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Environmental & Regulatory Services Division
Bureau of Petroleum Products and Tanks
201 West Washington Avenue
P.O. Box 7837
Madison, WI 53707-7837

Wisconsin COMM 10 Material Approval

Equipment: AutoStik II (ASII/4 or ASII/8 Designation), AutoStik Junior (ASJ Designation), and BulkStik Static and Continuous Automatic Tank Gauging Systems[1]

Manufacturer: Franklin Fueling Systems
92 Industrial Park Rd.
Saco, ME 04072

Expiration of Approval: December 31, 2009

SCOPE OF EVALUATION

The EBW AutoStik II and AutoStik Jr. Automatic Tank Gauging (ATG) Systems manufactured by Franklin Fueling Systems Inc., were evaluated as a means of monthly monitoring in accordance with **s. Comm 10.61 (4),** and as a means of tank tightness testing in accordance with **s. Comm 10.61 (3)** of the Wisconsin Flammable and Combustible Liquids Code.

[1] Note: As of March 1, 2004 the AutoStik II and the AutoStik Jr. product lines have been integrated into the INCON product line and are now produced by Franklin Fueling Systems. The console box will have Franklin Fueling Systems embossed on the cover. For systems installed prior to March 1, 2004 under the EBW brand name, reference Material Approval 20020004.

The EBW Statistical Automatic Continuous Leak Detection (SCALD) system was evaluated as a means of continuous statistical leak detection for underground tanks in accordance with **s. Comm 10.61 (4).**

EBW sensor models TSP-EIS, TSP-ULS, TSP-DIS, TSP-DDS, TSP-DTS, and TSP-HIS, were evaluated as a means of interstitial and containment sump monitoring in accordance with **s. Comm 10.61 (7).**.

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 – Comm 10.

DESCRIPTION AND USE

The various AutoStik II and AutoStik Jr. ATG systems with or without SCALD may be used on tanks that contain gasoline, diesel, aviation fuel, #4 fuel oil, and some solvents.

BulkStik Inventory Control System[2]

The EBW BulkStik Inventory Control system consist of a console and probe combination that measure inventory levels in underground and aboveground tanks. The system consists of the BulkStik console; the TSP-LL2-NNNI (NNN = shaft length) or TSP-LL2 magnetostrictive probe; and the appropriate float for the product type.

AutoStik II and AutoStik Jr. ATG's

The EBW AutoStik II and AutoStik Jr. Automatic Tank Gauging (ATG) Systems, consist of a console and probe combination that can be used as either a monthly monitoring or tightness testing leak detection system in underground tanks. The standard ATG probe is a magnetostrictive probe that senses the liquid level. Each probe has temperature sensors that are used to correct the level for temperature effects. A water sensor is used to detect water ingress.

The **AutoStik II and AutoStik Jr.** with the **magnetostrictive probe** can perform both tightness testing (0.1 gph) and automatic tank gauging (0.2 gph) on tanks with a capacity up to 15,000-gallons.

The **AutoStik II and AutoStik Jr.** with the **TSP-LL2 series probe** can perform only automatic tank gauging, **not tightness testing**, on tanks with a capacity up to 30,000-gallons.

[2] The BulkStik Inventory Control Systems are approved for use as part of a valid leak detection methodology for UST systems that use either Manual Tank Gauging, Inventory Control, or Statistical Inventory Control (SIR) only. The BulkStik system is not capable of performing any monthly monitoring or tank tightness testing.

Due to the variation in liquid levels caused by dynamic environmental conditions that AST's experience, the BulkStik system is not approved for use as a leak detection methodology for AST's. At the present time, there is no requirement for leak detection systems on AST's, other than interstitial monitoring on double wall tanks.

Note: For all models, monthly and annual testing can only be performed on one tank at a time. If several tanks are manifolded together, an isolation valve has to be installed so as to separate the tanks individually during testing.

AutoStik II and AutoStik Jr. ATG's w/SCALD

The EBW AutoStik II and AutoStik Jr. Automatic Tank Gauging (ATG) Systems with Statistical Continuous Automatic Leak Detection (SCALD), consist of a console and probe combination (TSP-LL2 series) that can be used as a monthly monitoring leak detection system in underground tanks. With the SCALD system, up to 2 tanks can be manifolded together.

When used for continuous statistical leak detection (monthly monitoring), the system determines when the tank is stable enough to begin data collection. At the beginning of each month, the SCALD system activates its "quiet time" search. This is performed continuously until enough valid data is acquired to calculate a leak rate on the data collected. If it passes the 0.2 gph test, the test is recorded, and the test cycle is started over. At the end of the 30-day period the last good test result is recorded in the permanent tank testing record. If the leak rate does not pass, or if the data was insufficient for performing the calculation, the operator must before the end of the month manually run the static leak detection test. A report can be generated either automatically or manually every 30 days showing the final results.

Liquid Sensors

The EBW AutoStik II, AutoStik Jr., and BulkStik systems have the ability to work with all of the sensors that are described in this section unless otherwise indicated.

The model **TSP-EIS** electro-optic point liquid sensor is used for monitoring the dry interstitial space of double wall fiberglass and steel tanks. It is also suitable for use in containment sump spaces. When the sensor comes in contact with a liquid, it sends a signal to the console that will warn of the presence of a liquid. In fiberglass tank interstitial spaces, the sensor is fished around the outside of the inner wall of the tank and located on the bottom. In steel double wall tanks, the sensor is lowered down to the bottom of the 2" riser pipe that provides access to the interstitial space. If the sensor is used in containment sumps, it is placed on the bottom of the sump.

The model **TSP-ULS** is a universal liquid sump sensor used in monitoring containment sumps to detect for the presence of a liquid. It is also used as an interstitial sensor on steel double wall tanks. When the sensor comes in contact with a liquid, it sends a signal to the console that warns it of the presence of a liquid. It is based on a float switch technology. In containment sumps, the sensor is placed on the bottom of the sump. In steel double wall tanks, the sensor is lowered down to the bottom of the 2" riser pipe that provides access to the interstitial space.

The model **TSP-DIS** is a discriminating liquid sensor, which may be used to monitor the interstitial space of double wall tanks, sumps or other locations where the presence of liquid indicates a leak. The sensor discriminates between petroleum and water, issuing different alarms for each. In fiberglass tank interstitial spaces, the sensor is fished around the outside of the inner wall of the tank and located on the bottom. In steel double wall tanks, the sensor is lowered down to the bottom of the 2" riser pipe that provides access to the interstitial space. If the sensor is used in containment sumps, it is placed on the bottom of the sump.

The model **TSP-DDS** is a discriminating liquid sensor that provides reliable monitoring of dispenser pans and containment sumps. The TSP-DDS combines magnetic float switch sensors with an innovative polymer strip that reacts to hydrocarbons. The sensor discriminates between water and hydrocarbons, issuing different alarms for each. Three different alarms are generated by.the sensor; water in the sump, product detected, and sump full. The sensor is installed in dispenser and containment sumps using a uni-strut bracket assembly that mounts to the sump piping. The sensor is mounted vertically in the sump with the bottom of the sensor touching the bottom of the sump.

The model **TSP-DTS** is a discriminating liquid sensor that provides reliable monitoring of turbine and containment sumps. The TSP-DTS combines magnetic float switch sensors with an innovative polymer strip that reacts to hydrocarbons. The sensor discriminates between water and hydrocarbons, issuing different alarms for each. The sensor generates three different alarms; water in the sump, product detected, and sump full. The sensor is installed in turbine and containment sumps using a uni-strut bracket assembly that mounts to the sump piping. The sensor is mounted vertically in the sump with the bottom of the sensor touching the bottom of the sump.

The model **TSP-HIS** is a hydrostatic interstitial sensor used to monitor the brine level in double wall fiberglass tanks. The sensor contains two floats; one for a low brine condition and one for a high brine condition. The console will generate a low brine alarm in the event the brine level drops below the bottom float and a high brine alarm if the brine level goes above the top float. The sensor is mounted vertically in the reservoir area and rests on the bottom of the reservoir.

TESTS AND RESULTS

Testing of the AutoStik II and AutoStik Jr. Automatic Tank Gauging (ATG) systems for monthly monitoring was conducted in accordance with the EPA Automatic Tank Gauging Systems protocol. When using leak declaration thresholds of 0.05 gph and 0.10 gph, the probabilities of detection of a leak of 0.10 and 0.20 gph, respectively, were certified to within the 95-5 ranges required by the EPA protocols.

Testing of the AutoStik II and AutoStik Jr. Automatic Tank Gauging (ATG) systems with Statistical Continuous Automatic Leak Detection (SCALD) was conducted in accordance with a modified version of the EPA Automatic Tank Gauging Systems protocol. When using a leak declaration threshold of 0.1 gph, the probabilities of detection and false alarm were certified to within the 95-5 ranges required by the EPA protocols.

Liquid Sensors

Testing of the liquid and brine sensors were conducted in accordance with a modified version of the EPA Standard "Liquid-Phase Product Detectors" protocol.

MONITORING SYSTEM OUTPUT

Detailed here are examples of the typical Tank Report, Regulatory Report, SCALD Report, and Sensor Status Report.

AUTO/STIK
EBW
4805 VOGES RD
MCFARLAND, WI 53558
1-800-225-9787

10/18/1997 02:42

LEAK TEST REPORT

PLUS 2 5014.3 GAL
PLUS

LEAK TEST	0.100 G/H
LEAK THRESHOLD	0.050 G/H
CONFIDENCE LEVEL	99.0%
TEST STARTED	21:19
TEST STARTED	10/17/1997
GROSS CAPACITY	56.12%
BEGIN GROSS	2814.2 GAL
BEGIN NET	2808.0 GAL
BEGIN LEVEL	52.630 IN
BEGIN TEMP	62.720 F
BEGIN WATER	0.4 GAL
BEGIN WATER	0.130 IN
END TIME	2:39
END DATE	10/18/1997
END GROSS	2814.3 GAL
END NET	2808.6 GAL
END LEVEL	52.632 IN
END TEMP	62.878 F
END WATER	0.4 GAL
END WATER	0.131 IN

HOURLY DATA

TIME	DEG F	GAL
22:44	62.721	2809.23
23:44	62.751	2808.78
0:44	62.885	2809.07
1:44	62.883	2809.09

SLOPE	0.01 GAL/HR
SLOPE LOW	-0.04 GAL/HR
SLOPE HIGH	-0.04 GAL/HR
TEST RESULTS	PASSED

SLOPE EQUALS CALCULATED
LEAK RATE

Standard (Static) Tank Leak Test REPORT

The data shown on the standard leak test report is:

1) Date and time that the report was produced (this can be different from the test End Time and Date.
2) Tank name, number, and volume capacity (GAL). Then the Leak Test Precision & Threshold is shown (0.1 gph Annual Precision test — the default is the 0.2 gph monthly compliance test).
3) Test Confidence Level (here @ 99%... there is still a 1 % chance that the results are not accurate).
4) The test-START Time and Date
5) The Gross Capacity / percent full value in the tank
6) BEGIN values @ start of test (ie. GROSS and NET)
7) The test-END (finish) Time and Date, and
8) The values @ END of the test (ie. TEMP and WATER)
9) Hourly data (time, temperature, & net volume)
10) Slope is the (+/–) rate of change in product volume. It is the calculated leak rate and is used to determine the Test Result. Slope is affected by leaks, and by many other sources of interference.
11) Slope Low and High is the amount of disturbance to the leak test from temperature changes. Values close to each other indicate that thermal expansion or contraction was not a cause of interference. Values that are far apart will cause an increase or indeterminate test result.
12) Test Results are either: Increase Passed Failed or Indeterminate (if tests run 8 hours without a definite result).

Static Leak Report Example

AUTO/STIK
EBW
4805 VOGES RD
MCFARLAND, WI 53558
1-800-225-9787

08/27/1998 2:22 PM

REGULATORY REPORT

HARDWARE STATUS

TS-CIM	NOT INSTALLED
TS-ROM	NOT INSTALLED
TS SEM 1	NOT INSTALLED
TS-SEM 2	NOT INSTALLED
IO MOD 1	NOT INSTALLED
IO MOD 2	NOT INSTALLED
PRINTER	OPERATIONAL
FAX/MOD	OPERATIONAL

PROBES

PROBE 1	OPERATIONAL
PROBE 2	OPERATIONAL

SENSORS

SENSOR 1	OPERATIONAL
SENSOR 2	OPERATIONAL
SENSOR 3	OPERATIONAL
SENSOR 4	OPERATIONAL
SENSOR 5	OPERATIONAL

LINES

LINE NO. 1	OPERATIONAL
LINE NO. 2	OPERATIONAL

AUXILIARY INPUTS

AUX IN 1	OPERATIONAL
AUX IN 2	OPERATIONAL

PASSED LEAK TESTS

TANK 1

08/26/1998	7:42 PM
LEAK TEST	0.20
SLOPE	-0.03

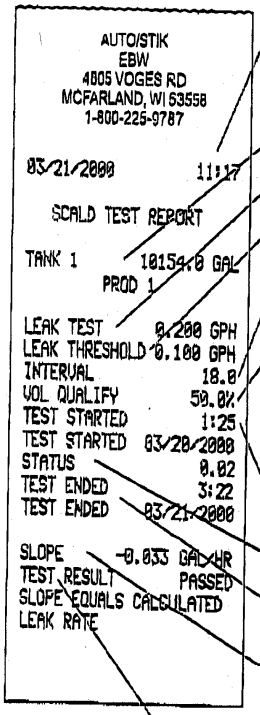
TANK 2

08/26/1998	7:42 PM
LEAK TEST	0.20
SLOPE	-0.04

Regulatory Report Example

SCALD Leak Test REPORT

SCALD is an acronym for Statistical Continuous Automatic Leak Detection. This test is typically used at sites that dispense 24 hours a day, where leak testing can only be done between dispenses. It runs a 0.2 gph Monthly Regulatory Compliance Test. The information that is shown on the SCALD leak test report is:

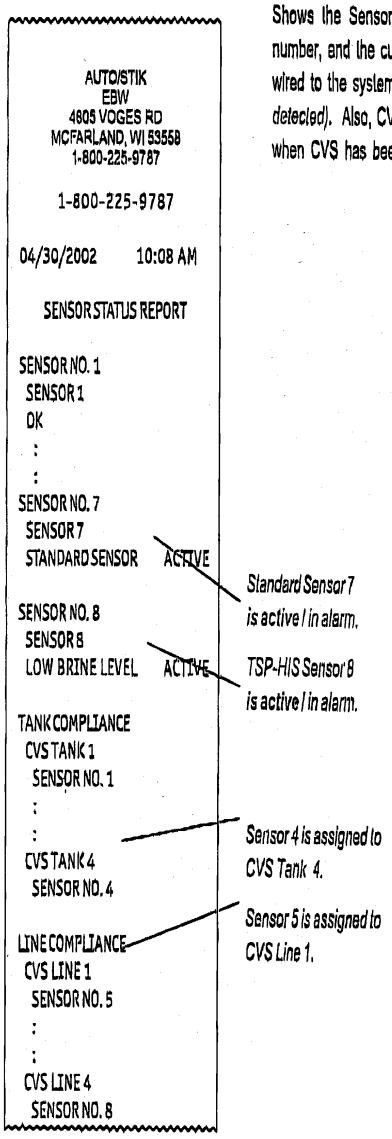


1) Date and time is the time-stamp when the report was produced (may not necessarily agree with the test finished time and date unless the report was printed exactly when the test finished)
2) Tank name, Volume capacity (GAL) and Product name
3) Leak Test is the type of SCALD leak test (defult)
4) Leak Threashold is calculated by dividing the Leak test setting by 2.
5) Interval is a diagnostic value used by technicians
6) Volume Qualify is the minimum percent required in the tank for SCALD tank leak tests (regulations in some areas may require a minimum 50 % full tank, or some other percent full)
7) Test Started is the time and date when the SCALD leak test started
8) Status is a diagnostic value used by technicians
9) Test Ended is the time and date when the SCALD tank leak test finished
10) Slope is the (+/–) rate of change in product volume. It is the calculated leak rate and is used to determine the Test Result. Slope is affected by leaks, and by many other sources of interference.
11) Test Results are either: Increase, Passed, Failed, or Indeterminate

SCALD Leak Report Example: Current status of 24-hour leak detection (SCALD).

Sensor Status REPORT

Shows the Sensor name, the sensor input-channel number, and the current status of each sensor that is wired to the system *(OK or ACTIVE in alarm / leak detected)*. Also, CVS data will be shown on the report when CVS has been programmed (enabled).



Standard Sensor 7 is active / in alarm.

TSP-HIS Sensor 8 is active / in alarm.

Sensor 4 is assigned to CVS Tank 4.

Sensor 5 is assigned to CVS Line 1.

Sensor Status Report Example: CVS is part of an interstitial monitoring system.

LIMITATIONS / CONDITIONS OF APPROVAL

General

- All monitoring equipment shall be installed, calibrated, operated, and maintained in accordance with the manufacturer instructions, and certified every 12 months for operability, proper operating condition, and proper calibration. Records of sampling, testing, or monitoring shall be maintained in accordance with Comm 10.625

- The manufacturer shall submit for a revision to this Wisconsin Material Approval application if any of the functional performance capabilities of this equipment are revised. This would include, but not be limited to changes in software, hardware, or methodology.

- While 3rd party testing does determine a required minimum tank level, EPA leak detection regulations require testing of the portion of the tank system which routinely contains product. Consistent testing at low levels could allow a leak to remain undetected.

  During leak testing, a minimum level of product in tank shall be maintained so as to ensure testing of the portion of the tank and/or piping that routinely contains product, regardless of testing system capability. For instance, if product levels are routinely maintained at 60%, but the leak detection system is capable of testing at 15% product level, then testing shall be performed at 60% levels.

- If performing a tank tightness test, minimum tank level shall be 95%, regardless of leak detection system capability, in accordance with **Comm 10.61 (3)**.

AutoStik II and AutoStik Jr. ATG (static 0.2 gph monthly monitoring and 0.1 gph tightness testing)

- Critical performance parameters for the AutoStik II and AutoStik Jr. ATG's with the **magnetostrictive probes**:

Parameter	Value
Maximum Tank Size[1]	**Up to 15,000 gallons**
Software Version	**N/A**
Minimum Tank Level	Minimum product level is based on tank diameter as follows: **24" dia/min 9";** **36" dia/min 10.5";** **48" dia/min 12";** **52" dia/min 12.5";** **64" dia/min 14";** **72" dia/min 15";** **76" dia/min 15.5";** **84" dia/min 16.5";** **96" dia/min 17.5";** **108" dia/min 19";** **120" dia/min 21";** **126" dia/min 21.5";** **132" dia/min 22";** **144" dia/min 23.5";**
Waiting time between filling tank and test start[2]	**6 hours min.** (monthly-0.2 gph) **5 hrs. 18 min.** (annual-0.1 gph)
Waiting time between dispensing and test start	**None**
Test Period[3]	**Variable based on quality of test data. Average times[4]:** **5 hrs. 10 min.** (monthly-0.2 gph) **5 hrs. 44 min.** (annual-0.1 gph)

1: Monthly and annual testing can only be performed on one tank at a time. If several tanks are manifolded together, an isolation valve will have to be installed so as to separate the tanks individually.
2: There must be no delivery during waiting time.
3: There must be no delivery or dispensing during testing.
4: System automatically determines minimum time based on test conditions being met. Test times will generally be longer for larger tanks.

AutoStik II and AutoStik Jr. ATG (static 0.2 gph monthly monitoring only)

- Critical performance parameters for the AutoStik II and AutoStik Jr. ATG's with the **TSP-LL2 series probes**:

Parameter	Value
Maximum Tank Size[1]	**Up to 30,000 gallons**
Software Version	**N/A**
Minimum Tank Level	Minimum product level is based on tank diameter as follows: **24" dia/min 9";** **36" dia/min 10.5";** **48" dia/min 12";** **52" dia/min 12.5";** **64" dia/min 14";** **72" dia/min 15";** **76" dia/min 15.5";** **84" dia/min 16.5";** **96" dia/min 17.5";** **108" dia/min 19";** **120" dia/min 21";** **126" dia/min 21.5";** **132" dia/min 22";** **144" dia/min 23.5";**
Waiting time between filling tank and test start[2]	**4 hours minimum[3]**
Waiting time between dispensing and test start	**2 hours minimum**
Test Period[4]	**Variable based on quality of test data. Average time[5]:** **6 hrs. 51 min.**

1: Monthly and annual testing can only be performed on one tank at a time. If several tanks are manifolded together, an isolation valve will have to be installed so as to separate the tanks individually.
2: There must be no delivery during waiting time.
3: This probe can only perform a 0.2 gph monthly test.
4: There must be no delivery or dispensing during testing.
5: System automatically determines minimum time based on test conditions being met. Test times will generally be longer for larger tanks.

AutoStik II and AutoStik Jr. ATG's w/SCALD 2.0 (24-hour, 0.2 gph monthly monitoring)

Note: If the tank fails the 0.20 gph CSLD test for the monthly period or if the data was insufficient for performing the calculation, the operator must, before the end of the 30th day, manually run the monthly static test above.

If the data was insufficient (inconclusive) for performing the calculation for 2 consecutive months, the operator shall, before the end of the second month, perform a tightness test in accordance with Comm 10.61(3).

- Critical performance parameters for the using the AutoStik II and AutoStik Jr. ATG's w/SCALD 2.0 and TSP-LL2 series probes are:

Parameter	Value
Maximum Tank Size[1]	**Up to 49,336 gallons**
Maximum Number of Manifolded Tanks[2]	**2**
Software Version	**2.0**
Minimum Tank Level[3]	**14%**
Maximum Monthly Throughput	**257,818 gallons**

1: For single or aggregate capacity of manifolded tanks.
2: Limited to two tanks manifolded together unless specifically approved by Franklin Fueling Systems.
3: The SCALD system will automatically check the tank level, and not perform a test if the tank level is below the minimum.

Liquid Level Sensors

The Liquid Sensors shall be placed such that a release from any portion of the tank or piping will be detected.

Part Number	Description	Application
TSP-EIS	Electro-optic Liquid Sensor	Fiberglass or Steel Tank Dry Interstitial and Containment Sumps
TSP-HIS	Dual Float Liquid Level	Brine Filled Interstitial of Double Wall Fiberglass Tank and Sump
TSP-ULS	Float liquid Sensor	Steel Tank Interstitial and Containment Sumps
TSP-DIS	Discriminating Liquid Sensor	Fiberglass or Steel Tank Dry Interstitial and Containment Sumps
TSP-DTS **TSP-DDS**	Float Technology Liquid Sensor w/Hydrocarbon Sensing Strip	Containment Sumps

This approval will be valid through December 31, 2009, 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: March 1, 2004

Reviewed by: _____

Greg Bareta, P. E.
Engineering Consultant
Bureau of Petroleum Products and Tanks

Approved by: _____ Date: _____