# Standard Operating Procedure

*Installation and Extraction of the*
*FLX-VP™ Vapor Pin® Sampling Device*

## Scope & Purpose

**Scope**

This standard operating procedure describes the installation, use, and extraction of the FLX-VP™ Vapor Pin® Sampling Device 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 FLX-VP™ for the collection of sub-slab soil-gas samples or pressure readings.

## Equipment Needed

- Assembled FLX-VP™ (FIGURE 1)
  - FLX-VP™ barb fitting with O-ring
  - FLX-VP™ base
  - Silicon Sleeve
- Vapor Pin® Cap
- Installation/Extraction Tool
- Rotary Hammer Drill
  - ⅝-Inch (16mm) diameter hammer bit
  - 1½-Inch (38mm) diameter hammer bit for flush mount applications
- ¾-Inch (19mm) diameter bottle brush
- Wet/Dry Vacuum with HEPA filter (optional)
- Dead Blow Hammer
- VOC-free hole patching material (hydraulic cement) and a putty knife or trowel
  - This is for repairing the hole following the extraction of the FLX-VP™

**Figure 1. Assembled FLX-VP™**

## 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 ⅝-inch (16mm) diameter hole through the slab and approximately 1-inch (25mm) into the underlying soil to form a void. The hole must be ⅝-inch (16mm) in diameter to ensure a seal.
   - If a flush mount installation is required, drill a 1½-inch (38mm) diameter hole at least 1¾-inches (45mm) into the slab. It is recommended that you use the drill guide.
4. Remove the drill bit, brush the hole with the bottle brush and remove the loose cuttings with the vacuum.
5. Assemble your FLX-VP™Vapor Pin® Sampling Device and Vapor Pin® Sleeve (Figure 1).
6. Place the lower end of the FLX-VP™ assembly into the drilled hole. Place the small hole located in the handle of the Installation/Extraction Tool, over the FLX-VP to protect the barb fitting and tap the FLX-VP™ into place using a dead blow hammer (Figure 2). Make sure the Installation/Extraction Tool is aligned parallel to the FLX-VP™ to avoid damaging the barb.
   - During installation, the Vapor Pin® Sleeve will form a slight bulge between the slab and the FLX-VP™ shoulder. If the silicone sleeve slides excessively upward, creating a large bulge at the top of the FLX-VP™ Sampling Device, reinstall the FLX-VP™ Vapor Pin® Sampling Device using a new silicone sleeve. The top of the silicone sleeve should only cover the lower one or two barbs of the FLX-VP™ Vapor Pin® Sampling Device.

7. Place the protective cap on the FLX-VP™ to prevent vapor loss prior to sampling (Figure 3).
8. For flush mount installations, cover the FLX-VP™ with a flush mount cover, using either the plastic cover or the optional Stainless Steel Secure Cover (Figure 4).
9. Allow 20 minutes or more (consult applicable guidance for your situation) for the sub-slab soil-gas conditions to re-equilibrate prior to sampling.

## Sampling

1. Remove the Vapor Pin® Cap and connect your sample tubing to the barb fitting of the Vapor Pin® Sampling Device.
2. Create a connection by using a short piece of Tygon™ tubing to join the FLX-VP™ Vapor Pin® Sampling Device with the Nylaflow tubing (Figure 5). Put the Nylaflow tubing as close to the FLX-VP™ Vapor Pin® Sampling Device as possible to minimize contact between soil gas and Tygon™ tubing. You do not **have** to use Nyflaflow tubing, any stiff tubing will suffice.
   - If you wish to directly connect to FLX-VP™ Vapor Pin® Sampling Device accessory (e.g. Swagelok fitting, T0-17 tube, or quick connect) unscrew the barb fitting and replace with accessory (Figures 6 and 7)
3. Prior to sampling, conduct a leak test in accordance with applicable guidance. If a leak test is not specified, refer to the SOP Leak Testing the Vapor Pin® Sampling Device, via Mechanical Means (Figure 8). For flush-mount installations, distilled water can be poured directly into the 1½ inch (38mm) hole.

**Figure 5.**

**Figure 6.**

**Figure 7.**

**Figure 8.**

**Figure 9.**

## Extraction Procedure & Reuse Notes

1. Remove the protective cap, and thread the Installation/Extraction Tool onto the FLX-VP™ Vapor Pin® Sampling Device (Figure 9). Turn the tool clockwise continuously, don't stop turning, the FLX-VP™ Vapor Pin® Sampling Device will feed into the bottom of the Installation/Extraction Tool and will extract from the hole like a wine cork, **DO NOT PULL!**
2. Fill the void with hydraulic cement and smooth with a trowel or putty knife.
3. Prior to reuse, remove the silicon Vapor Pin® Sleeve and Vapor Pin® Cap and discard. Decontaminate the Vapor Pin® Sampling Device in a Alconox® solution, then heat in an oven to a temperature of 265° F (130° C). For Stainless – ½ hour, Brass 8 minutes.