TRUCHEK®

Continuous Leak Detection

Tank-Tightness Testing

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Many tank owners and fuel-system designers choose Xerxes double-wall fiberglass underground storage tanks because of Xerxes' long history as a leader in underground storage technology. The unique integral-rib design and construction of all Xerxes tanks make them strong and robust. The fiberglass construction of these tanks makes them resistant to both internal and external rust. Further, more and more customers choose a Xerxes double-wall tank because the two walls of protection provide extra security in the unlikely event of a leak.

To enhance that double-wall protection, Xerxes offers the option of TRUCHEK, a hydrostatic, tank-monitoring system for double-wall tanks. TRUCHEK is an easy, precise and reliable method for providing continuous leak detection and also for performing a tank-tightness test.

TRUCHEK meets EPA criteria for tank-tightness testing and has received third-party verification from Underwriters Laboratories (UL). Like the tanks that Xerxes manufactures, TRUCHEK provides a long, successful record of performance. TRUCHEK's performance is based on use in thousands of tanks in many different types of installations. This proven performance is increasingly important as regulations are becoming more strict for the continuous monitoring of double-wall tanks.

Tank-Tightness Testing

The TRUCHEK system provides a simple, precise and reliable method to perform a tank-tightness test. It takes into account the impacts of thermal expansion or contraction of the product, vapor pockets, tank deflection, evaporation, condensation and the location of the water table.

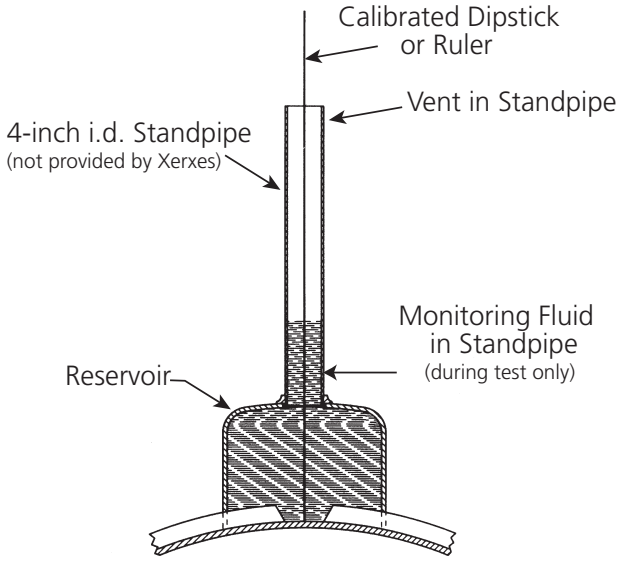
Using a simple 10-hour tightness-test procedure while the tank is not in use, TRUCHEK is capable of detecting a loss of liquid in the tank at a rate of 0.05 gallons per hour with a 99% probability of detection (PD) and a 1% probability of false alarm (PFA). This meets the strict NFPA 329 criteria.

A shorter 4-hour test, which allows product dispensing, is capable of detecting a loss of liquid in the tank at a rate of 0.05 gallons per hour with a 95% probability of detection (PD) and a 5% probability of false alarm (PFA). This shorter test exceeds EPA's criteria for a tank-tightness test stating that a test must be able to detect a leak rate of 0.1 gallon per hour with a 95% PD and a 5% PFA.

Features and Benefits

- Has third-party verification from Underwriters Laboratories
- Meets or exceeds EPA and NFPA testing criteria
- Can be tested at the time of installation as well as during the lifetime of a tank
- Allows product dispensing during the 4-hour test
- Can be performed on a variety of tank sizes, as large as the Xerxes double-wall, 30,000-gallon tank
- May provide a less expensive option to periodic tank tests as a way to meet regulations

Typical Tank-Tightness Test Using TRUCHEK



To conduct a TRUCHEK test, follow the TRUCHEK Tank-Tightness Testing Procedure outlined in this brochure and fill in the attached TRUCHEK Data Log form as appropriate for the diameter size of the tank to be tested. Keep the completed form as part of the tank records that may be required by federal, state and/or local regulations or codes.

Continuous Leak Detection

Changing regulations in some markets require that double-wall tanks have continuous leak detection using a constant vacuum, air pressure or hydrostatic pressure in the interstice of a double-wall tank. For many reasons, a Xerxes double-wall tank with TRUCHEK's continuous leak detection is the ideal solution for complying with these strict new requirements. Vacuum and air-pressure systems have had very limited use in continuously monitoring jacketed tanks. In fact, some systems are brand new to the market.

On the other hand, TRUCHEK has an excellent track record of successfully monitoring thousands of Xerxes double-wall tanks for well over a decade. While being highly effective, the TRUCHEK system is also simple and trouble-free in both design and operation. TRUCHEK's operation does not require the difficult process of maintaining a constant vacuum or pressure in a tank's interstice, or the special equipment necessary to do that. Additionally, TRUCHEK avoids the problem caused by false tank-leak alarms that can occur when all fittings and connections to an air or vacuum monitoring system aren't absolutely tight. With TRUCHEK, simple monitoring of the fluid level inside the reservoir of a Xerxes double-wall tank is all that is necessary.

Here's how TRUCHEK works (see drawings to right): When you order a Xerxes double-wall tank with the TRUCHEK option, the interstice between the two tank walls is filled at the factory with a monitoring fluid. The monitoring fluid also partially fills a reservoir on the top of the tank. This creates a hydrostatic pressure that enables the operator to monitor the walls of both the primary tank and the secondary tank. An electronic reservoir-monitoring probe alarms when the fluid level either falls below or rises above the acceptable level within the reservoir.

Primary-Tank Leak:

Because the specific gravity of the monitoring fluid is greater than that of the petroleum product stored, a breach in the primary tank causes the monitoring fluid to go into the inner tank in both a dry hole and a wet hole.

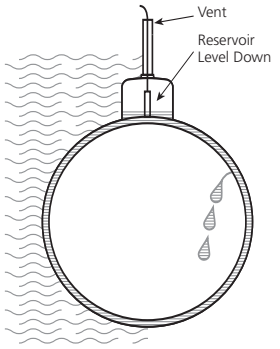
Secondary-Tank Leak:

The level of the monitoring fluid fluctuates if the pressure inside the interstice is either greater than or less than the pressure of the surrounding water table.

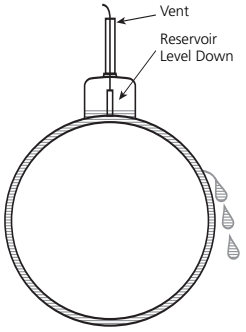
In a dry hole, a breach in the secondary tank causes the monitoring fluid to go into the backfill surrounding the tank.

In a wet hole, the monitoring fluid in the reservoir goes up if a breach in the secondary tank occurs where the height of the water table above the leak is 30 percent greater than the level of the monitoring fluid above the breach. In a wet hole, where the height of the water table above the leak is less than 30 percent, the monitoring fluid goes into the groundwater.

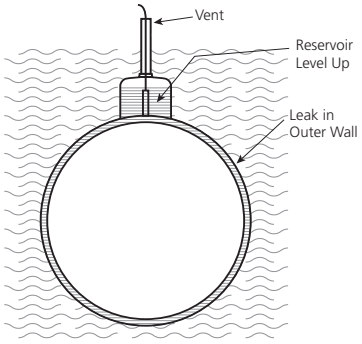
Primary-Tank Leak in Wet Hole or Dry Hole



Secondary-Tank Leak in Dry Hole



Secondary-Tank Leak in Wet Hole



Features and Benefits

- Provides continuous monitoring of both primary and secondary tanks
- Provides effective monitoring in both dry-hole and wet-hole environments
- Meets California's strict new regulations for continuous monitoring of tanks
- Is compatible with most electronic monitoring systems
- Has been proven highly effective over thousands of tank installations

TRUCHEK® DATA LOG

Fill out the site location, tank information and test boxes below. Be sure to choose the correct test box according to the diameter of the tank being tested. Follow the test procedures on the other side of this form. A separate test form is needed for every tank. For additional copies of the form, contact the UST coordinator at the Xerxes manufacturing facility nearest you. (See back cover for information.)

SITE LOCATION AND TANK INFORMATION

Site Location:

Address: _____

_____

Phone: _____

Contact name: _____

Tank Information:

Nominal Gallons: _____

Diameter: _____

Approximate standpipe length: _____

Product type: _____

Test Date: _____ Person Performing Test: _____

4-FOOT-, 6-FOOT- AND 8-FOOT-DIAMETER DOUBLE-WALL TANKS

95% - 5% TEST

1a. Start level (inches in standpipe)		
2a. End level after 4 hours	-	
3. Difference (subtract 2a from 1a)	=	
4. Calibration factor	x	.20
5. Volume change	=	
6. Test hours	÷	4
7. Gallons-per-hour loss	=	

(If 0.05 gallons/hour or less, tank passed.)

Note: maximum allowable dispensing volume during test:
8-foot-diameter tank – 1,200 gallons maximum
6-foot-diameter tank – 500 gallons maximum
4-foot-diameter tank – 300 gallons maximum

99% - 1% TEST

1b. Start level (inches in standpipe)		
2b. End level after 10 hours	-	
3. Difference (subtract 2b from 1b)	=	
4. Calibration factor	x	.20
5. Volume change	=	
6. Test hours	÷	10
7. Gallons-per-hour loss	=	

(If 0.05 gallons/hour or less, tank passed.)

Note: No product dispensing allowed.

10-FOOT-DIAMETER DOUBLE-WALL TANKS

95% - 5% TEST

1a. Start level (inches in standpipe)		
2a. End level after 6 hours	-	
3. Difference (subtract 2a from 1a)	=	
4. Calibration factor	x	.30
5. Volume change	=	
6. Test hours	÷	6
7. Gallons-per-hour loss	=	

(If 0.05 gallons/hour or less, tank passed.)

Note: maximum allowable dispensing volume during test:
10-foot-diameter tank – 750 gallons maximum

99% - 1% TEST

1b. Start level (inches in standpipe)		
2b. End level after 10 hours	-	
3. Difference (subtract 2b from 1b)	=	
4. Calibration factor	x	.30
5. Volume change	=	
6. Test hours	÷	10
7. Gallons-per-hour loss	=	

(If 0.05 gallons/hour or less, tank passed.)

Note: No product dispensing allowed.

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Tank-Tightness Testing Procedure

1. Pre-Test Notes:

1.1. Do not conduct this TRUCHEK tank-tightness test until after the tank is installed and has backfill placed to at least the top of the tank.

1.2. If the tank contains water or product, do not start the test until at least 24 hours after product has been delivered to the tank in order to equalize the temperature in the tank. **Note: The test can also be conducted when the tank is empty.**

1.3. If monitoring wells are in place, ascertain water-table levels prior to and after the tank-tightness test to assure there is no extreme water-table fluctuation during the test. **Note: Extreme water-table fluctuations during the test period may affect the results of the tank-tightness test.**

1.4. The test is considered invalid and should be repeated when testing a 4-foot-, 6-foot- or 8-foot-diameter tank if:

- the groundwater level is above the bottom of the tank but below the top of the tank AND if the groundwater level increases by more than 3 inches during the 4-hour test or more than 7 inches during the 10-hour test; OR
- the groundwater level is above the top of the tank AND the water level rises 2 inches during the 4-hour test or more than 5 inches during the 10-hour test.

1.5. The test is considered invalid and should be repeated when testing a 10-foot-diameter tank if:

- the groundwater level is above the bottom of the tank but below the top of the tank AND if the groundwater level increases by more than 4 inches during the 6-hour test or more than 7 inches during the 10-hour test; OR
- the groundwater level is above the top of the tank AND the water level rises 3 inches during the 6-hour test or more than 5 inches during the 10-hour test.

2. Test Instructions:

2.1. If it was not previously installed, install a 4-inch NPT threaded standpipe to the factory-supplied reservoir. Check to see that the threaded connection is tight. Confirm that the standpipe remains vented to the atmosphere at all times. (At the owner's discretion, the standpipe can remain as part of the tank apparatus so the electronic reservoir-monitoring probe can be checked and future tank-tightness tests can be performed. However, the standpipe is not used in continuous monitoring of the tank, is not part of the monitoring system and is not provided by Xerxes.)

2.2. Remove the electronic reservoir-monitoring probe through the standpipe. Check to see that the probe functions correctly and carefully put it in a safe place.

2.3. Prepare a monitoring-fluid solution of 30% calcium-chloride mix. Eight to 10 gallons of monitoring fluid should be all that is necessary to top off the reservoir and to raise the fluid level. Pour the monitoring fluid through the standpipe in 1-gallon increments. (If calcium-chloride flakes are available, mix at 5.22 pounds of flakes to 1 gallon of water.)
Caution: Raising the monitoring-fluid level into the standpipe is temporary and performed only to determine tank tightness. In normal use, the monitoring fluid will not rise to the level of the standpipe, which serves only as an access to the reservoir. Leaving the monitoring fluid at a raised level may cause excessive pressure and damage the tank.

2.4. If the connection is visible, check to see there are no monitoring-fluid leaks at the standpipe/reservoir connection.

2.5. Using a dipstick or ruler marked with 1/8-inch increments, raise the monitoring-fluid level into the standpipe approximately 6 to 12 inches. Do not overfill the standpipe.
Caution: The tank may be damaged by excessive hydrostatic pressure. To increase the accuracy of the tank-tightness test, use water-finding paste to pinpoint the calibrated-dipstick measurements.

2.6. If performing the 95%-5% test and dispensing product during the test, record the meter reading(s) for the dispenser(s) connected to the tank being tested.

2.7. Check the monitoring-fluid level and record it on line 1a or line 1b on the Data Log form on the other side of these instructions. The more accurate the measurement, the more accurate the tank-tightness test will be.

2.8. If performing the 95%-5% test, wait 4 hours (6 hours for 10-foot-diameter tanks). Then check the monitoring-fluid level again and record it on line 2a. **Note: See the maximum allowable dispensing volume for product in the test boxes on Data Log form.**

2.9. If performing the 99%-1% test, wait 10 hours after the initial measurement. Then check the monitoring-fluid level again and record it on line 2b. **Note: No dispensing of product is allowed during this extended test.**

2.10. Subtract line 2a from line 1a, or line 2b from 1b. Enter the figure on line 3.

2.11. Multiply the figure on line 3 by the calibration factor on line 4 and enter the result on line 5.

2.12. Divide the line 5 figure by the number of hours in the test (as noted in line 6).

2.13. Enter the result of dividing line 5 by line 6 on line 7. If the figure is 0.05 gallon/hour or less, the tank has passed the test.

2.14. Record reading(s) of dispenser(s) after conducting the tank-tightness test. Compare these to the readings taken prior to the test to verify that you have not exceeded the maximum product-dispensing rate for the specific tank as noted on the TRUCHEK Data Log form.

2.15. If the tank test fails, repeat the test to confirm that you made no errors in the testing procedures. **Note: See Points 1.4. and 1.5. in this procedure for explanation for invalid tests.** If the test fails again, immediately contact technical support at Xerxes' corporate office for further instructions.

2.16. After the test is completed:

- remove the additional monitoring fluid with a pump and adjust the level of the monitoring fluid in the reservoir to the level stated in Monitoring Section of the current Xerxes Installation Manual and Operating Guidelines for Single-Wall and Double-Wall Fiberglass UndergroundStorage Tanks; and
- carefully replace the electronic probe system and check the positions of the high-fluid-level and low-fluid-level sensors.

2.17. Maintain the Data Log form as a permanent record and submit it to any jurisdiction that requires it.

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