

Aging Tanks: They're Not Getting and Younger!

Strategies for Inspecting, Managing,
Upgrading, and Replacing UST's

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Overview

- About 3/4 of existing UST's will be over 30 years old this decade
 - Not just the tanks, but related piping & equipment
- Risk Management – more than just compliance
- Internal Video Inspections will show problems & possible causes.

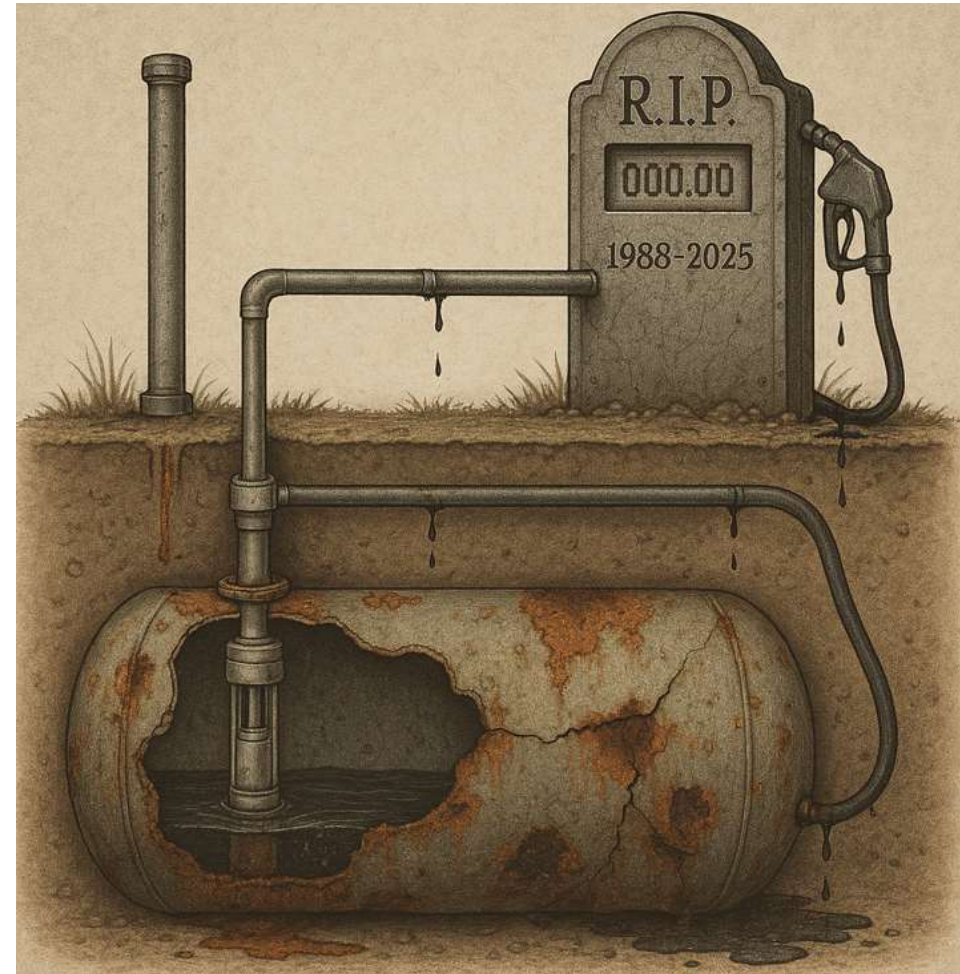


Image created by AI – not a real tank 😊



Risk Management of UST's

- Evaluate risk factors for specific installations
 - Site risk factors
 - Equipment risk factors
 - Piping, Sumps, UDC's, ATG's
 - Steel UST's
 - Fiberglass UST's
- Establish risk management practices
 - Frequency/Type of leak detection
 - Frequency/Type of inspections & maintenance
 - Removal/Replacement/Upgrading schedules



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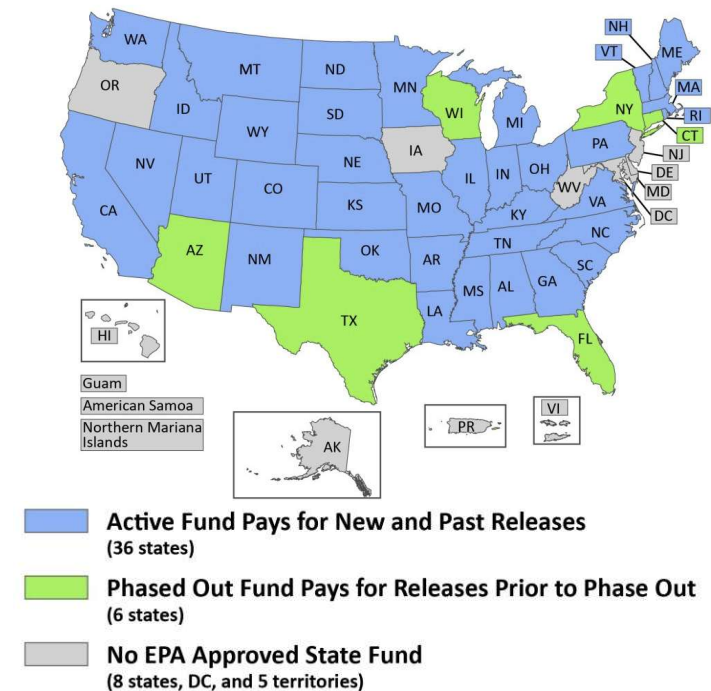


“Site” Risk Factors

- Sensitive Receptor Survey
- Construction activities at site
- Groundwater conditions (& flooding)
- Change in product storage and compatibility
- Throughput volume
- State Cleanup Fund



Map of State Financial Assurance Funds (2025)





Risk Assessment – Equipment: Not Just Tanks

- Piping: SW vs DW (what generation?)
- STP's: Inside sumps or “buried in the dirt”
- Dispensers: UDC's or no containment
- Spill/Overfill Prevention: Current technology?
- Leak Detection: Current technology?



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Corrosion in ULSD (tank) or Ethanol (sumps)

- Impacts multiple components





Single Wall Systems

- No UDC's
- Any leaks go directly into the ground
- Site will likely have existing contamination



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Single Wall Systems

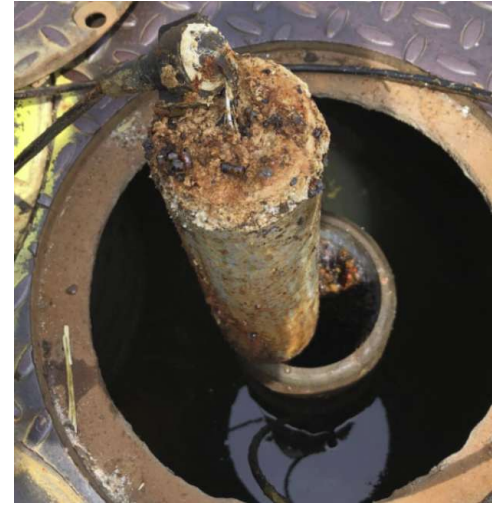
- No STP Sumps
- Leaks go directly into the ground
- Site will likely have existing contamination





ATG and Leak Detection

- Faulty sensors may not detect leak
- Many problems caused by corrosion





Piping Concerns

- Single wall higher risk
 - No containment if leak occurs
- Some leaks from damage
- Early generation flex piping
 - Higher risk of failure





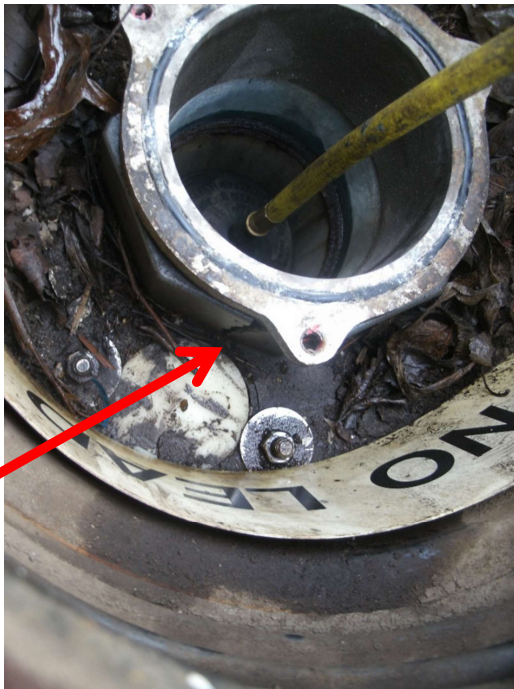
STP Sumps & UDC's

- Water Intrusion
- Lack of Containment
- Boot Failure
- Cracks/Splits



Spill Containers – Cracks & Tears

- Faulty equipment may allow leak into ground or water into tank.
- Pre-1988 UST systems had some time without spill buckets





Risk Assessment - Tanks

Steel

- Make/Model/Age
- Type of Corrosion Protection
- C.P. systems records/history
- Tank Maintenance (STI R-111)
- Experience with similar UST's



Fiberglass

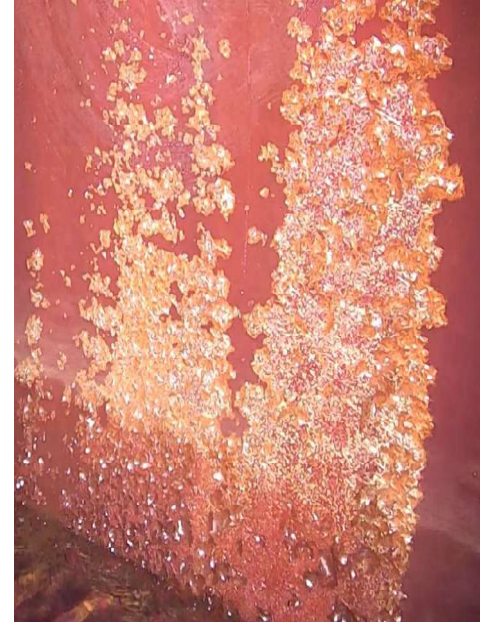
- Make/Model/Age
- Installation Checklist
- Warranty (UL Listing)
- Product Compatibility
- Experience with similar UST's





Possible Fiberglass Tank Issues

- Degradation of tank interior and gel coat
- Deflection and/or flattening of tank bottom
- Crack formation – often along rib lines
- Leak of product into hollow rib space
- Product in normally dry interstice
- Loss of brine from interstice
- Ingress of groundwater
- Leak of product into ground



These issues impact a small percentage of tanks.
Many old tanks are still in good shape.
But you don't know unless you check!



Crack & Ingress in SWF

PUL

Age
39

MO





SWF – Blisters & Ingress

PUL

Age
33

OH





SWF – Multiple Cracks & Ingresses

PUL

Age
37

TN





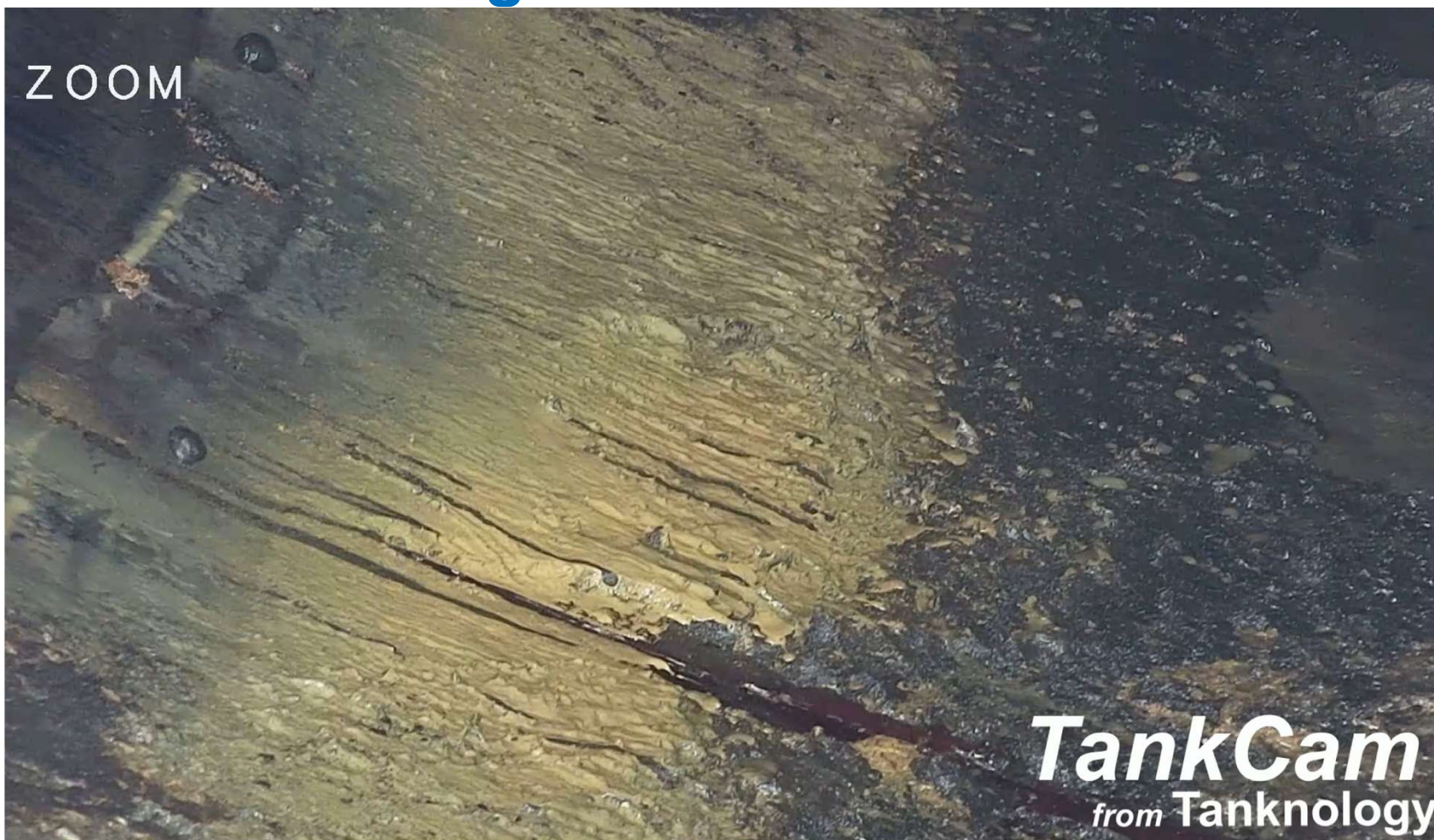
SWF Crack & Ingress

ZOOM

RUL

Age
41

TX



TankCam
from Tanknology



SWF – Deflection, Cracks, & Ingresses

PUL

Age
42

LA





SWF Crack & Ingress



PUL

Age
44

VA

TankCam
from Tanknology



Crack in SWF (Looking for spare bung)



RUL

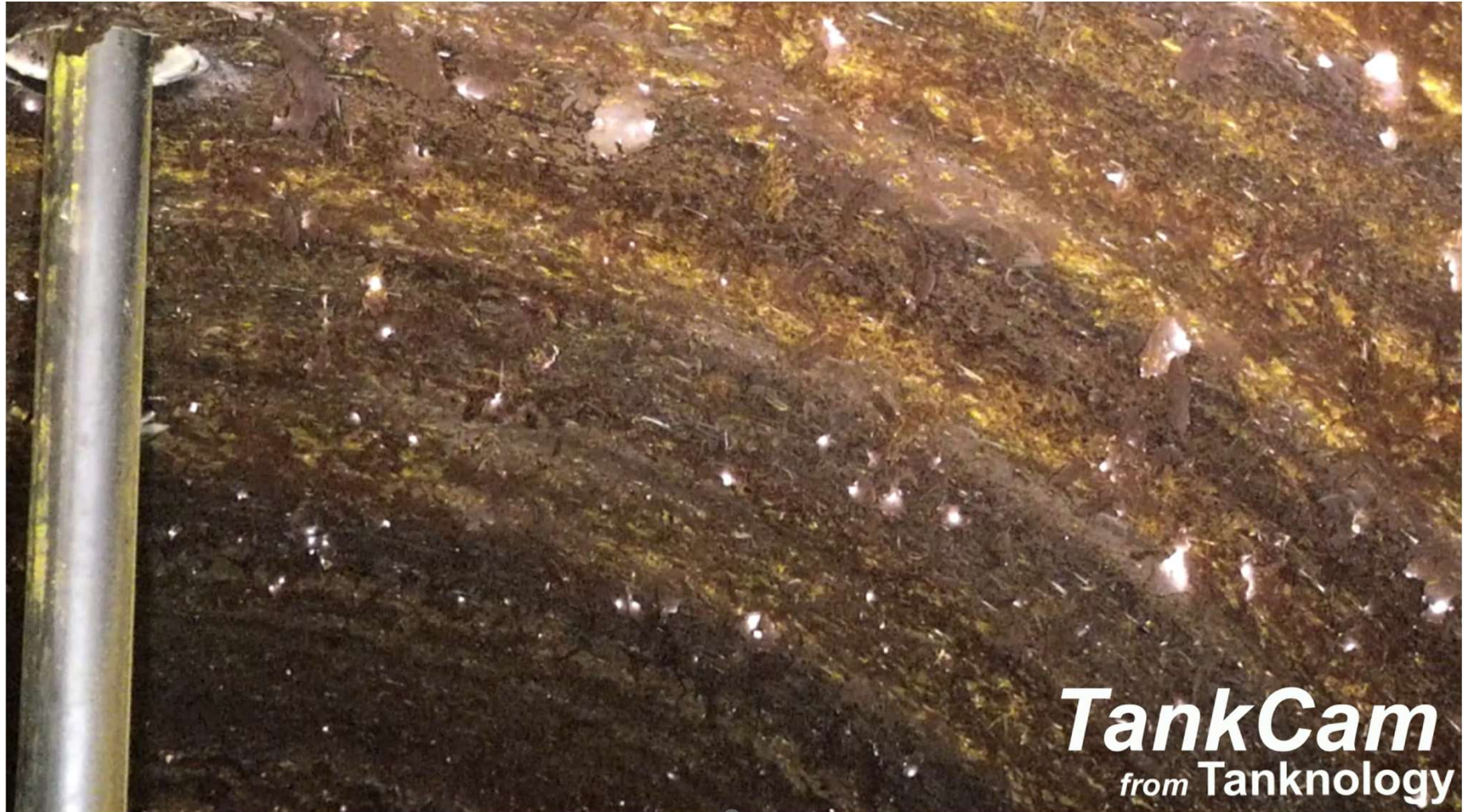
Age
46

IL

TankCam
from Tanknology



SWF- Blisters & Flaking



PUL

Age
23

TX

TankCam
from Tanknology

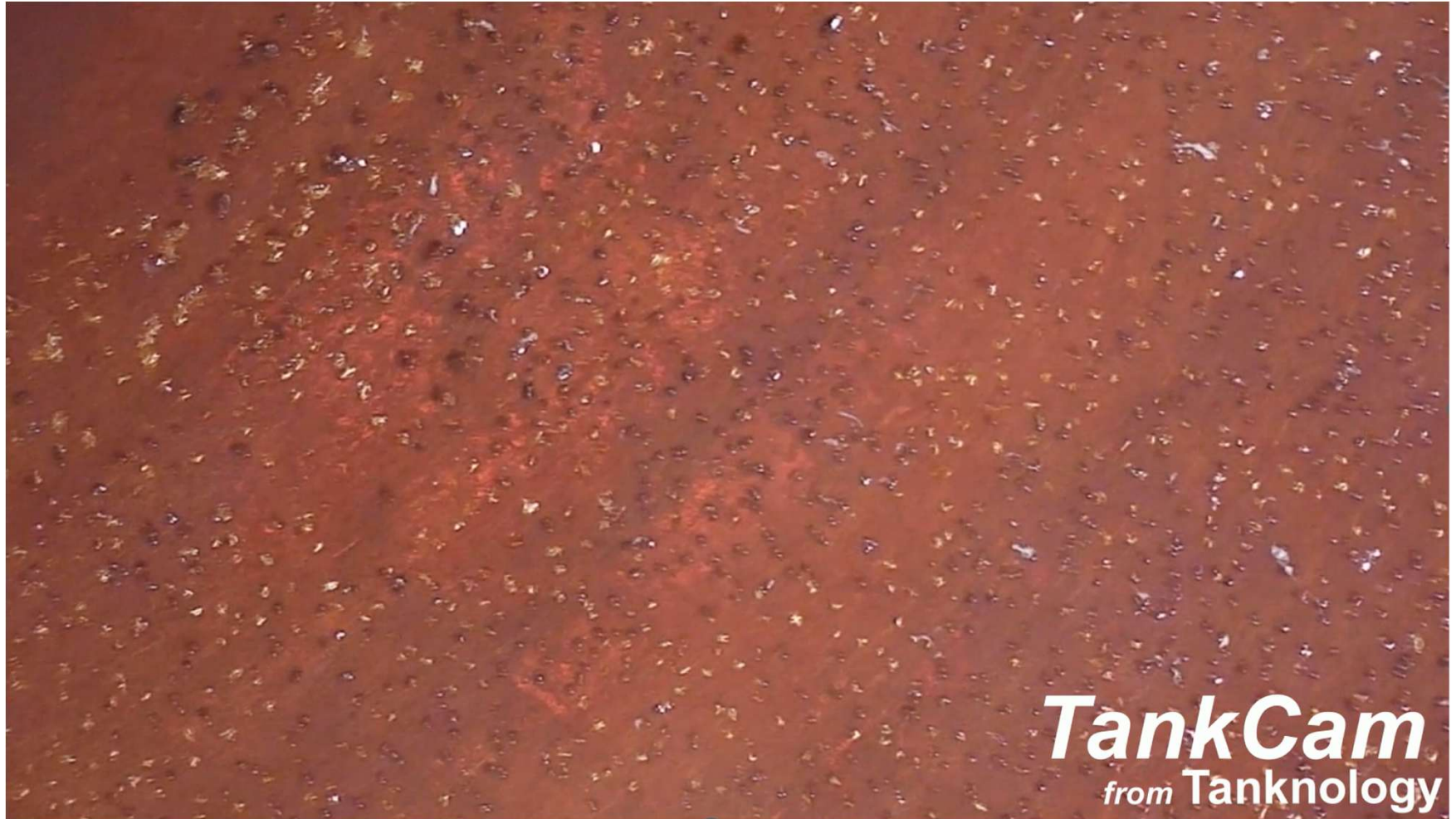


DWF - Blisters

RUL

Age
22

CA



TankCam
from Tanknology



Brine Ingress - DWF

PUL

Age
24

TX





DWF – Loss Brine & Ingress

PUL

Age
35

FL



TankCam
from Tanknology

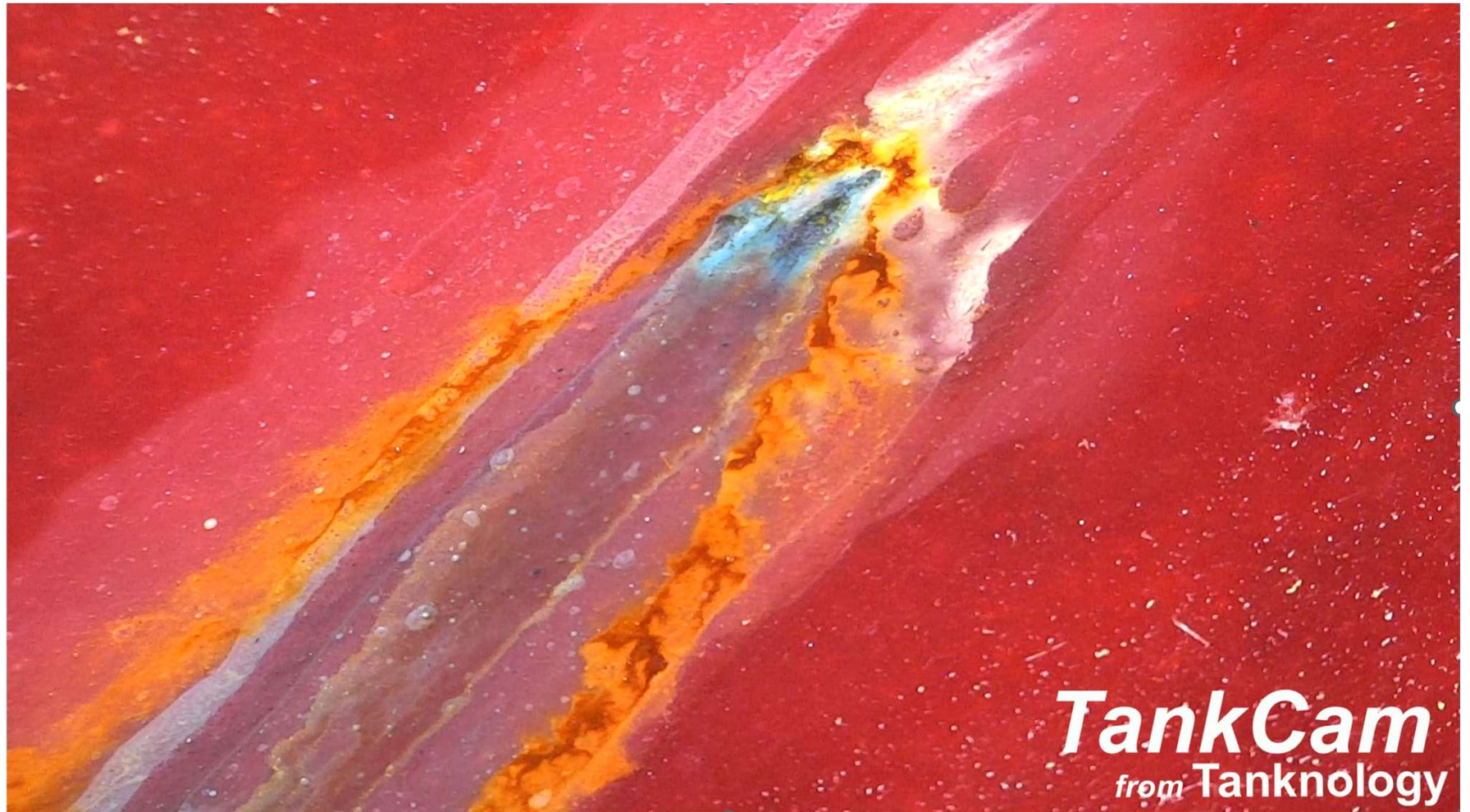


Brine Ingress - DWF

DSL

Age
1

NC



TankCam
from Tanknology



Crack/Leak in FRP Tank – Tank Test & Video



PUL

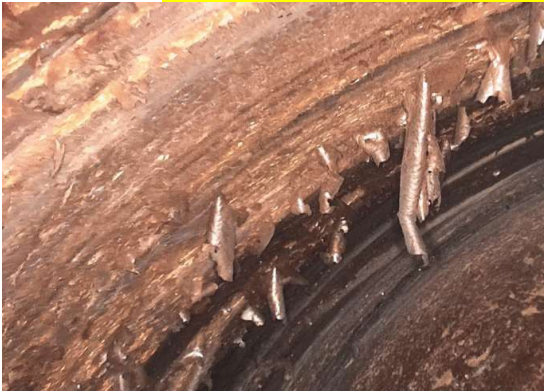
Age
27

IL



Aging FRP Tanks: Gas vs DSL; Same Site

Gasoline tank has flaking, blisters, and cracks.



Diesel tank has none, just minor residue.



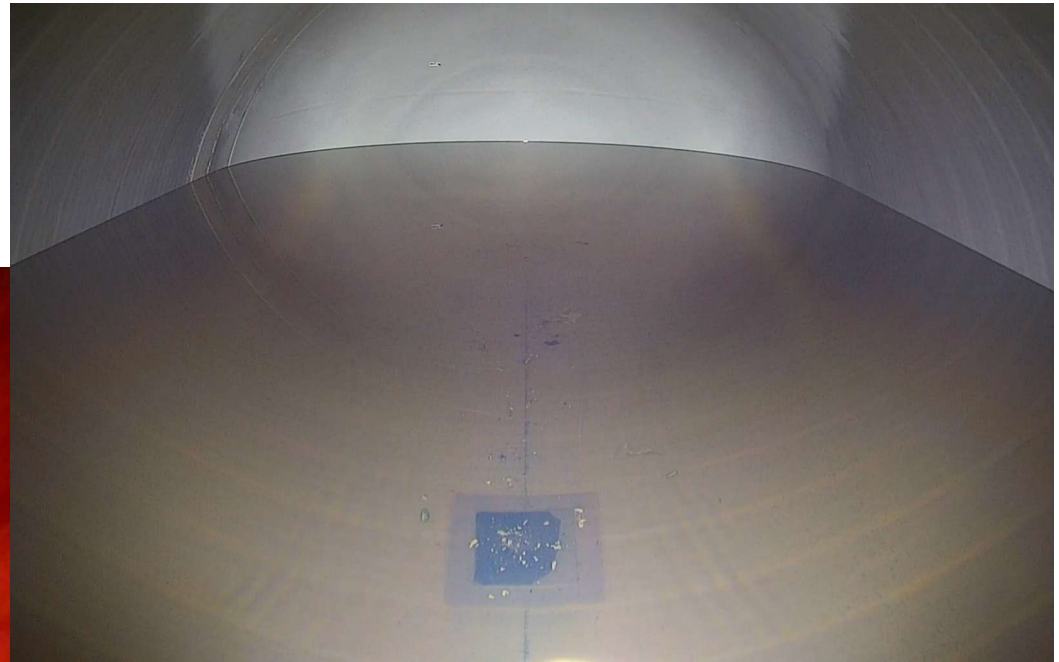
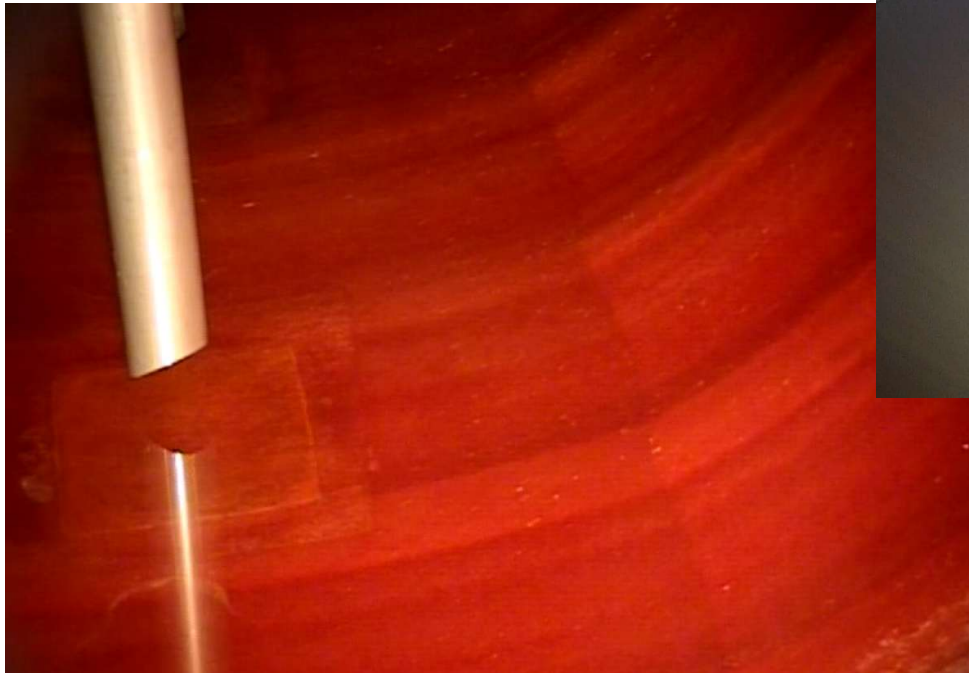
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Fiberglass Tanks – Good Condition

With good installation and storing compatible products, FRP tanks should last many years.



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Possible Steel Tank Issues

- External corrosion
 - If C.P. systems not maintained
 - Or problem with coating/jacket
- Internal corrosion
 - Worse with ULSD but can happen with other fuels
 - Often water or cleanliness issues
- May form pinholes or cracks along welds
- Product in normally dry interstice
- Ingress of groundwater
- Leak of product



These issues impact a small percentage of tanks.
Many old tanks are still in good shape.
But you don't know unless you check!



Ingress in Steel Tank

Off
Road
DSL

Age
47

AL





Ingress in Steel Tank

RUL

Age
45

MS





Ingress in Steel Tank – visible after TankClean™

E85

Age
30

TX





Ingress in Steel Tank

DSL

Age
23

GA



TankCam
from Tanknology



DW Steel – Product in Interstitial

DSL

Age
19

TX





Jacketed Steel – Product in Interstitial

DSL

Age
28

MI



TankCam
from Tanknology



Jacketed Steel – Bubble at Interstitial Riser



VacuTect & TankCam

Confirmed a leak in the
Interstitial Riser pipe on
a DW Steel Tank

DSL

Age
UNK

WI





Lined Steel Tank Failure & Ingress.

RUL

Age
48

OH





Lined Steel Tank Failure & Ingress

RUL

Age
49

OK

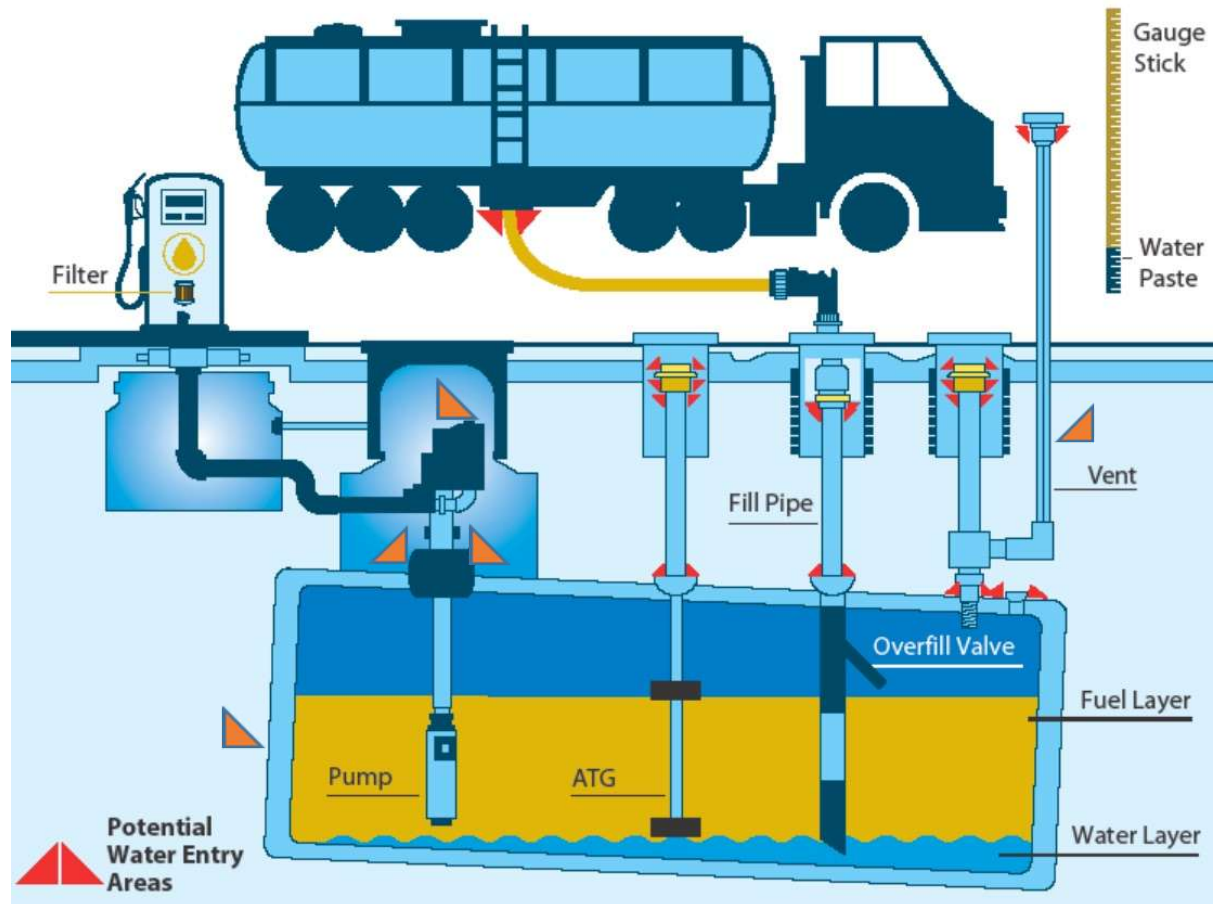


TankCam
from Tanknology



STI Guidance: Keeping Water Out of Tanks

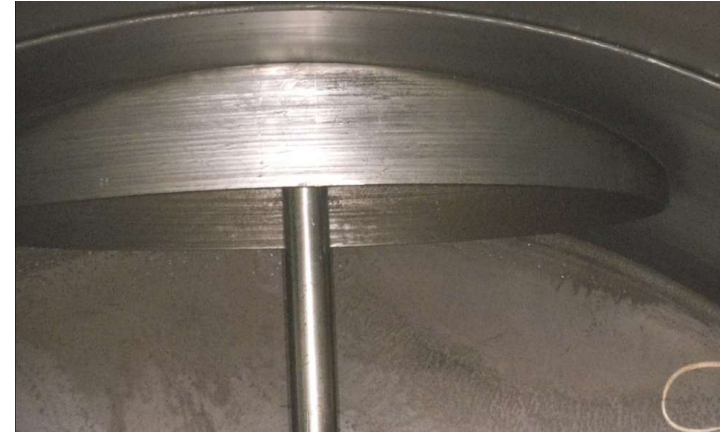
Water entry points in your fuel storage tank system



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Steel Tank – Clean/Dry





Summary Information

- Problems identified/confirmed with recent TankCam inspections

Tank Material	Total Tanks	RUL	PUL	DSL	OTHER	Ave. Age Years
SW Fiberglass	65	26	33	4	2	38
DW Fiberglass	22	8	12	1	1	24
SW Steel	13	2	1	7	3	33
DW Steel	14	1	3	10	0	18
Lined Steel	17	11	5	1	0	44
TOTALS:	131	48	54	23	6	34

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Common Sense Tips for Maintaining Tanks

1. Store products that are compatible with UST 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. Check equipment for signs of corrosion or degradation.
6. Keep out water, sediment, debris, sludge, microbes.
 - “Enhanced” water monitoring.
 - Use tank cleaning and biocides if/when necessary.
 - Consider other options for extreme humidity.
7. Inspections for “at-risk” tanks or planning purposes.
8. Consider “Increased Monitoring” practices

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“Increased Monitoring” Practices

- Site with no STP/UDC sumps & sensors
 - 30-Day Walk-Through Inspection
 - **Check STP pits and under dispensers (per PEI RP900)**
- Single Wall Lines
 - ELLD instead of MLD
 - Tank-top upgrade with sumps & UDC's
 - Change to suction instead of pressure piping
- Aging Tank Leak Detection Options
 - ATG – run static test weekly instead of monthly
 - Increase minimum fuel level for passing ATG tests
 - Use SIR in addition to ATG (for tanks and lines)
 - Annual tank test in addition to CSLD
 - Pressure decay test on DSL tanks (in addition to gasoline)
 - Install chemical resistant lining in tanks
 - Keep tanks clean/dry

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Investigating Aging UST Systems



- Gather information about the tank, including:
 - Age. Material. SW or DW.
 - Any repairs, upgrade, or lining?
 - Compatibility with different types of fuels.
 - Results from prior internal assessments or structural tests.
- Inspect the material inside the fuel filter for signs of microbial growth, material degradation, or corrosion.
- Measure the roundness or deflection of fiberglass reinforced plastic tanks.*
- Measure the bottom flattening of fiberglass tanks.*
- Conduct an internal video assessment of the tank** for signs of microbial buildup, degradation, or discontinuities.
- Conduct an internal manned assessment of the tank.**

See Upcoming ASTM WK90823 Guide for Aging Tanks





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**Internal tank inspection videos
recorded with TankCam® system.
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