



Approval # 20030001  
(Replaces 20000015)

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: Automatic Tank Gauges,  
Tank Tightness Testing and  
Liquid and Vapor Product Detectors

Manufacturer: OPW Fuel Management Systems  
6900 Santa Fe Drive  
Hodgkins, IL 60525-9909

Expiration of Approval: December 31, 2006

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### SCOPE OF MATERIAL EVALUATION

The Petrosonic III and Site Sentinel I, II and III automatic tank gauges (ATGs); Petro Sentry TLD III and Site Sentinel vapor detectors; Site Sentinel liquid detector for ground water monitoring; and Petro Sentry IV, Petro Sentry VII, and Site Sentry interstitial liquid detectors/sensors, as manufactured by OPW Fuel Management Systems have been evaluated for conformance with the current edition of the Wisconsin Flammable and Combustible Liquids Code. The test procedures addressed only each method's ability of detecting leaks, and not safety hazards.

This approval has been based upon Commerce evaluation of information submitted by the manufacture and third party evaluation and is considered confidential. Specific information relating to qualifying the information submitted should be made to the manufacture or submitter.

This evaluation summary is condensed to provide the specific installation and operation parameters necessary to maintain the subject systems in compliance with the Wisconsin

Administrative Code – Comm 10.

**DESCRIPTION AND USE**

**Automatic Tank Gauge Systems:**

- ◆ Petrosonic III ATG w/ Model 613 Probes
- ◆ Site Sentinel I, II & III ATG w/ Model 613 / 924 Probes

The Petrosonic III and Site Sentinel ATGs are approved as complying with **section COMM 10.615 (4)(a)** under the following criteria:

The **Petrosonic III And Site Sentinel ATGs with the Model 613 probe** may be used for tanks containing gasoline, diesel fuel, aviation fuel, solvents, and other products that will not physically damage the probe and are covered by API Standard 2540 volume correction tables.

<b>0.2 g/hr leak rate</b>	
Wait time after fill	12 hours
Minimum product level for Petrosonic III for 2 hour minimum test period.	59% of capacity or greater
Minimum product level for Site Sentinel with Model 613 probe for 2 hour minimum test period..	14% of capacity or greater
Maximum tank size	15,000 gallons

The **Site Sentinel I, II & III ATG with Model 924 probes** may be used for tanks containing gasoline, diesel fuel, aviation fuel, solvents, and other products that will not physically damage the probe and are covered by API Standard 2540 volume correction tables.

<b>0.2 g/hr leak rate</b>	
Wait time after fill	8 hours
Minimum product level for 30 minute and 1 hour test	50% or greater
Minimum product level for 2 and 3 hour test	14% of capacity or greater
Maximum tank size	20,000 gallons

The **Site Sentinel I, II & III VTTT w/ Model 613 / 924 Probes** for volumetric testing.

<b>0.1 g/hr leak rate</b>	
Wait time after fill	12 hours
Minimum product level for 2 and 3 hour test	Greater than 90% capacity
Maximum tank size w/ Model 613 probe	15,000 gallons
Maximum tank size w/ Model 924 probe	20,000 gallons

There are no acceptable deviations in the standard test protocol.

The ATGs do not determine the level of groundwater above the bottom of the tank. The systems test for water incursion. Tank deformation effects are addressed by beginning the test only after the waiting period has passed and the tank is stabilized. Level changes are converted to volume changes using the theoretical ratio calculated from tank geometry or interpolation from the tank manufacturer's chart. The minimum water level (threshold) in the tank that the system can detect was found to be 0.37 inches. The minimum change in water level that can be tested by the system was found to be 0.0062 inches provided the water level is above the threshold.

**Leak Detection Sensors:**

Part No.	HC Polymer	Float Switch	Vapor Sensor	Optical Sensor	Water Sensor	Description
30-3206	X				X	short polymer cable with water sensor
30-3221-2-		Dual				brine tank monitor
30-3219-12	X					polymer strip in 12" plastic housing
30-3221-1A		Single				float switch in 3" plastic housing
30-3221-1		Single				float switch in large plastic housing
30-3222			X			Vapor sensor
30-3223				X		Optical sensor
30-3207-nn*	X					polymer cable for interstice w/o water sensor
30-3210-nn*	X				X	polymer cable for interstice with water sensor
30-3221-2		Dual				bottom float reversed for alarm
30-3221-1B		Single				float switch w/brass housing
30-3224	X	Single				combination of 30-3221-1A and 30-3219-12
30-3225	X	Dual				combination of 30-3221-2 and 30-3219-12

\*nn = length in feet

**Optical Sensor** - The optical sensor detects changes in the index of refraction when the sensor passes from air to liquid.

Alarm occurs when the threshold liquid level is reached.

**Single Float Switches** - Single float switches come in a variety of configurations. These may be used for-sump monitoring and interstitial monitoring for steel tank.

**Dual Float Switches** - Dual float switches can be configured to alarm in several ways. The switch may be either on or off when wet or dry by turning the float over. For reservoir applications they may alarm when the level is either too high or too low. They may also be programmed to give a warning at low level followed by an alarm at high level.

**Hydrocarbon Sensitive Polymer Cables** - These cables are constructed of a polymeric material that changes resistance (that affects the voltage at the controller) when exposed to hydrocarbons. When the voltage reaches the threshold (which can be programmed at the controller) an alarm occurs. These cables can be housed in either a flexible sheath of any length or in a rigid plastic housing. These systems were found to be capable of detecting a layer of product of less than 1/8 inch in thickness floating on water. These cables do not alarm in water.

**Vapor Sensors**- The vapor sensor uses a metal oxide semiconductor, which changes resistance when exposed to hydrocarbon vapors. The voltage change produced by the resistance change will result in an alarm when the threshold voltage is reached. The reuse of sensors exposed to diesel fuel requires threshold voltage adjustment after each time they alarm.

**Water Sensors** - The water sensors are based on conductivity. Any conductive liquid such as brine or water will produce a voltage change that will result in an alarm. These sensors are unaffected by nonconductive materials such as gasoline or diesel fuel. These sensors can be incorporated into the flexible sheath of the polymer cable or mounted in rigid plastic housings. The alarm turns off if the sensor is removed from water.

OPW Leak Detection Sensors can be installed in a variety of applications including sump and pan monitoring, and interstitial monitoring of double wall tanks.

OPW Fuel Management Systems manufactures the Site Sentinel Automated monitoring system. Up to sixteen sensors (external or tank gauges) associated with the Site Sentinel I and one-hundred twenty eight associated with the Site Sentinel II & III, that are designed to monitor the presence of water or fuel in dispenser, pump or pipe sumps, and the interstitial space of double wall tanks can be interfaced with the unit.

### **Petroentry TLD III and Site Sentinel Vapor Detectors**

The Petroentry TLD III and Site Sentinel vapor detectors both provide quantitative output and continuous sampling frequency. The Petroentry TLD III and Site Sentinel consoles when used with the Model 30-3201 vapor sensor are approved for use as vapor phase out-of-tank product detectors to be installed in vapor monitoring systems that comply with **s. COMM 10.61 (5)**, or to be installed as interstitial monitors in systems that comply with **s. COMM 10.61 (7)**, and to detect products specified in the Description and Use section.

An assessment shall be made of the installation site to determine the extent of existing soil contamination. The detectors shall be used only if the level of background contamination will not interfere with detection of a release and the probe will be able to detect an increase in contamination of product above background. The vapor monitoring system in which the vapor detectors are used shall be designed and installed in accordance with **s. COMM 10.61 (5)**. Approval of the design and well placement must be obtained for each site in accordance with **s. COMM 10.10**.

The Petroentry TLD III detectors are UL – Listed for use in Class I, Group C and D hazardous locations when installed in accordance with manufacturer's instructions and the Wisconsin Electrical Code.

### **Site Sentinel Liquid Detector for Interstitial and Groundwater Monitoring**

The Site Sentinel liquid sensors are product permeable and provide continuous monitoring. Sensor 30-3206 is designed for interstitial monitoring; sensors 30-3207 and 30-3210 are designed for groundwater monitoring.

The detectors were evaluated for their ability to detect a layer of liquid floating on water. Accuracy, response times, lower detection limits, and specificity were determined.

### **Petroentry IV, Petroentry VIII, and Site Sentinel Interstitial Liquid Detectors**

The Liquid Sensor 30-3200 is a point sensor that detects liquids using thermal conductivity; the sensor has a qualitative output and continuous sampling frequency. The Liquid Sensor has a product activation height of less than 2 cm for the products tested: gasoline, synthetic fuel, diesel fuel, #2 fuel oil, and water.

The Universal Sump sensor 30-3204 is a float switch, providing qualitative output and continuous sampling. The Universal Sump sensor has a product activation height of less than

3.5 cm. for the products tested: gasoline, synthetic fuel, diesel fuel, #2 fuel oil and water. The Universal Reservoir Probe 30-3205 is a float switch designed to monitor changes in the level of either ethylene glycol or calcium chloride solutions in interstitial or annular spaces in double walled tanks. The Universal Reservoir Probe is capable of detecting increases in solution height of 20 cm. or more and decreases in solution height of 6 cm. or more.

#### **Site Sentinel Liquid Detector for Groundwater Monitoring**

The Site Sentinel console used with liquid detectors 30-3207 or 30-3210 are approved for compliance with **s. COMM 10.61 (6)(e)** for use in groundwater monitoring systems that comply with **s. COMM 10.61 (6)** to detect specified products.

The groundwater monitoring system in which the liquid detectors are used shall be designed and installed in accordance with **s. COMM 10.61 (6)**. Approval of the well design and placement must be obtained in accordance with **s. COMM 10.10**.

Monitoring wells shall be located in porous backfill in accordance with **s. COMM 10.61 (5)(a), (g), and (h)** and shall be clearly marked and secured.

#### **Petroentry IV, Petroentry VIII, and Site Sentinel Liquid Detectors for Interstitial Monitoring**

The Petroentry IV and VIII and Site Sentinel consoles used with the Liquid Sensor 30-3200, and Universal Sump sensor 30-3204, or liquid sensor 30-3206 are approved as interstitial monitors to be installed in systems that comply with **s. COMM 10.61 (7)** to detect products specified in the Description and Use section.

The Petroentry IV and VIII and Site Sentinel consoles used with the Universal Reservoir Probe 30-3205 are approved for monitoring the level of solutions in the interstitial or annular space of double walled tanks where the geometry of the interstice allows detection of leaks in accordance with **s. COMM 10.61 (8)(a)**.

Interstitial monitoring systems shall be designed and installed in accordance with **s. ILMR 10.61 (7)**. Approval of the sensor placement shall be obtained for each site in accordance with **s. COMM 10.10**.

Approval of the placement of the Liquid Sensor, Universal Sump Sensor and Universal Reservoir Probe shall be obtained in accordance with **s. COMM 10.10**. Sensors shall be placed so that they will be able to detect a leak in any portion of the primary containment that routinely contains product. The geometry of the interstice must be such that the detector will be able to detect a 0.2 gph or 150-gallon release within 30 days.

**LIMITATIONS / CONDITIONS APPROVAL**

Procedures specified by OPW Fuel Management Systems shall be used for the installation and maintenance of the subject equipment and to conduct all service and test activities. Records of sampling, testing or monitoring shall be maintained in accordance with Comm 10.625.

All consoles utilized in the evaluation of leak detection, with printers, shall be programmed to provide the following information on the printout:

- ◆ Site/Facility Identification (Name and address)
- ◆ Tank capacity and content
- ◆ Method of leak detection
- ◆ Test date
- ◆ Test start and end time
- ◆ Tank volume at time of test
- ◆ Final leak test result – leak rate in gallon per hour (gph) if applicable.
- ◆ Test declaration – “Pass” or “Fail”
- ◆ Manufacturer of test equipment/method.

This approval will be valid through December 31, 2006, 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.

Reviewed by: \_\_\_\_\_

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

Approved by: \_\_\_\_\_

Date: \_\_\_\_\_