Bell Performance, Inc. **tel** 407-831-5021
1340 Bennett Drive **fax** 407-331-1125
Longwood, FL 32750
www.bellperformance.com
www.WeFixFuel.com

Top Ways Microbes Cause Headaches For Stored Fuel Users (And What To Do About Them)

Today's fuels are not what they used to be. This has tremendous implications for everyone who stores fuel for later use, as well as fuel polishers and service providers for whom these stored fuel users are a core part of their business. Truck fleets, emergency backup generators, mission critical facilities, fuel polishers, tank cleaners – they're all affected by how fuels have changed.

Consider the facts:

- ***More than half of all consumers aren't happy with the fuels they use***
- ***More than 90% of tanks inspected show microbial growth in as little as 2 months after cleaning***
- ***Signs of corrosion damage in fuel storage tanks can appear within 6 months of cleaning***
- ***Today's diesel fuels have less than 25% of the storage life of fuels from thirty years ago***

Whether you use stored fuel or you provide fuel polishing/tank cleaning services, these fuel issues cost time and money. For some situations like mission critical usage or emergency backup systems, they have the real potential to cause huge problems for all of these parties by compromising the stored fuel's ability to do what it needs to do at important times of need. Microbial problems in fuel are a consistent and serious threat.

Chances are, you find yourself in this boat. These issues are a threat to your business or a threat to those you do business with. So the ball is in your court. Are you going to shine the light of solution on your clients' problems with microbes in fuel? Will you stay ahead of microbe problems in the stored fuel you rely on? Read on and learn more here.

1. Did you know that fungus, bacteria and mold grow more quickly in biodiesel blends than in other fuels?

Good fuel housekeeping practices always involve staying in control of water accumulation in storage tanks, as water is the key ingredient needed for microbes to grow and thrive. Once a microbial colony is established in a tank or fuel system, they can quickly cause major problems (from filter plugging to destruction of fuel stability and quality). And what's more, they're impossible to get rid of without using a potent biocide treatment to kill them.

Microbial growth from fungus, bacteria and mold is associated with the storage of conventional petrodiesel fuel storage, but they grow just as easily when you have a portion of bio- added to that diesel fuel. Microbes need water to live and they feed off elements of the diesel fuel at the

Bell Performance, Inc. **tel** 407-831-5021
1340 Bennett Drive **fax** 407-331-1125
Longwood, FL 32750
www.bellperformance.com
www.WeFixFuel.com

same time. Biodiesel not only provides provides an excellent food source for all kinds of microbes, but is hygroscopic itself – it attracts more water than the diesel fuel would alone.

All of this should be a concern to users and servicers of stored diesel fuel because low level concentrations of biodiesel are now universally present in almost all diesel fuel. Fuel suppliers can add up to 5% biodiesel concentration to diesel fuel without labelling it as such. This makes today's stored diesel fuels even more of a meal for problem-causing fuel microbes.

***Your Action Items (What To Do)**:* If you rely on stored fuels in your business, you should be vigilant about the presence of water in storage tanks and watch for possible signs of microbial infestation. The first and most noticeable sign of this problem from an operational standpoint is a rise in the rate of filter plugging. Then you can look for the presence of significant water in the bottom of the tank. Typically, if those two things are noted, it would be time to do a strip test to detect microbes. If that comes back positive, it's time for remedial action.

2. Government regulations have directly contributed to a rise in microbial problems in fuel

This is not to say that the government is causing these problems, but rather, that a couple of pieces of legislation have changed the fuel environment such that microbial problems are more widespread than ever before.

The big one is the mandate for the use of ultra-low sulfur diesel fuel. The sulfur content in diesel fuel used to act like a natural biocide, restricting the growth of microbes. Once that was taken out in 2006-2007, there's far less content in the fuel that prevents bacteria and fungi from establishing themselves in fuel. And this means you're more likely to develop microbial fuel problems even when using something to control the water in the fuel. That's not to say this means water-controlling treatments have no use, but the chances of problems developing even with their use is higher than ever, and is more a direct result of the mandate to get the sulfur out of diesel fuel.

The other mandate is the Renewable Fuels mandate. Congress mandates a certain volume of renewable fuels (ethanol and biodiesel) to be used in the national fuel supply. And if some of your clients have anything to do with state or local government, it probably falls on them to be required to use a certain amount of biofuel in their fuel supply. And as noted above, biofuels like ethanol and biodiesel are even more likely to develop microbial problems than other fuels.

***Your Action Plan**:* Being prepared with facts will give you a sense of what to expect. If you know there's a greater chance of this kind of problem, you're better able to recognize and correctly assess the problem. **Fuel testing** is invaluable for monitoring the condition of stored fuel and knowing if a problem is about to strike. It's bad enough to have an unexpected problem arise. But if you don't know what to do about this unexpected problem, the tensions can triple. When you have the right answer on what to do about an unexpected problem, your problems are minimized and your professional life is easier.

Bell Performance, Inc. **tel** 407-831-5021
1340 Bennett Drive **fax** 407-331-1125
Longwood, FL 32750
www.bellperformance.com
www.WeFixFuel.com

3. If your stored fuel has microbe problems, you probably have corrosion problems, too.

Or if you haven't noticed corrosion issues, it's only a matter of time. Microbes are associated with system corrosion because 1) they give out acidic byproducts during their life cycle, and 2) their presence is correlated with the presence of free water which, itself, is highly corrosive to fuel storage tanks. Those are good reasons to get rid of any microbe problems you (or your customers) find. Replacing filters is a hassle and an expense but maybe some people decide to live with that. But the longer the microbes persist in the storage system, the more damage they are causing to the more expensive parts of the fuel storage and distribution system. And that's when the big bills start to come in. Not to mention, the longer microbial problems stick around, detected or undetected, in stored critical use fuel, the greater chance that fuel isn't going to execute its function during an emergency. And that's when the really really big bills come in.

Your Action Item: Once discovered, it's imperative to take action on microbe problems in fuel and storage tanks.

4. Getting rid of bacteria and fungi in fuel (and protecting stored fuel for the future) requires specific action

It used to be that simply controlling water accumulation was enough to prevent most microbe problems in fuel (See point #2). And it's still important to maintain proper housekeeping in this regard, because you will prevent some microbe problems this way. But not nearly all of them. Once this kind of problem is noticed, a biocide must be used to actually kill the microbes. Then the fuel is filtered to get rid of the dead microbes. As a stored fuel user, you can do this either by being prepared with extra fuel filters, or by paying a polishing service. It just depends on your expense tolerance. But the biocide use is the key part of the equation. You simply cannot get rid of a microbe problem in any kind of fuel (biodiesel, diesel or even ethanol) without it.

Your Action Item(s): To stay ahead of problems like these, there are two best practice recommendations. First, implement a biocide as a solution for this serious problem. There aren't many biocides out there because the regulation on their development and sales are very strict. Bell Performance carries a very good biocide called ***Bellicide*** but we're not here to tell you why you should buy it. Rather, examine some of the choices in the marketplace and look for some important features:

1) It should be concentrated, with treat rates of no more than 1 oz to 40 gallons for "shock treatment" and a lower dose for maintenance.

2) It should be effective in both the water phase and the fuel phase. This is essential because the biocide is going to encounter both in the tank, and there are certain biocides out there that are

Bell Performance, Inc. tel 407-831-5021
1340 Bennett Drive fax 407-331-1125
Longwood, FL 32750
www.bellperformance.com
www.WeFixFuel.com

actually deactivated in water.

3) It should maintain a kill rate for a long time. This speaks to the power and effectiveness of the biocide – they get "used up" as they encounter microbes in the fuel. So if a biocide keeps killing for a longer time, it means it's more effective, pound for pound, than something that doesn't.

And the fourth suggestion dovetails into the second best-practice suggestion.

4) Make sure you partner with a someone that can offer support, including showing you how to best use the biocide. A biocide is only effective when it comes in contact with the microbes in the tank. That means the fuel needs to be circulated. If a biocide supplier can't show you how to do that, you're better off going with one that will. Because there are few things worse than spending money to solve a serious problem and then not seeing it work because you didn't know how to properly apply it.

5) This means that you should seriously consider partnering with a knowledgeable expert to help carry out a good fuel PM (preventive maintenance) program on your stored fuel.

What makes a good partner? The best partners start by demonstrating that they have your best interests in mind. That means they're really to educate you on what they're doing (and why), along with making best practice recommendations on the things that you really should be authorizing for the care of your fuel, while steering you away from the snake oil things that don't work. That's what a partner does – they help you, they don't just help themselves at your expense.

A good fuel maintenance partner should also employ a hybrid approach to the care of stored fuel and storage tanks. A hybrid approach means they combine effective chemical treatment of the fuel (like fuel stabilizers, dispersants and biocides) with high quality mechanical cleaning processes to remove water, sludge and biomass. Both of these essential elements should be supported by best-of-breed diagnostic testing and monitoring of the stored fuel to give you an accurate picture of how the fuel's condition is doing.

If this sounds like something you should be considering, talk to Bell Performance. We can point you in the right direction. Just give us a call or go to www.BellPerformance.com and click on Fuel & Tank Services.