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Department of Safety and  
Professional Services

Approval # 20120006

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

# Wisconsin SPS 310 Material Approval

Equipment: TraceTek Leak Detection Systems

Manufacturer: Tyco Thermal Controls  
307 Constitution Drive  
Menlo Park, CA 94025

Expiration of Approval: December 31, 2014

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### **SCOPE OF EVALUATION**

The TraceTek TT1000 series water sensitive cables, TT3000 conductive liquid sensing cables, TT5000 series hydrocarbon sensing cables, TT5001 liquid organic solvent sensing cables, TT7000 sulfuric and nitric acid sensing cables, TT-Flat Probe, TT-FFS, and the TT-Mini-Probe, manufactured by Tyco Thermal Controls, were evaluated as a means of pipeline and sump monitoring in accordance with **ss. DSPS 310.130, DSPS 310.510(4), DSPS 310.515(7), and DSPS 310.515(8).**

This evaluation summary is condensed to provide the specific installation, application, and operational parameters necessary to maintain the subject systems in compliance with the Wisconsin Administrative Code – DSPS 310.

**DESCRIPTION AND USE**

The TraceTek Leak Detection System consists of a console (alarm and location module), leak sensing cable, and/or sensor probes for the detection of liquids. The sensor probes and cable are capable of detecting multiple types of liquids including hydrocarbons. The system is designed for use within secondarily contained piping and sumps.

**Console/Alarm Module Application Chart**

<b>Console/Alarm Module Model No.</b>	<b>Application</b>
TTA-SIM	The TTA-SIM can be used as a stand-alone leak detection alarm unit, or it can be installed in networks with other TraceTek TTA-SIM, TTSIM, TT-NRM or TTDM-128 modules. It can be used with TraceTek sensing cables, point sensors, and normally open, dry contact devices(float, pressure or vacuum switch, optical probe with adapter, limit switch, etc.)
TTC-1	The TraceTek TTC module It is designed for use with any TraceTek sensor, and can be integrated into a variety of monitoring systems. The TTC-1 is ideally suited to be easily integrated into centralized monitoring systems for large facilities. Typical applications include monitoring for leaks from individual pieces of equipment where a single length of TraceTek sensing cable is used.
TTDM-128	Each TTDM-128 module directly monitors up to 1500 m (5000 ft) of sensor cable and a network of up to 128 remote TraceTek modules. The remote modules may be a combination of sensor interface modules (TTSIM), relay modules (TT-NRM) or additional TTDM-128 modules. All status and event information is made available via the front panel keyboard or RS232/RS485 MODBUS digital communication to a host computer, PLC or plant/building automation system.
TTSIM-1	The TTSIM-1 is a Sensor Interface Module capable of monitoring up to 1500 meters (5000 feet) of TraceTek sensing cable. When liquid is detected, the TTSIM-1 locates the leak and communicates the leak details to the host monitoring system. The TTSIM-1 can communicate to a variety host monitoring systems including a TraceTek TTDM-128, a PLC, DCS or Building Management System using standard protocols.
TTSIM-1A	The TTSIM-1A can be used as a stand-alone leak detection alarm unit, or in networks with other TraceTek TTSIM, TT-NRM or TTDM-128 modules. When liquid is detected, the TTSIM-1A unit indicates the leak with an LED, and switches a relay to provide local voltage-free contact closure. The TTSIM-1A can also communicate to a host monitoring system such as a TraceTek TTDM-128 or directly to a PLC or other host system using standard protocols.
TTSIM-2	The TTSIM-2 can be used as a stand-alone leak detection alarm unit, or in networks with other TraceTek TTSIM, TT-NRM or TTDM-128 modules. When liquid is detected, the TTSIM-2 unit indicates the leak, displays the location of the leak and switches a relay to provide local voltage-free contact closure. The TTSIM-2 can also communicate to a host monitoring system such as a TraceTek TDM-128 or directly to a PLC or other host system using standard protocols.

**Cable/Probe ↔ Product Application Chart**

Cable/Probe Model No.	Product Sensing
TT1000	Water
TT3000	Conductive liquid
TT5000	Hydrocarbons (gas, diesel, Jet A, #2 fuel oil)
TT5001	Liquid organic solvents
TT7000	Sulfuric and nitric acid (strong mineral acids)
TT-Flat Probe	Water
TT-FFS	Hydrocarbons (gas, diesel, Jet A, crude oil)
TT-Mini-Probe	Conductive liquid

**TESTS AND RESULTS**

Testing of the TraceTek TT5000 and TT-FFS leak detection system was conducted in accordance with the EPA protocol for evaluation of liquid-phase out-of-tank product detectors with respect to liquid contact product detectors. The probabilities of detection and false alarm of a leak were certified to within the 95-5 ranges required by the EPA protocols. The cables and probes were tested with gasoline (with up to 10% ethanol), diesel fuel, #2 heating oil, and crude oil- dependant on sensor.

**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 **DSPS 310.500(9)**.
- 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.
- All equipment shall be installed, operated and maintained in accordance with procedures specified by Tyco Thermal Controls.
- TraceTek TT5000 sensor cables shall be contained in a carrier pipe (double-wall interstice) to be able to detect a hydrocarbon leak within the 3.0 gph catastrophic leak detection requirement.
- To provide adequate leak detection for hazardous liquids, sensor cables shall be contained in a carrier pipe (double-wall interstice).

- In order to adequately provide leak detection in sumps both a hydrocarbon cable or sensor and a water or conductive liquid sensor shall be placed in the sump.
- Critical performance parameters for the TraceTek leak detection systems:

Model Number	Cable or Sensor/Networked Capacity	Maximum Cable Range (ft.) Stand Alone/Networked
TTA-SIM	1/0	500
TTC-1	1/0	250
TTDM-128	1/128	5000/150,000
TTSIM-1	1/0	5000
TTSIM-1A	1/0	500
TTSIM-2	1/0	500

This approval will be valid through December 31, 2014, 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: May 1, 2012

Reviewed by: \_\_\_\_\_ Signature on file  
 Greg Bareta, P. E.  
 Engineering Consultant  
 Bureau of Petroleum Products and Tanks

Approved by: \_\_\_\_\_ Signature on file \_\_\_\_\_ Date: \_\_\_\_\_