



Department of Commerce

Safety & Buildings Division

201 West Washington Avenue

P.O. Box 2658

Madison, WI 53707

Approval #

990042-U (Replaces 950007-U)

Wisconsin Material Approval

Material

Vaporless Line Leak Detection

Manufacturer

Vaporless Manufacturing, Inc.
8700 E. Long Mesa Drive
Prescott Valley AZ 86314

SCOPE OF EVALUATION

The Vaporless LD-2000 series, LD-2200 series, and LD-3000 series mechanical line leak detectors manufactured by Vaporless Manufacturing, Inc., have been evaluated for use as automatic line leak detectors (hourly monitoring test) as specified in **s. Comm 10.615 (1)** of the Wisconsin Administrative Flammable and Combustible Liquids Code. The Vaporless PLC-5000 Site Controller with the 98 LD-2000 line leak detector was evaluated as a line tightness test in accordance with **s. Comm 10.615 (2)**.

DESCRIPTION AND USE

The Vaporless LD-2000 mechanical line leak detection system uses a preset threshold and a single test to determine whether a pipe is leaking. The system declares a leak if a threshold of 2.5 gph is exceeded. The LD-2000 is designated for use with Red Jacket or F.E. Petro pumps. The LD-2000T is a modification of the LD-2000. Modifications were made to allow the unit to be installed on a Tokheim or F.E. Petro pump.

The LD-2000E leak detector is also a modification of the LD-2000 leak detector. The modifications were introduced to specifically improve the performance of flexible lines. The LD-2000E can be installed on Red Jacket or F.E. Petro pumps. The LD-2000ET is to be installed on Tokheim or F.E. Petro pumps.

The Vaporless LD-3000 was designed for use with larger, rigid pipeline systems and high capacity submerged pumps (Red Jacket or F.E. Petro).

The Vaporless LD-3000S and LD-2000S are identical in performance to the LD-3000 and LD-2000, except that they are equipped with an automatic shutoff feature.

In system operation, when the pump is activated, fuel is metered into the line to raise the pressure. If a leak is present, sufficient pressure cannot be achieved to force the system into its fully open position. Thus, a leak will be indicated by a very slow dispensing rate. The LD-2000S and LD-3000S include a preset switch and a timer. If the line pressure does not rise above 15 psi within a preset time period after activation of the pump, the submerged pump is turned off. When no leak is present, the LD-2000, LD-2000S and LD-2000T open to full flow in less than 5 seconds; the LD-3000 and LD-3000S open to full flow in approximately 9 seconds; and the LD-2000E and LD-2000ET open to full flow in approximately 1 1/2 minutes.

There is no required waiting period between the last delivery of the product to the tank or through the pipeline and the start of the test.

The PLC Site Controller will perform 0.1, 0.2 and 3.0 gallon per hour tests when equipped with the 98 LD-2000 line leak detector. It can also be used with other suitable approved sensors to monitor sumps or double wall tanks. A mechanical leak detector may be included in the PLC Site Controller system. The system prints "pass" or "fail" on the test report. The leak rate in gallons per hour is printed only if the threshold is exceeded. The threshold for declaring a 0.1 gph leak is 0.068 gph. The threshold for declaring a 0.2 gph leak is 0.136 gph. The threshold for declaring a 3.0 gph leak is 2.5 gph.

TESTS AND RESULTS

The performance of the LD-2000, LD-2200 and LD-3000 series leak detectors was evaluated using the EPA protocol for evaluating pipeline leak detection systems. Additional evaluations were made to verify that the modifications incorporated in models ending with "T" or "S" did not affect the performance of the detectors. Additional evaluations were performed to show that the "99" and "2200" designations did not affect the performance of the detectors.

All systems are capable of detecting a leak rate of 3 gph at a pipeline pressure of 10 psi with a probability of detection of 100 percent and a probability of false alarm of 0 percent. The performance of the PLC-5000 system with the 98 LD-2000 line leak detector was evaluated using the EPA protocol for evaluating pipeline leak detection systems - line tightness tests.

LIMITATIONS OF APPROVAL

The Vaporless LD-2000 series, LD-2200 series and the PLC-5000 system are approved for use on both rigid and flexible lines. The maximum capacity of the rigid line shall be no more than 170 gallons. The maximum capacity of the flexible line shall be no more than 40 gallons.

The Vaporless LD-3000 and LD-3000S are approved for use on steel or fiberglass lines with a diameter between 1 and 6 inches with a capacity of up to 316 gallons (700 feet or less of 3-inch diameter line).

The operating instructions and test procedures specified by Vaporless Manufacturing, Inc. shall be used to conduct all tests. The owner is responsible for the maintenance requirements specified by the manufacturer.

The Vaporless systems may be used with gasoline, diesel, aviation fuel and many solvents. They shall not be used to test lines containing waste oil or #4 and heavier fuel oils.

This approval will be valid through December 31, 2004, unless manufacturing modifications are made to the product or a re-examination is deemed necessary by the department. The Wisconsin Material Approval Number must be provided when plans that include this product are submitted for review.

DISCLAIMER

The Department is in no way endorsing or advertising this product. This approval addresses only the specified applications for the product and does not waive any code requirement unless specified herein.

Reviewed by: _____

Approval Date: _____ By: _____

Duane Hubeler, P.E.
Code Consultant
Program Development Bureau

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