



FTPI RP 2007-2 Field Test Protocol for Testing the Annular Space Of Installed Underground Fiberglass Double and Triple-Wall Tanks With Dry Annular Space

Introduction: This field test procedure is designed to test the integrity of the dry annular space of double or triple wall underground fiberglass storage tanks. The test procedure draws a vacuum on the annular space and monitors for vacuum decay over a prescribed period of time. The vacuum test time depends on the volume of the annular space and the installation site conditions. The underground fiberglass tank may contain any level of liquid (e. g. product or water) and liquid may be removed or added at any time during the annular space test. However, product deliveries should be avoided if possible. If a delivery occurs during the test and the vacuum experiences a significant change, the test should be restarted.

Test Time: The procedures require a vacuum to be drawn on each tank annular space and held for a period of time. The vacuum should be expected to decay over time. However, there is a time period that has been established by laboratory tightness testing to recognize an acceptable change in the vacuum level and this will vary based on the tank annular space volume, the type of fluid in the tank and the backfill conditions. The test procedures require an initial vacuum of 10" Hg during the initial hold time and a maximum vacuum loss of 2" Hg. If the vacuum loss exceeds 2" Hg during the hold time, the test is repeated.

The hold times will be different based on the volume of the annular space - the larger the space the longer the hold time. The annular space volume is a function of the tank volume and the manufacturer's method of creating the annular space.

If a leak is present and the leak is a non-volatile fluid like water or diesel fuel, the given testing times will apply but it is necessary to confirm after the vacuum test that the annular space did not accumulate any liquid during the test. If the leak is air or a volatile fluid like gasoline, the leak will be evident based on the vacuum test results.

WARNING

Be sure to follow all federal, state, local rules and OSHA safety procedures.

1. Obtain owner verification that the primary tank is currently sound and has not leaked in the past.
2. If possible, confirm that there is no liquid in the interstitial space with a hand or electronic sensor.
3. Use a venturi-eductor type air mover only. Do not use an electric or gasoline vacuum pump. Use of a vacuum pump could result in a safety hazard if flammable liquids are present.
4. If a leak of volatile fluid like gasoline is present, the exhaust from the venturi may contain flammable vapors.
5. Do not apply a vacuum to the primary tank.

Equipment Required

1. A vacuum gauge with a range of 0-30" Hg with increments of 0.5" Hg or smaller.
2. A small air driven venturi capable of pulling 15" Hg when operated with compressed air.
3. A valve and an air hose.
4. A vacuum regulator or automatic shut-off valve that will shut off at 12" Hg

Pretest Procedure

1. Check to make sure that the tank to be tested is a dry monitored tank. If it is a wet monitored tank, it does not need to be tested with this procedure. However, check the brine level – if it is within proper levels, the tank meets the annular space integrity requirements. If the brine is outside the specified requirements, contact the manufacturer.
2. Determine if the interstitial space is a "tight wrap" design or an earlier 1980's vintage "110% containment" design with a larger volume interstitial space. If the interstitial space is a "tight wrap" then the test times will be shorter.
3. Check the annular space for vapors or liquid. If the annular space is free of vapors and liquid, proceed with the test.
4. If vapors or liquid are found, investigate the source and determine whether the tank is leaking. If the tank is found to be leaking, do not continue beyond this step and contact the manufacturer.
5. If you are unable to determine if the annular space is free of vapors and liquid, proceed with the test.
6. Identify the volume of the tank. The test time will vary with tank size.

Test Procedure

1. Connect the vacuum gauge, valve and vacuum venturi to an annular space fitting. The valve should be between the compressor and the fitting. The gauge should be between the valve and the fitting so it will read when the valve is closed. It is highly recommended to use an automatic vacuum shut-off valve and set it at 12" Hg.

2. Ensure all connections are airtight.
3. Start the vacuum venturi and open the valve.
4. When the vacuum level reaches 12" Hg, close the valve and stop the vacuum venturi (do not exceed 12" Hg vacuum).
5. Wait until the vacuum level stabilizes at or above 10" Hg. Increase to 12" Hg again if necessary by repeating steps 3 and 4. Hold for 5 minutes or longer at 10" Hg, with a vacuum decrease of less than 0.5" Hg. If a stable vacuum cannot be maintained, a leak is indicated and the test should be terminated.
6. Record the vacuum level and the time.
7. Hold the initial vacuum for the period of time shown in the following tables based on tank size and type.

Hold times for "tight wrap" tanks:

Tank Capacity *	Hold Time
Up to 15,000 gallons	1 Hour
Over 15,000 and up to 24,000 gallons	2 Hours
Over 24,000 and up to 34,000 gallons	3 Hours
Over 34,000 and up to 44,000 gallons	4 Hours
Over 44,000 gallons and up to 50,000 gallons	5 Hours
*This is the total tank capacity, including all compartments in a multi-compartment tank.	

Hold times for "110% containment" tanks:

Tank Capacity *	Hold Time
Up to 2,000 gallons	1 Hour
Over 2,000 and up to 5,000 gallons	2 Hours
Over 5,000 and up to 9,000 gallons	3 Hours
Over 9,000 and up to 14,000 gallons	4 Hours
Over 14,000 and up to 19,000 gallons	6 Hours
Over 19,000 and up to 24,000 gallons	8 Hours
Over 24,000 and up to 29,000 gallons	10 Hours
Over 29,000 gallons and up to 30,000 gallons	12 Hours
*This is the total tank capacity, including all compartments in a multi-compartment tank.	

8. If the vacuum level is 8" Hg or higher at the end of the hold time, and the annular space is dry, the tank has passed the test.
9. If the tank vacuum level is below 8" Hg after the specified time, go back and repeat, starting at step 2.
10. If the tank fails to hold 8" Hg after three attempts, call the tank manufacturer.
11. The presence of water or fuel in an annular space that was dry at the beginning of the test will confirm that that a leak is present.
12. On triple wall tanks, follow steps 1 through 10 for each annular space.

IMPORTANT NOTICE

I. This field test protocol, published by the Fiberglass Tank and Pipe Institute ("Institute"), addresses subjects of a general nature associated with the testing of the annular space in installed fiberglass-reinforced plastic double and triple-wall tanks with dry annular space as part of underground storage tank (UST) system. Federal, State and local laws and regulations governing the testing of such installations and UST systems should be reviewed. Trained personnel should perform the types of work covered by the field test protocol.

II. When the field test protocol is complete, one copy of the results should be retained in the tester's files, and one copy in the owner/operator's file.

III. The Institute is not undertaking to meet the duties of underground storage tank system owners/operators, employers, manufacturers, or suppliers to warn and properly train and equip their employees, and others exposed or in contact with fiberglass tanks and materials, concerning their obligations under Federal, State or local laws or regulations, as well as health and safety risks and precautions.

IV. Information concerning safety and health risks and proper precautions with respect to particular materials and conditions should be obtained from the manufacturer or supplier of the material, or the applicable material safety data sheet.

THE FIELD TEST PROTOCOL MAY BE USED BY ANYONE DESIRING TO DO SO. EVERY EFFORT HAS BEEN MADE BY THE INSTITUTE TO ASSURE THE ACCURACY AND RELIABILITY OF THE INFORMATION IT CONTAINS. HOWEVER, THE INSTITUTE MAKES NO REPRESENTATION, WARRANTY, OR GUARANTEE IN CONNECTION WITH THIS FIELD TEST PROTOCOL AND HEREBY EXPRESSLY DISCLAIMS ANY LIABILITY OR RESPONSIBILITY FOR LOSS OR DAMAGE, INCLUDING PERSONAL INJURY OR PROPERTY OR OTHER DAMAGES OF WHATEVER NATURE, RESULTING FROM ITS USE OR FOR THE VIOLATION OF ANY FEDERAL, STATE, OR LOCAL LAW OR REGULATION WITH WHICH THIS CHECKLIST MAY CONFLICT.

V. If you have questions concerning the proper testing the annular space of fiberglass double and triple-wall underground storage tanks, contact the manufacturer. Institute testing protocol sponsors are listed below:

Owens Corning Fiberglass Corp.

Fiberglass Tower
Toledo, OH 43659
Phone: 936-273-4383

Containment Solutions, Inc.

333 No. Rivershire Dr. Suite 190
Conroe, Texas 77304
Phone: 936-756-7731

Xerxes Corporation

7901 Xerxes Ave. South
Minneapolis, MN 55431
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VI. Comments and suggested revisions to this field test protocol are invited.
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