# Best Practices Using Photoionization Detection in CIPP Installation



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# Topics

- What does PID mean?
- How many different types are available?
- What is a PID?
- How does this technology operate?
- How can this be used in the CIPP industry?
- Understanding best practices

#### Measuring Devices for CIPP Industry





### What is a PID?







**PID** = Photo-Ionization Detector

Detects VOCs (volatile organic compounds) in low concentrations of 0.1 to 2000 ppm

A PID is a very sensitive broad spectrum monitor

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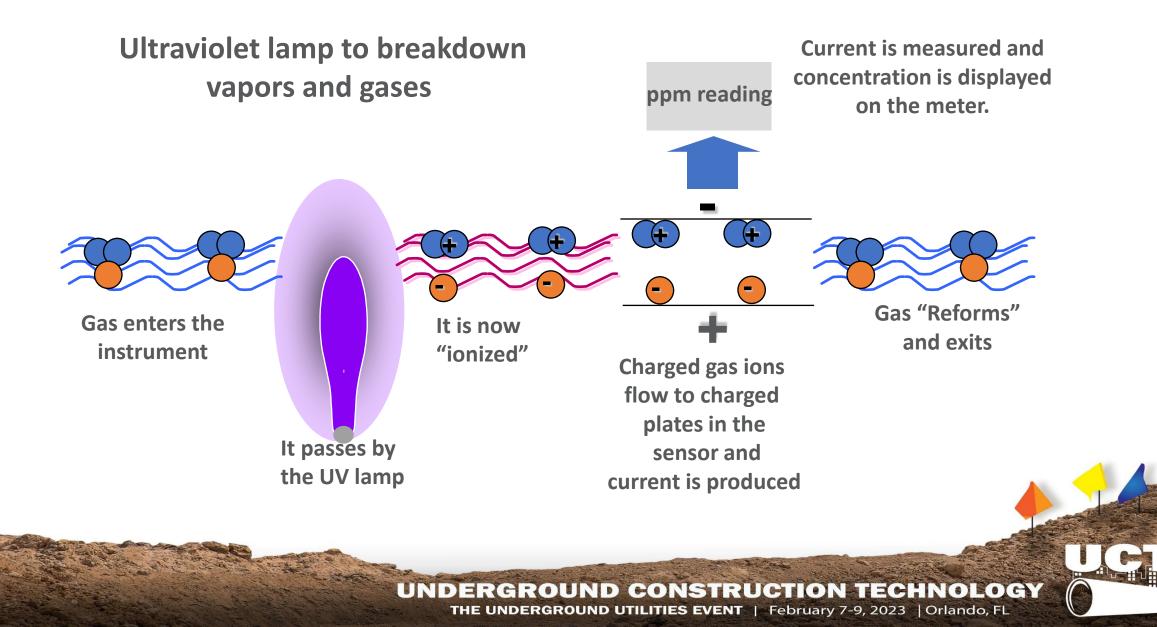
## What does the PID do?



- Monitors for Volatile Organic Compounds
- For Example:
  - Gasoline
  - Styrene
  - Acetone

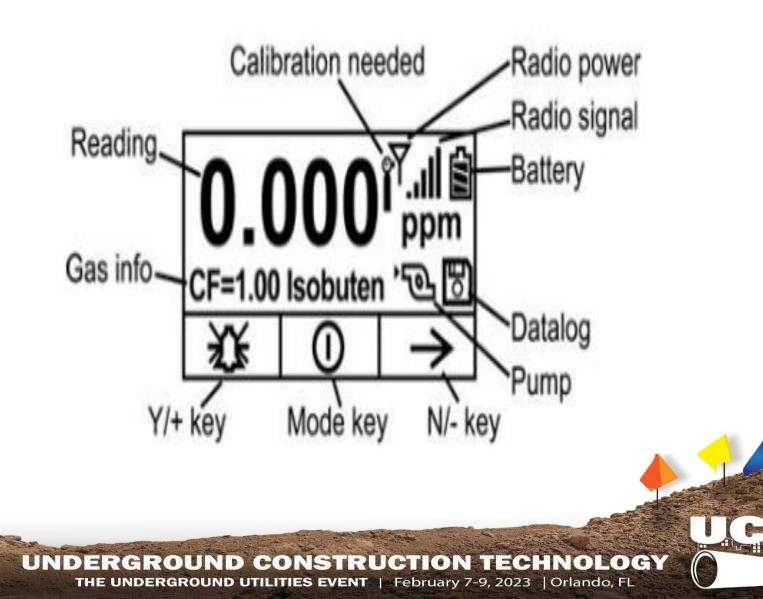
#### UNDERGROUND CONSTRUCTION TECHNOLOGY

### How does a PID work?



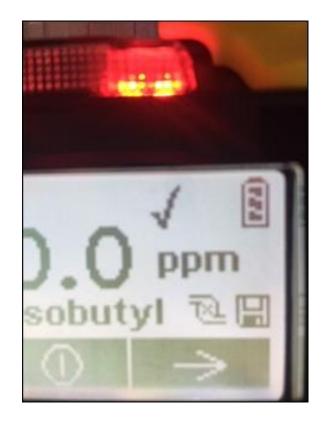
## What do the typical screen symbols mean?





## Understanding PID Screen

- Common Problems:
  - If it has a pump watch for errors
  - MOISTURE
  - Battery Life
  - Temperature Conditions



### Multi Gas Detector with PID



#### UNDERGROUND CONSTRUCTION TECHNOLOGY

### Multi Gas Detector Styrene Challenges



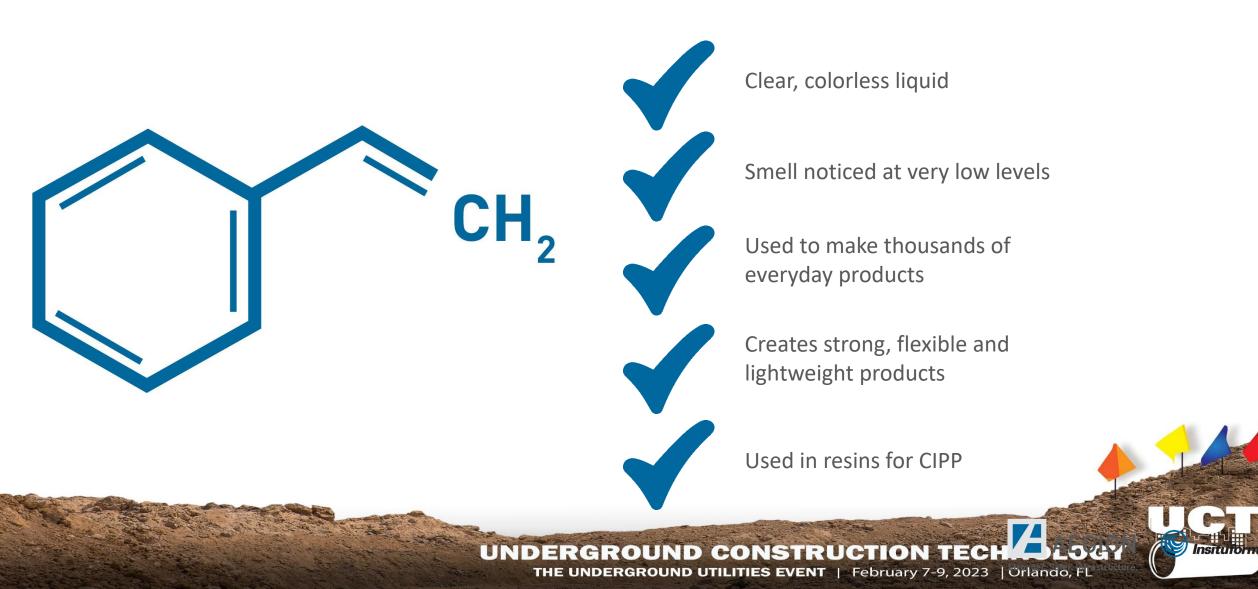
#### UNDERGROUND CONSTRUCTION TECHNOLOGY

## Before using consider what a PID can and cannot do!

- **PID is very sensitive**
- PID is very Accurate when Calibrated
- PID is not very selective



## How does this Technology relate to CIPP?



## Using PID's to measure styrene.

## Styrene travels through the air with a vapor density 3.6 CH • People are exposed to styrene every day in tiny amounts that may occur naturally in tobacco smoke and food

#### Detected at extremely low levels (0.1 PPM)

This low level of detection is typically 100 times lower than the worker protection limit

#### Application Examples -White Paper

#### 👎 ASCE paper 103122.pdf - Adobe Acrobat Pro DC File Edit View Window Help Home Tools Document 🗒 🗇 🖶 🖾 📿 🕜 🚯 1 / 10 🕨 👘 🝚 🕂 136% 🗸 🚼 🛃 🕎 ? Sign In Search Tools... ASCE 骨 Create PDF Check for updates Edit PDF Health Risks Assessment from Cured-in-Place Pipe Lining Export PDF **Fugitive Styrene Emissions in Laterals** 😑 Comment Mark A. Knight, MASCE<sup>1</sup>; Marios A. Ioannidis<sup>2</sup>; Faten Salim<sup>3</sup>; Tadeusz Górecki<sup>4</sup>; and Dennis Pivin<sup>5</sup> Organize Pages 🛱 Enhance Scans Abstract: The aim of this study was to improve the understanding of styrene emissions in sewer laterals, resulting from the installation Protect and steam curing of a resin impregnated cured-in-place-pipe (CIPP) liner, within a sanitary sewer. The study included development and performance assessment of a controlled field test program that measures and records styrene emissions before, during, and after steam-curing 🔏 Fill & Sign a CIPP liner. Measured styrene emissions are then compared with those of published studies and regulatory exposure guidelines to assess Prepare Form the potential risk exposure. The field study measurements confirmed that high styrene concentrations can exist in sewer laterals during the steam-curing of the CIPP liner. They also confirm that water, in proper functioning P-traps, will prevent high styrene emissions from exiting the lateral and into buildings. Fugitive emission modeling shows that the risk of exceeding the acute exposure guideline limits is very low, even when high styrene concentrations exist in a lateral with a dry P-trap, and the styrene odor threshold is exceeded within the building, that is, when the building occupants smell styrene. DOI: 10.1061/(ASCE)PS.1949-1204.0000690. This work is made available under the terms of the Creative Commons Attribution 4.0 International license, https://creativecommons.org/licenses/by/4.0/. Introduction In a typical urban environment, residences and businesses have Subscription Expired laterals that transfer sewage from buildings into the sanitary sewer. Subscribe now to restore access to The cured-in-place pipe (CIPP) lining process, first developed in All plumbing codes in North America require buildings to have a desktop, mobile and web tools. the 1970s, has become one of the most common methods to ren-P-trap that is filled with water. This P-trap stops sewer gas from mileteriorated and leaking gravity sanitary sewers in North into the building N

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#### UNDERGROUND CONSTRUCTION TECHNOLOGY

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#### lateral monitoring locations



## Study objectives

 Evaluate hand held Photoionization Detector (PID) and Organic Vapor Monitors' (OVM) ability to estimate Styrene levels before, during and after a steam cured CIPP lining project;



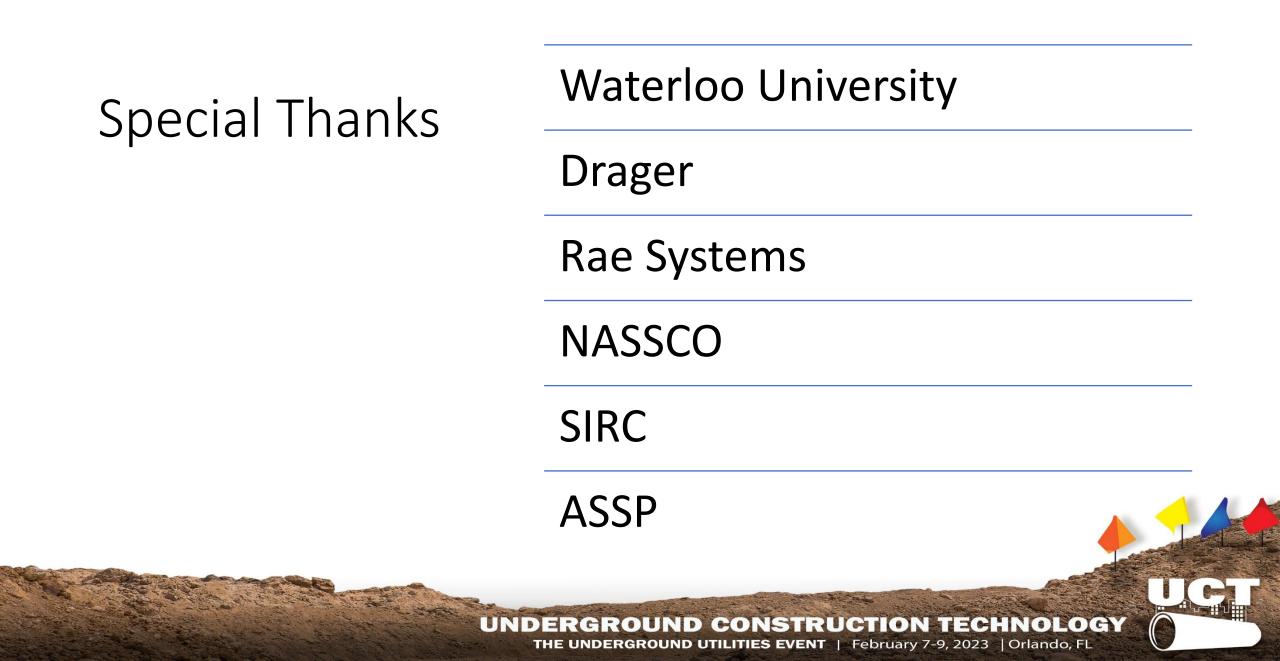
RAE PID

#### UNDERGROUND CONSTRUCTION TECHNOLOGY

## Key Findings Using PID sampling

- 1. PID's measures VOC concentrations
- 2. Must calibrate and use calibration factor for Styrene





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# Questions?