BioFuels Compatibility Issues?

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National Tanks Conference
Louisville, KY
September 2018

Tanknology

Outline

- Alternative or BioFuels – What's out there?
- What compatibility issues exist?
  - Potential?
  - Actual?
  - Recommendations & Resources
- Examples of Findings
  - Pictures of Fittings
  - Videos Inside Tanks
- Recommended Actions

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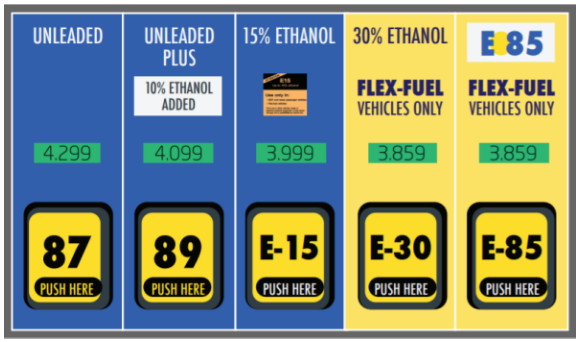
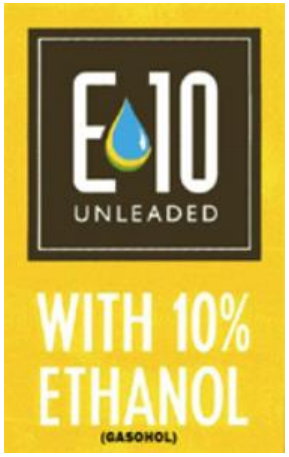
Types of BioFuels





Water?

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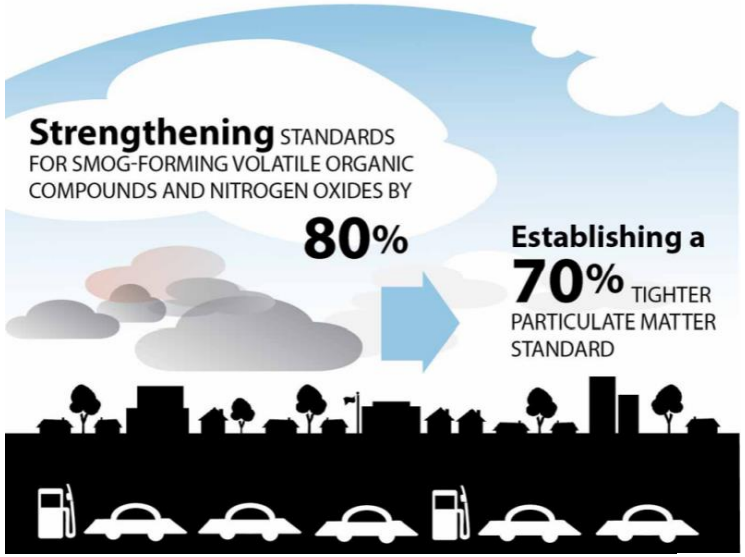
Tier 3 Gasoline (ULSG)

- EPA requirement beginning in 2017
- Gasoline meets 10 ppm sulfur (average)
- Tracked at refinery (credits, averaging, banking)
- Goal: Reduce sulfur & NOx emissions

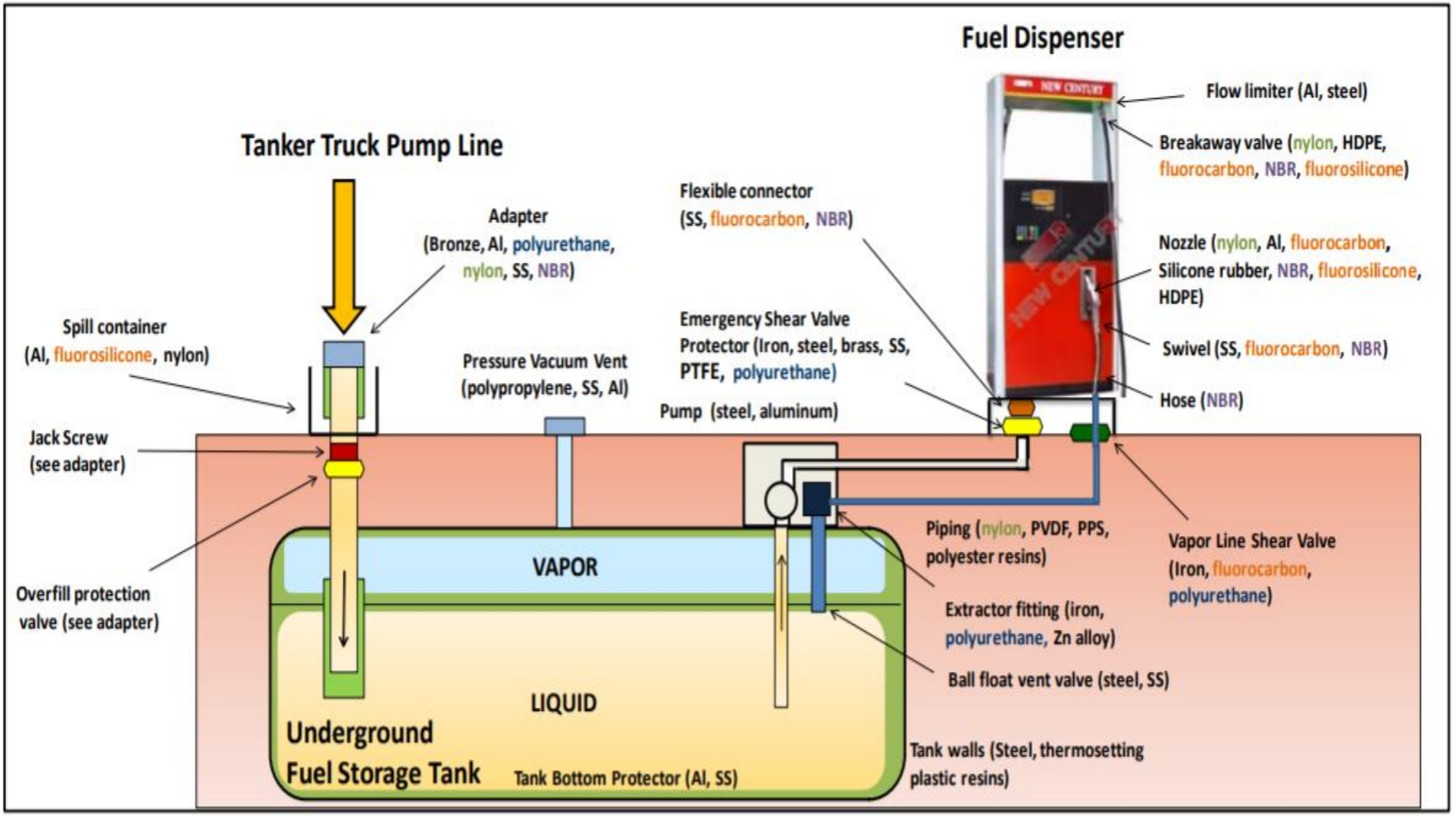


EPA Requirements

- Must verify compatibility for >E10 and >B20 fuels.

Area	1988 Requirement And Citation	Significant Changes To Requirements, Implementation,[1] And Preamble Location	Additional Information About The Change
Compatibility	Owners and operators must use UST systems made of or lined with materials that are compatible with the substance stored in the UST system. Two codes of practice are referenced in a note. [§ 280.32]	▪ EPA adds a requirement that owners and operators notify the implementing agency at least 30 days prior to switching to a regulated substance containing greater than 10 percent ethanol, greater than 20 percent biodiesel, or any other regulated substance the implementing agency identifies and meet one of the following: o Demonstrate compatibility through a listing by a nationally recognized independent testing laboratory or through equipment or component manufacturer approval; o or Use another method determined by the implementing agency to be no less protective of human health and the environment than the compatibility demonstration methods listed above ▪ EPA adds a requirement to maintain records to demonstrate compliance with 280.32 for as long as the UST system is storing regulated substances containing greater than 10 percent ethanol, greater than 20 percent biodiesel, or any other regulated substance the implementing agency identifies. ▪ EPA removes references to one code of practice. ▪ EPA revises definitions of motor fuel and regulated substance. **Implementation:** immediately [Section IV.D.4]	The 1988 UST regulation required UST systems to be compatible with the substance stored in them. This change does not alter that, but rather helps owners demonstrate their UST system is compatible with certain fuels before storing them. As newer fuels with different chemical properties enter the market place, it is even more important for owners and operators to clearly understand how to demonstrate that their UST systems are compatible with these fuels before storing them to ensure there are no releases to the environment due to stored fuels being incompatible with UST systems.

UST System Components



ORNL/TM-2013/243

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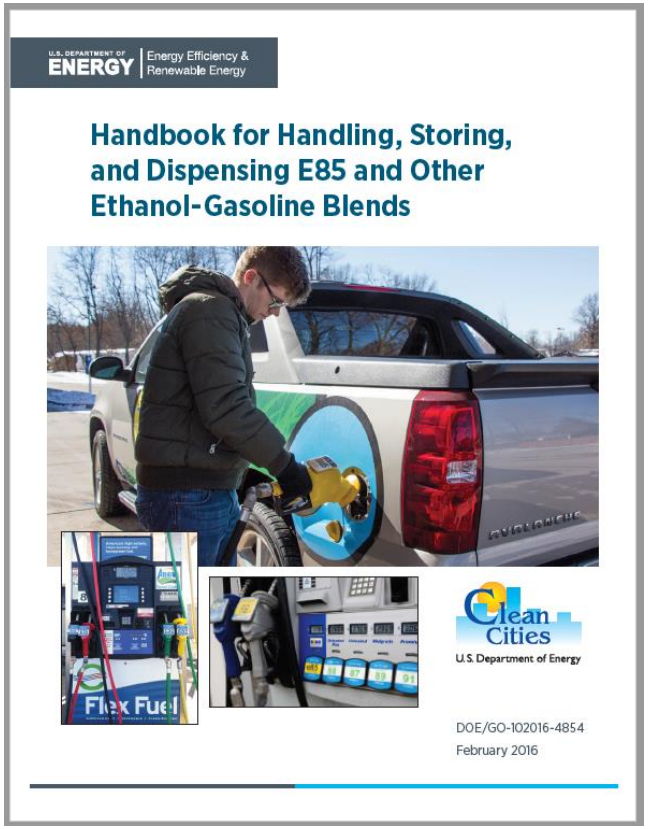
US DOE – Ethanol Handbook

- Certain materials commonly used with gasoline may be incompatible with mid- and high-level alcohol blends.
- Ethanol blends may impact metallic and elastomer materials in fueling systems.
- E85 acts like a cleaning agent and will initially mobilize sludge in storage tanks. E85 can also cause corrosion of some soft metals…
- Blends below E25 do not cause corrosion of metals (unless accompanied by a separate aqueous phase).
- Can combine with water and form “phase-separation” with high alcohol content that sinks to bottom of tank.



- https://www.afdc.energy.gov/uploads/publication/ethanol_handbook.pdf

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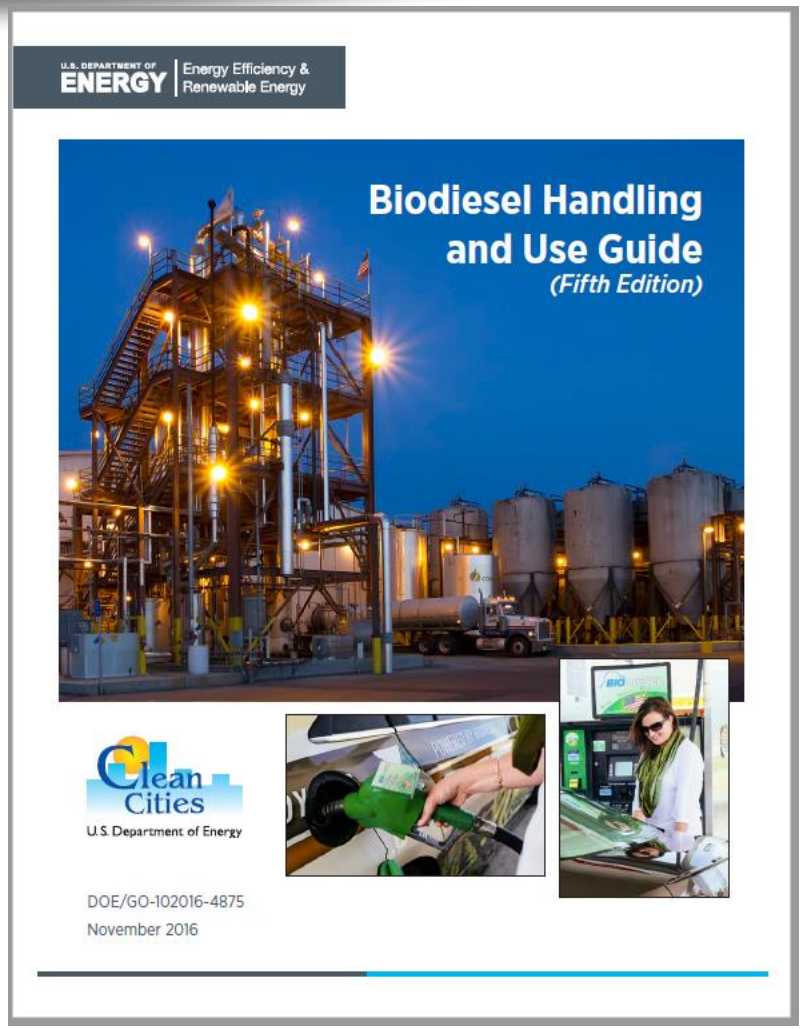
US DOE – BioDiesel Guide

- May cause cleaning of tank and temporary increased filter changes (>B20)
- B100 gels at higher temperature so may need heaters.
- B100 is not compatible with some hoses and gaskets.
- B100 is not compatible with some metals and plastics.

ASTM D975, allows for up to 5 vol% biodiesel to be blended into compliant diesel fuels.



- https://www.afdc.energy.gov/uploads/publication/biodiesel_handling_use_guide.pdf

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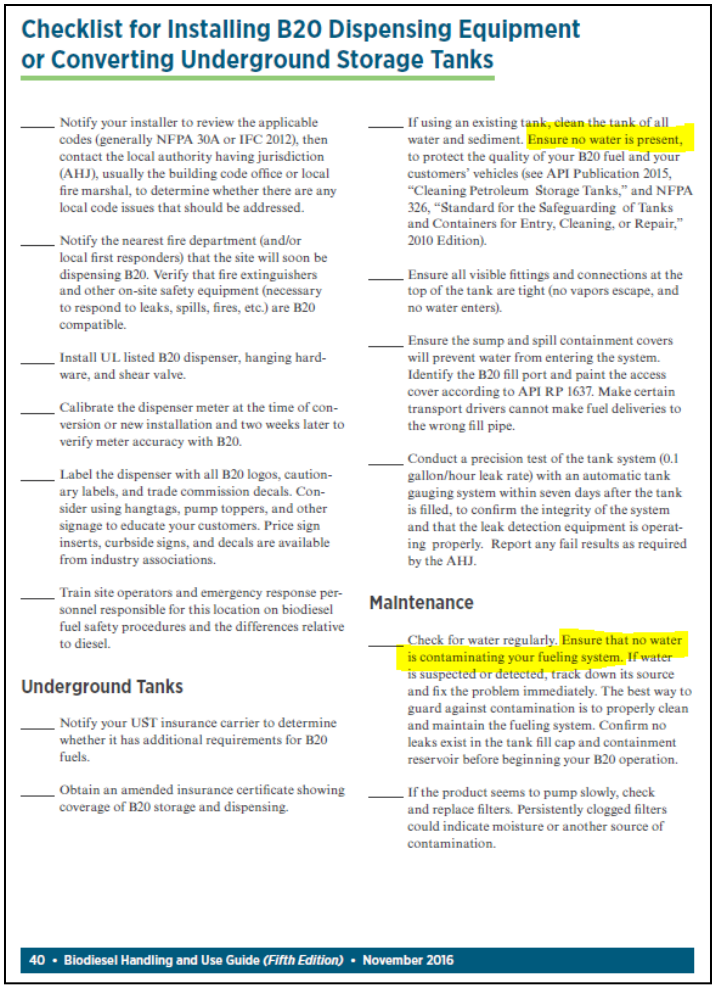
US DOE – BioDiesel Guide

- Checklist for B20 Installation
- Notify AHJ
- Verify equipment compatibility
- Proper labels (dispenser & fill)
- **Clean tank of all water and sediment**
- Ensure all fittings are tight
- Conduct precision test after 7 days
- Maintenance: **Check for water regularly**



Checklist for Installing B20 Dispensing Equipment or Converting Underground Storage Tanks

___ Notify your installer to review the applicable codes (generally NFPA 30A or IFC 2012), then contact the local authority having jurisdiction (AHJ), usually the building code office or local fire marshal, to determine whether there are any local code issues that should be addressed.

___ Notify the nearest fire department (and/or local first responders) that the site will soon be dispensing B20. Verify that fire extinguishers and other on-site safety equipment (necessary to respond to leaks, spills, fires, etc.) are B20 compatible.

___ Install UL listed B20 dispenser, hanging hardware, and shear valve.

___ Calibrate the dispenser meter at the time of conversion or new installation and two weeks later to verify meter accuracy with B20.

___ Label the dispenser with all B20 logos, cautionary labels, and trade commission decals. Consider using hangtags, pump toppers, and other signage to educate your customers. Price sign inserts, curbside signs, and decals are available from industry associations.

___ Train site operators and emergency response personnel responsible for this location on biodiesel fuel safety procedures and the differences relative to diesel.

Underground Tanks

___ Notify your UST insurance carrier to determine whether it has additional requirements for B20 fuels.

___ Obtain an amended insurance certificate showing coverage of B20 storage and dispensing.

___ If using an existing tank, clean the tank of all water and sediment. Ensure no water is present, to protect the quality of your B20 fuel and your customers' vehicles (see API Publication 2015, "Cleaning Petroleum Storage Tanks," and NFPA 326, "Standard for the Safeguarding of Tanks and Containers for Entry, Cleaning, or Repair," 2010 Edition).

___ Ensure all visible fittings and connections at the top of the tank are tight (no vapors escape, and no water enters).

___ Ensure the sump and spill containment covers will prevent water from entering the system. Identify the B20 fill port and paint the access cover according to API RP 1637. Make certain transport drivers cannot make fuel deliveries to the wrong fill pipe.

___ Conduct a precision test of the tank system (0.1 gallon/hour leak rate) with an automatic tank gauging system within seven days after the tank is filled, to confirm the integrity of the system and that the leak detection equipment is operating properly. Report any fail results as required by the AHJ.

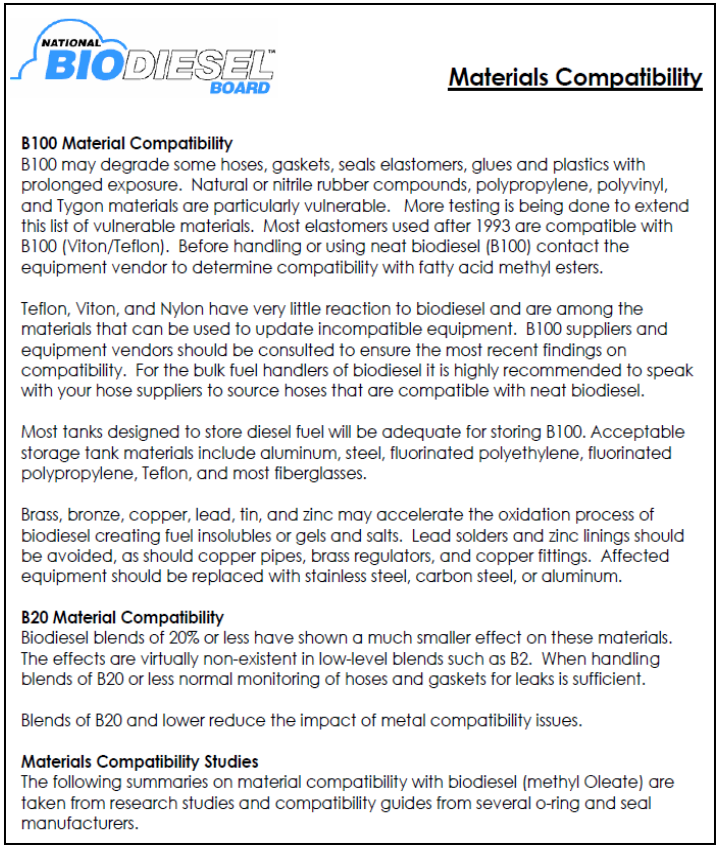
Maintenance

___ Check for water regularly. Ensure that no water is contaminating your fueling system. If water is suspected or detected, track down its source and fix the problem immediately. The best way to guard against contamination is to properly clean and maintain the fueling system. Confirm no leaks exist in the tank fill cap and containment reservoir before beginning your B20 operation.

___ If the product seems to pump slowly, check and replace filters. Persistently clogged filters could indicate moisture or another source of contamination.

BioDiesel Board – Materials Compatibility

- B100 may degrade some hoses, gaskets, elastomers, glues, and plastics with prolonged exposure.
- Rubber/nitrile & Tygon vulnerable
- Teflon, Viton, and Nylon have very little reaction
- Most tanks materials o.k.
- Brass, bronze, copper, lead, tin, and zinc may have problems
- B20 has smaller effects
- Many compatibility studies done



NATIONAL BIODIESEL BOARD

Materials Compatibility

B100 Material Compatibility
B100 may degrade some hoses, gaskets, seals elastomers, glues and plastics with prolonged exposure. Natural or nitrile rubber compounds, polypropylene, polyvinyl, and Tygon materials are particularly vulnerable. More testing is being done to extend this list of vulnerable materials. Most elastomers used after 1993 are compatible with B100 (Viton/Teflon). Before handling or using neat biodiesel (B100) contact the equipment vendor to determine compatibility with fatty acid methyl esters.

Teflon, Viton, and Nylon have very little reaction to biodiesel and are among the materials that can be used to update incompatible equipment. B100 suppliers and equipment vendors should be consulted to ensure the most recent findings on compatibility. For the bulk fuel handlers of biodiesel it is highly recommended to speak with your hose suppliers to source hoses that are compatible with neat biodiesel.

Most tanks designed to store diesel fuel will be adequate for storing B100. Acceptable storage tank materials include aluminum, steel, fluorinated polyethylene, fluorinated polypropylene, Teflon, and most fiberglasses.

Brass, bronze, copper, lead, tin, and zinc may accelerate the oxidation process of biodiesel creating fuel insolubles or gels and salts. Lead solders and zinc linings should be avoided, as should copper pipes, brass regulators, and copper fittings. Affected equipment should be replaced with stainless steel, carbon steel, or aluminum.

B20 Material Compatibility
Biodiesel blends of 20% or less have shown a much smaller effect on these materials. The effects are virtually non-existent in low-level blends such as B2. When handling blends of B20 or less normal monitoring of hoses and gaskets for leaks is sufficient.

Blends of B20 and lower reduce the impact of metal compatibility issues.

Materials Compatibility Studies
The following summaries on material compatibility with biodiesel (methyl Oleate) are taken from research studies and compatibility guides from several o-ring and seal manufacturers.

- http://biodiesel.org/docs/ffs-performace_usage/materials-compatibility.pdf?sfvrsn=4

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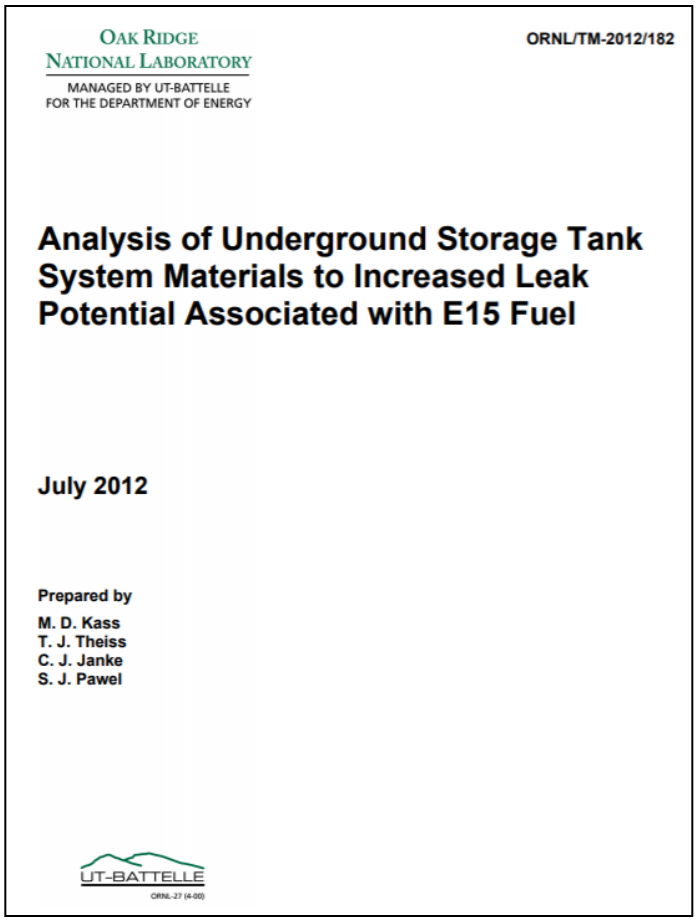
Analysis of UST Leak Potential with E15

- Steel: If precautions are undertaken to keep water out of tanks, and stress corrosion cracking is not a factor, then the corrosion potential is minimized and E15 offers no added risk to metal corrosion than E10.
- Fiberglass: The pre-1990 resin was severely damaged from exposure to CE25a, along with one of the post-1990 resins. The remaining post-1990 resin and the advanced resin type both remained intact after exposure to CE25a.
- The technology and materials used in the manufacture of FRP tanks also applies to underground FRP piping systems as well. Therefore the compatibility of FRP piping systems should be the same or similar to FRP underground storage tanks.
- In general, the materials used in existing UST infrastructures would not be expected to exhibit compatibility concerns when moving from E10 to E15.



OAK RIDGE NATIONAL LABORATORY
MANAGED BY UT-BATTELLE FOR THE DEPARTMENT OF ENERGY

ORNL/TM-2012/182

Analysis of Underground Storage Tank System Materials to Increased Leak Potential Associated with E15 Fuel

July 2012

Prepared by
M. D. Kass
T. J. Theiss
C. J. Janke
S. J. Pawel

UT-BATTELLE

https://info.ornl.gov/sites/publications/files/Pub36356.pdf

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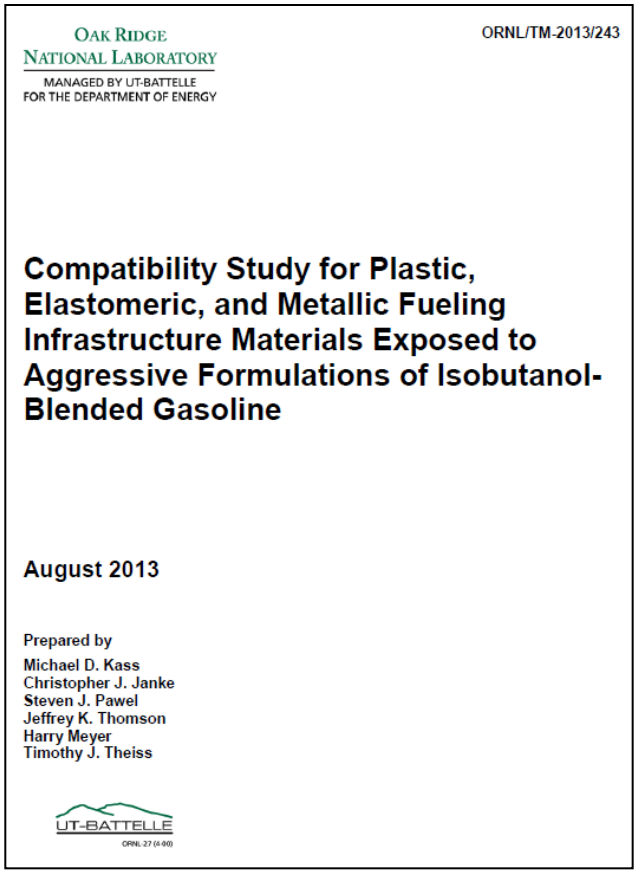
Isobutanol Compatibility Study

- Elastomer Results: Some level of swelling (or volume expansion) upon exposure to fuels is expected for elastomeric materials, and this swelling serves to provide a tight seal to prevent leakage.
- Plastic Results: The plastics that exhibited the lowest volume swelling (and smallest change in hardness) in the test fuels were the permeation barrier materials: PPS, PET, PVDF, and PTFE
- Plastic Results: Four fiberglass resins were tested and all were found to be sensitive to alcohol blends.
- Metal Results: Very little corrosion was noted for the metallic specimens exposed to any of the test fuels.



Miscibility with water is limited.

https://info.ornl.gov/sites/publications/files/Pub44488.pdf

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ASTSWMO Compatibility For UST Systems

Compatibility Considerations for UST Systems

Final Report

Updated May 2016

2016 version no longer mentions concern about fiberglass UST's.

Compatibility of UST Systems with Biofuels
June 2013

standard. In some regions of the country, mounting evidence from failures and field observations also suggest there may be some impacts to fiberglass USTs. Thus, even with E10, there is a real possibility that many equipment failures may be associated with equipment incompatibility but are not investigated sufficiently to be recognized or reported as such.

92 Octane UST – breakdown observed during pre-blast inspection

92 Octane UST interior – water entering tank through crack

UST 92 Octane interior view: horizontal cracking in tank shell

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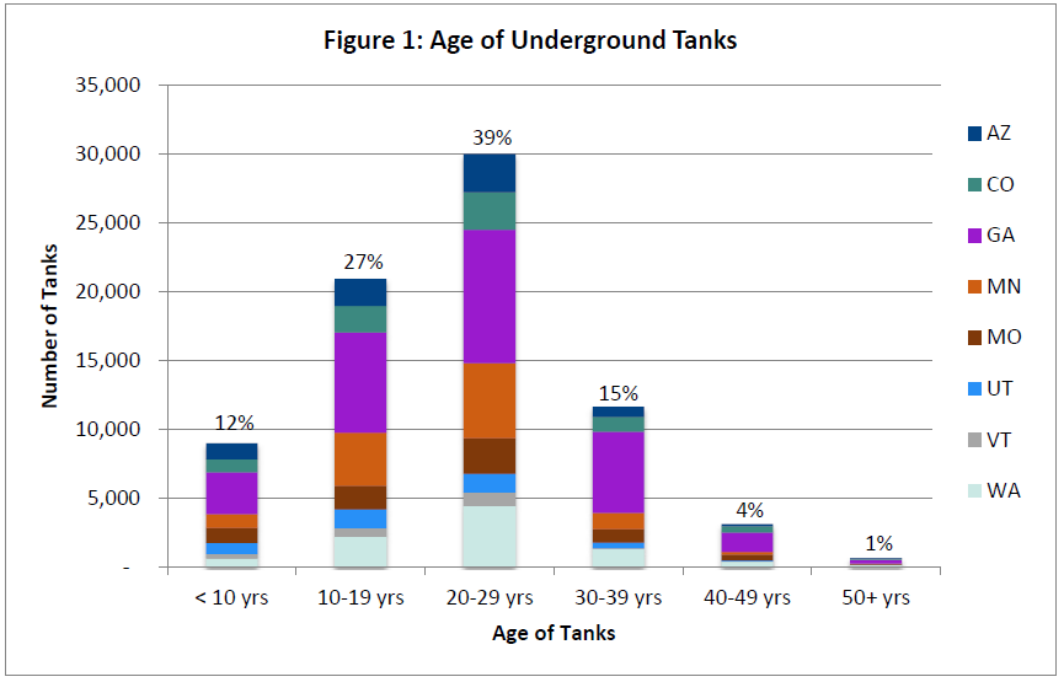
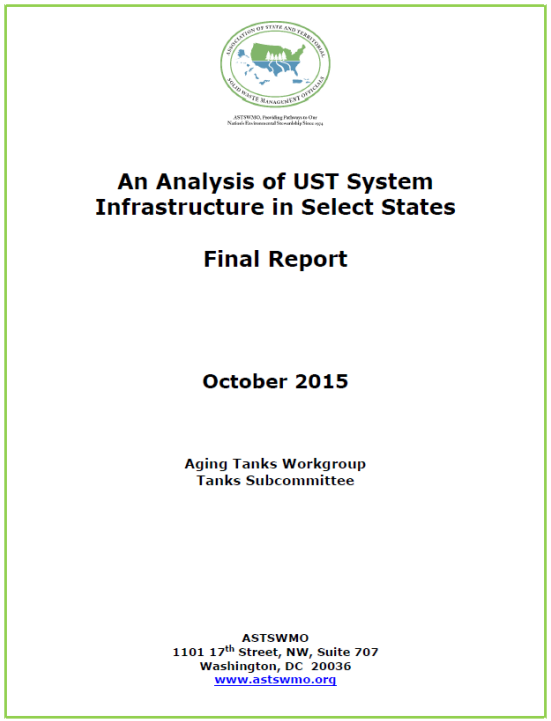
ASTSWMO – Aging Tanks

- http://astswmo.org/files/policies/Tanks/2015-10-ASTSWMOAgingTanks%20Report-Final.pdf





An Analysis of UST System Infrastructure in Select States

Final Report

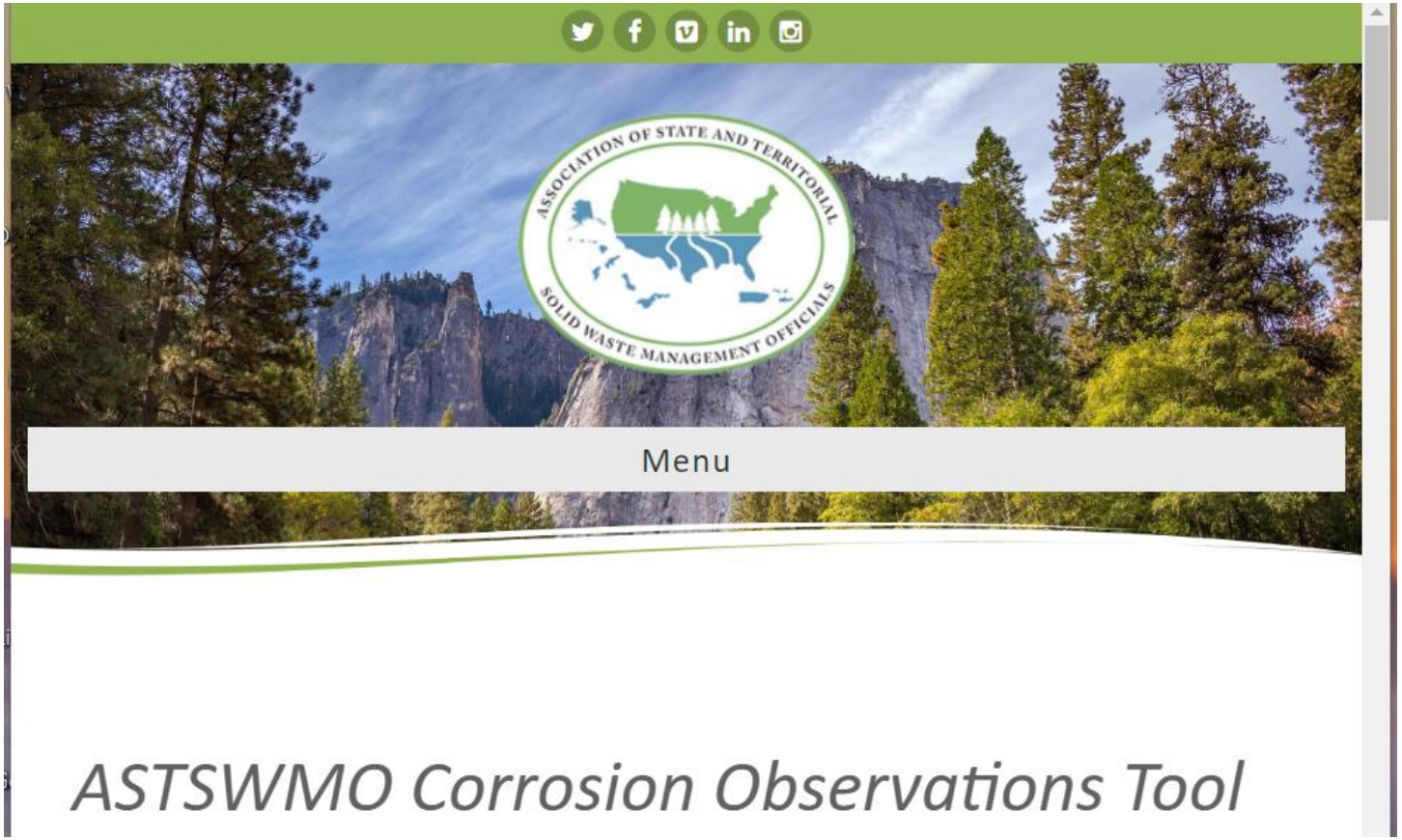
October 2015

Aging Tanks Workgroup
Tanks Subcommittee

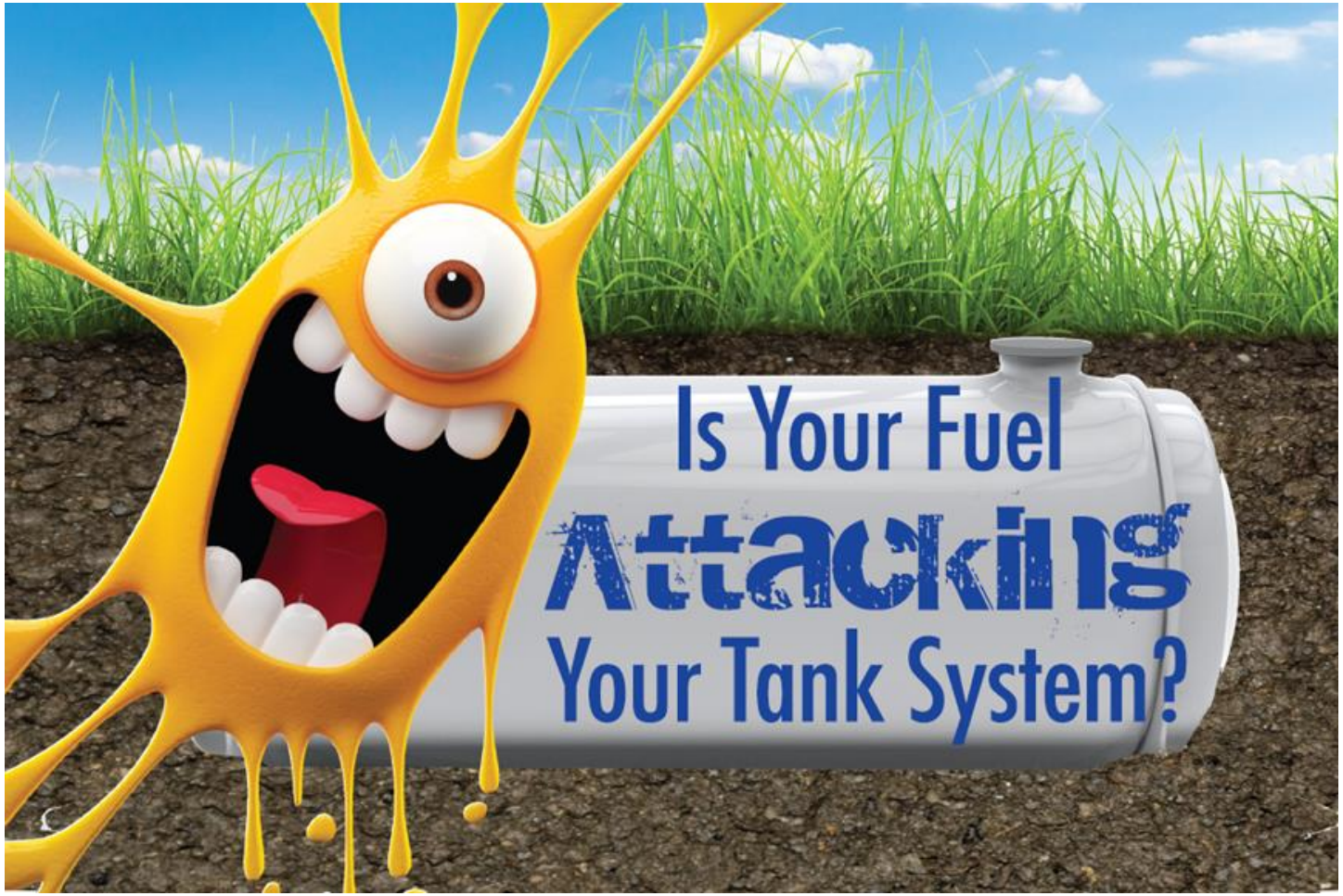
ASTSWMO
1101 17th Street, NW, Suite 707
Washington, DC 20036
www.astswmo.org

ASTSWMO – Corrosion Observations

- http://astswmo.org/astswmo-corrosion-observations-tool/



So What Could Possibly Go Wrong?



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NATURAL RESOURCES

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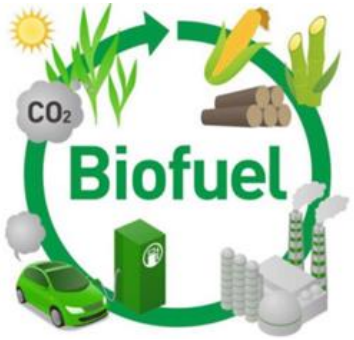
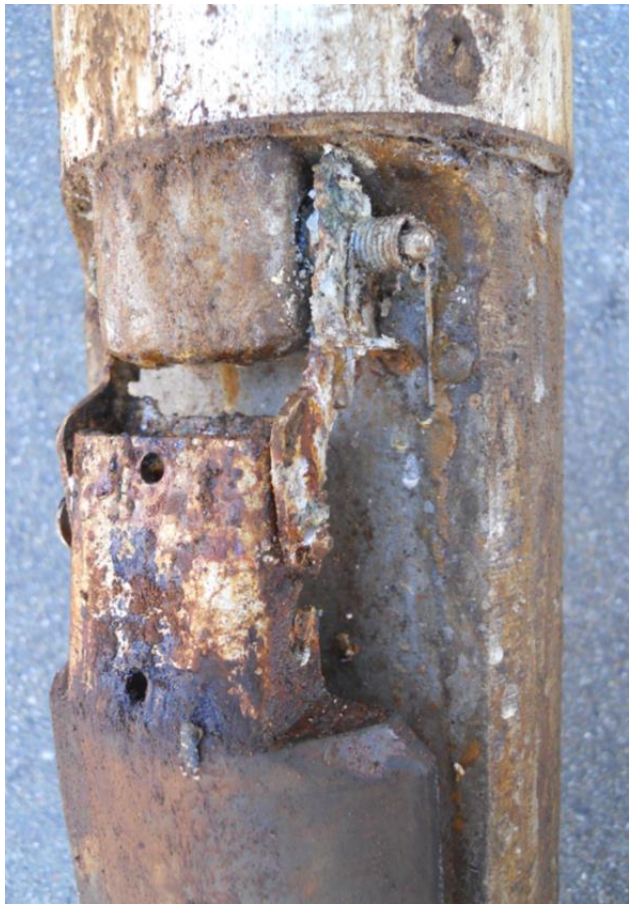
Possible Issues

- Corrosion of Metallic Components
  - Often when water intrusion and/or microbial growth present
  - Tank Fittings
  - Overfill Equipment
  - Leak Detection Equipment
  - Dispenser meters, filters, fittings, etc.
  - Tanks & Piping?
  - Biodiesel may exacerbate issues?
- Degradation of Plastics and Elastomers
  - Often dependent on age and rating of equipment
  - Gaskets, O-rings, sealants, etc.
  - Some “soft” metals
  - Tanks & Piping?
- Accelerated Corrosion in Sumps (Ethanol)
- Future Fuels - ???



Failed Overfill Protection - ULSD

Heavily corroded. Broken spring. Stuck float.



Failed Overfill Protection - ULSD

Heavily corroded.
Broken spring.
Stuck float.

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Failed Overfill Protection in ULSD

Corroded ball float in tank with ULSD

Regular gasoline tank at same site

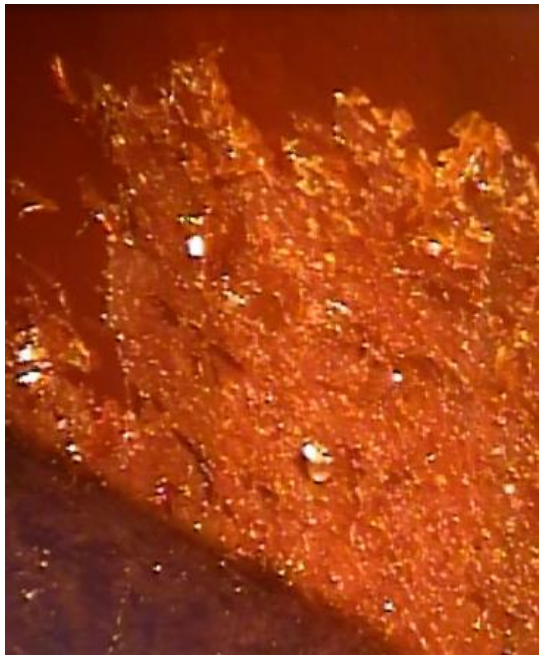
Overfill Protection: Diesel vs E10

Corrosion more likely in Diesel tanks.

Same Site, Different Reactions

E10 Gasoline

- Blisters and flaking.
- Minimal corrosion on ball float.



Diesel (ULSD)

- Smooth/glossy fiberglass.
- Heavy corrosion on ball float.

Filters and Housings

Dispenser Meters

DIXON PUMPS

BAD FUEL = CORROSION PROBLEMS

Patrick Eakins - Dixon Pumps CFE

One of the constants in the petroleum equipment industry is that corrosion problems are increasing, not decreasing. When I talk with tank owners, they think that corrosion is a result of moisture. Although that is a contributing factor, the real culprit is microbial contamination.

All fuel has some level of contamination. If left unchecked and unmanaged, the fuel will continue to degrade at an alarming rate due to the contaminants in the fuel. Microbial-influenced corrosion or MIC results in damage of varying degrees. As microbes reproduce in the fuel, their waste by-products continue to disperse throughout the fuel system. The waste is often acidic. Acidic sludge and slime will accumulate at the bottom of the tank. This acidic layer, its dispersants, and off-gassing vapor cause damage.

STP's

STP Parts – Functional Elements

Line Leak Detection

ATG's

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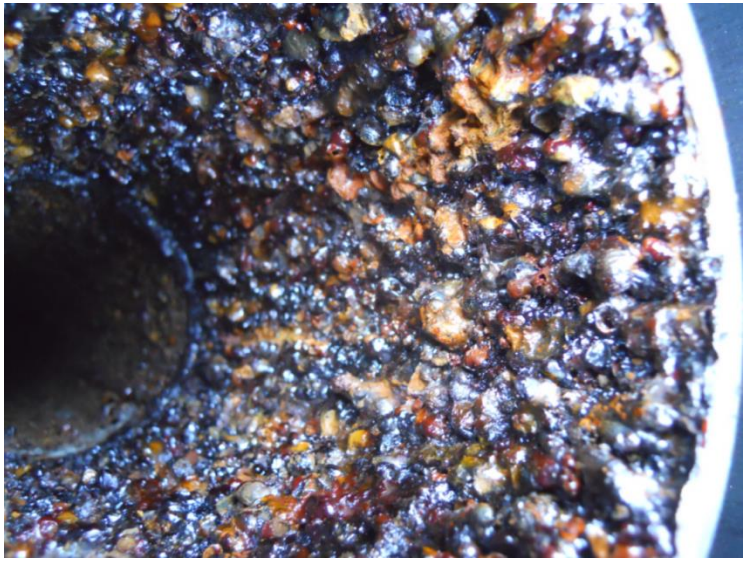
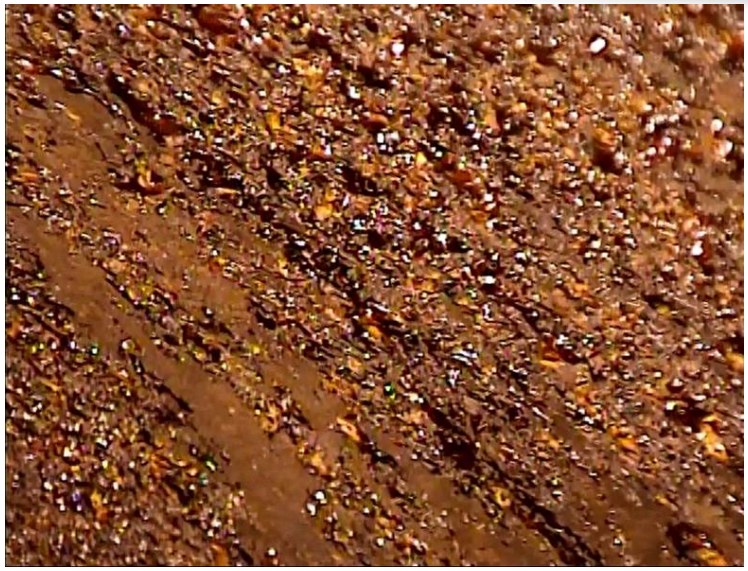
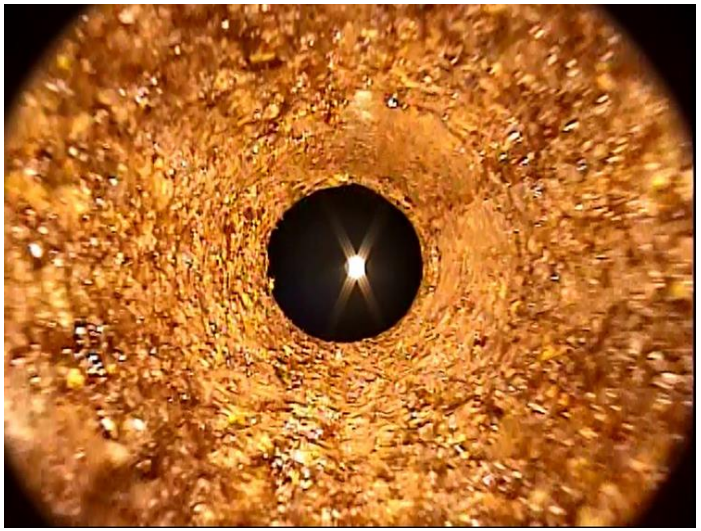
Tank Fittings & Risers



ULSD Corrosion





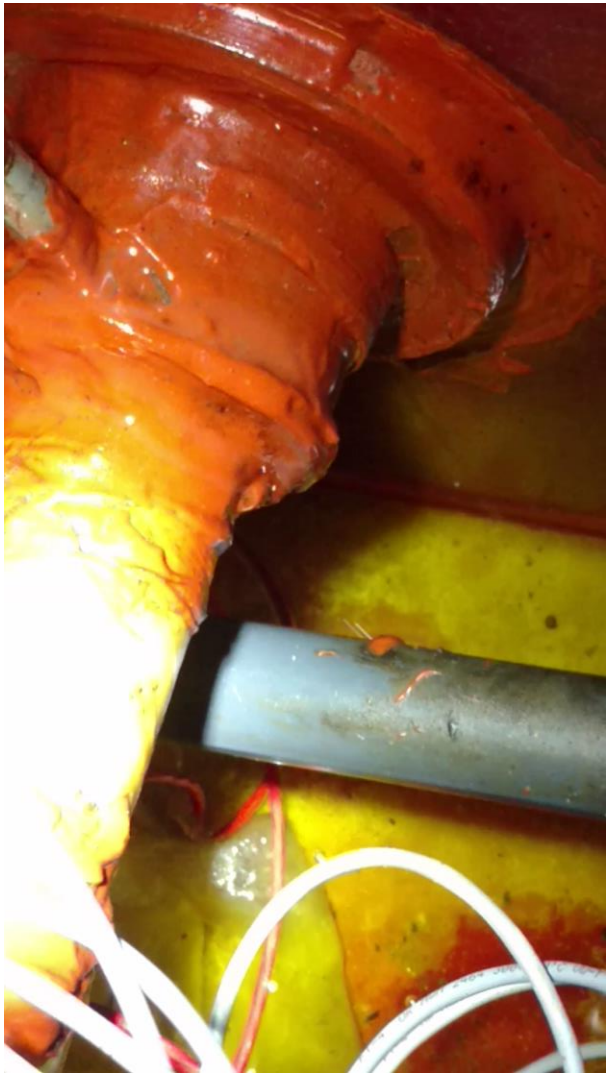
STP in ULSD - Corrosion

Top
Section

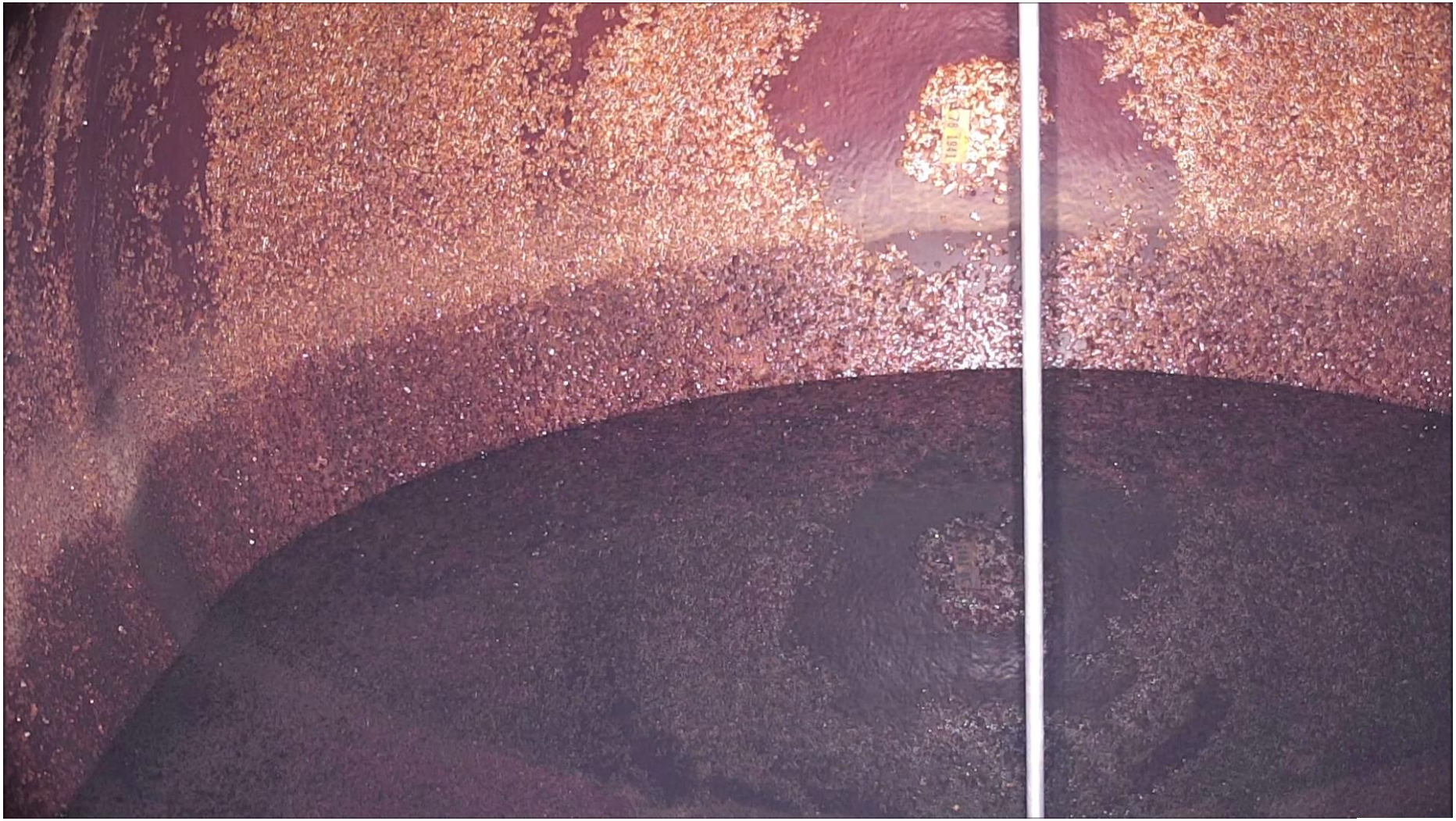
Bottom
Section &
Motor

Line Leak - BioDiesel

- DWF Pipe – Dripping from secondary piping



Widespread Blisters in FRP (E10)



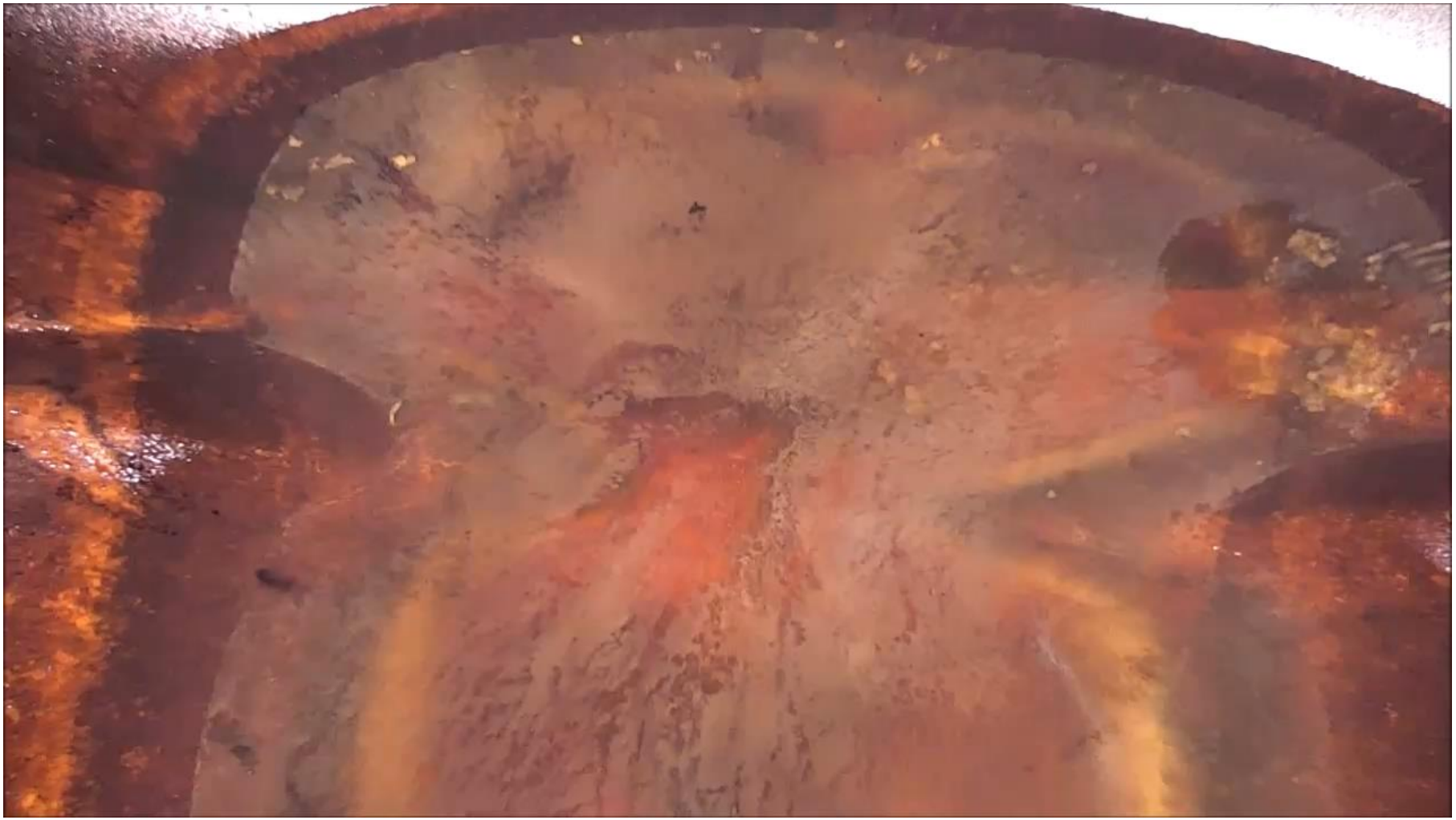
Corrosion in Steel Tank (ULSD)

FRP Blistering & Flaking (E10)

Jacketed Steel Tank – Red Dye Diesel

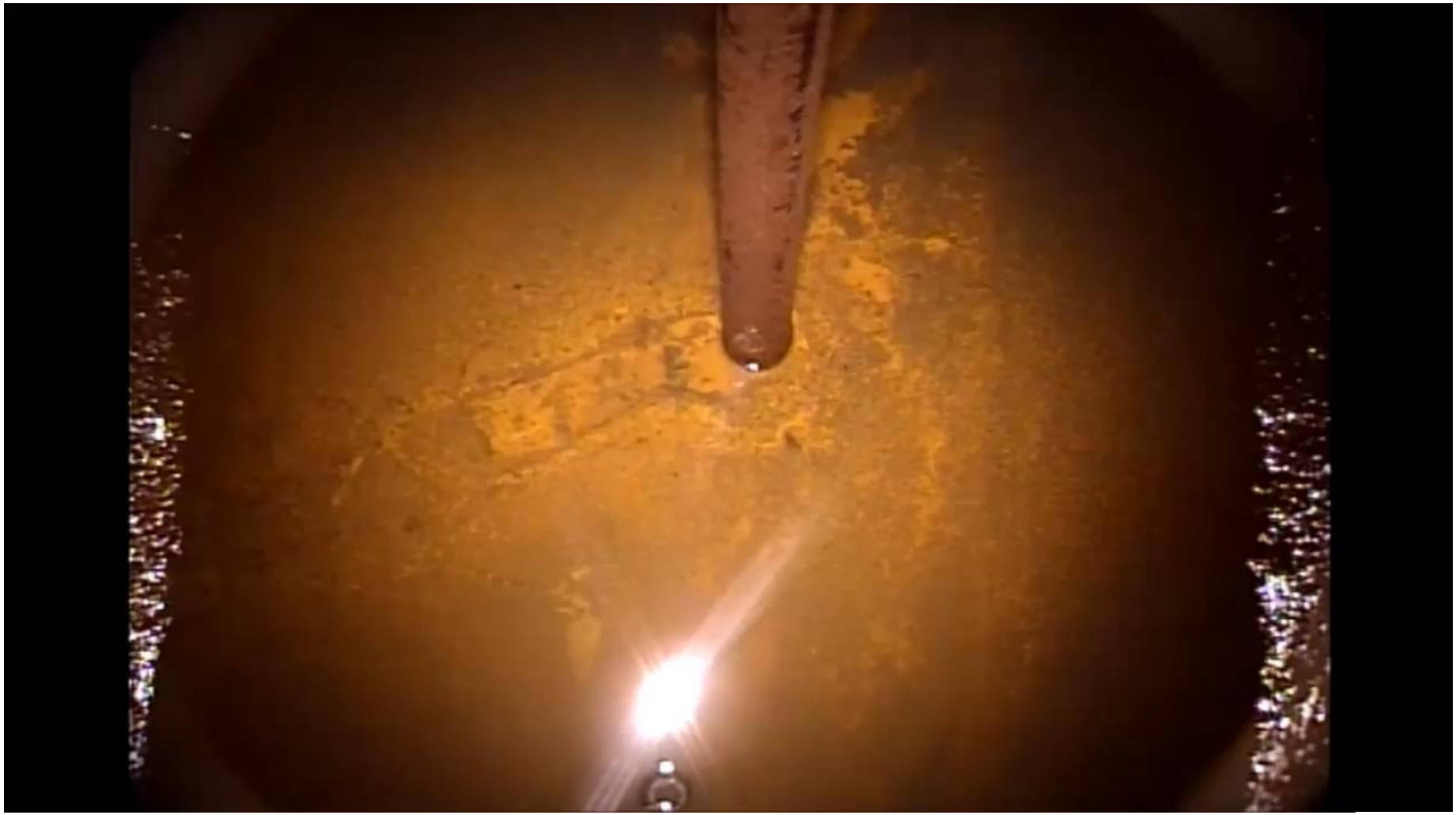
Technician poured a small amount of water into interstitial monitoring pipe for troubleshooting purposes.

DWF – Leak into Interstitial



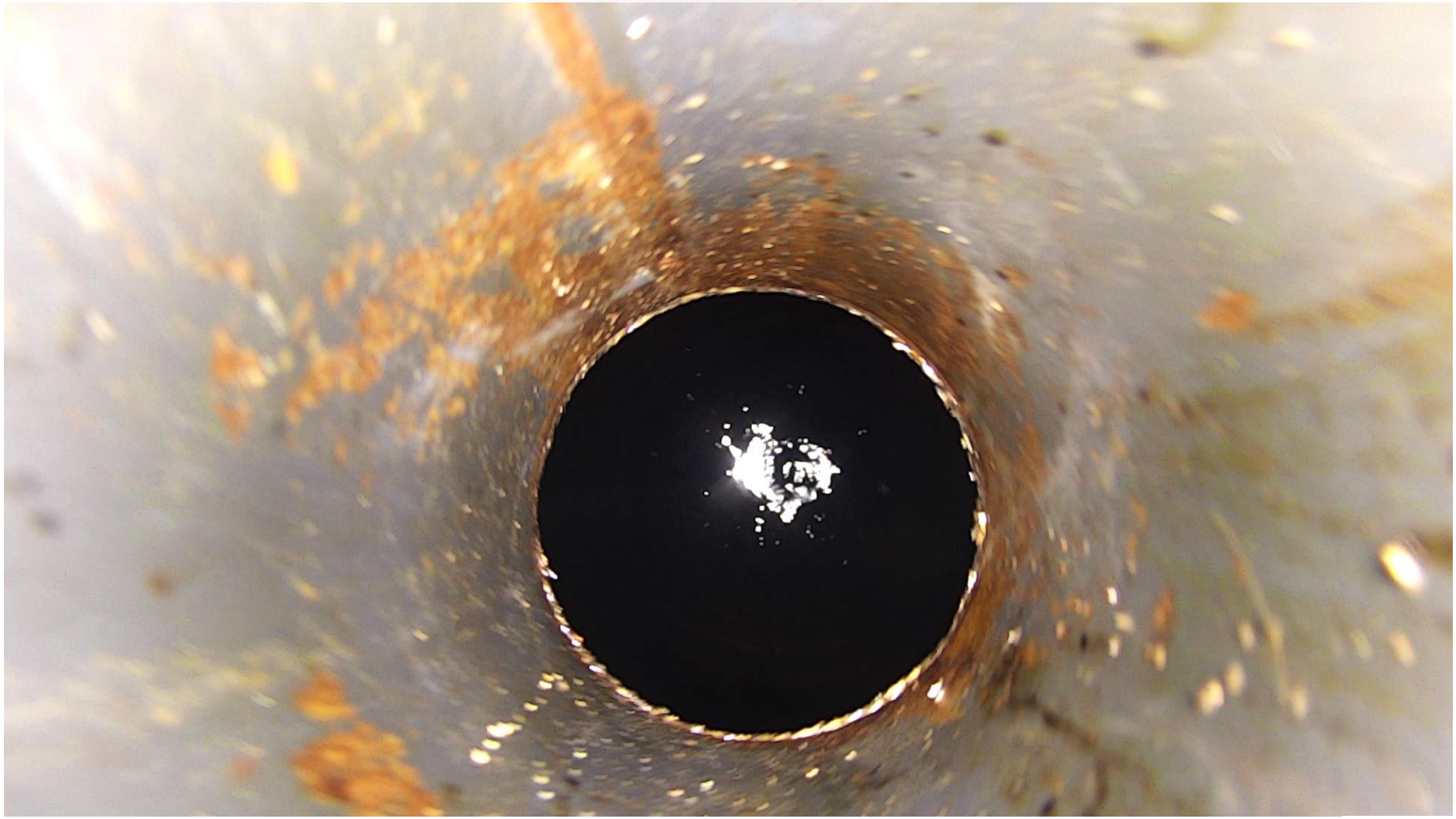
Technician poured water into interstitial space to confirm crack in tank wall.

DW Steel – Leaking Interstitial - ULSD



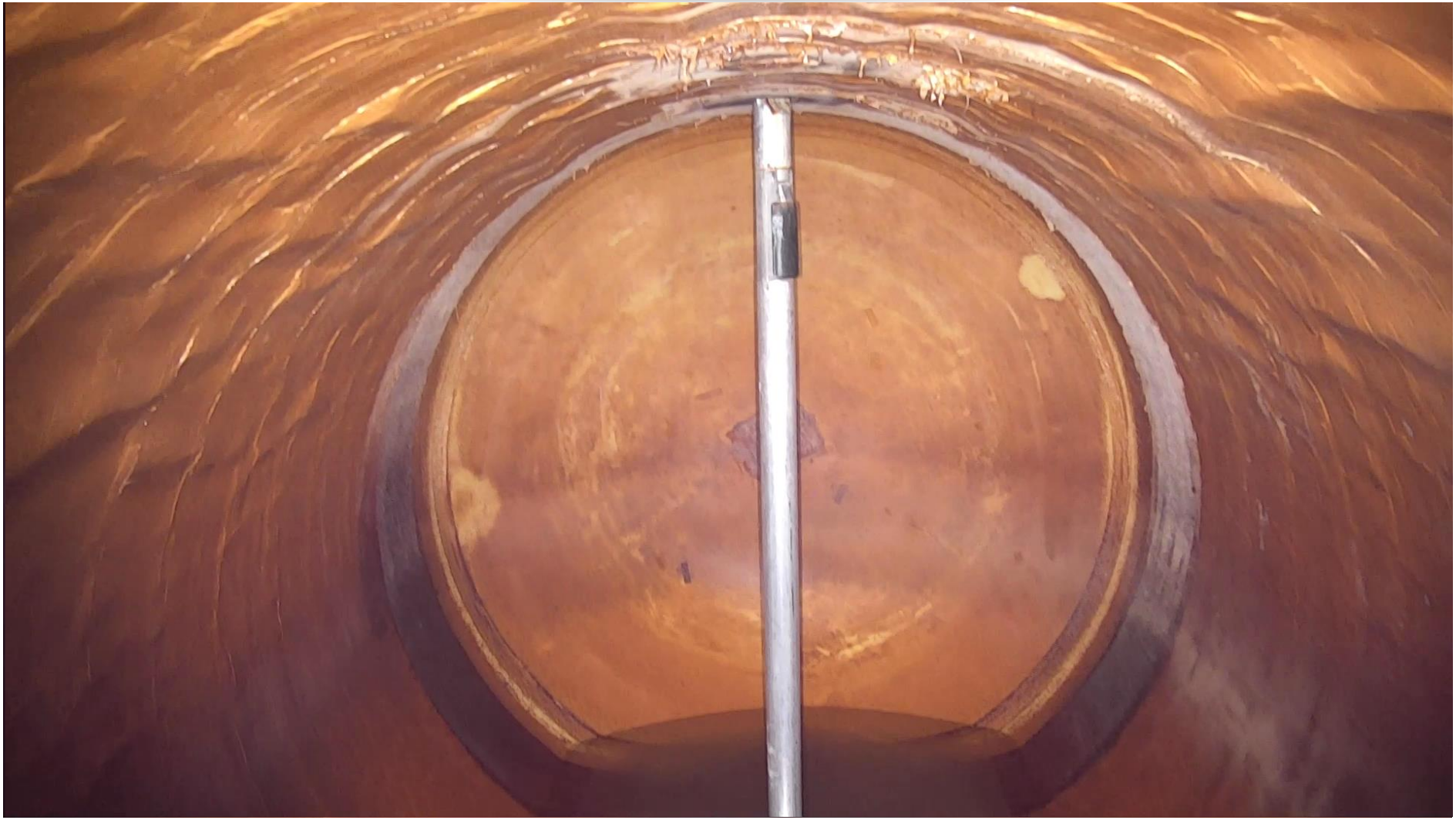
Blistering in Fiberglass Tank (E10)

Steel Tank – Diesel



Sludge but no water observed.

Deflection/Wrinkles/Ingress in FRP Tank



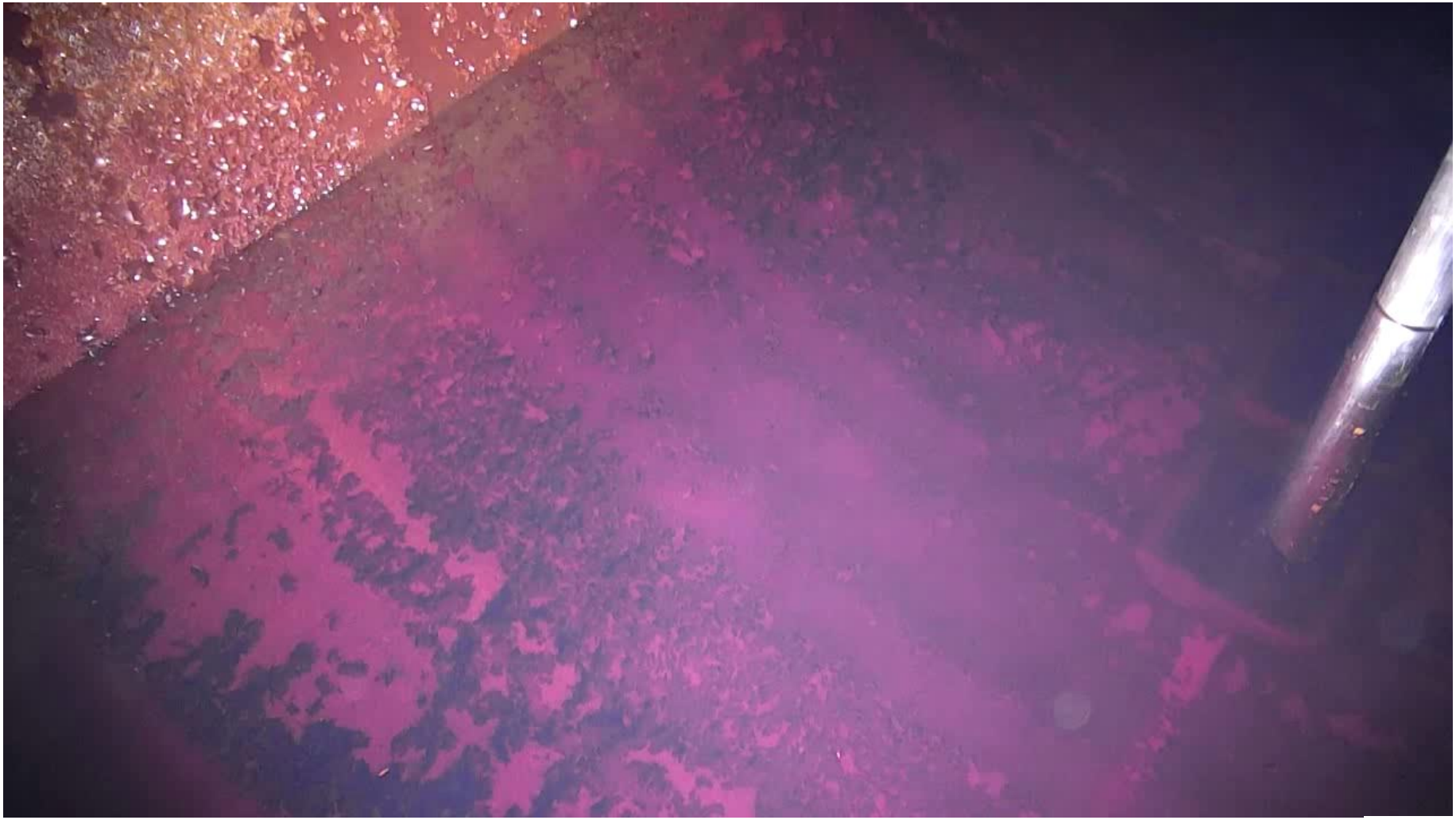
Premium(E10) Tank

Interstitial Leak – Diesel DW Steel

Steel Tank. “Slime” on STP. E85

Corrosion in ULSD Steel Tank

Blistering and Flaking (E10)



Corrosion in E10 Steel Tank

Leak in SW Fiberglass Tank

Corrosion in Steel Tank

Failed Tank Lining (E10)

Crack - DW Fiberglass Tank

Sludge and Slime

Maybe growing a new fuel source in the tank?

Sludge and Debris

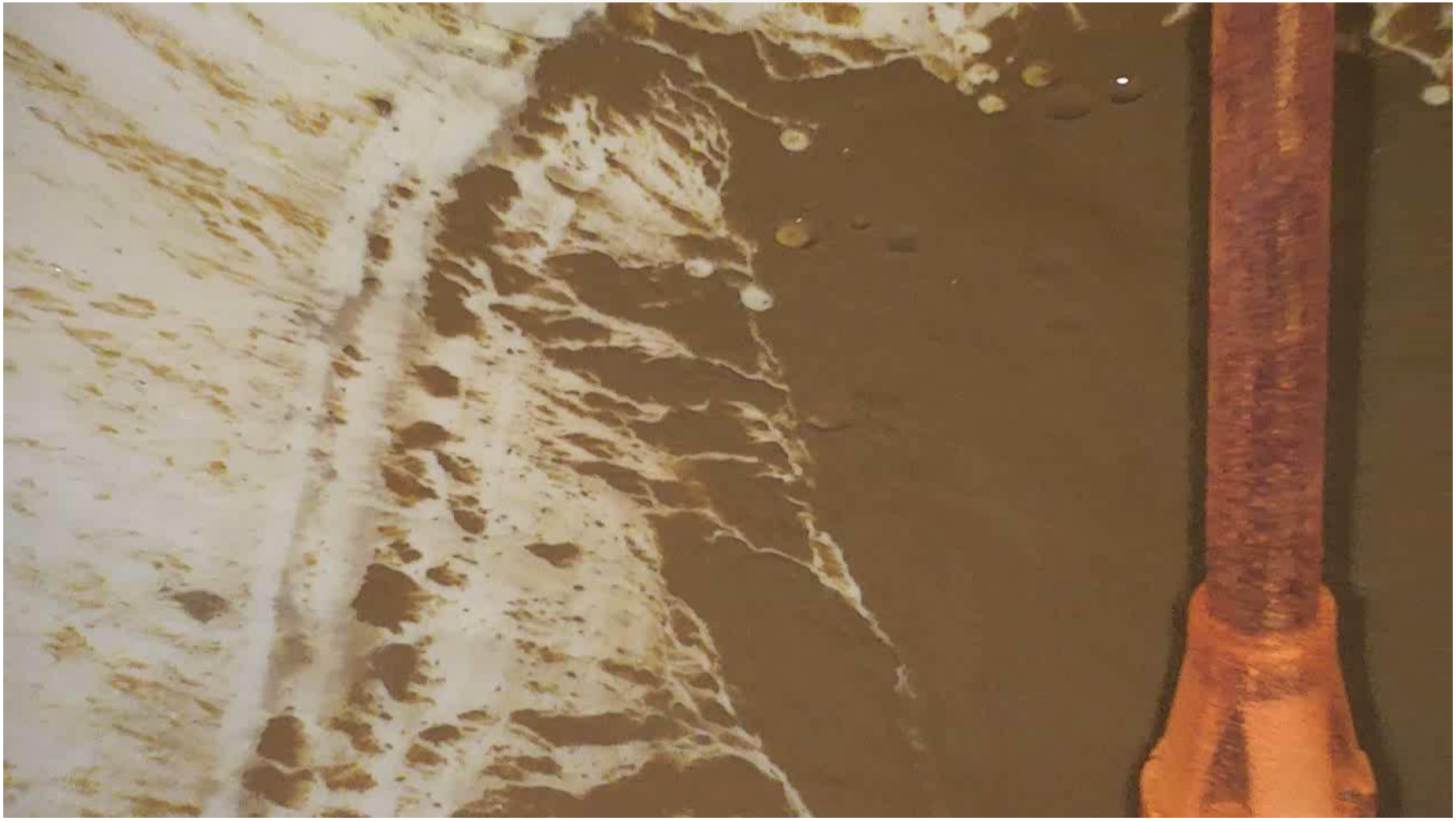
Tank Cleaning – FRP Tank with ULSD

Water Ingress – SW Fiberglass Tank

Water Ingress – Steel Tank

Fuel Delivery into Empty Tank

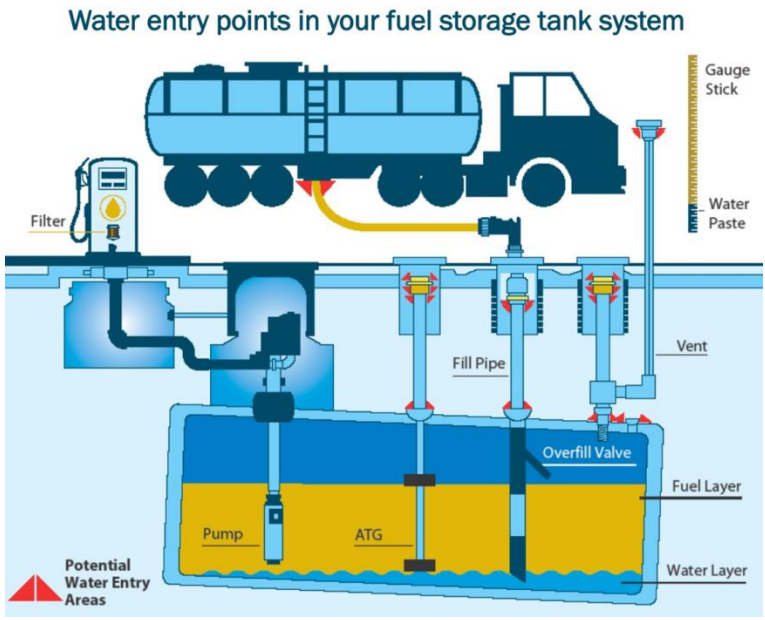
New DW FRP Tanks



Corrosion on STP Shaft from “Dirty” Ballast Water

Recommended Actions

- Inspect for signs of degradation
  - Risers, filters, caps, gaskets, overfill equipment
  - Internal inspections for “at risk” equipment
- Keep water and microbes out of tanks
  - Check caps/gaskets and spill bucket drains.
  - Stick for water. ATG may not detect all water.
  - Checks or sweep along tank bottom.
  - Remove water and clean tanks if needed.
  - Treat with biocide as needed.
- Ensure compatibility
  - Tanks, piping, pumps, sumps, dispensers, hanging hardware, gaskets, filters, thread sealant, spill, overfill &leak detection systems.
  - Get accurate age equipment
  - Check resources or approval letters
  - Make proper notifications when changing to >E10 or >B20



STI SPFA

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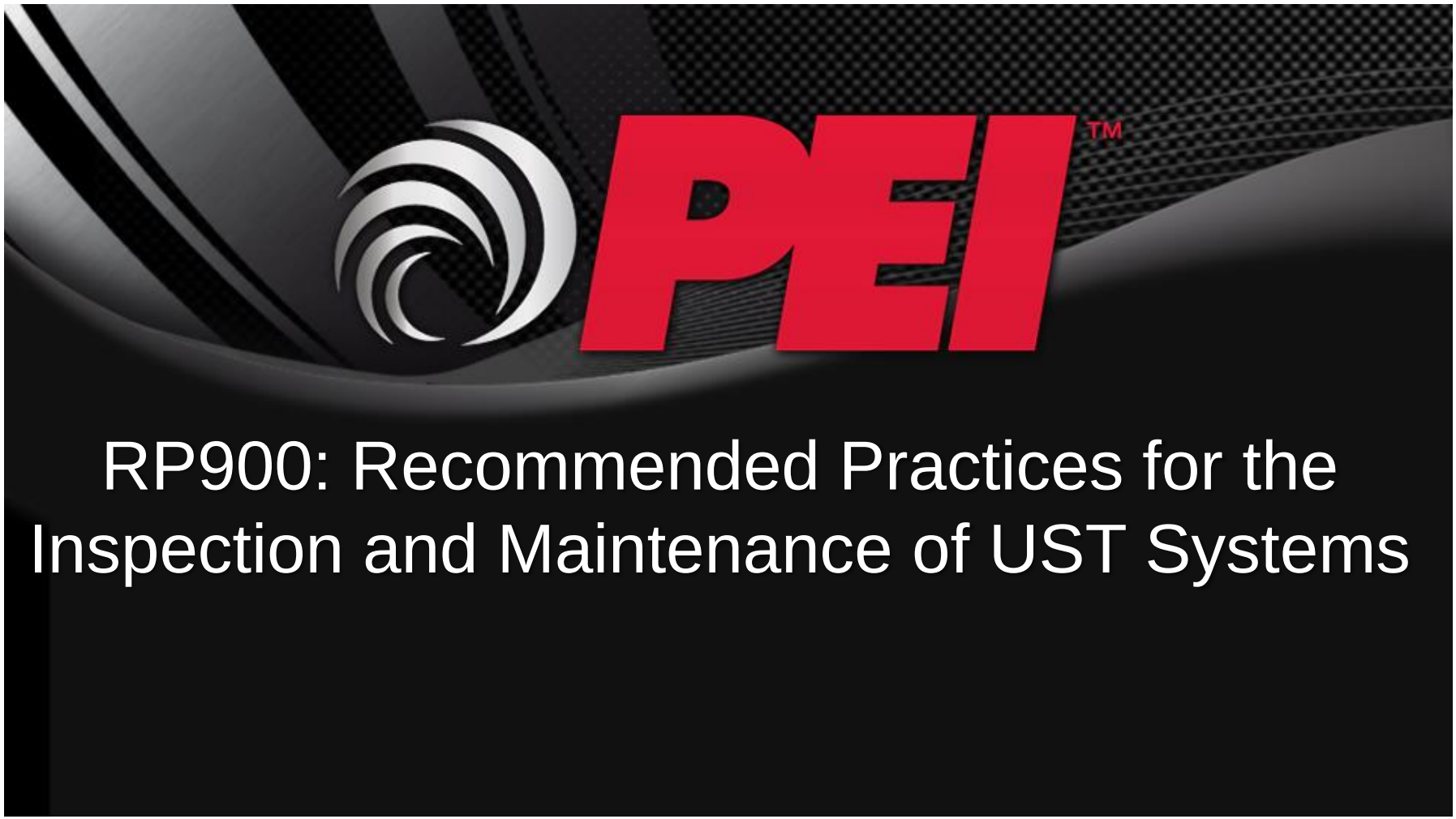
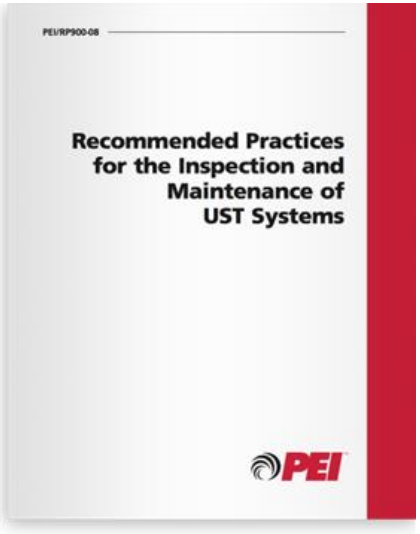
PEI RP900 Inspections



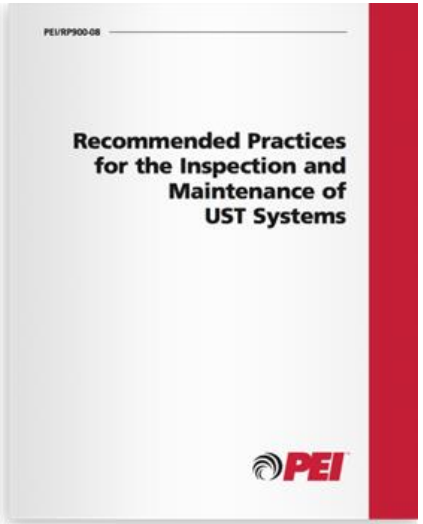
Water Management in Storage Systems

- Water Management more important than before
  - Gasoline is now ethanol-blended (E10, E15?)
  - Diesel is now ULSD and likely has some biodiesel
- Water can enter UST's in a number of ways
  - Holes/cracks/fittings/caps/gaskets
  - Delivered with load of fuel
  - Ballast water
  - Condensation
- Water Detection is challenging
  - ATG's might not be good enough
- Water Removal is challenging
  - Might need to search along entire tank bottom



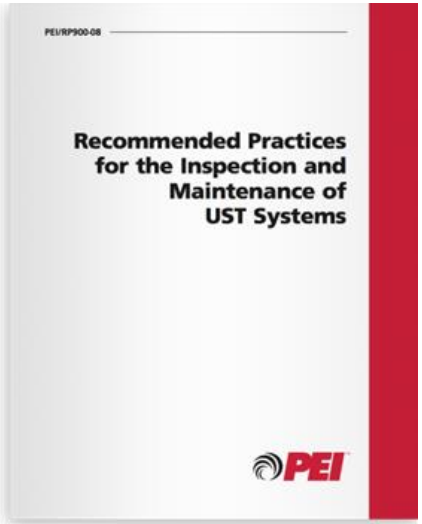
Water in UST's Storing E10 Gasoline

- Water Issues with E10 Gasoline
  - Can normally absorb about 0.5%
  - Can cause "Phase Separation" in greater amounts
- Indications of water in E10 Gasoline
  - Water finding paste on gauge stick
  - ATG probe indicates water or density increase
  - Water block filters clogged
  - Hazy/cloudy fuel
  - Stalled vehicles or equipment failures
- Strategies
  - Prevent water entry
  - Detect water (filters, stick with paste, upgrade ATG)



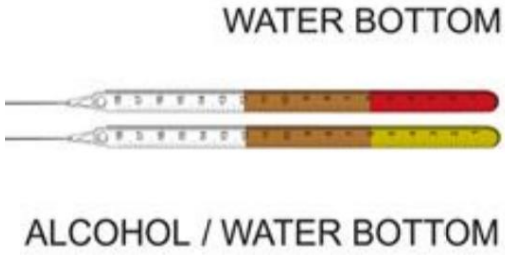
Water in UST's Storing Diesel Fuel

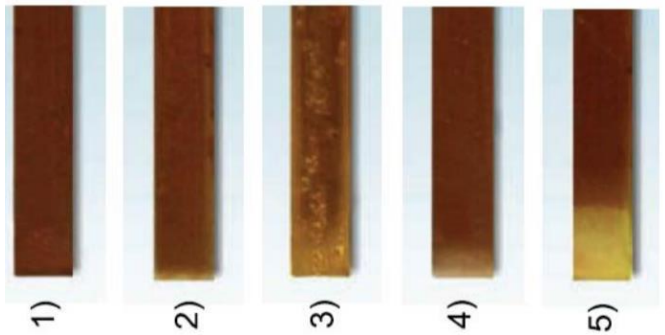
- Water Issues with Diesel
  - Can cause increased microbial growth
  - Can cause corrosion of UST components
- Indications of water Diesel
  - Water finding paste on gauge stick
  - ATG probe indicates water or density increase
  - Water block filters clogged
  - Hazy/cloudy fuel
  - Corrosion or failure of metallic components
- Strategies
  - Prevent water entry
  - Detect water (filters, stick with paste, upgrade ATG)
  - Manage Water Bottoms (sample & test)
  - Use Biocide and Have Tanks Cleaned (if microbial growth)



Sticking Tanks For Water

- Must use Water Finding Paste compatible with **ethanol fuels**.
- Follow directions carefully. Time in tank and color change vary.





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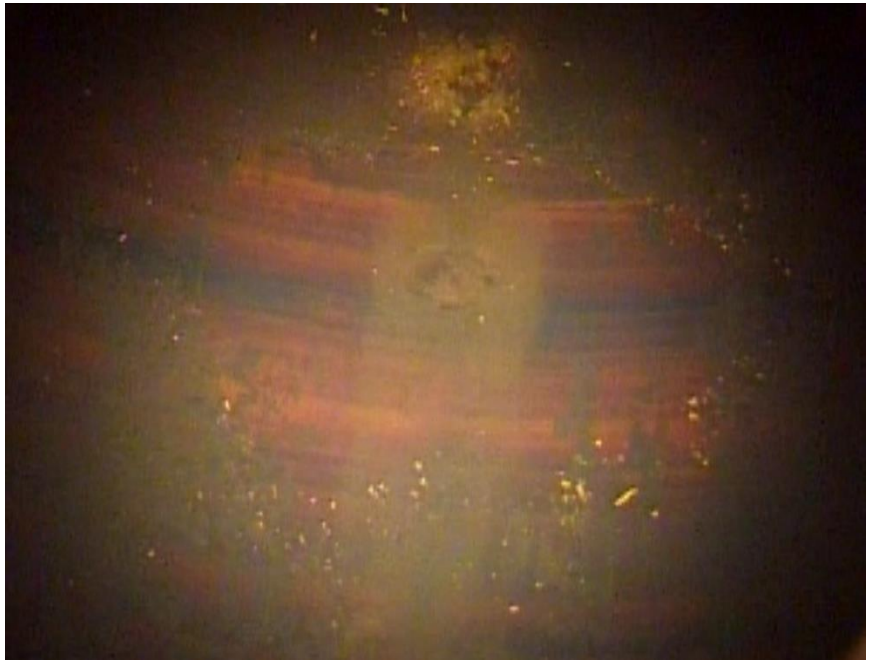
How to Sample Fuel

- Bacon Bomb Sampler

- Vacuum Jar Sampler

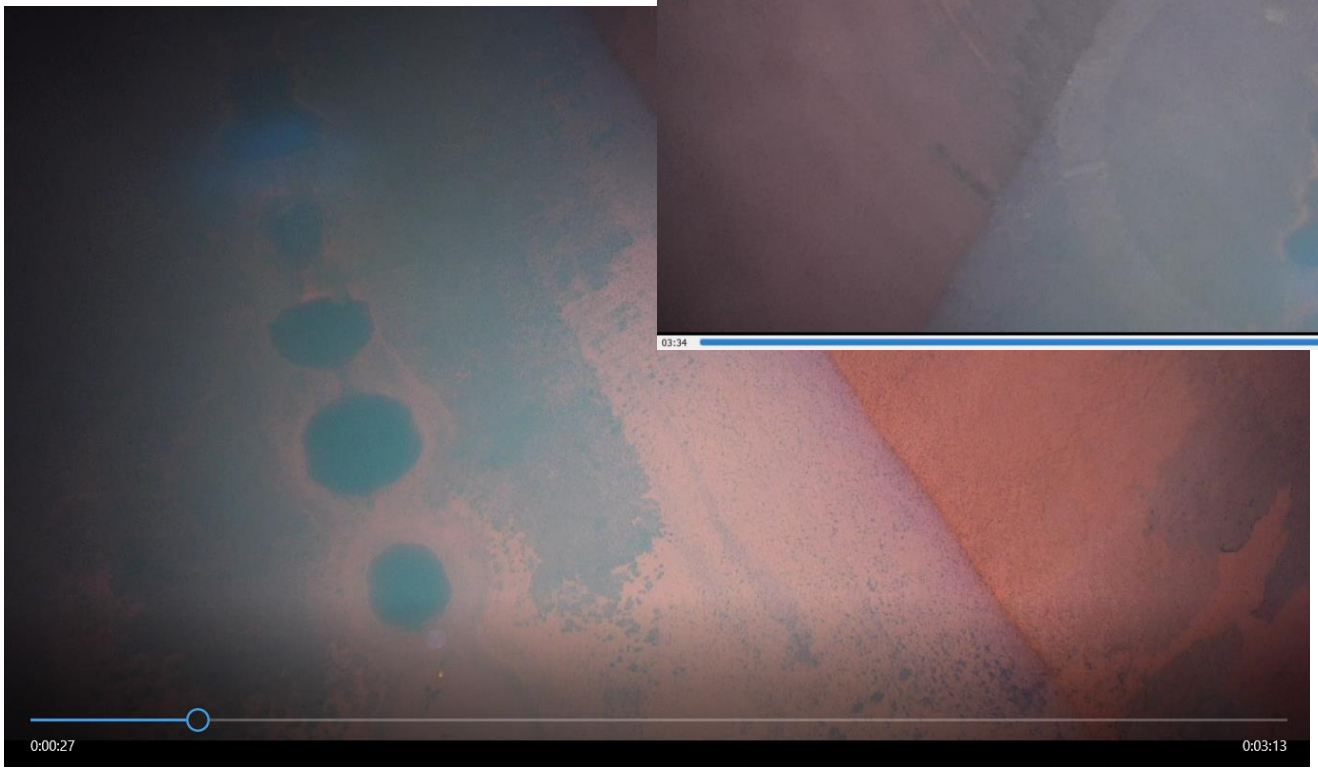
Where to Take Samples

- Search for a “representative” sample
- Fill Pipe – worst location to check – usually clean
- ATG probe – better
- STP – best – if accessible
- Drag vacuum jar sampler tubing along bottom of tank



Water in Bottom of ULSD Tank

Even small puddles across bottom of tank can host microbes.

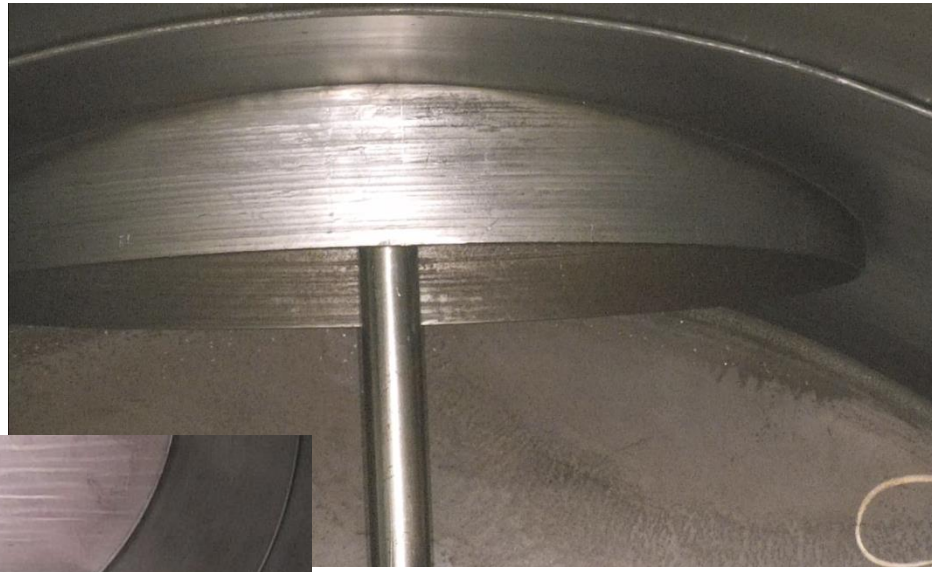


Water in Bottom of ULSD

Steel Tank with ULSD & NO water

No Water

No Problems



Upgraded ATG Probes & Float Kits

- Many manufacturers offer probes to provide better detection of water than standard probe.
- Options for “Phase Separation” or “Density”

Franklin Fueling Systems

OPW TANK GAUGES

VEEDER-ROOT

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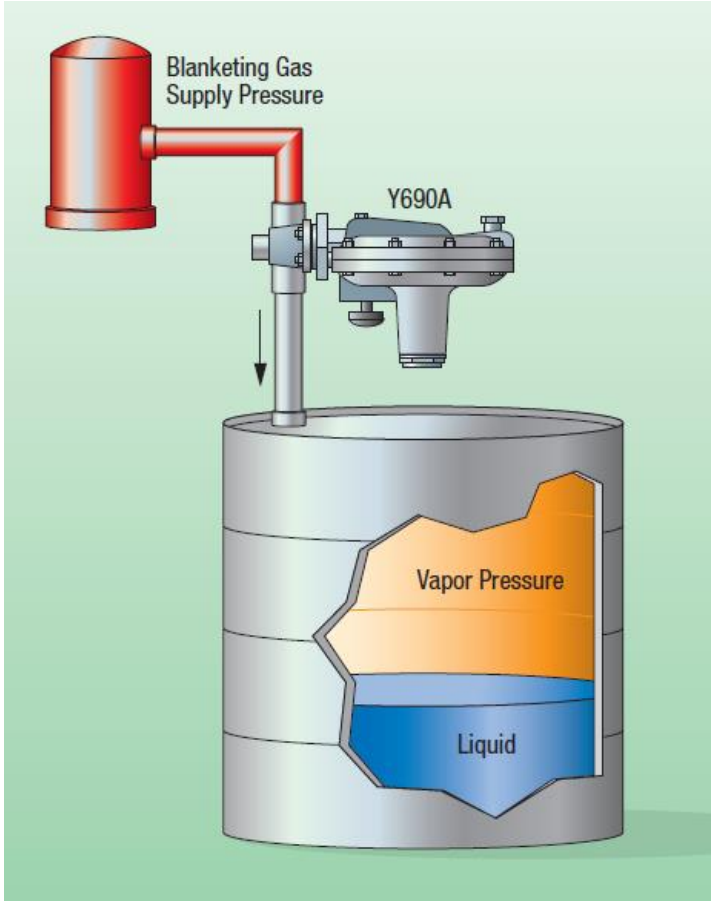
Other Strategies (not in RP900)

- **Internal Inspections**
- Options:
  - Manned Entry
  - Removal and inspection of components (STP, Ball Floats, Filters, etc.)
  - Remote Video Inspection

(That's pretty much what the first part of this presentation was all about!)

Other Strategies (not in RP900)

- **Nitrogen Blanketing System**
- Eliminates moisture and oxygen
- Commonly used in bulk storage
- Vaporless Manufacturing markets product for UST's and other tanks systems up to 50K gals.



Vaporless Manufacturing, Inc.

FISHER

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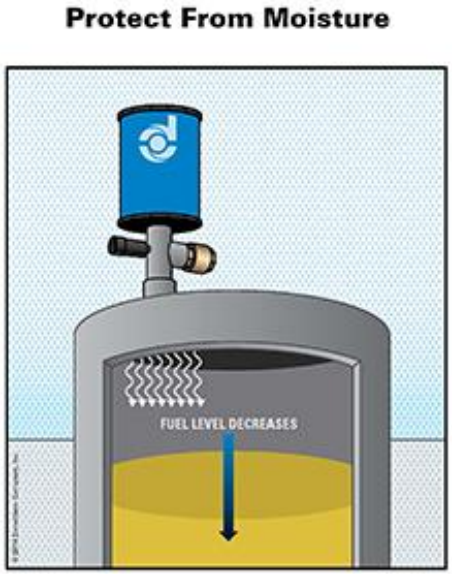
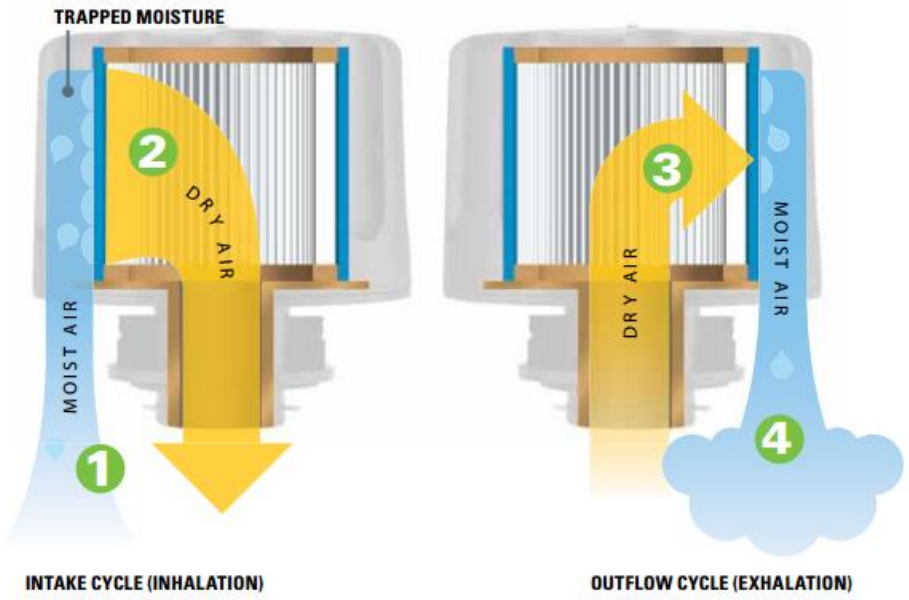
Other Strategies (not in RP900)

- **Tank Vent Desiccant System**
- Eliminates Moisture from ullage space
- Donaldson Company (and others)





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CRC – Preventive Maintenance Guide

Preventive Maintenance Guide for

Diesel Storage and Dispensing Systems

This guide provides practical tips for maintaining underground storage tanks (USTs), minimizing fuel contamination and maximizing fuel system cleanliness necessary for diesel equipment. Adopting these guidelines can help improve fuel quality, prolong equipment life, reduce corrosion and owner's operating expenses. All suggestions below should be performed in a safe, legal and environmentally sensitive manner.

Good water management eliminates most fuel quality problems:

Keep water from entering tanks to minimize tank water bottoms:

- Remove standing water, ice and/or snow around tank fill covers.
- Make sure all tank opening bungs and caps are tight – Inspect and replace any broken gaskets.
- Keep fill and vapor recovery buckets clean – pump out any water, clean out excess fuel and dirt (don't depress drain plungers allowing contamination into the tank).
- Verify tank vents are installed and caps are sealing properly – replace cap or repair as needed.
- Avoid prolonged periods of low tank volume to minimize tank water from condensation.

No detectable water is desirable and if found should be removed as soon as possible. Test removed water for microbes. If detected, take appropriate corrective action. If biocide is used, expect more frequent filter changes for a brief period.

Methods of detecting contaminants/water

Tank gauging—physically stick tank bottoms with water finding paste weekly and compare to automatic tank gauge electronic measurements (if available).

- The following will affect the water level measurements: Striker plate below gauging equipment, drop tube tank protection devices, sloping tank, and correct use of water finding paste.

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CRC Preventive Maintenance Guide

Examples of microbial contaminated samples and corroded fuel system parts:

F1. - ATG Floats w Corrosion Products

F2. - Diesel Tank Bottom Sample w Microbes

F3. - Corroded Dispenser Filter

Evidence of contaminants and/or water:

Dispenser filters	Other indicators
• Clogging/frequent replacements	• Meter failure
• Slow flow, especially after new receipts—indicates possible contamination (should be >5 gallons per minute)	• Automatic Tank Gauge (ATG) water warnings/alarms • Automatic nozzle shutoff failures • Customer complaints
• Observed rust, microbial slime or other contamination	• Check valves not seating

- ☑ Check for tank water bottoms before and after fuel deliveries.
- ☑ Evaluate the use of corrosion inhibitors and/or biocide to help control problematic systems.
- ☑ Consider use of water-sensing filters for diesel retail dispensers to help indicate water presence.
- ☑ Carefully take weekly dispenser nozzle samples in a clear jar. Fuel should be clear & bright without haze or particulates.
- ☑ Unless needed as retains, carefully dispose of samples in an approved, environmentally sound manner.

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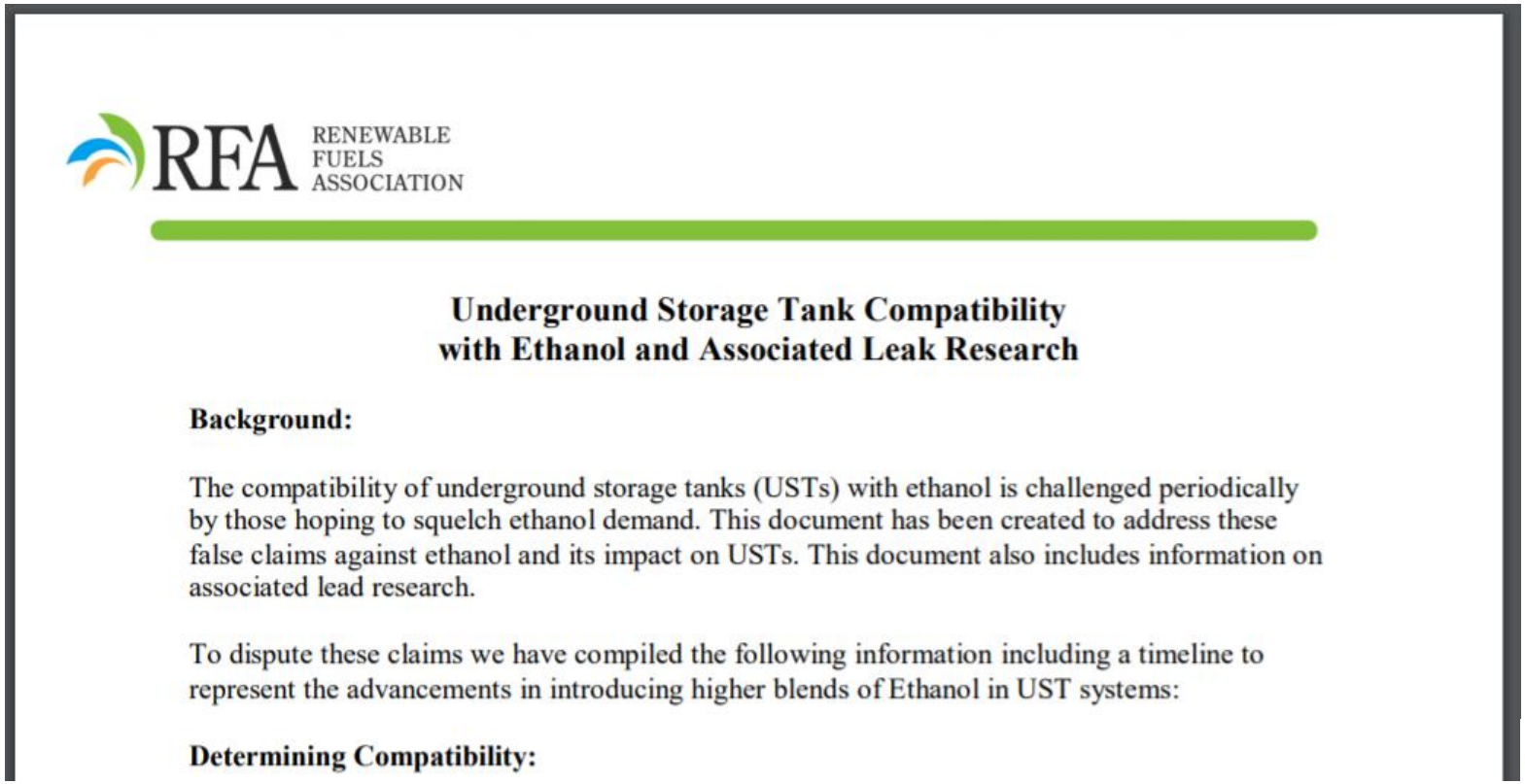
RFA – Compatibility Research

- https://ethanolrfa.org/wp-content/uploads/2017/11/RFA-UST-TALKING-POINTS-11.2017.pdf



RFA RENEWABLE FUELS ASSOCIATION

Underground Storage Tank Compatibility with Ethanol and Associated Leak Research

Background:

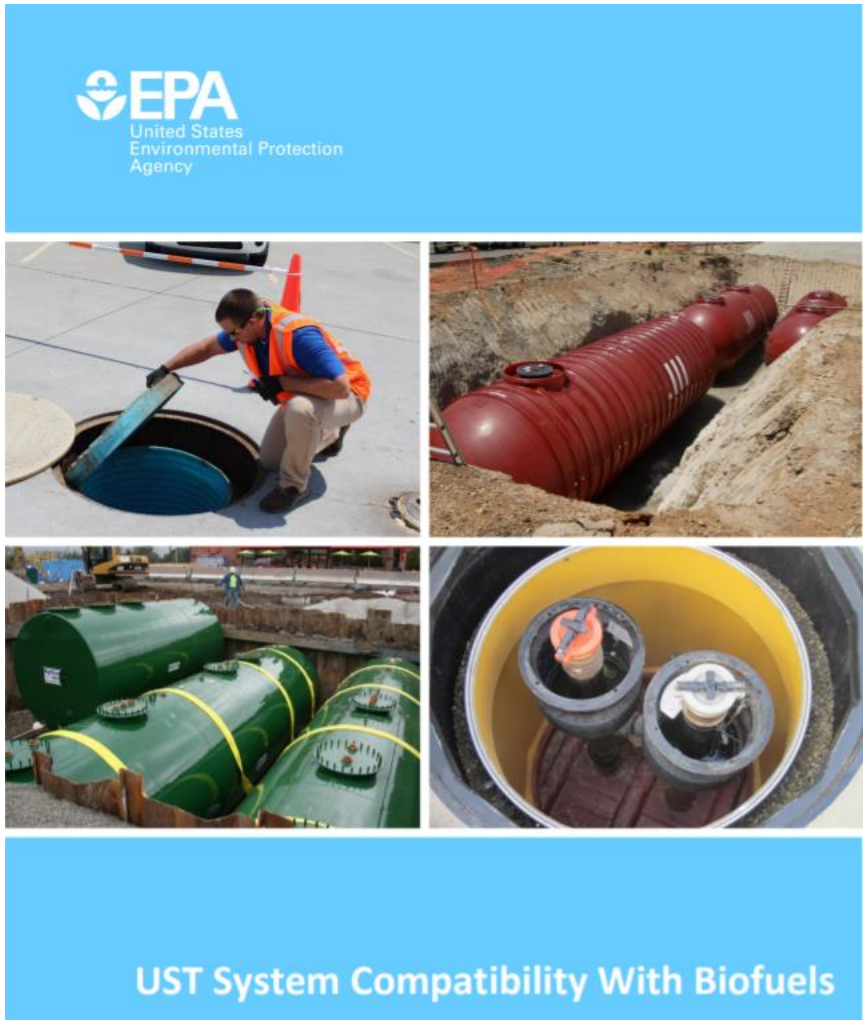
The compatibility of underground storage tanks (USTs) with ethanol is challenged periodically by those hoping to squelch ethanol demand. This document has been created to address these false claims against ethanol and its impact on USTs. This document also includes information on associated lead research.

To dispute these claims we have compiled the following information including a timeline to represent the advancements in introducing higher blends of Ethanol in UST systems:

Determining Compatibility:

EPA – Compatibility With BioFuels

- https://www.epa.gov/ust/ust-system-compatibility-biofuels



UL Certification Website

- http://database.ul.com/cgi-bin/XYV/template/LISEXT/1FRAME/index.htm

ONLINE CERTIFICATIONS DIRECTORY

Home Quick Guide Contact Us UL.com

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Search results

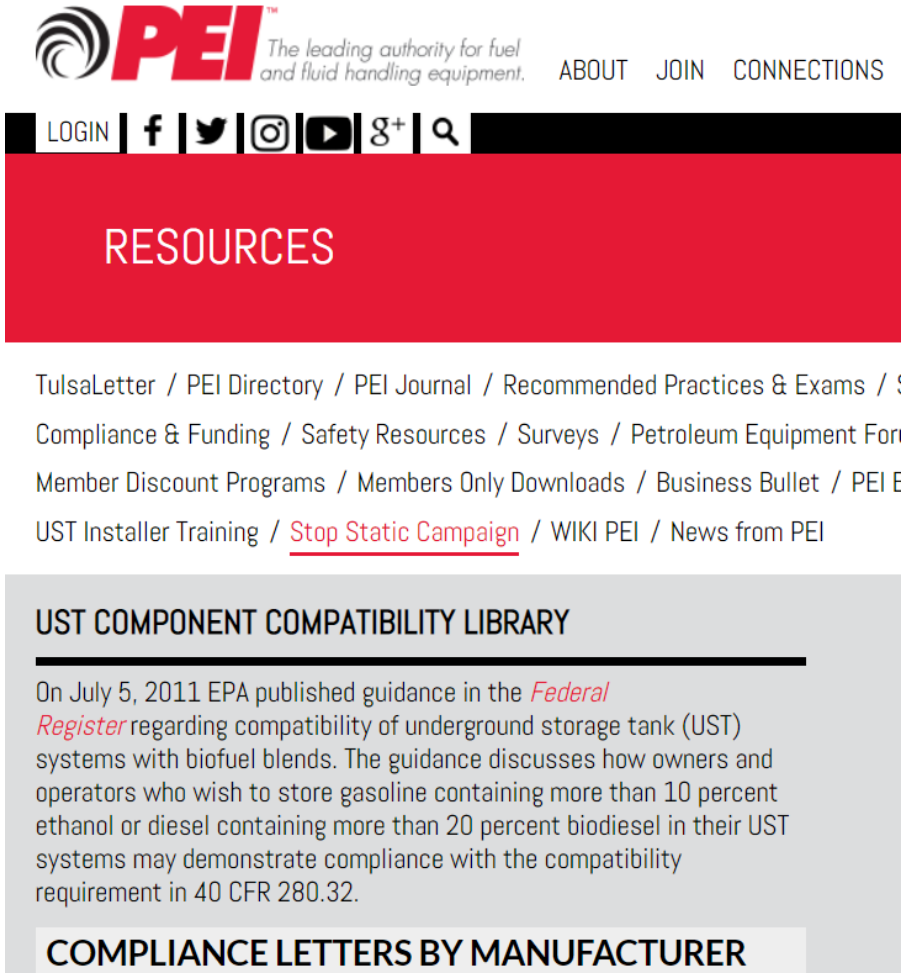
You may choose to Refine Your Search.

Company Name	Category Name	Link to File
HIGHLAND TANK & MFG CO	Aboveground Flammable-liquid Tanks	EEEV.MH5086
HIGHLAND TANK & MFG CO	Aboveground Flammable-liquid Tanks Certified for Canada	EEEV7.MH5086
HIGHLAND TANK & MFG CO	Oil/Water Separators	EGZI.MH18131
HIGHLAND TANK & MFG CO	Protected Aboveground Tanks for Flammable and Combustible Liquids	EELU.MH18216
HIGHLAND TANK & MFG CO	Protected Aboveground Tanks for Flammable and Combustible Liquids Certified for Canada	EELU7.MH18216
HIGHLAND TANK & MFG CO	Special-purpose Tanks	EFVT.MH20646
HIGHLAND TANK & MFG CO	Special-purpose Tanks Certified for Canada	EFVT7.MH20646
HIGHLAND TANK & MFG CO	Underground Tanks	EGHX.MH4242
HIGHLAND TANK & MFG CO	Underground Tanks	EGHX.MH25373
HIGHLAND TANK OF NORTH CAROLINA	Underground Tanks	EGHX.MH20396

Model number information is not published for all product categories. If you require information about a specific model number, please contact Customer Service for further assistance.

PEI – Compatibility Letters

- https://www.pei.org/ust-component-compatibility-library



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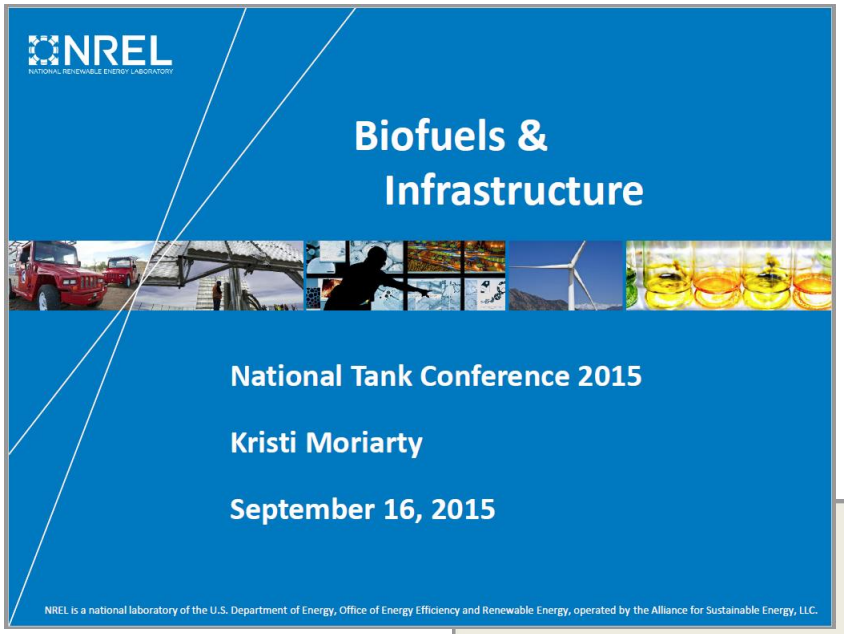
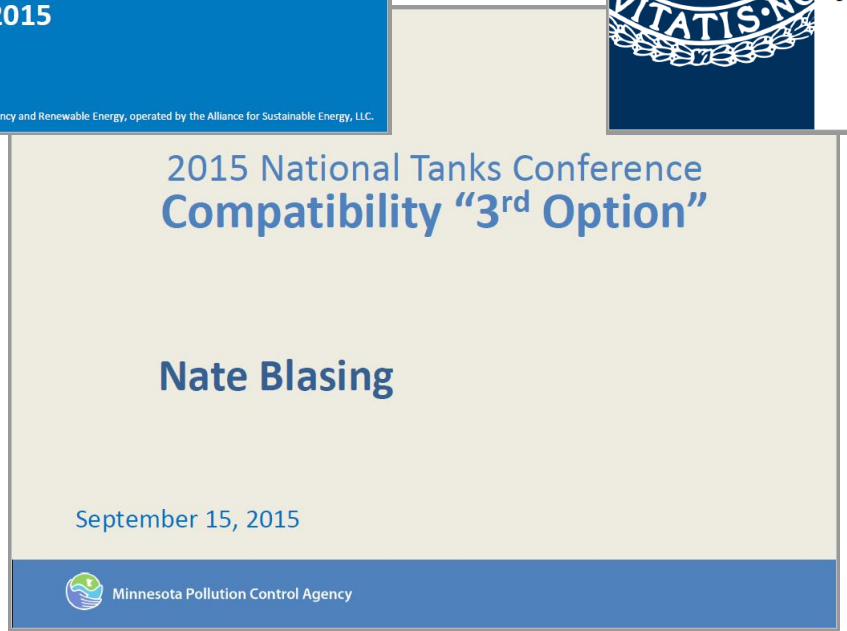
Prior NTC Presentations (2015)

Compatible? Can You Prove It?





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Summary of Tips for Maintaining Tanks

1. Store products that are compatible with materials.
2. Maintain and monitor leak detection and C.P. systems.
3. Inspect and verify overfill and spill prevention.
4. Cycle product through tank regularly (or keep tanks full).
5. Keep out water, sediment, debris, sludge, microbes.
6. “Enhanced” water monitoring.
7. Check equipment for signs of corrosion or degradation.
8. Internal inspections for “at-risk” tanks or planning purposes.
9. Use tank cleaning and biocides if/when necessary.
10. Consider other options for extreme cases.
11. Make proper confirmation of compatibility and notification if switching to >E10 or >B20 blends.

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Any Questions?

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