

Leak detection for underground storage tank pressure piping

Many leaks from underground storage tank (UST) systems are a result of piping failure. In fact, piping failures occur more than twice as frequently as tank failures. Since piping is assembled in the field, the piping integrity is sensitive to field conditions. Also, with numerous possible connections in a piping run, leaks are more likely to occur at connection points. Leaks from pressurized piping can cause great environmental harm because the pressure in the line will continually force product through a hole in the piping into the ground.

What is a pressurized piping system?

A pressurized piping system has a submersible pump located above the tank. Product is pumped from the tank at a typical pressure of 30 pounds per square inch (psi). Some piping systems may be pressurized as high as 60 psi.

What are the leak detection requirements for pressurized piping?

All pressurized piping must have an automatic (mechanical or electronic) line leak detector. An annual function test is required by an agency-approved tester.

Additionally, pressure piping must also have **one** of the periodic methods described below:

- Line tightness testing annually at 0.1 gallons per hour (gph) by an agency approved tester
- Line tightness testing monthly at 0.2 gph (electronic line leak detector or statistical inventory reconciliation (SIR))
- Interstitial monitoring used with some double-walled piping applications
 - Sump sensor with monthly passing test results, and an annual sensor test by an agency approved tester, or
 - Monthly visual inspection of sump by owner/operator

Note: If any portion of the product piping is located lower than the top of the tank, an anti-siphon device is required to be installed.

Note: Pressurized piping installed after December 22, 2007, must be secondarily contained and must have a liquid-tight submersible pump sump and under-dispenser sumps. This piping must use a continuous automatic line leak detector plus interstitial monitoring.

What performance standard must the piping leak detection methods meet?

Each leak detection method must meet certain performance standards according to Minn. R. ch. 7150. The following is a summary for each method.

- Automatic line leak detectors must be capable of detecting a leak of three gph at ten pounds per square inch line pressure within one hour, and alerting the operator by sending an audible or visual alarm, by restricting flow, or by shutting off flow.
- Line tightness tests (annually) must be capable of detecting a leak of 0.1 gph from any part of the piping that routinely contains product, at one and one-half times the operating pressure.
- Line tightness tests (monthly) must be capable of detecting a leak of 0.2 gph from any part of the piping that routinely contains product, at standard operating pressure.

- SIR must be capable of detecting a leak of at least 0.2 gph and be performed according to Minnesota Pollution Control Agency (MPCA) guidelines by a listed SIR vendor.
- Continuous interstitial monitoring must be able to detect a leak from the inner piping wall by gravity flow to a liquid-tight sump with a sump sensor that alerts the operator by sending an audible or visual alarm, by restricting flow, or by shutting down flow.
- Non-continuous interstitial monitoring must be able to detect a leak from the inner piping wall by gravity flow to a liquid-tight sump that is visually inspected on a monthly basis.

How do I know if my piping leak detection system meets the performance standards?

Line tightness testing methods and automatic line leak detectors must be evaluated by a third-party testing laboratory to determine if it meets the required performance standards. The federal government then reviews the evaluation; if the minimum standard is met, the method and vendor are listed on the National Work Group of Leak Detection Evaluations (NWGLDE) website found at <http://nwglde.org/>. The test results from this evaluation are known as performance claims and must be provided to you.

Eligible SIR vendors are listed on the NWGLDE website at <http://nwglde.org/>. For more information, please see the SIR fact sheet located on the UST Program webpage.

Do I have to report a possible leaking pipe based on test results?

Any time that:

- Piping fails a line tightness test
- Piping fails an SIR evaluation or has an inconclusive result for two consecutive months
- A leak is signaled by a line leak detector
- A leak is discovered through interstitial monitoring

The tank owner must immediately call the Minnesota Duty Officer at 651-649-5451 or 800-422-0798. You must immediately investigate and resolve all suspected leaks.

How must the piping leak detection system be maintained?

All manufacturers' maintenance and calibration schedules must be followed. These schedules may be found in the manufacturers' instruction manual.

Sumps for interstitial monitoring must be maintained liquid-tight and free of water, product and debris. For piping installed after December 22, 2007, the secondary containment sumps must be visual inspected by an agency-approved tester annually and have integrity tests conducted every three years.

An agency-approved tester must test sump sensors annually for proper function if equipped. Testing should follow any manufacturer's instructions, and should verify that the alarm sounds or the pump shuts off or restricts flow when the sensor is in contact with water or product.

An agency-approved tester must test automatic line leak detectors (both mechanical and electronic types) annually for proper function. Testing of the leak detector must comply with the manufacturer's testing requirements and involve creation of a physical leak in a piping segment in order to verify the applicable leak detection threshold.

Unattended card-lock facilities

Unattended card-lock facilities must have automatic line leak detectors that shut off the flow of fuel. This is most commonly done with an electronic line leak detector.

What records must be kept on file?

Without written records, there is no way to verify that leak detection is being performed. Owners and operators are required to maintain certain written records. These records must be kept at the facility where the tanks are located, or if kept elsewhere, must be immediately submitted to the MPCA upon request.

The following records must be kept **as long as any automatic line leak detector is used**:

- Documentation of the manufacturer's written performance claims
- Documentation of the manufacturer's written maintenance and calibration schedules

The following records must be kept for at least **five years**:

- **For line leak detectors:** monthly test results, annual function test results, and documentation of any repairs or maintenance
- **For line tightness testing:** annual third-party test results, or monthly leak detector test results (if an electronic line leak detector is used in lieu of third-party tightness testing)
- **For SIR:** inventory control sheets and monthly SIR provider reports
- **For interstitial monitoring:** monthly visual sump check record (if no sump sensor), or annual sump sensor function test results
- **For interstitial monitoring:** annual visual inspection reports of secondary containment sumps
- **For interstitial monitoring:** integrity testing of secondary containment sumps (required every three years)

Need more information?

Visit the UST Program at <https://www.pca.state.mn.us/waste/underground-storage-tank-systems>. The site has forms, fact sheets, and other information about USTs and UST requirements.

You can also call the MPCA at 651-296-6300 or 1-800-657-3864 and ask for the UST Program.