Issue Date: 11/21/2025

Purpora Engineering, Inc.

Petro Tite Large Volume Line Tightness Test for Annual Testing on Pressurized Pipeline Systems

LINE TIGHTNESS TEST METHOD

Certification

Leak rate of 0.1 gph with PD = 99.9167% and PFA = 0.00837%.

Leak Threshold

0.05 gph.
A pipeline system should not be declared tight if the test result indicates a loss that equals or exceeds this threshold.

Applicability

Gasoline (compatible with all blends of ethanol), diesel, biodiesel blends B6-B100, aviation fuel, fuel oil #4.

Specification

System tests steel, fiberglass and flexible plastic pipelines.
Tests are conducted at 150% operating pressure.
Mechanical line leak detectors shall be removed or manually isolated from the pipeline for duration of test or check valve in pump must be manually closed if testing is to be conducted with mechanical line leak detector in place.

Pipeline Capacity

Bulk Modulus (psi) of pipeline to be tested	Maximum Pipeline Volume Allowed for Specific Bulk Modulus (gallons)
1000	51.86
2000	103.72
3000	155.58
4000	207.44
5000	259.30
6000	311.16
7000	363.02
8000	414.88
9000	466.74
10000	518.60
11000	570.46
12000	622.32
13000	674.18
14000	726.04
15000	777.90
16000	829.76
16032	831.42
20000	831.42
25000	831.42
30000	831.42
35000	831.42
40000	831.42
50000	831.42
55000	831.42
60000	831.42
65000	831.42
70000	831.42
75000	831.42
80000 and greater	831.42

Maximum combined volume for flexible and rigid pipeline of 831.44 gallons with a minimum bulk modulus of 16,032 PSI.

Waiting Time

None between delivery and testing.
None between dispensing and testing.

Pre-test Bulk Modulus Determination

Prior to performing the leak test, the bulk modulus must be determined for the line being tested in accordance with Purpora Engineering Bulletin 25. An explanation of bulk modulus and a spreadsheet to assist in the calculation can be acquired by contacting Purpora Engineering or going to the following website: https://purporaengineering.com/trusted-line-and-tank-testing/reference/

Test Period

Minimum of four (4) consecutive readings at 15-minute intervals are required for a valid test. The final 4 leak rates must have an accumulated leak rate of less than 0.0500 gph to pass.

For a line that indicates a leak rate less than 0.05 gph:

- The minimum test time is one hour (four 15-minute intervals).
- Pressure and volume readings less than 0.05 gph which eventually diminish to zero indicate temperature and piping stabilization, and no additional readings are required.
- In the case where there are four **intervals** that total less than 0.05 gph, with the leak rate **increasing** between any of the four intervals, that indicates possible thermal expansion that is masking a leak. Over time, the fuel expansion will stabilize, therefore revealing an accurate leak rate. In this case, the test needs to continue for additional **intervals** until there are four consecutive identical leak rates, or, until the observed leak exceeds 0.05 gph. If the observed leak rate continues to increase and the rate **exceeds** 0.05 gph, a leak can be declared.

For a line that indicates a leak rate greater than or equal to 0.05 gph:

- The minimum test time is 1 hour and 15 minutes (75 minutes total - five 15-minute intervals).
- Volume loss exceeding 0.05 gph which gradually diminishes to zero may indicate temperature change or piping expansion/contraction. This requires the test time to be extended.

Calibration

This method utilizes a digital pressure gauge with a resolution of 0.01 PSI to improve the resolution for larger lines. Consult with the manufacturer and/or the Authority having Jurisdiction (AHJ) to determine frequency of calibration of the digital pressure gauge.

Comments

The manufacturer does not support test results if the technician does not hold a current Petro-Tite certification when the test is performed. Re-certification is required by the manufacturer every 2 years. Third party evaluation was not conducted utilizing a test manifold. Multiple lines can be tested using the Petro Tite 3 way manifold if the total volume being tested is within the maximum volume as determined by the bulk modulus of the combined multiple lines. Test data are acquired and recorded manually. Test time for larger volume lines with simulated leaks during the evaluation ranged from 60 to 270 minutes.

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