

### Scope:

This standard operating procedure describes the installation and use of the Mini Vapor Pin® for sub-slab soil-gas sampling.

### Purpose:

The purpose of this procedure is to assure good quality control in field operations and uniformity between field personnel in the use of the Mini Vapor Pin® for the collection of sub-slab soil-gas samples or pressure readings.

### Equipment Needed:

- Assembled Mini Vapor Pin® [FLX-VP™ barb fitting with O-ring, Mini Vapor Pin® base, and silicone sleeve (Figure 1)]. *As shown on Figure 1, the silicone sleeve only extends onto the flat portion of the Mini Vapor Pin® for installation. It will slide onto the Mini Vapor Pin® as it is hammered into place;*
- Hammer drill;
- 5/8-inch (16mm) diameter hammer bit (hole must be 5/8-inch (16mm) diameter to ensure seal. (Hilti™ TE-YX 5/8" x 22" (400 mm) #00206514 or equivalent);
- 3/4-inch (19mm) diameter bottle brush;
- Wet/Dry vacuum with HEPA filter (optional);
- VAPOR PIN® installation/extraction tool;
- Dead blow hammer;
- Mini Vapor Pin® secure cover with O-ring;
- Mini Vapor Pin® drilling guide.



Figure 1. Assembled Mini Vapor Pin®

### Installation Procedure:

- 1) Check for buried obstacles (pipes, electrical lines, etc.) prior to proceeding.
- 2) Set up wet/dry vacuum to collect drill cuttings.
- 3) Drill a 5/8-inch (16mm) diameter hole through the slab and approximately 1-inch (25mm) into the underlying soil to form a void. Hole must be 5/8-inch (16mm) in diameter to ensure a seal. ***The drilled hole must be perpendicular to the slab for the mandatory Secure Cover to seat correctly. It is strongly recommended that the Mini-Vapor Pin® drilling guide be used for this purpose (Figure 2).***
- 4) Remove the drill bit, brush the hole with the bottle brush, and remove the loose cuttings with the vacuum.



Figure 2. Mini Vapor Pin® Drilling Guide

- 5) Ensure the diameter of the hole will accommodate the Mini Vapor Pin® by inserting the top of the Mini Vapor Pin® into the hole. It should be easily inserted (Figure 3). If the Mini Vapor Pin® is tight, ream the hole with the bit and re-try.

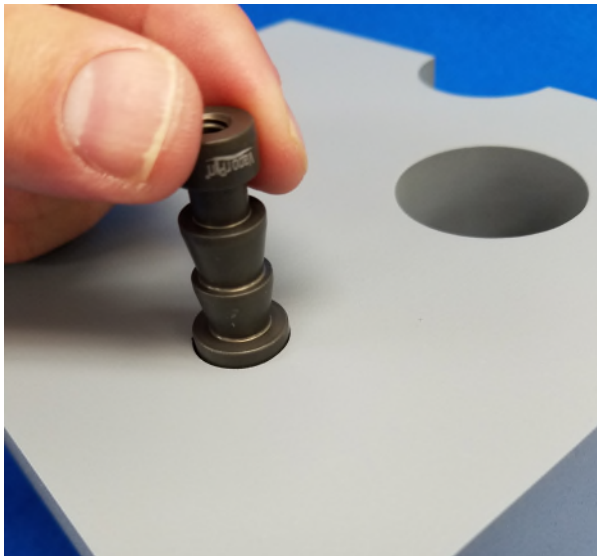


Figure 3. Testing the Hole Diameter

- 6) Place the lower end of the assembled Mini Vapor Pin® into the drilled hole (Figure 4). Place the small hole located in the handle of the installation/extraction tool over the barb fitting and tap the Mini Vapor Pin® into place using a dead blow hammer (Figure 5) until the top of the Mini Vapor Pin® is flush with the slab (Figure 6).

Make sure the installation/extraction tool is aligned parallel to the Mini Vapor Pin® to avoid damaging the barb fitting. During installation, the silicone sleeve will slide onto the Mini Vapor Pin®.

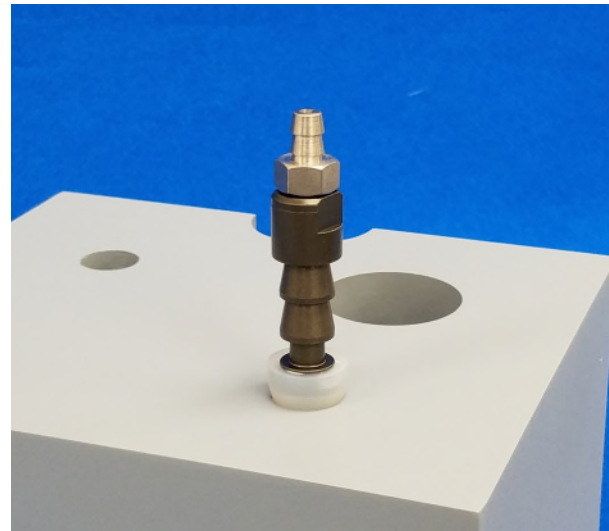


Figure 4. Mini Vapor Pin® Installation (Step 1)

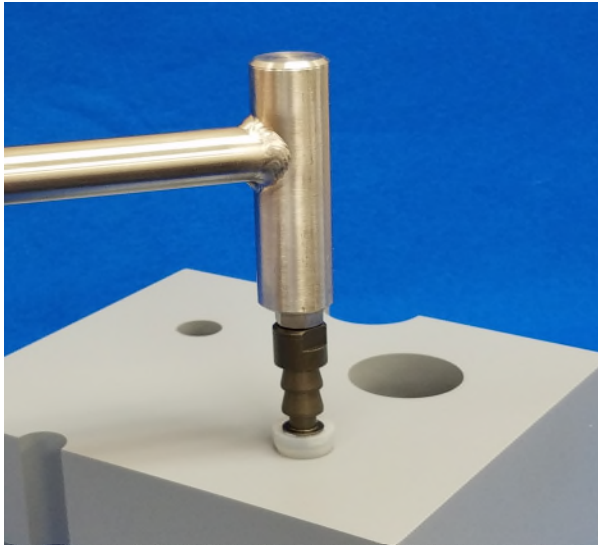


Figure 5. Mini Vapor Pin® Installation (Step 2)



Figure 6. Mini Vapor Pin® Installation Complete

- 7) Remove the barb fitting and screw the Mini Pin™ Secure Cover onto the Mini Pin™ (Figure 7). Allow 2 hours or more (consult applicable guidance for your situation) for the sub-slab soil-gas conditions to re-equilibrate prior to sampling.

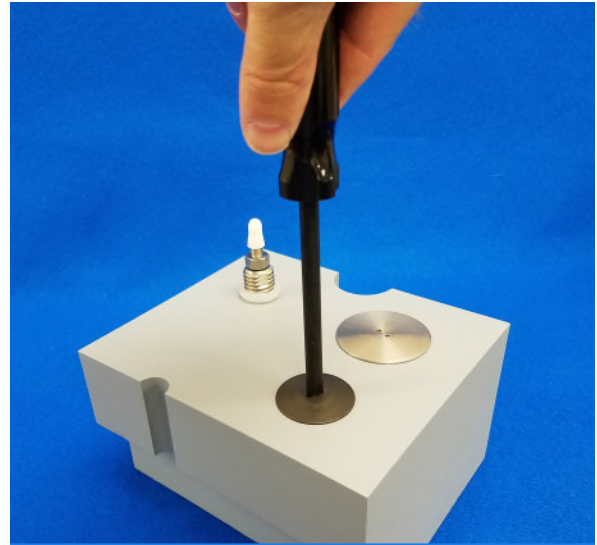


Figure 7. Spanner Tool and Secure Cover

- 8) Remove the Secure Cover, re-install the barb fitting and connect the Nylaflow® sample tubing to the barb and begin sampling. This connection can be made using a short piece of Tygon™ tubing to join the Nylaflow® tubing. Push the Nylaflow® tubing as close to the top of the barb fitting as possible to minimize contact between soil gas and Tygon™ tubing (Figure 8).

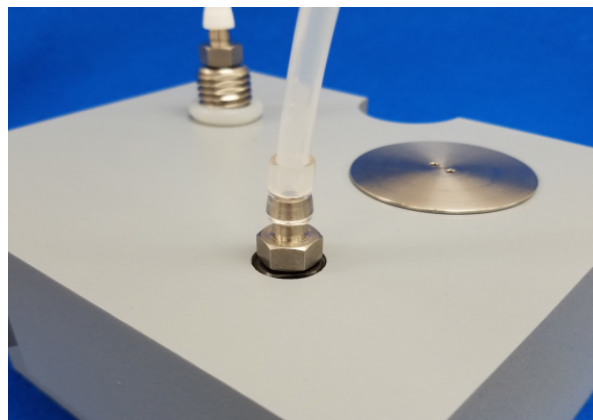


Figure 8. Mini Vapor Pin® Sample Connection

If you wish to directly connect to a Swagelok fitting, TO-17 tube, or quick connect, use those accessories instead of the barb fitting (Figure 9).

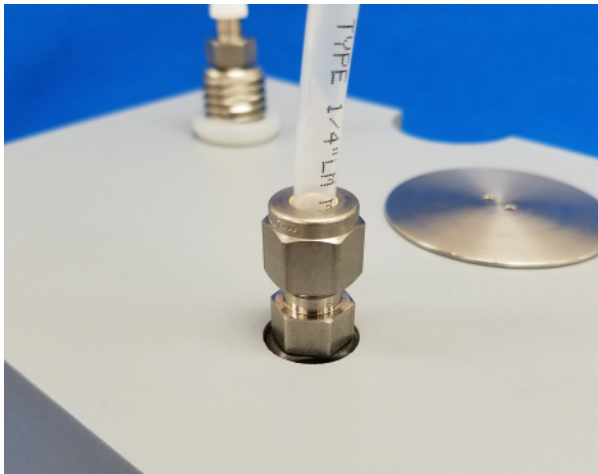


Figure 9. Mini Vapor Pin® with Swagelok® Connection

9) Conduct leak tests in accordance with applicable guidance. If the method of leak testing is not specified, an alternative can be the use of a water dam and vacuum pump, as described in SOP Leak Testing the FLX-VP™ via Mechanical Means (Figure 10).



Figure 10. Water dam used for leak detection

10) Collect sub-slab soil gas sample or pressure reading. When finished, replace the barb fitting or accessory with the Mini Vapor Pin® Secure Cover until the next event (Figure 11).



Figure 11. Mini Vapor Pin® with Secure Cover

The Mini Vapor Pin® is designed to be used repeatedly; however, accessories, replacement parts and supplies may be required periodically. These parts are available on-line at [www.vaporpin.com](http://www.vaporpin.com).