibitors to protect tanks and other engine parts from rust and corrosion

Solutions

When microbial growth occurs in a storage tank it must be killed, removed, and prevented from coming back.

- 1) Treatment with **biocide** and removal of tank bottoms will help to kill active infestations and remove the environment that they need to feed and create waste when they occur.
- 2) Usage of **proper tank maintenance programs** including regular testing with **proper storage tank housekeeping measures** are very effective measures to prevent microbial growth.

