STATE OF WISCONSIN
Department of Agriculture,
Trade and Consumer Protection

Approval # 20150013
(Replaces #20100002)

Bureau of Weights and Measures
Storage Tank Regulation
P.O. Box 7837
Madison, WI 53707-7837

Wisconsin ATCP 93 Material Approval

Equipment: EZY 3 Locator Plus Nonvolumetric Tank Tightness Test

Facility Owner: Estabrook's Inc.
1505 Woodside Ave.
Essexville, MI 48732

Expiration of Approval: December 31, 2018

SCOPE OF EVALUATION

The EZY 3 Locator Plus Nonvolumetric Tank Tightness Test, manufactured by Estabrook's Inc., has been evaluated in accordance with **s. ATCP 93.130(1)(a)** of the current edition of the Wisconsin Administrative Flammable and Combustible Liquids Code.

This evaluation summary is condensed to provide the specific installation, application and operation parameters necessary to maintain the subject systems in compliance with the Wisconsin Administrative Code – ATCP 93.

DESCRIPTION AND USE

The EZY 3 Locator Plus Nonvolumetric Tank Tightness Test is a non-volumetric test method, and is not affected by temperature changes, tank dimensional changes, end deflection, or trapped vapor pockets.

The EZY 3 Locator Plus test method uses a microphone placed in the ullage of the underground tank. Acoustic signals produced by leaks into the ullage or by bubbles produced by leaks below the product level, are detected by the microphone. These signals are then recorded, and analyzed further by a trained operator.

The test begins by placing the sealed microphone assembly into the ullage of the tank, and then recording a baseline signal at atmospheric pressure. The baseline signal recording consists of the background acoustical noise present from the tanks surroundings. Since air will not leak into the tank under atmospheric conditions, this signal will not include any leak. After the background signal is recorded, the tank pressure is reduced through the use of a vacuum pump by approximately 1.0 psid, and the acoustic signal of the tank again recorded. Under these conditions, if a leak is present the difference in the acoustic signal will be detected by the operator.

Tank products that can be tested using this method include diesel, gasoline, aviation fuel, #4 & #6 fuel oil, solvents, waste oil; virtually any liquid approved by the manufacturer.

TESTS AND RESULTS

The performance of the EZY 3 Locator Plus test as an annual tank tightness testing method was verified by Ken Wilcox Associates in accordance with the EPA Protocol for nonvolumetric tank tightness testing systems. The EZY 3 Locator Plus system was found to detect a leak of 0.1 gph with 100 percent probability of detection and 1.6 percent probability of false alarm. The calculated confidence interval was within established parameters; this illustrates that the data set was large enough to provide a realistic assessment of the expected detection and false alarm capabilities.

LIMITATIONS / CONDITIONS OF APPROVAL

- **Prior to beginning any testing, groundwater level must be determined by measurement through the use of an observation well or soil probe in the tank excavation backfill.**

    - If the groundwater level is below the tank bottom, then the Estabrook EZY 3 Locator Plus method can be used alone.

    - If the groundwater level is above the tank bottom, then a water conductivity sensor must be used in conjunction with the Estabrook EZY 3 Locator Plus method. The Estabrook EZY 3 Locator Plus method will detect leaks in the ullage and product space above the groundwater level; but not in the portion of the product space below the groundwater level. Water conductivity testing must also be performed.

- Tank product level will be gauged before and after the test. An increase in level is a **failure**. *Additionally a failure to maintain adequate test pressure in the tank during the test is a failure.*

- Testing must be conducted under reasonably quiet conditions. Heavy traffic, nearby trains, industrial centers, or construction activities could produce sound levels that could compromise the test. Testing periods should be selected in order to minimize these effects.

- The primary tank of double-wall tanks shall be tested with a vented, non-liquid filled interstice.

- All operators of the Estabrook EZY 3 Locator Plus method shall pass certification testing through Estabrook, and be re-certified every two years to maintain their certification.

- As part of the certification/re-certification process, all operators of the Estabrook EZY 3 Locator Plus method shall pass a hearing test aided or un-aided with a pass/fail minimum threshold of 40 dBHL at frequencies of 500, 1K, 2K, 3K, 4K, 6K, and 8K Hz. (dBHL= decibel hearing threshold level)

- Equipment shall be calibrated on an annual basis by Estabrook's Inc., and documented by serial number. The Certificate of Calibration shall be provided with the submittal of any test forms to the department.

When Groundwater Level in Tank Excavation Backfill is Below Bottom of Tank:

- The EZY 3 Locator Plus test is approved for use as a method of tank tightness testing specified in **s. ATCP 93.515(4)**.

- Critical performance parameters for the EZY 3 Locator Plus Method:

Parameter	Value
Tank size for a single tank or Each tank in a manifolded system [1]	Up to 30,000 gallons
Average waiting time after filling tank	No waiting time required
Average Data Collection Time per Test	2 minutes after vacuum achieved
Minimum Test Pressure Differential [2]	0.5 psi

1: As long as each manifolded tank contains a microphone, water sensor, and pressure monitoring gauge.

2: The test pressure in psig (vacuum) is equal to the hydrostatic pressure of the product in the tank, plus the required minimum test pressure differential (0.5 psi), minus the hydrostatic pressure from the groundwater and pressure from the backfill on the tank.

Size of Tank	Acceptable Product Levels	Type of leak that may be tested for
50 to 12,000 gallons	Empty to 99%. Ullage volume must not be less than 50 gallons [3]	Product and Ullage leaks
12,000 to 30,000 gallons	Ullage volume must not exceed 12,000 gallons or be less than 50 gallons [3]	Ullage leaks
50 to 30,000 gallons	Empty to 99%.	Product leaks

3: Minimum ullage size is the greater of either 50 gallons or 1% of the total tank volume.

When Groundwater Level in Tank Excavation Backfill is Above Bottom of Tank:

- When testing for ullage and product leaks above the groundwater level, the EZY 3 Locator Plus test is approved for use as a method of tank tightness testing specified in **s. ATCP 93.515(4)**. **The Limitations/Conditions of Approval as stated above still apply.** However, in testing for product leaks below the groundwater level, water conductivity testing must also be performed and the following additional Limitations/Conditions of Approval apply:

  - For tanks containing up to 10% ethanol follow a) or b):
    a) Water sensor shall be installed and calibrated per Estabrook procedures using recommended biocide solution. Test time shall be increased to a minimum of two hours after water calibration, unless failed sooner, or;

    b) Tank shall be emptied of product prior to testing. Water sensor shall be installed and calibrated per Estabrook procedures using recommended biocide solution.

    - Following the completion of the acoustic portion of the test, an additional water sensor calibration check shall be performed to ensure the water sensor stayed in calibration throughout the test period. The amount of biocide used shall be equivalent to the average calibration amount determined previously.

  - For tanks containing between 11 to 100% ethanol:
    - Tank shall be emptied of product prior to testing. Water sensor shall be installed and calibrated per Estabrook procedures using recommended biocide solution.

    - Following the completion of the acoustic portion of the test, an additional water sensor calibration check shall be performed to ensure the water sensor stayed in calibration throughout the test period. The amount of biocide used shall be equivalent to the average calibration amount determined previously.

- Critical performance parameters for the water conductivity test method:

Parameter	Value
Minimum Detectable Water Level [1]	0.014 in.
Minimal Detectable Change in Water Level	0.0095 in.
Minimum Data Collection Time per Test [2]	Varies based on tank size and configuration

1: Minimum water level in tank must be adjusted to at least 0.014 in. before calibrating sensor and starting test.
2: In order to calculate the minimum data collection time for tanks without ethanol, assume 0.10 gph leak, and calculate time required to detect the minimal detectable change in water level (0.0095 in.) based on tank size/configuration. For tanks containing ethanol, test time shall be increased to a minimum of two hours after water calibration, unless failed sooner.

This approval will be valid through December 31, 2018, 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 in this document.

Effective Date: August 14, 2015

Reviewed by: Signature on file Date: _____
Elise Uphoff
Environmental Engineering Specialist

Approved by: Signature on file Date: _____
Greg Bareta, P. E.
Section Chief
Storage Tank Regulation
Bureau of Weights and Measures