

CLEAN FUELS NATIONAL



**RECOMMENDED PRACTICES AND FUEL
QUALITY ISSUES**

WHO IS CLEAN FUELS NATIONAL?

- Family-founded in the year 2000
- Largest Fuel Quality Provider in the United States
- Patented Phase Separation Remediation program



STATE OF THE BUSINESS

What Are We Seeing?

- 30% to 40% Increase in Annual Tank Cleaning
- 3 Million Gallons of phase corrected in 2016
- Over 4 million gallons by the end of 2017



WHERE ARE THESE ISSUES?

- NJ to South Carolina
- Texas
- Florida
- Midwest



WHAT ARE THE MAIN ISSUES WE ARE SEEING?

- DSL issues – Water/Microbial Growth

Most issues we are encountering could have been prevented with a basic PM/Housekeeping Schedule



WATER INFILTRATION AND MICROBIAL GROWTH

When water enters a tank, even the smallest amount can allow for the growth of bacteria , algae and other microorganisms.

These organisms cause a variety of problems for the fuel and tank environment.



MICROBIAALLY INDUCED CORROSION



All metal surfaces are subject to the ravages of the corrosion caused by microorganisms. They form biofilms, slimy layers of colonies, that eat away at monitors, STPs and other equipment.

For this reason, even fiberglass tanks are subject to the damages caused by these metal-degrading organisms.



ACIDIFIED FUEL

Not only do these microorganisms actually eat fuel, their waste is acidic.

This further degrades the fuel, adding to the problem of corrosion caused by algae and bacteria.



WHAT CAN BE DONE?



First and foremost, keep water out of the tank.

For heavy contamination, a judicious use of biocide – and rigorous tank cleaning – can solve the problem.

When preventative maintenance measures have failed, we provide reliable emergency services to get your tank back up and running.



WHAT ARE THE MAIN ISSUES WE ARE SEEING?

- Phase Separation in Ethanol Blended Fuels



WHAT IS PHASE SEPARATION?

- What is Phase Separation?
- What are the Consequences of Phase Separation
- How can phase separation be avoided



WHAT IS PHASE SEPARATION?

- To understand phase, we need to understand the nature of blended fuels
- Blended fuel contains ethanol, a molecule that will mix with either water or fuel
- The ethanol in blended fuel allows for absorption of water – to an extent
- When the absorption threshold of a blended fuel is breached, phase separation occurs



FACTORS LEADING TO PHASE SEPARATION

- A blended fuel higher in ethanol will absorb more water
- Higher temperatures mean more water absorption
- As temperatures drop, the fuel becomes less tolerant of water
- Once the absorption threshold is breached, the water will fall out of suspension – and take the ethanol with it. As little as five gallons of water in 1000 gallons of fuel will cause phase separation



WINTER IS COMING

- Water hidden by blended fuels in warmer weather can rear it's head when temperatures drop
- Cold fuel loses some of it's ability to hide water contamination
- Fuel becomes more vulnerable to phase separation in cold weather
- Cold temperatures at night can lead to phase separated fuel in the morning.



CONSEQUENCES OF PHASE SEPARATED FUEL

- **Reduced Octane Fuel**
 - Wear and tear on customer engines, reduced engine performance
 - Customer dissatisfaction
- **The water/ethanol layer in a phase separated tank is a serious threat.**
 - Degrades tank equipment
 - Clogs filters
 - Causes damage to the tanks and engine components of vehicles



RESULTS OF PROPER HOUSEKEEPING

- Decreased expenditures – filters, seals, gaskets, etc
- Increased customer satisfaction – Faster pump rates, high quality fuel/increased MPG and equipment vitality
- Avoidance of equipment shutdowns



SLOW PUMP RATES – LOST OPPORTUNITY

When problems inside your fuel storage system start manifesting at the pump, the consequence is more serious than an upset customer.

- Slow flow rates mean longer fueling times, fewer customers can get fuel during peak hours
- Lines at the pump drive away potential customers
- Lost customers means lost revenue
- The cost of repairs and frequent filter changes is compounded by the cost of lost sales



PREVENTION - PART 1

REMOVE STANDING WATER

- **Immediately remove the source of water contamination.**
 - Water standing in sumps will find a way into the tank
 - The more water in a tank, the more likely phase separation becomes.
 - Check tanks from the ATG monthly for water, due to tank tilt in some cases it is more likely to be found from this access vs. only checking from the fill before incoming deliveries.



STANDING WATER IS A THREAT TO FUEL QUALITY



In addition to degrading equipment and accelerating corrosion, water in your sumps will find a way into your tanks.

Once water is creeping in to your tanks your blended fuels are at risk for phase separation.



PREVENTION - PART 2

HOUSEKEEPING

- Vigilant housekeeping
 - Test your tanks for water
 - Don't rely solely on ATG's
 - Phase detecting paste
 - Remove water from sumps and wells
- Listen to your filters
 - Frequent filter changes are an indication of water contamination



WATER INFILTRATION: BEST CASE SCENARIO

- Water is detected on a routine check.
- Water is removed from the tank immediately.
- Sumps are kept dry, the point of water entry is determined, equipment integrity is maintained.
- Business continues uninterrupted.



HOW CAN CLEAN FUELS NATIONAL HELP?



- When phase separation or fuel related issues occur, Clean Fuels National offers 24 hour emergency response.
- We offer fuel correction, allowing you to salvage fuel that would otherwise be lost.
- After removing water and cleaning the product, field tests are performed. A reduced-octane fuel can be boosted with a mid-grade or premium product.



PREVENTATIVE MAINTENANCE

The top fuel retailers in the US utilize a regiment of routine preventative maintenance inspections to monitor equipment integrity, fuel quality and curtail problems before they end up at the nozzle.

Waiting until catastrophe hits is the most expensive way to deal with the problem of water infiltration.

“An ounce of prevention is worth a pound of cure.”

