

TWENTY-SEVENTH EDITION, 2020

LIST OF LEAK DETECTION EVALUATIONS FOR STORAGE TANK SYSTEMS



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DISCLAIMER

GENERAL

Appearance on this list is not to be construed as an endorsement by any regulatory agency nor is it any guarantee of the performance of the method or equipment. Equipment should be installed and operated in accordance with all applicable laws and regulations.

This list of Leak Detection Evaluations was prepared by a work group consisting of State and EPA members and is limited to evaluations of leak detection equipment and procedures or systems, conducted by an "independent third-party evaluator" (see Appendix "Glossary of Terms") and reviewed by the work group. This list includes evaluations conducted in accordance with either EPA Standard Test Procedures for Evaluating Leak Detection Methods (EPA/530/UST-90/004 through 010) or other test procedures accepted by the NWGLDE as equivalent to the EPA standard test procedures (see Part III "Acceptable Test Protocols").

The National Work Group on Leak Detection Evaluations (NWGLDE) does not guarantee the performance of any leak detection method or equipment appearing on this List, nor does it warrant the results obtained through the use of such methods or equipment.

SPECIFIC

- The NWGLDE does not evaluate methods or equipment and appearance on this List does not mean they are automatically acceptable for use in any particular state or local jurisdiction.
- The NWGLDE List is not an EPA List, nor does appearance on this list constitute endorsement or approval by the NWGLDE or EPA. Anyone claiming that a device or method is "EPA approved" because it appears on this list is making a false claim.
- The NWGLDE makes no representations concerning the safe operation of any method or equipment. Users of any method or equipment appearing on this List assume full responsibility for the proper and safe operation of said equipment and assume any and all risks associated with its use.
- On each data sheet, this List reports parameters and data values for methods, equipment, and software that are specific to the most current third-party evaluation submitted to the NWGLDE. Subsequent modifications or changes to the method, equipment, or software may produce parameters and data values that are significantly different than the listed third-party evaluation parameters and data values. It is the responsibility of the local implementing agency to accept or reject those modifications or changes.
- NWGLDE Listings apply to leak detection functionality only and not material compatibility. Since long term material compatibility with the product stored is not addressed in test procedures and evaluations, the NWGLDE makes no representations as to the compatibility of leak detection equipment with the product stored.
- Unless specifically indicated on the individual data sheets, performance with alternative fuels has not been demonstrated **with the following exception:**

Biodiesel B6 through B20 meeting ASTM D7467 and biodiesel B100 meeting ASTM D6751 may be used with all equipment listed for diesel whether or not these alternative fuels are included on individual data sheets. This exception DOES NOT APPLY to leak detection test methods using Out-Of Tank Product Detection (Vapor Phase) for B6-B20, and Out-Of Tank Product Detection (Liquid and Vapor Phase) and any tracer-based test methods for B100. For these methods, individual data sheets will have to be referenced to determine applicability.

- Measurements derived for minimum detectable water level and minimum water level change for automatic tank gauge method, continuous automatic tank gauge method, and certain non-volumetric tank tightness test method listings were calculated in 100% hydrocarbon fuels, unless otherwise noted.
- NWGLDE listed leak detection equipment may be applicable for use with additional liquids after consultation with the manufacturer and/or third party evaluator and subject to approval by the implementing agency.

The National Work Group on Leak Detection Evaluations (NWGLDE) is pleased to publish our 27th Edition, 2020 of the "List of Leak Detection Evaluations for Storage Tank Systems." Please note, the NWGLDE has significantly changed the format of this List. All of our listings are kept current on our webpage: <http://www.nwglde.org>. As this webpage has the current listings and most users access our information through the much easier-to-navigate webpage, the NWGLDE will no longer be maintaining a full, printed List of all of the NWGLDE evaluations. Instead, the new "List" will simply be a list of the changes made to the evaluations and methods within the past year. Attached, please find only those listings that are new or updated since the previous publication (26th Edition, January 2019). Please use our webpage to access current information, listings, and methods.

For help with accessing anything on our web site, please contact our webmaster, David Wilson, at djwilson@utah.gov, or give him a call at (801) 536-4138.

If you need to contact members of the work group, information for contacting them may be found on our webpage (http://www.nwglde.org/group_members.html). The work group team and team leaders are also listed on our webpage to help you determine the appropriate contacts (http://www.nwglde.org/team_members.html).

Vendors should send new third-party evaluations, which were performed by an "independent third-party evaluator" (see Glossary of Terms on webpage), to be reviewed by the work group to the team leader and all of the members of the team. Please follow all requirements and policies for submittals and include all documentation for a more prompt review (available on our webpage).

Please note, all reviews and listings are conducted and prepared by the NWGLDE, an independent work group consisting of state and EPA members. It is not a work group specifically affiliated with EPA or any specific state. The NWGLDE does not "approve" leak detection equipment or procedures. The "List" includes leak detection equipment/procedures that the work group has reviewed. The review confirms that the leak detection equipment/procedures were third-party evaluated in accordance with an acceptable protocol and in accordance with the EPA performance standards under appropriate test conditions. Implementing agencies must approve leak detection equipment and procedures, ensure appropriate installation, and determine compliance with UST regulations.

Thank you and we look forward to working with you soon.

Don Taylor, Chair
National Work Group on Leak Detection Evaluations (NWGLDE)





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What's New Since The 26th Edition List, 2019 (01/31/2019)

MOST RECENT WEBSITE ADDITIONS/REVISIONS:

- ◆ **AC/CENT Environmental**
 - **Dri-Sump Containment Tightness Test Method**
Added to Secondary and Spill Containment Test Method January 31, 2019
- ◆ **Mesa Engineering**
 - **Mesa 2-D Method with ACT v1 and ACT v2 Water Level Sensor**
Revised listing March 4, 2019
- ◆ **PMP Corporation**
 - **PMP Piping Sump Sensor 63228 and 63229 as evaluated with the Veeder-Root TLS-350 (software version 11.02)**
Added to Interstitial Detector (Liquid-Phase) Method May 28, 2019
- ◆ **Fueling and Service Technologies, Inc.**
 - **Hydro-Tite™ Leak Detection System For Secondary Containment**
Added to Secondary and Spill Containment Test Method May 31, 2019
- ◆ **ASIS Automation and Fueling Systems, Inc.**
 - **FOX SIR V1 and V2**
Added to Statistical Inventory Reconciliation Test Method (Quantitative) May 16, 2019
- ◆ **DocCanDo, LP**
 - **DocCanDo SIR 1.0**
Added to Statistical Inventory Reconciliation Test Method (Quantitative) June 17, 2019
- ◆ **Leak Detection Technologies, Inc.**
 - **MCleak Enhanced Interstice Test for Doubled-Walled Tanks, UDCs, Sumps and Spill Buckets**
Added to Interstitial Tank Tightness Test Method and Secondary and Spill Containment Test Method July 3, 2019
- ◆ **Hansa Consult of North America, LLC**
 - **HCNA Pressure Step Leak Detection System, Version 2.2**
Added to Line Leak Detection Method for Airport Hydrant and Field Constructed Systems July 30, 2019
- ◆ **AIUT Ltd**
 - **FuelPrime IRC Version 2.4**
Added to Statistical Inventory Reconciliation Test Method (Quantitative) August 13, 2019
- ◆ **Leighton O'Brien**
 - **Dry Test (0.025 gph)**

— FUTURE EVENTS — NWGLDE MEETING:

The NWGLDE Fall meeting will be held October 23-25, 2019 in Seattle, Washington, at the Renaissance Seattle Hotel.

Additional details are available by downloading the following Memo and Agenda:

VENDOR INVITATION MEMO

EPA, Regulator, Interested Parties
INVITATION MEMO

MEETING AGENDA

Contact **Don Taylors** for more information.

Added to Non-Volumetric Tank Tightness Test Method (Ullage) August 28, 2019

- ◆ **Purpora Engineering, Inc.**
 - [Alert 8200 Series Underfill Method](#)
Revised listing September 10, 2019
- ◆ **Atmos International Limited**
 - [Atmos International Pipeline Leak Detection System](#)
Added to Line Leak Detection Method for Airport Hydrant and Field Constructed Systems September 30, 2019
- ◆ **Veeder-Root**
 - [Secondary Containment Leak Detection \(SCLD\) TLS-450Plus and TLS-350/ProMax/EMC Console with Vacuum Sensors 857280-100, 200, 30x, or Assembly 332175-001](#)
Added to Continuous Interstitial Line Monitoring Method (Pressure/Vacuum) October 28, 2019
- ◆ **Veeder-Root**
 - [Secondary Containment Leak Detection \(SCLD\) TLS-350/ProMax/EMC Console with Vacuum Sensors 857280-100, 200, 30x, or Assembly 332175-00](#)
Revised listing October 28, 2019
- ◆ **AIUT Ltd.**
 - [FuelPrime IRC Version 3.2 SIR Continual Reconciliation System for CITLDS Using Multiple ATG System with Magnetostrictive Tank Probes for Tanks and Associated Pipelines](#)
Added to Continuous In-Tank Leak Detection Method (Continual Reconciliation) October 31, 2019
- ◆ **Pneumercator Company, Inc.**
 - [Tamper-Resistant, Non-Discriminating LS600LDxx-T and Discriminating LS600LDxx- FT/FLT Liquid Float Switch Leak Sensors with Console Model: LC1000-Series, LC2000-Series, TMS1000-Series, TMS2000-Series, TMS3000-Series, and TMS2000W-Series](#)
Added to Interstitial Detector (Liquid-Phase) December 16, 2019
- ◆ **Core Engineered Solutions**
 - [SafeSite Vacuum Interstitial Monitoring System](#)
Added to Continuous Interstitial Line Monitoring Method (Pressure/Vacuum) and Continuous Interstitial Tank System Monitoring Method (Pressure/Vacuum) December 17, 2019

AC'CENT Environmental

Dri-Sump Containment Tightness Test Method

SECONDARY AND SPILL CONTAINMENT TEST METHOD

Certification Leak rate of 0.1 gph with PD = 100%, and PFA = 0%

Please be aware that the authority having jurisdiction in your particular state, territory, tribe or municipality may have set a minimum detectable leak rate for secondary and spill containment testing.

Applicability For testing spill and sump containments that are free of debris or measurable liquid, located in non-saturated backfill consisting of sand, pea gravel, or clay/silt.

Specification Containment must be free of debris and measurable liquid.
Containment backfill can be moist but not saturated with measurable liquid as verified by visual observation of liquid level in Vapor Stimulator Tubes (VST) or if the sump bottoms are deeper than the VST through observation wells located in the containment backfill.
VSTs shall be installed per manufacturer's installation training and certification procedures and instructions which include the minimum number of VSTs, placement and depth for each type of containment.

Vapor Stimulator Tubes (VST) Placement Chart

Containment Sump Type	Minimum Number of VSTs per Containment Sump	Maximum Horizontal Distance from Sump Wall	Minimum Length of VST	Backfill Soil Type Acceptance	Minimum Test Time for pass or fail results
Spill Bucket	1	8 inches (±1")	18 inches	All	1 minute
Under Dispenser Containment Sump (UDC)	1	8 inches (±1")	18 inches	All	1 minute
Transition Sump (UDC depth)	1	8 inches (±1")	18 inches	All	1 minute
Transition Sump (STP depth)	2	8 inches (±1")	36 inches	All	1 minute
Submersible Turbine Sump (STP)	2	8 inches (±1")	36 inches	All	1 minute

Pre-test Verification A manometer is used to indicate adequate air flow and communication between VSTs in a 5-10 second pre-test procedure. Communication will be verified between two VSTs within the tank, piping, and dispenser in the same type backfill.

Waiting Time No waiting time before test begins.

Test Period Minimum of one minute once the test begins.

System Features A leak is determined by observation of a change in the specialized laser light beam from a dot to a line which is indicative of the presence of the proprietary heavy vapor.

Comments Dri-sump Containment Tightness Test method uses the proprietary heavy vapor aerosol instead of water

to completely fill the sump, interstice or vessel.

AC'CENT states this proprietary vapor aerosol is made from a formula of chemicals which are all food grade, pH neutral, non-petroleum based, non-toxic, non-flammable, and pose no environmental impact. The dissipation of the aerosol reverts back to normal organic elements in ambient air.

When installed per the manufacturer's placement requirements this method allows for detecting heavy vapor egress from the containment at any point. The method automatically tests for adequate flow of air and vapor through the backfill each time the system is activated. Any stoppage of flow through the VST or backfill will cause increased vacuum on the View Chamber that is quickly identified by a significant collapse of the View Chamber side walls.

Temperature is not a factor.

The evaluation testing was conducted with three different non-metallic commercially manufactured deep containment sumps, 300 gallon capacity, 47 inches diameter and 60 inches long. These were installed as would typically be found at a fuel service station. They were tested in different backfill types, including: sand; pea gravel, and clay/silt mix. The presence of water above the bottom of the sumps was not evaluated.

Danny Brevard, PG
AC'CENT Corporate Offices
P. O. Box 3289
Lufkin, TX 75903-3289
E-mail: info@info@accent-us.com
URL: www.accent-us.com

Evaluator: Ken Wilcox Associates
1125 Valley Ridge Dr
Grain Valley, MO 64029
Tel: (816) 443-2494
Dates of Evaluations: 10/04/18



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Mesa Engineering

Mesa 2-D Method with ACT v1 and ACT v2 Water Level Sensor

NON-VOLUMETRIC TANK TIGHTNESS TEST METHOD (VACUUM)

Certification	Leak rate of 0.1 gph with PD = 100% and PFA = 1.6%.
Leak Threshold	A tank system should not be declared tight when an acoustic signal is detected above the background or baseline noise by a computer data acquisition system, or when water ingress is detected by the water sensor.
Applicability	<u>Alternative Fuel containing no greater than 15% ethanol (with ACTv2 sensor only)</u> , Gasoline, diesel, aviation fuel, fuel oil #4, fuel oil #6, solvents, and waste oil.
Tank Capacity	Maximum of 30,000 gallons. Evaluated at product levels between 8%* and 91% full. Maximum of 30,000 gallons per tank for manifolded tank systems. If isolation cannot be performed, the tanks can be tested simultaneously using two sondes (sound amplifier modules) or else they must be pressurized simultaneously and tested separately, depressurizing between tests.
Waiting Time	None between delivery and testing.
Test Period	When groundwater level in tank excavation backfill is below bottom of tank: After the Vacuum conditions are established on the tank, the data collection times are very short, typically one minute or less. When groundwater level in tank excavation backfill is above bottom of tank or when the groundwater level in the tank excavation backfill has not been determined: The time it takes for water ingress to increase the water level in the tank to allow the water sensor to detect the "minimum detectable change in water level" (see "Water Sensor" section below). Test period based on water ingress is dependent on tank size. For example, the test period is 0.97 hours for a 10,000 gallon (96" dia x 319" lg) tank. The correct test period is always determined from the field calibration on each specific tank. Before starting test, water sensor must be calibrated to "minimum detectable water level" (see "Water Sensor" section below) according to manufacturer's instructions. There must be no dispensing or delivery during test.
Test Pressure	Under normal test conditions, a vacuum of 60 inches of water or -2.16 psig must be used.
Temperature	Acoustic signal is independent of product temperature.
Water Sensor	Conductivity water sensor must be used to detect water ingress and must be calibrated for every test when groundwater level in tank excavation backfill is above bottom of tank or when the groundwater level in the tank excavation backfill has not been determined. Minimum detectable change in water level is 0.016 inch. Minimum water level in tank must be adjusted to at least 0.14 inch (0.0625 inch with ACTv2), which is the sensor's minimum detectable water level), before calibrating sensor and starting test.
Groundwater	Groundwater level in tank excavation backfill must be determined by observation well or soil probe in tank excavation backfill. If groundwater level in tank excavation backfill is above bottom of tank or the groundwater level in the tank excavation backfill has not been determined, water sensor must be used and test time extended to ensure water ingress detection during test. Groundwater ingress may only be detected in alternative fuels if using the ACTv2 Water Sensor and if the groundwater increases the water level in the tank bottom vs. going into solution with the alternative fuel, which may not be known and would therefore render an inconclusive test.

Comments

*Although not evaluated using empty tanks, a third party acoustics specialist has certified the device is equally effective when tanks are empty as when tanks contain product.

Test may be inconclusive if there is high background noise.

Vacuum test method may not be effective in some tank excavation backfill (such as clay) because it may plug holes in tank.

If free product is present in tank excavation backfill, a leak in the free product zone may not be detected by a vacuum test method.

An observation well or soil probe in tank excavation backfill may help determine backfill material, water level in tank excavation backfill, and presence of free product. Manufacturer must certify test operator at least every 2 years.

More than 4 psi pressure differential across the tank wall at any location in the tank could damage tank.

For ACT v2 Sensor, the sensor is not compatible with ethanol based fuels with an ethanol content above 15%.

For ACT v2 Sensor, the sensor will also perform in any fuel that does not absorb water, including but not limited to kerosene, heating oil, and Jet A fuel.

Mesa Engineering
5801 Dierker
Houston, TX 77041
Tel: (713) 895-7000
E-mail: charlie@atsenvironmental.com
URL: www.mesatest.com

Evaluator: Ken Wilcox Associates
Tel: (816) 443-2494
Date of Evaluation: 0717/01 (MESA); 12/8/05 (ACTv1); and
3/5/18 (ACTv2)



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PMP Corporation

PMP Piping Sump Sensor 63228 and 63229 as evaluated with the Veeder-Root TLS-350 (software version 11.02)

INTERSTITIAL DETECTOR (LIQUID-PHASE)

Detector:

Output type: qualitative
Sampling frequency: continuous
Operating principle: float switch

Test Results:**Piping Sump
Sensor
63228**

	<u>Ethanol- free gasoline</u>	<u>diesel*</u>	<u>water</u>	<u>E10</u>	<u>E15</u>	<u>E25</u>	<u>E85</u>
Lower detection limit (in)	1.309	1.239	1.135	1.348	1.332	1.326	1.304
Precision (in)	0.010	0.004	0.007	0.008	0.003	0.005	0.006
Detection time (min)	<1	<1	<1	<1	<1	<1	<1

**Piping Sump
Sensor
63229**

Lower detection limit (in)	1.353	1.234	1.156	1.368	1.365	1.367	1.352
Precision (in)	0.017	0.004	0.011	0.009	0.011	0.009	0.011
Detection time (min)	<1	<1	<1	<1	<1	<1	<1

*Evaluations determined these sensors' responses to the liquids shown above. Biodiesel blends B6-B20 meeting ASTM D7467 and biodiesel B100 meeting ASTM D6751 would also produce an alarm if the lower detection limit is exceeded. Responses to these fuels were not determined but would be expected to be very similar to the diesel responses.

Comments:

These sensors were third party evaluated with a Veeder Root TLS-350 console (software version 11.02). PMP Corporation claims that these sensors will work with these other consoles: the TLS-450, TLS-4 series, TLS-350 series, TLS-300 series, TLS-PC, ILS-350, Simplicity, Gilbarco EMC series, EMC Basic series, EMC-PC, Red Jacket ProMax and ProPlus.

PMP Corporation
25 Security Drive
Avon, CT 06001-0422
Tel: (860) 677-9656
Toll Free: (800) 243-6628
E-mail: sales@pmp-corp.com
URL: www.pmp-corp.com

Evaluator: Solutions Engineering Group
420 N Main Street
Montgomery, IL 60538-1367
Tel: (630) 701-7703
Date of Evaluations: 10/20/2018



Fueling and Service Technologies, Inc.

Hydro-Tite™ Leak Detection System For Secondary Containment

SECONDARY AND SPILL CONTAINMENT TEST METHOD

Certification	Minimum Level Change (MLC) of 0.00065 inch in 12 minutes with PD = 95% Please be aware that the authority having jurisdiction in your particular state, territory, tribe or municipality may have set a minimum detectable leak rate for Secondary and Spill Containment Test Methods.
Leak Threshold	0.0020 inch/12min fluid level change (0.010 inch/hour). A containment vessel should not be declared tight if the test result indicates a loss or gain that equals or exceeds this threshold.
Applicability	Water.
Specification	System tests wetted portion of turbine, transition and dispenser containment sumps, and spill buckets after test liquid is temporarily added in accordance with PEI RP-1200 requirements. Uses a magnetostrictive probe to measure rise or drop of liquid level.
Waiting Time	Water level readings must stabilize (due to distortion of sumps and wave action) and temperature in sump must be close to equilibrium prior to beginning test.
Test Period	12 minutes.
System Features	Up to 4 probes can be connected to the laptop.
Calibration	No calibration is required.
Comments	Pass/fail criteria is based on a fluid level change, not a leak rate. No minimum detectable leak rate has been determined. Test utilizes a magnetostrictive probe coupled to a laptop computer containing proprietary software and algorithms. Probe must be suspended as described in the installation manual to keep the probe as vertical as possible. The position of the probe should be adjusted until the rod is not touching the float at any location on the rod. Results may be converted to gal/hr using beginning and ending of test surface area of liquid in test vessel. Test should not be conducted if the ground water level is measured above the bottom of the sump

Fueling and Service Technologies, Inc, (Fastech)
7050 Village Drive
Buena Park, CA 90621
Tel: (714) 523-0194

Evaluator: Ken Wilcox Associates
Tel: (816) 443-2494
Dates of Evaluations: 02/19/04, 11/28/17
Evaluation Protocol: Evaluation of Systems Used for testing of Secondary Containment Vessels, November 26, 2001.

E-mail: twyper@fastechus.com

ASIS Automation and Fueling Systems, Inc.

FOX SIR V1 and V2

STATISTICAL INVENTORY RECONCILIATION TEST METHOD (QUANTITATIVE)

Certification	Leak rate of 0.2 gph with PD > 99.9 % and PFA < 0.1% (Version 2). Leak rate of 0.1 gph with PD = 96.5% and PFA = 3.5% (Version 1).
Leak Threshold	0.1 gph for leak rate of 0.2 gph (Version 2). 0.05 gph for leak rate of 0.1 gph (Version 1). A tank system should not be declared tight if the test result indicates a loss or gain that equals or exceeds the threshold level of the version selected.
Applicability	Gasoline, diesel.
Tank Capacity	Maximum of 20,000 gallons for single tank. Maximum of 60,000 gallons cumulative capacity for manifolded tank systems with no more than 4 tanks in system.
Throughput	Maximum monthly throughput of 115,000 gallons.
Data Requirement	Minimum of 30 days of product level and flow through data. This method allows for closure of the station up to 2 days per week. This method does not require meter calibration.
Comments	63% of data sets evaluated were from manifolded tank systems. Of 41 data sets submitted for evaluation, 5 had inconclusive results with 2 coming from single tank systems and 3 coming from 2-tank manifold systems. Median monthly throughput of tanks evaluated was 20,086 gallons. Leak rates of 0.1, 0.2, and 0.3 gph were used in the evaluation. Data sets evaluated were randomly selected from a database of inventory records maintained by evaluator.

ASIS Automation and Fueling Systems, Inc.
Tatlisu Mahallesi Akif Inan Sokak No: 14
Istanbul, Turkey 34775
Phone: +90 216 540 6464
E-mail: info@asis.com.tr

Evaluator: Ken Wilcox Associates
Tel: (816) 443-2494
Dates of Evaluation: April 3, 2019



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DocCanDo, LP

DocCanDo SIR 1.0

STATISTICAL INVENTORY RECONCILIATION TEST METHOD (QUANTITATIVE)

Certification	Leak rate of 0.2 gph with PD > 99.9% and PFA < 0.1%. Leak rate of 0.1 gph with PD > 99.0% and PFA < 1.0%.
Leak Threshold	0.1 gph for leak rate of 0.2 gph 0.05 gph for leak rate of 0.1 gph A tank system should not be declared tight if the test result indicates a loss or gain that equals or exceeds the threshold of the version selected Gains (water ingress) are analyzed and evaluated on an individual basis
Applicability	Gasoline, diesel, aviation fuel, kerosene, waste oil
Tank Capacity	Maximum of 32,286 gallons for single tank Maximum of 32,286 gallons cumulative capacity for manifolded tank systems with no more than 3 tanks in system
Throughput	Maximum monthly throughput of 73,916 gallons
Data Requirement	Minimum of 30 days of product level and flow through data
Comments	34% of data sets evaluated were from manifolded tank systems 54% of data sets evaluated used data collected by Automatic tank gauges Of 41 data sets submitted for evaluation, all were analyzed with conclusive results Median monthly throughput of tanks evaluated was 14,870 gallons Data sets evaluated were supplied by evaluator

DocCanDo, LP
106 E. Main Street
Richardson, TX 75081-3327
Tel: (214) 907-1149
E-mail: howardldockery@txecss.com

Evaluator: S.S.G. Associates
Tel: (662) 234-1179
Dates of Evaluation: April 30, 2019



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Leak Detection Technologies, Inc.

MCleak Enhanced Interstice Test for Doubled-Walled Tanks, UDCs, Sumps and Spill Buckets

Interstitial Tightness Test Method

Certification	Leak rate of 0.005 gph with PD = 99.97% and PFA 3.3%
Leak Threshold	0.0017 gph
Applicability	Liquid filled interstices. Approved liquids: Water and Brine.
Interstitial Capacity	Maximum of 1,500 gallons.
Waiting Time	Tanks in service must be placed out of service for 72 hours before testing on the interstice can begin. If the tank is a new installation, the tank must be installed for a minimum of 72 hours for the test on the interstice to be valid due to potential thermal changes after installation. No wait time for UDCs, Sumps or Spill Buckets.
Test Duration	The test duration varies based on the surface area of the top of the interstitial liquid where the leak detection methods measurements are being taken.
Temperature	Measurement not required by this method.
Ground Water	Ground water level must be determined. When one or both sides of the interstice is under liquid, the test duration is determined by calculating the flow rate produced by the pressure differential and extending the test duration period to achieve the test sensitivity.
Calibration	Not required with this test method.
Comments	<p>The MC Leak Enhanced Leak Detection Method has a test duration calculator that automatically calculates the test duration when a tank, UDC, Sump or Spill bucket interstice has liquid on either the exterior or interior walls. Extend the interstitial fluid above the operating fluid level to overcome the head pressure of the liquid inside the primary tank or outside the secondary interstice wall. At no time can the interstice pressure exceed manufacturer specifications.</p> <p>The interstice is be 100% full.</p> <p>The minimum waiting period between topping off the fluid level in the interstitial reservoir to fine tune the desired level for testing is 1 hour.</p> <p>If a 4 inch riser is used to create the fluid reservoir in tank related components not affected by groundwater the test time after stabilization is 1 hour.</p> <p>The minimum measured liquid level change that exceeds the leak threshold of 0.0017gph that indicates a leak is variable due to the difference in the cross sectional surface area of the fluid reservoir.</p>

Leak Detection Technologies, Inc.
1889 N. Oracle Road
Tucson, AZ 85705
Tel: (855) 255-5325

Evaluator: Ken Wilcox Associates
Tel: (816) 443-2494
Date of Evaluation: 04/18/19

Hansa Consult of North America, LLC

HCNA Pressure Step Leak Detection System, Version 2.2

Line Leak Detection Method for Airport Hydrant and Field Constructed Systems

Certification	Leak rate of 0.00078% of line volume per hour in the pipeline segment being tested with PD > 95% and PFA < 5%.
Leak Threshold	0.00039% of line volume per hour. A pipeline system should not be declared tight if the test results indicate a loss that equals or exceeds the threshold.
Applicability	Gasoline, diesel, aviation fuel, fuel oil #4, solvents, waste oil, biodiesel B6-B20 meeting ASTM D7467, biodiesel B100 meeting ASTM D6751.
Specification	System tests either single or double-walled fiberglass or steel piping.
Pipeline Capacity	The HCNA 3rd party certified minimal detectable leak rate for large diameter pipeline systems (airport hydrant systems) is listed in the table below by maximum test section volume.

Test Section Volume (Gallons)	Leak Detection Rate Per Test Section Volume (EPA maximum allowable/HCNA 3rd party certified)		HCNA 3rd party certified minimum detectable leak rate. (Gallons Per Hour)
	EPA Semiannual Test- Leak Detection Rate Not To Exceed (Gallons Per Hour)	EPA Annual Test- Leak Detection Rate Not To Exceed (Gallons Per Hour)	
5,000 to 25,000	1.0	0.5	0.2
25,001 to 50,000	1.0	0.5	0.4
50,001 to 75,000	1.5	0.75	0.6
75,001 to 100,000	2.0	1.0	0.8
101,000 to 125,000	3.0*	1.5	1.0
125,001 to 150,000	3.0*	1.5	1.2
150,001 to 175,000	3.0*	1.5	1.4

* EPA semi-annual minimum detectable leak rate may be 6.0 gallons per hour until October 13, 2021 for pipe segments greater than 100,000 gallons. After October 13, 2021, the minimum detectable leak rate cannot exceed 3.0 gallons per hour.

Waiting Time	None between delivery and testing. None between dispensing and testing.
Test Period	Typically a minimum of 45 minutes after setup. Piping must be isolated and blocked during test.
System Features	System may be permanently installed on pipeline to perform monitoring, or may be transported and set up to perform line tightness testing. A single 45 minute test is required to simultaneously test as many sections as required consisting of typically two 15-minute monitoring periods at operating pressure, and one 15-minute monitoring period at a lower pressure level. System measures pressure changes in the pipeline over time at two different set pressures in three different test periods, typically 15 minutes each and reports output quantity in gph. The procedure ensures thermally induced volume changes do not affect line pressure changes during the test. Typical test pressures vary from 60-160 psi. Other pressures may be used, but a pressure differential of 100 psi is usually maintained. A test result is provided immediately after completion of each test for each test section. Pipeline segment being tested must be completely isolated.
Calibration	System must be calibrated in accordance with manufacturer's instructions. Calibration data is obtained prior to testing each specific pipeline segment.
Comments	Prior to conducting tests on a line, the HCNA Pipeline Leak Detection System V2.2 must be commissioned to confirm the existing line characteristics for each individual test section. System may be used on large underground bulk pipelines such as airport hydrant fueling systems. The third-party evaluations utilized a total of 84 tests at various facilities. 49 of these tests were conducted with various induced leak rates. 24 of the test were performed on pipeline volumes of less than 25,000 gallons.

Hansa Consult of North America, LLC (HCNA)
200 International Drive, Bldg. 120
Portsmouth, NH 03801
Tel: (603) 422-8833
E-mail: koverman@hcna-llc.com

Evaluator: Ken Wilcox Associates
Tel: (816) 443-2494
Date of Evaluation: 12/15/05, 09/11/18



AIUT Ltd

FuelPrime IRC Version 2.4

STATISTICAL INVENTORY RECONCILIATION TEST METHOD (QUANTITATIVE)

Certification	Leak rate of 0.2 gph with PD > 99.0 % and PFA < 0.1% For both single and manifolded tank systems
Leak Threshold	0.1 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. Other liquids may be tested after consultation with the vendor
Tank Capacity	Maximum of 30,000 gallons for single tank. Maximum of 50,000 gallons cumulative capacity for manifolded tank systems with no more than 5 tanks in system.
Throughput	Maximum monthly throughput of 84,708 gallons for single tanks and 40,512 gallons for manifold systems.
Data Requirement	Minimum of 30 days of product level and throughput data.
Comments	Data sets evaluated were supplied by the evaluator. 52% data sets were from manifolded tank systems. Of 45 data sets submitted for evaluation, 3 were analyzed with inclusive results. Median throughput of tanks evaluated was between 16,872 and 18,897 gallons. Leak rates of 0.1, 0.2 and 0.3 gph were used in evaluation. Results of evaluation is acceptable for tanks using ATG or dipstick to collect data.

AIUT Ltd
Wyczolkowskiego 113
44-109 Gliwice, Poland
Phone: +48 32 775 40 00

Evaluator: Ken Wilcox Associates
Tel: (816) 443-2494
Dates of Evaluation: 12/18/2015



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Leighton O'Brien

Dry Test (0.025 gph)

NON-VOLUMETRIC TANK TIGHTNESS TEST METHOD (ULLAGE)

Certification	Leak rate of 0.025 gph with PD = 100% and PFA = 0%.						
Leak Threshold	Tank ullage should not be declared tight when the pressure decay trend results in an indication of a 0.025 gph or greater loss on the test apparatus screen. A 1.25 ullage fail is the nitrogen decay equivalent to a liquid leak under 10 kPa at 0.025 gal/hr threshold. A 6.5 ullage fail is the nitrogen decay equivalent to a liquid leak under 10 kPa at 0.1 gal/hr threshold.						
Applicability	Gasoline, diesel, aviation fuel, fuel oil #4, fuel oil #6, solvents, and waste oil.						
Tank Capacity	Maximum of 30,000 gallons.						
Waiting Time	No wait time between delivery and testing. Static test required to determine static ullage warming rate. Length of static test varies and may be shortened by the technician once static ullage warming rate is recorded.						
Test Period	<p>A minimum of 10 minutes of data collection after stabilization occurs at test pressure. Test period increases depending on ullage size. Gasoline may take 1 – 2.5 hours to stabilize prior to data collection during pressure test. There must be no dispensing or delivery during testing. Average test times for 90% and 50% capacity during evaluation were:</p> <table><tr><th>Percentage of Tank Capacity</th><th>Average Test Times</th></tr><tr><td>90%</td><td>10 minutes</td></tr><tr><td>50%</td><td>64 minutes</td></tr></table>	Percentage of Tank Capacity	Average Test Times	90%	10 minutes	50%	64 minutes
Percentage of Tank Capacity	Average Test Times						
90%	10 minutes						
50%	64 minutes						
Test Pressure	Under typical test conditions, a pressure of 10 kpa is used.						
Temperature	Method is sensitive to temperature, atmospheric pressure and other environmental fluctuations. These are accounted for by acquiring static warming rate.						
Groundwater	Groundwater level in tank excavation backfill must be below the leak. If groundwater is very high, the test pressure may be increased with approval from Leighton O'Brien staff. Leaks below the water table are detected using the Leighton O'Brien Wet Test.						
Comments	<p>Test data is acquired by computer and forwarded electronically to an analysis center where Leighton O'Brien staff assist in the determination of the tank condition.</p> <p>Evaluated using 20,000 gallon Diesel tank at 90%, 50%, and 5% capacities. PD may decrease and PFA may increase with testing of higher ullage volumes. Manifolded tank systems must be isolated. Double walled tanks tested with interstice open to atmosphere OR with pressure device installed in interstitial space.</p> <p>Equipment calibration is performed yearly.</p> <p>Leighton O'Brien audits the onsite operator annually.</p> <p>More than 4 psi (27.6 kPa) pressure differential across the tank wall at any location in the tank could damage the tank.</p>						

Tel: +61 3 9804 220
E-mail: info@leightonobrien.com
URL: www.leightonobrien.com



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Purpora Engineering, Inc.

Alert 8200 Series Underfill Method

VOLUMETRIC TANK TIGHTNESS TEST METHOD (UNDERFILL)

Certification	Leak rate of 0.1 gph with PD = 99.58% and PFA = 0.42% for 1 hour test
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, waste oil, biodiesel blends B6-B20 meeting ASTM D7467, biodiesel B100 meeting ASTM D6751 and water. The principle of mass displacement testing allows the operator to adjust the weight of the test probe in proportion to the specific gravity of the test liquid.
Tank Capacity	Maximum of 30,000 gallons. Tank must be between 16% (with a fuel height of 14" or more) and 95% full.
Waiting Time	Minimum of 3 hours 41 minutes between delivery and testing. There must be no delivery during waiting time.
Test Period	Minimum of 1 hour 28 minutes to achieve PD = 99.58% and PFA = 0.42%. Test data are acquired and recorded by system's computer. Leak rate is calculated from the data determined to be valid by statistical analysis. There must be no dispensing or delivery during test.
Temperature	System measures product mass (which is not affected by temperature) instead of product volume.
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 0.2 psi pressure differential between the water table and fuel level at the bottom of tank during test. If no water table info available, two tests are required at different product heights of different tank pressures.
Calibration	Load cell must be calibrated at least once per year following manufacturers recommended practices, but not necessarily by manufacturer.
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. The manufacturer does not support test results if the technician does not hold a current Pupora Engineering certification when the test is performed. Recertification is required by the manufacturer every two years.

Atmos International Limited

Atmos International Pipeline Leak Detection System

Line Leak Detection Method for Airport Hydrant and Field Constructed Systems

Certification	Leak rate of 0.0021% of line volume (0.2 gph per 1000 gallons of product) in the pipeline segment being tested with PD > 95% and PFA < 5%.
Leak Threshold	0.001% of line volume in gph. A pipeline system should not be declared tight if the test results indicate a loss that equals or exceeds the threshold.
Applicability	Gasoline, diesel, aviation fuel, fuel oil #4, solvents, waste oil.
Specification	System tests either single or double-walled fiberglass or steel piping.
Pipeline Capacity	The Atmos 3rd party certified minimal detectable leak rate for bulk pipeline and hydrant systems is listed in the table below by maximum test section volume.

Leak Detection Rate Per Test Section Volume
(EPA maximum allowable/Atmos 3rd party certified)

Test Section Volume(Gallons)	EPA Semiannual Test- Leak Detection Rate Not To Exceed (Gallons Per Hour)	EPA Annual Test- Leak Detection Rate Not To Exceed (Gallons Per Hour)	Atmos 3rd party certified minimum detectable leak rate. (Gallons Per Hour)
5,000 to 23,810	1.0	0.5	0.50
23,811 to 47,619	1.0	0.5	1.00
50,001 to 71,429	1.5	0.75	1.50
75,001 to 95,238	2.0	1.0	2.00
100,001 to 119,048	3.0	1.5	2.50
119,049 to 142,857	3.0	1.5	3.00
142,858 to 166,667	3.0*	1.5	3.50
166,668 to 190,476	3.0*	1.5	4.00
190,477 to 201,690	3.0*	1.5	4.50

* EPA semi-annual minimum detectable leak rate may be 6.0 gallons per hour until October 13, 2021 for pipe segments greater than 100,000 gallons. After October 13, 2021, the minimum detectable leak rate cannot exceed 3.0 gallons per hour.

Waiting Time	None between delivery and testing. None between dispensing and testing.
Test Period	Typically 26 minutes after setup. Piping must be isolated and blocked during test.
System Features	System is portable and can be transported from line to line as a means of assessing integrity. System uses dual pressures: one high, one low to assess pressure change over time and compensate for thermal expansion. System includes computer-based software that electronically measures and records the pressure in the line. After the two test periods, the system automatically analyzes the data and prints a report. Pipeline segment being tested must be completely isolated.
Calibration	System must be calibrated in accordance with manufacturer's instructions.
Comments	Prior to conducting tests on a line, the Atmos Pipeline Leak Detection System must be commissioned to confirm the existing line characteristics for each individual test section.

System may be used on large underground bulk pipelines such as airport hydrant fueling systems. The third-party evaluation is an update to the July 26, 2016 evaluation to verify the performance of the Atmos system on lower volume lines between 5,001 and 50,000 gallons. An abbreviated set of 6 tests were performed between 15,715 and 23,810 gallons.

Atmos International Ltd.
St., Pauls, 781 Windsor Road
Manchester M20 2RW, United Kingdom
Tel: +44 161 445 8080

Evaluator: Ken Wilcox Associates
Tel: (816) 443-2494
Date of Evaluation: 07/26 /2016 , 02/27/2019



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Veeder-Root

Secondary Containment Leak Detection (SCLD) TLS-450Plus and TLS-350/ProMax/EMC Console with Vacuum Sensors 857280-100, 200, 30x, or Assembly 332175-001

CONTINUOUS INTERSTITIAL LINE MONITORING METHOD (PRESSURE/VACUUM)

Certification:

Certified as equivalent to European leak detection standard EN-13160-2, Part 2, as a Class I leak detection system.

Operating Principle:

System uses vacuum generated by the turbine pump to continuously maintain a partial vacuum within the interstitial space of double-walled tanks and double-walled piping.

System is designed to activate a visual and acoustic alarm, and turbine pump shutdown before stored product can escape to the environment.

System is capable of detecting breaches in both the inner and outer walls of double-walled tanks and double-walled piping.

Alarm Condition:

System alarms when a liquid or air leak occurs which causes the interstitial vacuum to decrease (pressure to increase) and the system is unable to maintain minimum vacuum.

System will also alarm if liquid is detected in the interstitial space, or if the vacuum level in the interstitial space decreases at a rate exceeding 85±15 liters/hour.

Applicability:

Underground double-walled tank, connected double-walled piping, and other connected interstitial spaces storing gasoline, gasohol, diesel, heating oil #2, kerosene, aviation fuel, motor oil, water.

Storage of biodiesel blends B6-B20 meeting ASTM D7467 and biodiesel B100 meeting ASTM D6751 would also produce a system alarm if the system threshold is exceeded. Responses to these fuels were not determined but would be expected to be very similar to the system's response when storing diesel.

Manufacturer's Specifications:

Alarm will activate when interstitial vacuum decreases to 1.7 psi (3.5" Hg) vacuum; 1.8 psi (3.6" Hg) vacuum for TLS-450Plus.

Default maximum vacuum level (pump-off pressure) is 8 psi vacuum (16.3" Hg), but can be set as low as 4 psi (8.2" Hg) if the monitored system requires that a lower level of vacuum be maintained.

The interstitial space shall be rated for the operating vacuum of the leak detector, regardless of temperature and groundwater level fluctuations.

Volume of monitored interstitial space must not exceed 8 m³ (2,114 gal) for tanks and 10 m³ (2,642 gal) for piping.

When monitoring double-walled tanks, a liquid sensor must be located at lowest point of interstitial space.

Calibration:

Functional and operational safety tests should be performed in accordance with manufacturer's instructions.

Comments:

Interstitial space is tested continuously.

System is connected to the interstitial space by a single vacuum line.

System was not evaluated with manifolded piping.

Vacuum is generated by the turbine pump and is measured and controlled by a vacuum control valve.

This system may not be compatible with all secondarily contained tanks and/or piping. Always consult with the tank and/or piping manufacturer and the manufacturer's applicable recommended installation practices before installing this system, or damage may be caused to the tank or piping by its use.

Veeder-Root
125 Powder Forest Dr.
Simsbury, CT 06070-2003
Tel: (860) 651-2700
E-Mail: info@veeder.com

Evaluator: Ken Wilcox Associates
Tel: (816) 443-2494
Dates of Evaluation: 06/09/2004, 05/10/2019

Veeder-Root

Secondary Containment Leak Detection (SCLD) TLS-450Plus and TLS-350/ProMax/EMC Console with Vacuum Sensors 857280-100, 200, 30x, or Assembly 332175-001

CONTINUOUS INTERSTITIAL TANK SYSTEM MONITORING METHOD (PRESSURE/VACUUM)

Certification:

Certified as equivalent to European leak detection standard EN-13160-2, Part 2, as a Class I leak detection system.

Operating Principle:

System uses vacuum generated by the turbine pump to continuously maintain a partial vacuum within the interstitial space of double-walled tanks and double-walled piping.

System is designed to activate a visual and acoustic alarm, and turbine pump shutdown before stored product can escape to the environment.

System is capable of detecting breaches in both the inner and outer walls of double-walled tanks and double-walled piping.

Alarm Condition:

System alarms when a liquid or air leak occurs which causes the interstitial vacuum to decrease (pressure to increase) and the system is unable to maintain minimum vacuum.

System will also alarm if liquid is detected in the interstitial space, or if the vacuum level in the interstitial space decreases at a rate exceeding 85±15 liters/hour.

Applicability:

Underground double-walled tank, connected double-walled piping, and other connected interstitial spaces storing gasoline, gasohol, diesel, heating oil #2, kerosene, aviation fuel, motor oil, water.

Storage of biodiesel blends B6-B20 meeting ASTM D7467 and biodiesel B100 meeting ASTM D6751 would also produce a system alarm if the system threshold is exceeded. Responses to these fuels were not determined but would be expected to be very similar to the system's response when storing diesel.

Manufacturer's Specifications:

Alarm will activate when interstitial vacuum decreases to 1.7 psi (3.5" Hg) vacuum; 1.8 psi (3.6" Hg) vacuum for TLS-450Plus.

Default maximum vacuum level (pump-off pressure) is 8 psi vacuum (16.3" Hg), but can be set as low as 4 psi (8.2" Hg) if the monitored system requires that a lower level of vacuum be maintained.

The interstitial space shall be rated for the operating vacuum of the leak detector, regardless of temperature and groundwater level fluctuations.

Volume of monitored interstitial space must not exceed 8 m³ (2,114 gal) for tanks and 10 m³ (2,642 gal) for piping. When monitoring double-walled tanks, a liquid sensor must be located at lowest point of interstitial space.

Calibration:

Functional and operational safety tests should be performed in accordance with manufacturer's instructions.

Comments:

Interstitial space is tested continuously.

System is connected to the interstitial space by a single vacuum line.

System was not evaluated with manifolded tanks.

Vacuum is generated by the turbine pump and is measured and controlled by a vacuum control valve.

This system may not be compatible with all secondarily contained tanks and/or piping. Always consult with the tank and/or piping manufacturer and the manufacturer's applicable recommended installation practices before installing this system, or damage may be caused to the tank or piping by its use.

Veeder-Root
125 Powder Forest Dr.
Simsbury, CT 06070-2003
Tel: (860) 651-2700

Evaluator: Ken Wilcox Associates
Tel: (816) 443-2494
Date of Evaluation: 06/09/2004, 05/10/2019

E-mail: info@veeder.com
URL: www.veeder.com



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AIUT Ltd.

FuelPrime IRC Version 3.2 SIR Continual Reconciliation System for CITLDS Using Multiple ATG System with Magnetostrictive Tank Probes for Tanks and Associated Pipelines

CONTINUOUS IN-TANK LEAK DETECTION METHOD (Continual Reconciliation)

Certification	Leak rate of 10 liters/24h (0.11 gph) for tanks and associated pipelines with PD > 99% and PFA < 1%.
Leak Threshold	5 liters/24h (0.055 gph) for single and manifolded tank systems including associated pipelines. A tank system should not be declared tight if the test results indicate a loss or gain that equals or exceeds this threshold.
Applicability	Gasoline, diesel. Other liquids may be tested after consultation with the vendor.
Tank Capacity	62,500 liters (16,511 gallons) for single tanks. 125,000 liters (33,521 gallons) for manifolded tanks. Maximum of 3 tanks manifolded allowed.
Throughput	102,488 liters (27,074 gallons) for single tanks. 195,541 liters (51,656 gallons) for manifolded systems.
Waiting Time	None.
Test Period	Data collection time: 14 days (1,300 – 1,400 readings). Data sampling frequency: at least four (4) per hour. System collects data (sales and levels) without interfering with normal site operation.
Temperature	Input data must be provided after excluding temperature effect.
Water Sensor	Must be used in Automatic Tank Gauge system to detect water ingress.
Calibration	The Automatic Tank Gauge used must have thermistors and probe checked and, if necessary, calibrated in accordance with manufacturer's instructions. Dispenser meter calibrations must be known.
Comments	Leak detection method is software based and independent from any specific hardware at site, but appropriate frequency and accuracy of input data is needed. Automatic Tank Gauges used with this method must employ a magnetostrictive probe and be on the NWGLDE List or be approved by vendor after consultation. Method reports a calculated leak rate and "Pass", "Fail" or "Inconclusive" for each tank system. Method was evaluated for tanks and associated pipelines for both single and manifolded tank systems with probes in each tank. Calibration errors, dispensing meter errors, vapor loss, thermal effects, conversion chart miscalibration must be known. The maximum size tank system in the evaluation was 100 000 liters (~26 417 gallons). The 80th percentile of tank sizes was 25,000 L (6,604 gallons). The maximum throughput in the evaluation was 156,433 liters/month (41,325 gal/mo). The 80th percentile of throughputs was 17,325 L/mo (4,431 gal/mo).

Phone: +48 32 775 40 00



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Pneumercator Company, Inc.

Tamper-Resistant, Non-Discriminating LS600LDxx-T and Discriminating LS600LDxx-FT/FLT Liquid Float Switch Leak Sensors with Console Model: LC1000-Series, LC2000-Series, TMS1000-Series, TMS2000-Series, TMS3000-Series, and TMS2000W-Series

INTERSTITIAL DETECTOR (LIQUID-PHASE)

Detector:

Output type: qualitative
Sampling frequency: continuous
Operating principle: magnetic reed switch

Test Results:

LS600Dxx-T	<u>unleaded gasoline</u>	<u>diesel</u>	<u>water</u>
Detection Time Wired (min)	<1	<1	<1
Detection Time Wireless (sec)	<65	<65	<65
Lower Detection (sec)	<1	<1	<1
Fall Time Wired (sec)	<1	<1	<1
Fall Time Wireless (sec)	<65	<65	<65
Threshold Level (in)	1.0562	0.9908	0.8596
LS600LDxx-FT/FLT			
Detection Time Wired (min)	<1	<1	<1
Detection Time Wireless (sec)	<65	<65	<65
Lower detection limit (in)	0.401	0.365	0.416
Fall Time Wired (sec)	<1	<1	<1
Fall Time Wireless (sec)	<65	<65	<65
Threshold Level (in)	0.9849	0.8992	0.7808

Comments:

The LS600LDxx-FT sensor should be situated on the containment floor, the standard sensor function with the LS600LD Series with the float positioned to raise indicating a leak condition. If suspended above the containment floor by its cable, a fault/tamper alarm is generated. The manufacturer states that the LS600LDxx-FT sensor is available with Buna-n or stainless-steel float for monitoring in most petrochemical and chemical storage tank applications.

Note: The term "Non-Discriminating" refers to (-T) models that do not differentiate between alarm and tamper conditions, whereas "Discriminating" (-FT/-FLT) models do differentiate between alarm and tamper/wiring fault conditions.

Pneumercator Company, Inc.
1785 Expressway Drive North
Hauppauge, NY 11788
Tel: (631) 293-8450 x112

Evaluator: Muskox Engineering
140 Switch Grass Crescent
Ottawa, Ontario, Canada K2J 5Z3
Tel: 613-617-6806
Dates of valuations: 06/03/19



Core Engineered Solutions

SafeSite Vacuum Interstitial Monitoring System

CONTINUOUS INTERSTITIAL LINE MONITORING METHOD (PRESSURE/VACUUM) and CONTINUOUS INTERSTITIAL TANK SYSTEM MONITORING METHOD (PRESSURE/VACUUM)

Certification:

Leak rate of 0.1 gph with PD=95.0% and PFA=<5.0% Evaluation Protocol for Vacuum-Wrapped Pressurized Portions of a Fuel Containment and Dispensing System. Revision 3A, Jairus D. Flora, Jr., Ph.D., December 15, 2006

Operating Principle:

System uses vacuum generated by a vacuum pump or submersible pump to continuously maintain a partial vacuum of a 7.5 psig, equivalent to 207.6" water column for a period of 60 minutes, and maintain vacuum for 30 seconds prior to testing. System is designed to activate a visual and acoustic alarm, and optional submersible pump shutdown before stored product can escape to the environment.

System was evaluated for detecting breaches within the interstitial space of 1/8" or greater of a double-walled tank or double-walled piping.

Alarm Condition:

System alarms when a liquid or air leak occurs which causes the interstitial vacuum to decrease (pressure to increase) and the system is unable to maintain a vacuum pressure of 1.0 psi per hour for three consecutive failures based upon the rate of vacuum decay. The system incorporates a minimum detectable pressure change of 0.028 psi.

System will also alarm if liquid is detected in the interstitial space, or if the vacuum level in the interstitial space decreases at a rate exceeding 0.1 gallons per minute in 15 minutes.

Applicability:

Double-walled piping or double-walled tank (underground or aboveground) with an interstitial space of 1/8" or greater, storing gasoline, gasohol, diesel, heating oil #2, kerosene, aviation fuel, motor oil, water. Storage of biodiesel blends B6-B20 meeting ASTM D7467 and biodiesel B100 meeting ASTM D6751 would also produce a system alarm if the system threshold is exceeded. Responses to these fuels were not determined, but would be expected to be very similar to the system's response when storing diesel.

Manufacturer's Specifications:

Alarm will activate when interstitial vacuum decreases 1.0 psi for three consecutive tests. Default maximum vacuum level (pump-off pressure) is 7.5 psi vacuum (207.6" water column), Volume of monitored interstitial space must not exceed 270 gallons or 5,120 feet of piping.

Calibration:

The system must be programmed by a factory trained technician or under the direction of the manufacturer. Programmed parameters include: system type (pressure or vacuum), test target pressure or vacuum (PSI or inH2O), test duration, maximum allowable loss, number of failed tests required to activate leak alarm, and optional disabling of the fuel pump.

Comments:

The System described herein was tested only with open interstitial spaces of 1/8" or greater, and therefore it cannot be concluded that it would operate satisfactorily with restricted interstitial spaces. This system may not be compatible with all secondarily contained tanks and/or piping. Always consult with the tank and/or piping manufacturer and the manufacturer's applicable recommended installation practices before installing this system, or damage may be caused to the tank or piping by its use.

Core Engineered Solutions
620 Herndon Parkway, Suite 120
Herndon, VA 20170
Tel: (703) 563-0320
E-Mail: info@core-es.com
URL: www.core-es.com

Evaluator: Dennis Eryou, PhD, P.E.
5501 Castello Drive
Naples, FL 34103
Tel: (239) 530-4301
Dennis@eryouengineering.com
Dates of Evaluation: January 22, 2019