



Release Detection Equipment: Not To Be Overlooked

National Tanks Conference September 24, 2025

Tim Smith

**U.S. Environmental Protection Agency
Office of Underground Storage Tanks**



Release Detection Equipment: Not To Be Overlooked

Food for thought

- Federal UST regulations are evergreen

Meeting compliance requirements

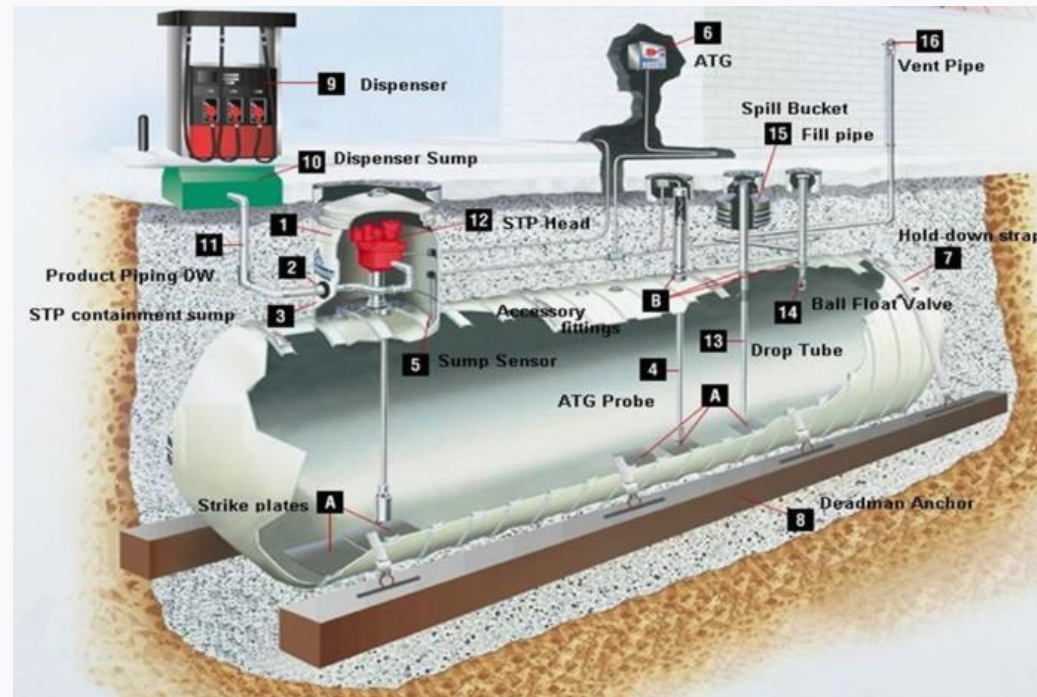
- Compatibility and functionality

Ensuring compliance

- Monitoring & testing results
 - How to determine proper performance

Compatibility Requirement in 280.32(b) and (c) applies to:

- Tanks
- Piping
- Containment sumps
- Pumping equipment
- Release detection equipment
- Spill equipment
- Overfill equipment





Functionality Requirement in 280.40(a)(4)

- Owners and operators of UST systems must provide a method, or combination of methods, of release detection that:
 - Meets the performance requirements in 280.43, 280.44, or subpart K of this part, as applicable, with any performance claims and their manner of determination described in writing by the equipment manufacturer or installer...





Leak Detection Bible

Issue Date: November 22, 1995
Revision Date: May 23, 2011

Hasstech

Leak Computer Tank Test System

VOLUMETRIC TANK TIGHTNESS TEST METHOD (UNDERFILL)

Hasstech is no longer in business.



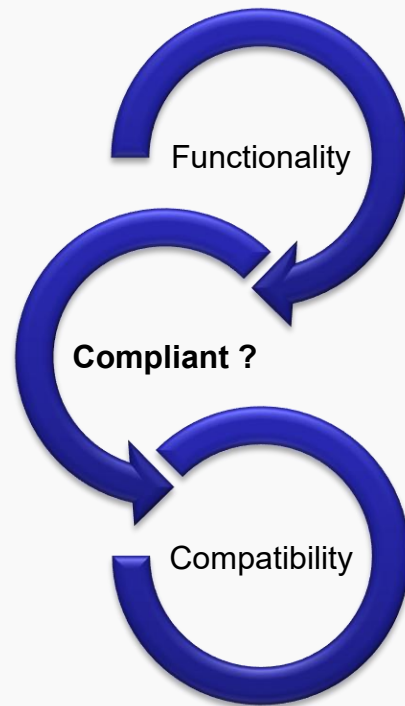
Certification	Leak rate of 0.1 gph with PD > 99% and PFA < 1.0%.
Leak Threshold	0.05 gph. A tank system should not be declared tight if the test result indicates a loss or gain that equals or exceeds this threshold.
Applicability	Gasoline, diesel, aviation fuel, fuel oil #4.
Tank Capacity	Maximum of 15,000 gallons. Tank must be minimum 90% full.
Waiting Time	Test data are acquired and recorded by system's computer that calculates a leak rate every minute, and determines waiting time for satisfactory data (test is finished when the standard deviation of 30 sequential leak rates is less than half of the last leak rate determined). There must be no dispensing or delivery during waiting time.
Test Period	Minimum of 1 hour, 10 minutes. Test data are acquired and recorded by system's computer. Leak rate is calculated from data determined to be valid by statistical analysis. There must be no dispensing or delivery during test.
Temperature	Average for product is determined by a minimum of 7 thermistors.
Groundwater	Depth to groundwater in tank excavation backfill must be determined. If groundwater is above bottom of tank, product level must be adjusted to provide a minimum net pressure of 1 psi at bottom of tank during test.
Calibration	Level sensor must be calibrated before each test. Thermistors must be checked annually and, if necessary, calibrated in accordance with manufacturer's instructions.
Comments	Not evaluated using manifolded tank systems. Tests only portion of tank containing product. As product level is lowered, leak rate in a leaking tank decreases (due to lower head pressure). Consistent testing at low levels could allow a leak to remain undetected. EPA leak detection regulations require testing of the portion of the tank system which routinely contains product. System no longer being manufactured and no support is available.

Hasstech
out of business

Evaluator: Law Engineering Industrial Services
Tel: (800) 672-6601
Date of Evaluation: 04/17/91



Functionality & Compatibility are Intertwined Short-term and Long-term Compliance



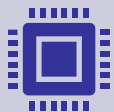


Compatibility Concerns

Concerns



What's in the tank and running through the piping?



Must all release detection equipment and components be compatible with the product stored?



Which components touch the regulated substance?

Considerations

- Product chemistry
 - Gasoline, diesel, biodiesel, ethanol blends, antifreeze, sodium hypochloride...
- Must I buy a stainless steel ATG console?
- Functional elements in contact with the product.

Tank and Piping Monitoring Methods (Compatibility Concerns)

Internal

- ATG
- CSLD
- SIR
- MTG
- ALLD



External

- Groundwater Monitoring
- Vapor Monitoring



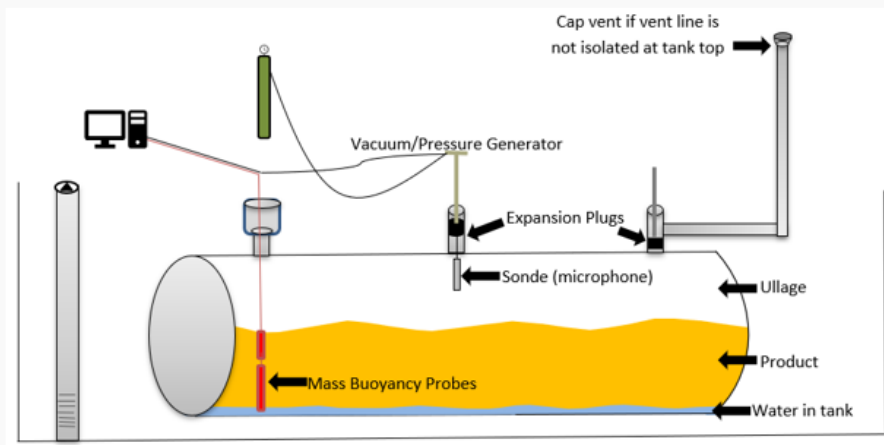
Interstitial

- Liquid point sensors
- Float sensors
- Brine, pressure - vacuum



Tank and Piping Precision Test Methods (Compatibility Concerns)

Volumetric



Non-volumetric





Functionality Concerns

Considerations

- Product chemistry
 - Gasoline, diesel, biodiesel, ethanol blends, antifreeze, sodium hypochloride...
- Will it work in all environments?
- Will it work in every tank or piping configuration?
- Any limitations on tank size, piping length, manifolded systems, head pressure...

Concerns



What's in the tank and running through the piping?



External / environmental considerations



Operating principles considerations, limitations

Will it work in every tank or piping configuration?
Limitations on tank or piping size, manifolded systems, head pressure...

Tank and Piping Monitoring Methods (Functionality Concerns)

Internal

- ATG
- CSLD
- SIR
- MTG
- ALLD



External

- Groundwater Monitoring
- Vapor Monitoring



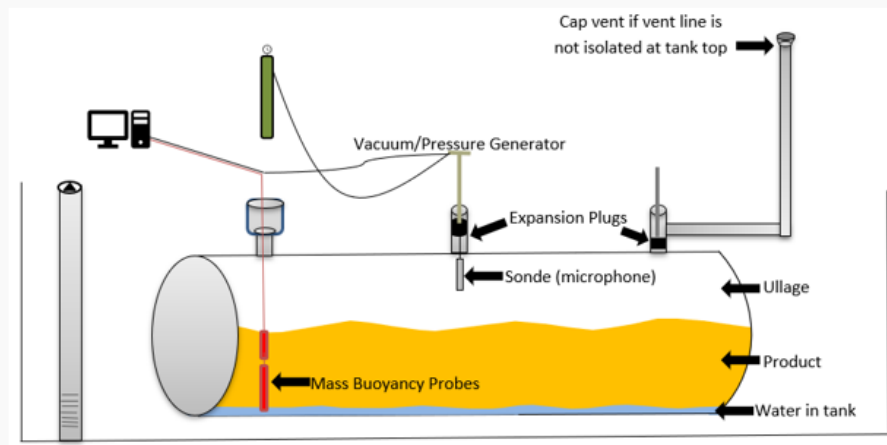
Interstitial

- Liquid point sensors
- Float sensors
- Brine, pressure - vacuum



Tank and Piping Precision Test Methods (Functionality Concerns)

Volumetric

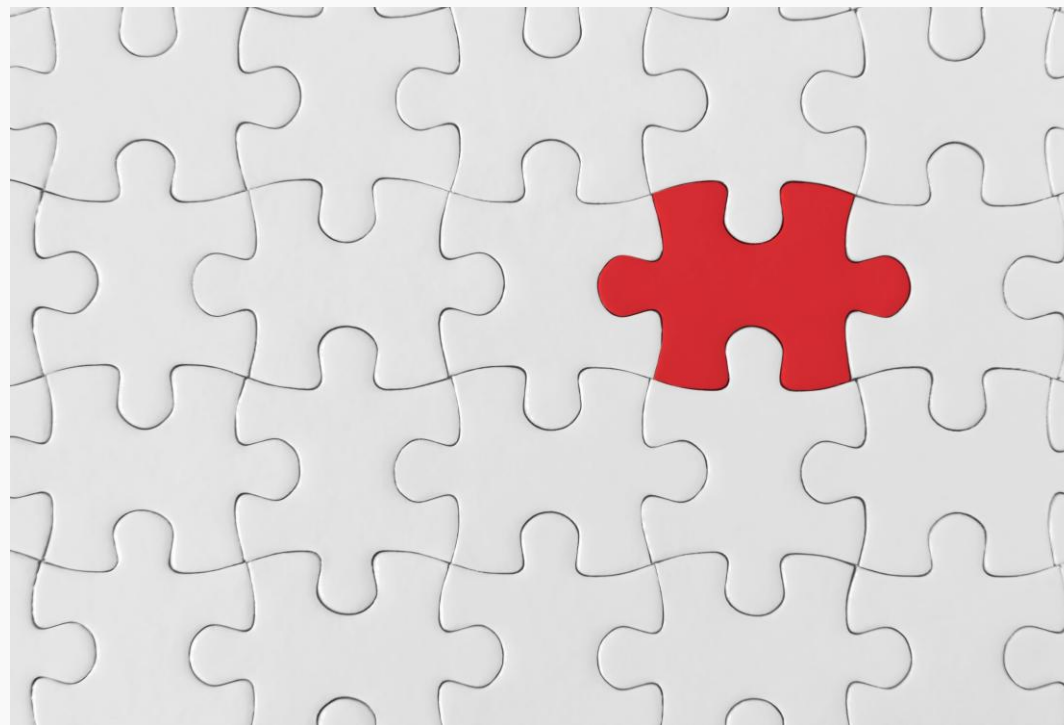


Non-volumetric



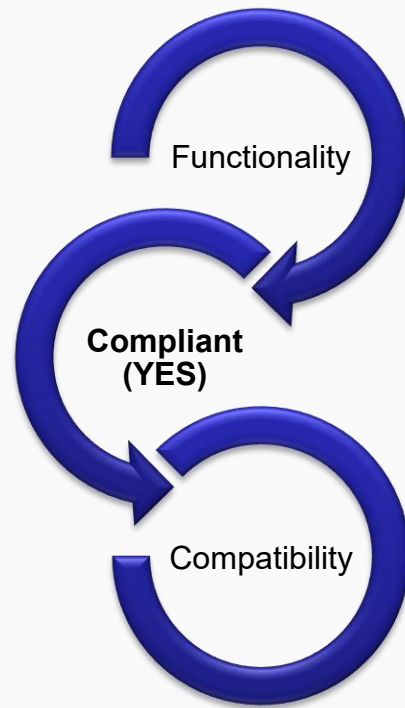


Functionality + Compatibility +
Proper Monitoring and Testing = Compliant





Functionality, Compatibility, and Proper Monitoring and Testing



UST Guide: Examination of Release Detection Monitoring & Test Methods





Purpose

- UST system owners and operators (O/O) and inspector information guide.
- Data that is available prior to testing or must be obtained to perform test.
- Increase knowledge about RD monitoring & testing methods.
 - Connect how and why of method to regulatory performance standards, scientific principles, and method objectives.



Objectives

- Increase UST O/O & inspector knowledge.
 - How should test be run?
 - What are the operating principles of the method?
 - What results should be obtained?
 - What results should be presented on report or made readily available upon request?
- Foster reporting consistency amongst industry.
 - Coordinate with testing companies.
 - Provide O/Os information to shape their expectations and agreements with testers and other service providers.
- Ensure appropriate testing is being performed.
 - Provide minimum data elements per monitoring and test method category.





Contents

- 30-Day (Monthly) Monitoring
 - ATGs
 - SIR
 - CITLD
- Annual Functionality Testing
 - PEI RP1200
 - ATG configuration
 - Probes and sensors
 - NWGLDE listed
 - Not covered by RP1200



- Secondary Containment Testing
 - PEI RP1200
 - Sump testing
 - NWGLDE listed
 - Dry sump
- Suspected Release Investigation
 - Tank tightness testing
 - Line tightness testing



ATG Report Example

START LEAK TEST
FEB 7, 2011 12:30 AM

TEST LENGTH 2 HOURS

T 1:UNLEAD
VOLUME = 601 GALS
ULLAGE = 2407 GALS
90% ULLAGE= 2106 GALS
TC VOLUME = 613 GALS
HEIGHT = 16.25 INCHES
WATER = 0.00 INCHES
TEMP = 30.9 DEG F

0.2 GAL/HR FLAGS:
LOW LEVEL TEST ERROR

STOP IN-TANK LEAK TEST
T 4:ROADMASTER
FEB 19, 2011 4:00 AM

STATION: HILLTOP, CENTRAL
S&P NUMBER: 051487
INSTRUCTIONS: NO SERVICE

FEB 19, 2011 4:00 AM

LEAK TEST REPORT

T 4:ROADMASTER
PROBE SERIAL NUM 051487

TEST STARTING TIME:
FEB 19, 2011 2:00 AM

TEST LENGTH = 2.0 HRS
STRT VOLUME = 2385.3 GAL

LEAK TEST RESULTS
0.20 GAL/HR TEST INVL

0.20 GAL/HR FLAGS:
TEMP CHANGE TOO LARGE

STOP LEAK TEST
T 2:SUPER
JAN 22, 2007 7:02 PM

LEAK TEST REPORT
T 2:SUPER
TEST STARTING TIME:
JAN 22, 2007 2:02 PM

TEST LENGTH 5 HOURS
STARTING TEMP = 31.0 F
ENDING TEMP = 27.7 F

LEAK TEST RESULTS
0.2 GAL/HR TEST INVALID
0.2 GAL/HR FLAGS:
RECENT DELIVERY
CHANGE IN TANK TEMP ZONE
TEMP CHANGE TOO LARGE

TEST ENDING TIME:
JAN 22, 2007 7:02 PM



ATG Report Example - Continued

CSLD TEST RESULTS

DD-MM-YY HH:MM XM

T 2: SUPER UNLEADED

PROBE SERIAL NUM 123002
0.2 GAL/HR TEST
PER: DD-MM-YY PASS

START LEAK TEST
FEB 28, 2011 12:30 AM

TEST LENGTH 2 HOURS

T 1: UNLEAD
VOLUME = 917 GALS
ULLAGE = 2091 GALS
90% ULLAGE = 1790 GALS
TC VOLUME = 936 GALS
HEIGHT = 22.03 INCHES
WATER = 0.00 INCHES
TEMP = 30.1 DEG F

TANK 1 PRODUCT: UNLEADED

START: SUN JAN 23, 10 3:30:00 PM
BEG STATUS:

BEG VOLUME: 8591.451 gal
NET: 8760.214 gal
BEG FUEL LEVEL: 85.9036 in
BEG H2O LEVEL: 0.3773 in
BEG TEMP: 30.36 °F
BEG UTF: 1481.537 gal
BEG ULLAGE: 95%=977.887 gal

END: MON JAN 24, 10 3:30:00 PM
END STATUS:

END VOLUME: 7959.450 gal
NET: 8113.777 gal
END FUEL LEVEL: 79.6290 in
END H2O LEVEL: 0.3773 in
END TEMP: 30.74 °F
END UTF: 2113.538 gal
END ULLAGE: 95%=1609.888 gal

INVENTORY CHANGE: -632.001 gal
NET: -646.437 gal



Miscellaneous Key Data Elements

Leak Rate
and
Threshold

Groundwater
Determination
in Backfill

Waiting
Period and
Test Duration

Test Pressure
Applied

Tank
Capacity

Limitations



Leak Detection Bible

Issue Date: November 22, 1995
Revision Date: May 23, 2011

Hasstech

Leak Computer Tank Test System

VOLUMETRIC TANK TIGHTNESS TEST METHOD (UNDERFILL)

Hasstech is no longer in business.



Certification	Leak rate of 0.1 gph with PD > 99% and PFA < 1.0%.
Leak Threshold	0.05 gph. A tank system should not be declared tight if the test result indicates a loss or gain that equals or exceeds this threshold.
Applicability	Gasoline, diesel, aviation fuel, fuel oil #4.
Tank Capacity	Maximum of 15,000 gallons. Tank must be minimum 90% full.
Waiting Time	Test data are acquired and recorded by system's computer that calculates a leak rate every minute, and determines waiting time for satisfactory data (test is finished when the standard deviation of 30 sequential leak rates is less than half of the last leak rate determined). There must be no dispensing or delivery during waiting time.
Test Period	Minimum of 1 hour, 10 minutes. Test data are acquired and recorded by system's computer. Leak rate is calculated from data determined to be valid by statistical analysis. There must be no dispensing or delivery during test.
Temperature	Average for product is determined by a minimum of 7 thermistors.
Groundwater	Depth to groundwater in tank excavation backfill must be determined. If groundwater is above bottom of tank, product level must be adjusted to provide a minimum net pressure of 1 psi at bottom of tank during test.
Calibration	Level sensor must be calibrated before each test. Thermistors must be checked annually and, if necessary, calibrated in accordance with manufacturer's instructions.
Comments	Not evaluated using manifolded tank systems. Tests only portion of tank containing product. As product level is lowered, leak rate in a leaking tank decreases (due to lower head pressure). Consistent testing at low levels could allow a leak to remain undetected. EPA leak detection regulations require testing of the portion of the tank system which routinely contains product. System no longer being manufactured and no support is available.

Hasstech
out of business

Evaluator: Law Engineering Industrial Services
Tel: (800) 672-6601
Date of Evaluation: 04/17/91



Project Timeline

October
2025

- Discuss draft with equipment vendors and testers.
- Get feedback on layout and contents.

Early
Winter
2025

- Route draft for review and comment to ASTSWMO, EPA Regions, other stakeholders.



Project Timeline Continued

Early
Spring
2026

- Discuss draft with select stakeholders.
- Refine, as needed.

Early
Summer
2026

- Brief EPA Regions and ASTSWMO.
- Post guide.



QUESTIONS?

Tim Smith
U.S. EPA – Office of
Underground
Storage Tanks

smith.timr@epa.gov
(202) 564-0643

