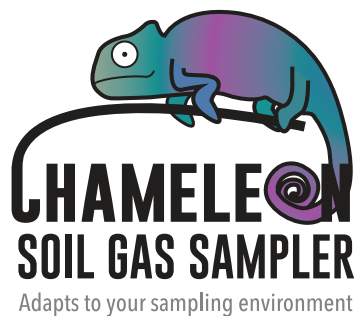


# SOIL GAS

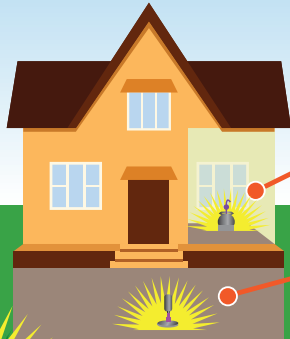
Sampling Solutions



*See What's Really There™*

# The All-In-One Soil Gas Sampling Solution

## Solutions for all 4 ZONES



1

**Indoor Air Quality**  
Soil gas levels inside structures.

2

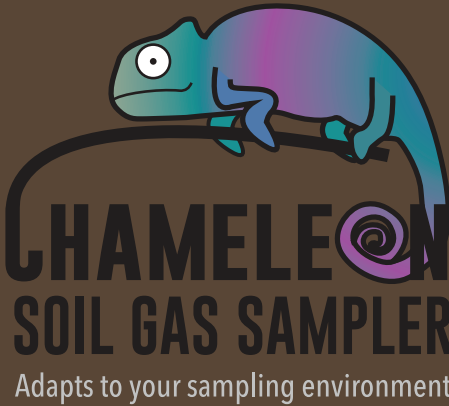
**Sub Slab / Vapor Intrusion**  
Reveals the soil gas concentrations right below buildings & potential for vapor intrusion over time.

3

**Surface Measurements**  
Determine contamination levels at the surface, or rate of emission from the surface into the air.

4

**Monitoring Well**  
For measuring soil gas concentrations anywhere in the Vadose Zone.



Vadose Zone

Capillary Zone

Ground Water Table

## Advantages of Soil Gas Sampling with Canisters

Sampling soil gas into canisters provides significant advantages over the use of passive adsorbent samplers with regard to both maintaining the integrity of the sample in the field and ensuring that the best analytical technique is used in the laboratory.

Canisters eliminate the need for pumps, batteries, and media selection, and the same sampling approach can be utilized for any gas concentration while being universal for all compounds. Furthermore, humidity and temperature concerns inherent with tube sampling do not affect canister accuracy.

Entech has a long history of engineering turn-key solutions specific to the environments being sampled. Designed with feedback from numerous sampling professionals, the Chameleon provides an all-in-one solution that is changing the way soil gas studies are conducted world-wide.

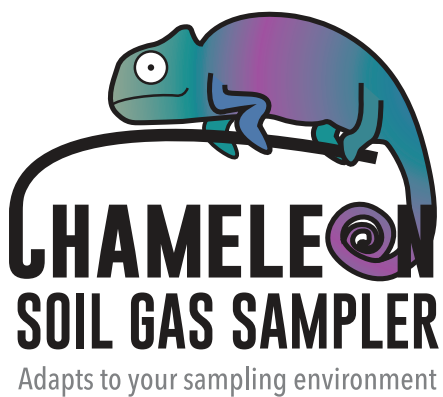
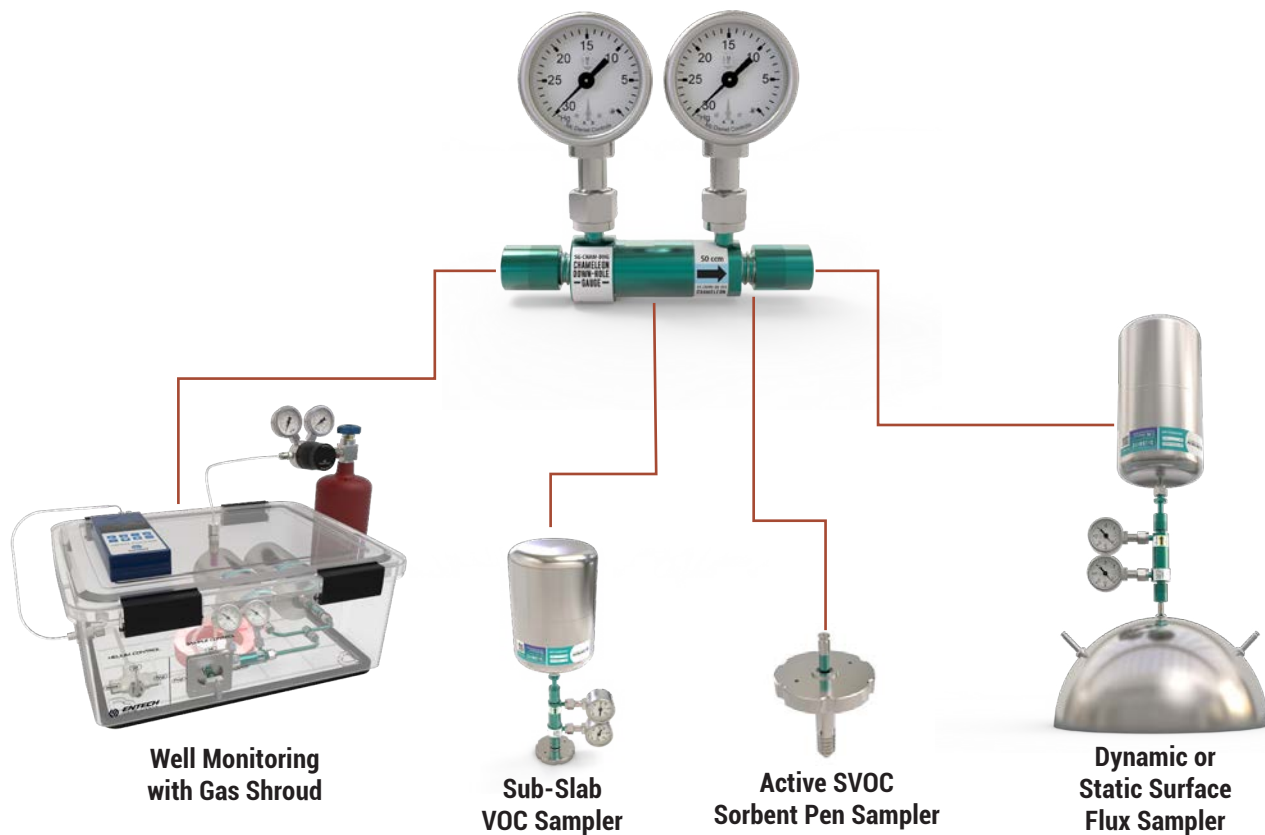
### **Sampling systems must be considered an extension of the laboratory.**

The Chameleon improves the accuracy of soil gas sampling by applying basic principles of gas chromatography. Chameleon maximizes recovery while minimizing carryover to yield the most accurate soil gas sample train available.

- Ensure all surfaces are inert (Entech Silonite™ coated stainless steel).
- Minimize surface area and shorten path lengths to canister.
- Minimize leak prone connections by engineering and machining custom solutions.
- Eliminate absorption (no plastic tubing where possible) .
- Prove system is leak-tight before delivery to field.
- Isolate the flow path from the outside world during transportation.

## The Chameleon Soil Gas Sampling Train

One Sample Train for All Soil Gas Sampling Techniques!!



## Create Your Chameleon Part Number.

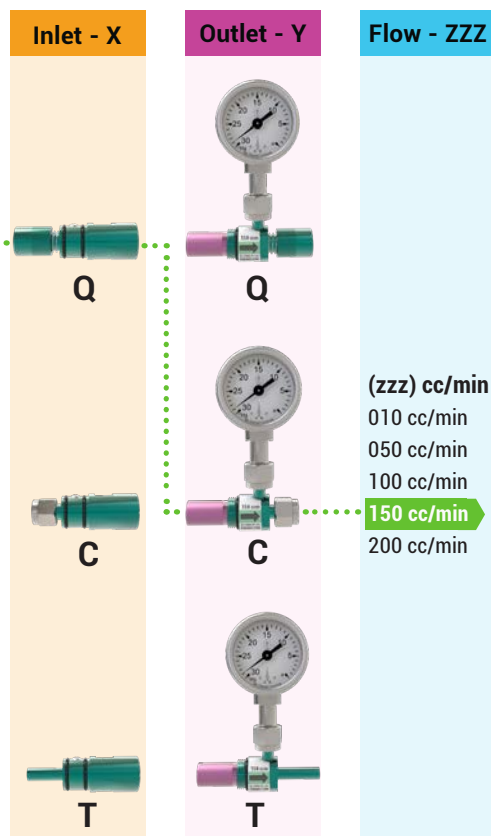
**Combine Any Inlet with Any Outlet!**

- The Chameleon can be configured to minimize compression fittings based on the line or fitting to which it connects.
- The inlet and outlet can be configured separately to optimize the sample train.
- The down hole vacuum gauge monitor can be added to any configuration, and verifies that excessive vacuum is not forming in the soil (<7.3" Hg vacuum).
- All configurations can be maintained under vacuum during shipment to the field to perform the shut-in test (leak test) automatically.

Configure your part # **SG-CHAM - X Y - ZZZ**

Substitute Q,C,T for your inlet (X) and outlet (Y), and append desired flow rate (ZZZ)

EXAMPLE



Do you need the Optional down-hole gauge?

ADD THIS PART # TO YOUR ORDER

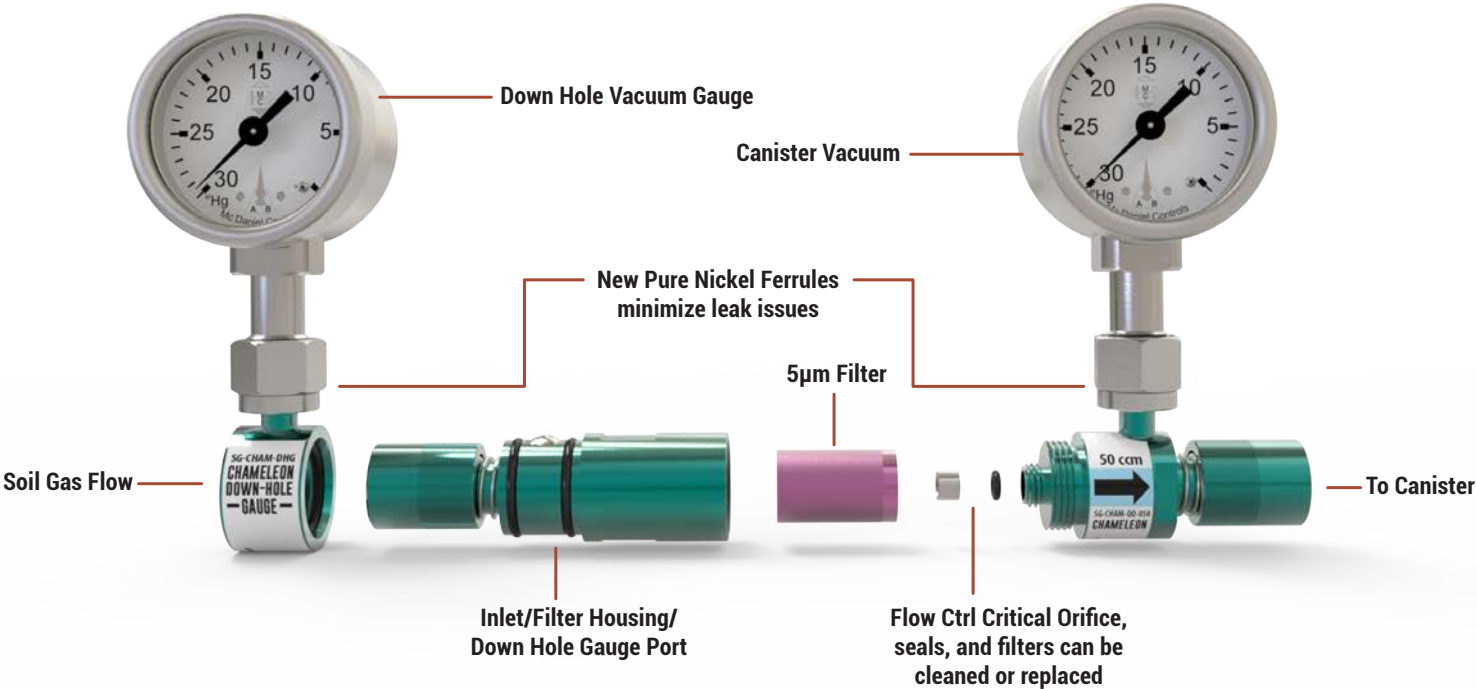
PN SG-CHAM-DHG

COMPLETE

**SG-CHAM-QC-150**

Example: SG-CHAM-QC-150 plus downhole gauge SG-CHAM-DHG

# Easy Maintenance and Replacement of All Components





## Sub-Slab & Vapor Intrusion Monitoring

No Grout. No Mess. No Contamination. Better Results.

Monitor gases directly under the slab of buildings to determine the potential for intrusion into the indoor environment. A vacuum tight seal is made through the building's foundation, with a unique "triple seal" using two O-rings and a water dam that ensures that only gases from beneath the slab will be drawn into the sample train and canister. After sampling, the slab face sealing fitting is removed allowing a temporary plug to be installed.

*Chameleon Soil Gas Sampler shown  
with Entech Sub-Tight™ Sampler.*



### Advantages:

- Most reliable, non-contaminating slab vapor seal on the market.
- Shortest and most inert flow path ensures complete recovery and no sample carryover.
- Chameleon controls the flow rate to avoid disturbing the equilibrium of VOCs between gas, adsorbed soil, and dissolved water phases.
- Avoids the use of contaminating plastic tubing. All surfaces are Silonite™ ceramic lined stainless steel to prevent outgassing of contamination while ensuring maximum compound recovery.
- Compatible with Entech Soil Gas Shroud for "complete flow path" leak testing right up to the canister.

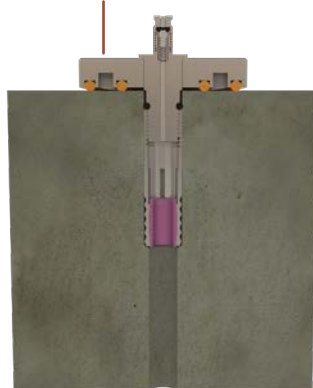


## Entech's Slab-Tight™ Sub-Slab Sampler

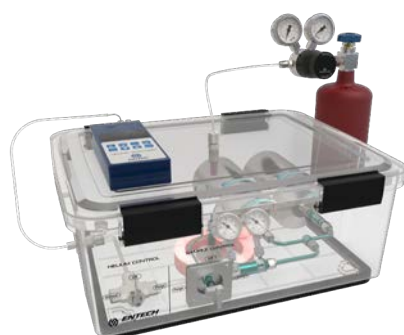
Complete the Sampling with Chameleon & Silonite™ MiniCan™

- Entech's unique Slab-Tight™ sub-slab sampler eliminates interferences created by grout and other slab sealing materials.
- Grout may contain contaminants that can positively bias the results.
- Added Down-hole moisture from the grout may affect the solid/liquid/gas phase equilibria.
- The Entech Slab-Tight™ sub-slab sampler makes a mechanical connection and seal with no chance of contaminating the collected soil gas.
- Tracer Gas Shroud for butane or helium leak checking is available.

Face-sealing Bonnet  
PN SG-SS-Bonnet-QT



PN SG-SS-50-Kit



PN SG-SS-SHR-50-Kit

### DESCRIPTION

### PART #

#### Sub-Slab Vapor Intrusion Canister Sampling Kit (50cc/min) (600cc, 1L, or 1.4L Cans sold separately)

#### SG-SS-50-Kit

Anchor, Wedge, and Plug Kit	SG-SS-AWP-Kit
Tool to expand anchor into the concrete	SG-SS-Expander
Bonnet with QT Fitting	SG-SS-Bonnet-QT
Bonnet Wrench - Tightens and releases Bonnet to concrete	SG-SS-Bonnet-Wrench
50cc/min Chameleon with FQT on Inlet & Outlet	SG-CHAM-QQ-050
Down-Hole Gauge for measuring vacuum below ground soil	SG-CHAM-DHG
50cc plastic preflush syringe and needle	07-20050

#### Sub-Slab Vapor Intrusion Canister Sampling Kit (50cc/min) w/ Tracer Gas Shroud (600cc, 1L, or 1.4L Cans sold separately)

#### SG-SS-SHR-50-Kit

50cc/min Chameleon Shroud Sample Train (w/ 3 way valve & magnetic latch)	SG-CHAM-TC-050-S
Anchor, Wedge, and Plug Kit	SG-SS-AWP-Kit
Tool to expand anchor into the concrete	SG-SS-Expander
Bonnet with QT Fitting	SG-SS-Bonnet-QT
Bonnet Wrench - Tightens and releases Bonnet to concrete	SG-SS-Bonnet-Wrench
Down-Hole Gauge for measuring vacuum below ground soil	SG-CHAM-DHG
50cc plastic preflush syringe and needle	07-20050
Tracer Gas Shroud for Helium	SG-He-Shroud
3-Way, w/ FMQT & 1/8" to 1/4" Tube Adapters	SG-SHR-APVI

### INDIVIDUAL PARTS

### PART #

Slab Anchor & Plug Kit - Not reuseable. One needed per installation	SG-SS-AWP-Kit
Shroud Foam Sealing Ring	SG-SHR-RNG
Dual Canister Adapter w/ 2 Female Micro-QT™ Valves	39-99014QT
600mL MiniCan with Micro-QT™ Valve	29-MC600QT
1L Silonite MiniCan	29-MC1LQT
Helium Analyzer (0.1-100%)	SG-He-Analyzer
Soil Gas Drill Kit	SG-SS-DRILL-Kit



# Surface Sampling

## Surface Flux Sampling

Analyze the soil gases right at the surface by using the Entech Soil Gas Flux Chamber. Simply place the 3L or 7.5L enclosure over the surface, allow the vapors to reach equilibrium, connect the Chameleon Soil Gas Sampler and Silonite™ MiniCan, and collect the equilibrated vapors into the inert Silonite™ MiniCan. This is a great means for looking for sites of maximum contamination and for general site assessment. Add a flow of purified nitrogen through the flux sampler to evaluate rates of outgassing as needed.

- Easy implementation
- No drilling
- Collect results quickly
- No materials left on-site
- Least invasive

Entech 1.4L MiniCan with Chameleon Soil Gas Sampler and Enhancement Enclosure.

## Surface Flux Measurement Test Kit

DESCRIPTION	PART #
<b>3L Flux Chamber Kit</b> (600cc, 1L, or 1.4L Cans sold separately)	<b>SG-FLX30-50-Kit</b>
3L Flux Chamber	SG-FLUX-30
50cc/min Chameleon, Female MQT Inlet and Outlet	SG-CHAM-QQ-050
<b>7.5L Flux Chamber Kit</b> (600cc, 1L, or 1.4L Cans sold separately)	<b>SG-FLX75-50-Kit</b>
7.5L Flux Chamber	SG-FLUX-75
50cc/min Chameleon, Female MQT Inlet and Outlet	SG-CHAM-QQ-050
INDIVIDUAL PARTS	PART #
600mL MiniCan with Micro-QT™ Valve	29-MC600QT
1L Silonite MiniCan	29-MC1LQT



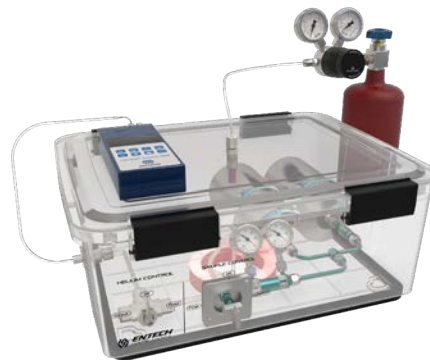
## Deep Well Monitoring

### Get the Whole Picture by Canister Sampling

In order to test contaminants well into the vadose zone or near the water table, deeper holes or “permanent sampling wells” must be installed. The Entech Chameleon Soil Gas Samplers connect to the tubing that is installed into these wells for easy and controlled filling into inert Silonite™ coated, canisters. Since these sampling sites are installed by different companies or agencies, the Chameleon was designed to change its inlet and outlet to adapt to whatever connections are needed, ultimately reducing the number of leak points and places for VOC contamination to build up.

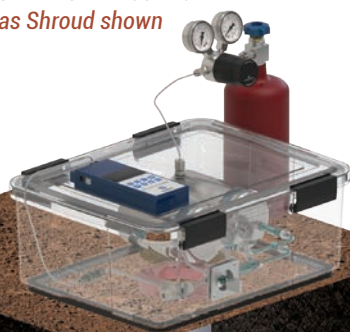
### Advantages:

- Simple, reliable, gas-tight connections ensures proper sampling.
- Chameleon is sent to the field under vacuum, to prove the entire sample train is leak-tight while also preventing contamination during shipping.
- Select the Chameleon that provides the required sampling rates (typically 150 or 200cc/min) based on agency requirements.
- Easily disassemble the entire Chameleon to clean parts if water is accidentally pulled into the sampler.
- Fewest number of fittings due to unique design of Chameleon.



*SG-MW-SHR-200-Kit Gas Shroud ensuring >95% soil gas collection*

*SG-MW-SHR-200-Kit Gas Shroud shown*



## Soil Gas Monitoring Well Sampling Kit w/out Shroud

DESCRIPTION	PART #
<b>Monitoring Well Kit, 200cc/min</b> (600cc, 1L, or 1.4L Cans sold separately)	<b>SG-MW-200-Kit</b>
200cc/min Chameleon, (no Down-hole Vacuum Gauge)	SG-CHAM-QQ-200
50cc plastic preflush syringe and needle	07-20050

## Soil Gas Monitoring Well Sampling Kit w/ Tracer Gas Shroud

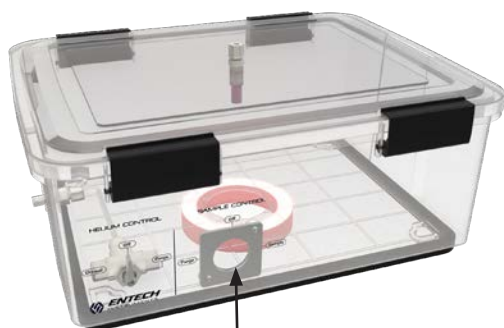
DESCRIPTION	PART #
<b>Monitoring Well Kit, 200cc/min</b> (600cc, 1L, or 1.4L Cans sold separately)	<b>SG-MW-SHR-200-Kit</b>
200cc/min Chameleon Shroud Sample Train (w/3 way valve & magnetic latch)	SG-CHAM-TC-200-S
Down Hole Vacuum Gauge	SG-CHAM-DHG
50cc plastic preflush syringe and needle	07-20050
Helium Tracer Gas Shroud	SG-He-Shroud

INDIVIDUAL PARTS	PART #
600mL MiniCan with Micro-QT™ Valve	29-MC600QT
1L Silonite MiniCan	29-MC1LQT
Optional Dual Can Adapter	39-99014QT
Helium Analyzer (0.1-100%)	SG-He-Analyzer

## Helium Tracer Gas Shroud Solution

The Entech helium shroud solution was designed to be easy to use, easy to clean, and affordable. It delivers on all points by allowing for the entire soil gas train to be connected and disconnected from the shroud in just seconds through the utilization of a magnetic latching system. The inexpensive shroud can be reused over and over with clean evacuated sampling trains that are shipped directly from the lab and snap right in! The sample trains are sent under vacuum, therefore just a quick glance at the gauge is all it takes to satisfy the field shut-in test.

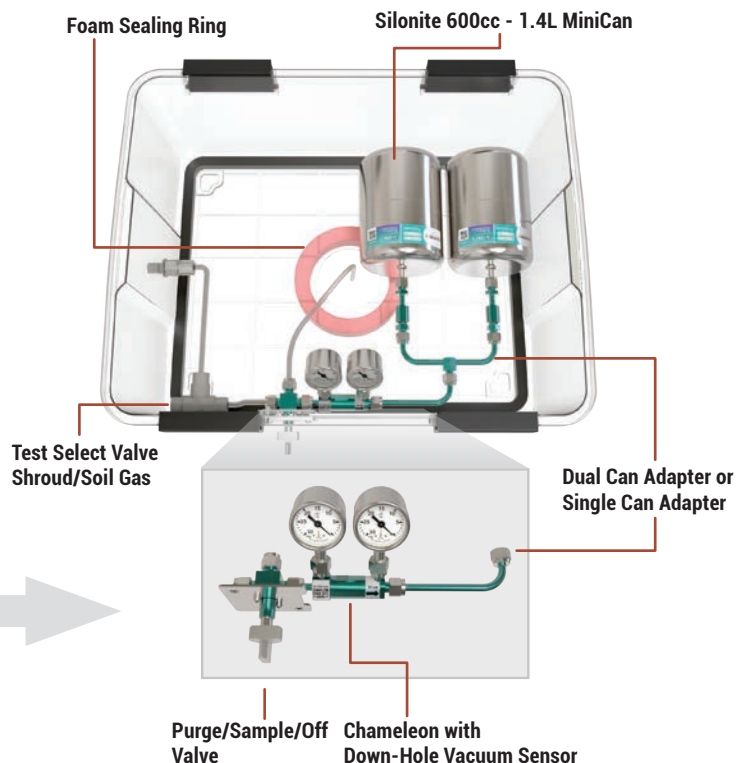
### Empty Shroud



### Detachable Sampling Train



### Example Well Monitoring Shroud



### Helium Analyzer

The Entech Helium Analyzer is a precision instrument for measuring the concentration of oxygen and helium in the tracer gas shroud. The analyzer is characterized by high accuracy and reliability thanks to innovative measurement techniques. The technology works by measuring the speed of sound, thus there is never a need to change the helium sensor.

*PN SG-He-Analyzer*

### Helium Tank & Regulator

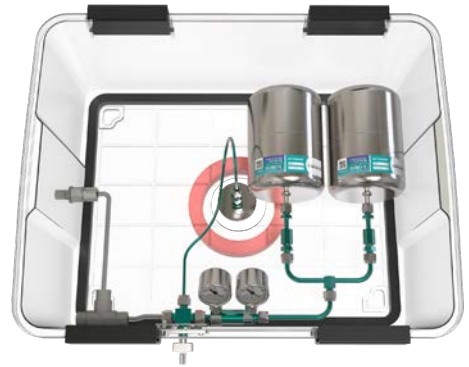
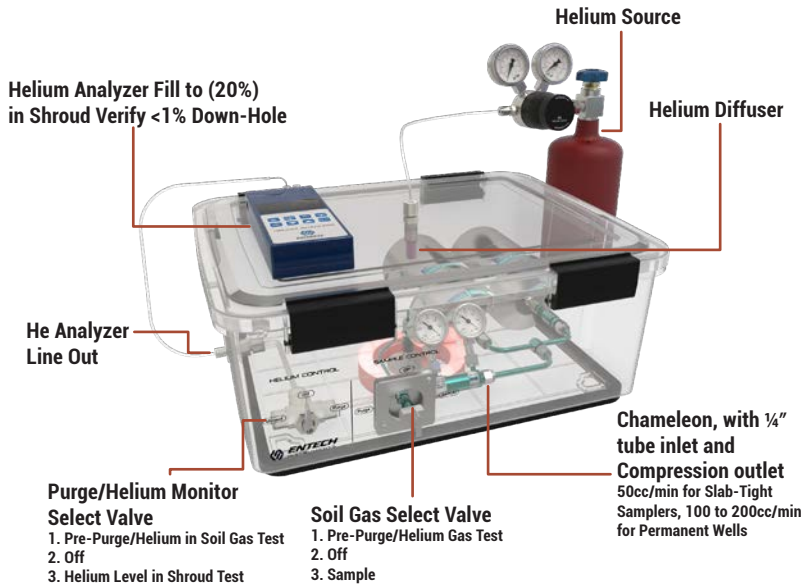
Entech provides 1800 psig He cylinders with a regulator, operated at 2-200 psi, to complete the all-in-one sampling solution.

*PN SG-He-Cylinder*





## Tracer Gas Shroud for Vapor Intrusion



## Tracer Gas Shroud for Well Monitoring



## CS1200E Indoor Air Quality Monitoring Solution



- Industry standard for time integrated sampling, from 1 hour to 1 month!!
- Proven recovery of low level T015 compounds to sub-PPBv levels (Ap Note 2014-05).
- Ultra low background, allowing measurements down to  $10^{-6}$  risk factors reliably, even for compounds requiring detection down to 2 part per trillion.
- Tool-free operation when using Micro-QT™ Valve Option.
- Easy start/stop automation if needed with TM1200 Timer.
- Now even better with improved Silonite™ coating!!

### Indoor Air Quality Test Kit

DESCRIPTION	PART #
<b>24 Hour Sample - 6L Canister</b>	<b>IAQ-60S-24-KIT</b>
6L Can with coated TrueSeal™ Valve	29-10622
Coated Flow Controller	39-CS1200ES4
<b>24 Hour Sample - 3.2L Canister</b>	<b>IAQ-32S-24-KIT</b>
3.2L Can with coated TrueSeal™ Valve	29-10322
Coated Flow Controller	39-CS1200ES4+

*24 Hour Kits are available for 600cc & 1L canister sampling*

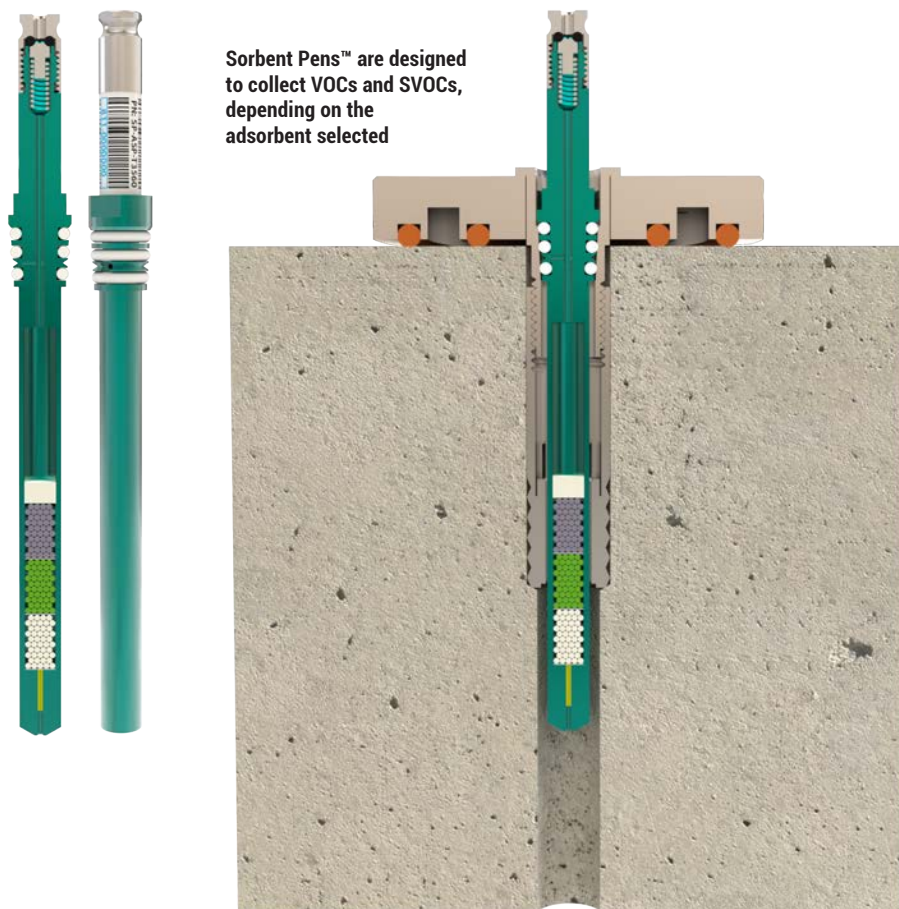


### Optimized Soil Gas Sampling

Slowing Down the Sampling Rate to 0.1 to 3 cc/min

- Combining the CS1200E and the Chameleon can drop the sampling rates down below the 10 cc/min limitation of the Chameleon alone.
- Allows a 3-24 hour sampling into a 600cc to 1L Silonite canister if needed.
- The CS1200E can be added to any Chameleon application.

*\*Note: Leak checking is not needed for long sampling times where the sampling rates are far below the soil gas diffusion rates, making ambient air dilution of the soil gas highly improbable.*

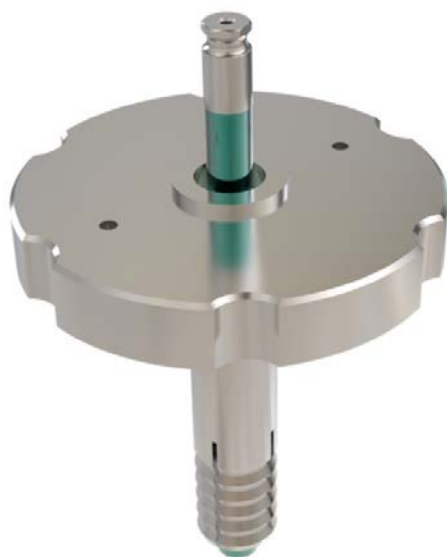


## Soil Gas with Sorbent Pens™

### SVOC Recovery During Vapor Intrusion Sampling

- SVOCs will not transfer through lines or come out of canisters quantitatively.
- The correct adsorbent must be chosen to allow collection and then release by thermal desorption in the laboratory.
- The Sorbent Pen allows active sampling by connecting the outlet of the Chameleon to an evacuated canister with a restricted flow similar to our CS1200.
- Active sampling will provide non bias concentrations of PCB, Dioxins, Diesel and other SVOC's in the soil gas matrix.





## Sub-Slab Vapor Intrusion Semi-Volatiles Sampling Kit

For Recovering PCBs, Diesel, and other SVOCs

DESCRIPTION	PART #
<b>Sub-Slab Sampling, 10cc/min with Down-hole Gauge Kit</b> (600cc, 1L, or 1.4L Cans sold separately)	<b>SG-SS-SP-10-Kit</b>
Anchor, Wedge, and Plug Kit	SG-SS-AWP-Kit
Sorbent Pen Compatible Bonnet and Water Dam	SG-SS-Bonnet-SP
Diffusive Air Monitoring Sorbent Pen w/ Tenax TA (35/60)	SP-DSP-T3560
10 cc/min Chameleon with Female MQT Inlet/Outlet	SG-CHAM-QQ-010
Down-Hole Gauge for measuring vacuum below ground soil	SG-CHAM-DHG
50cc plastic preflush syringe and needle	07-20050

INDIVIDUAL PARTS	PART #
Slab Anchor and Plug Kit - Not reuseable. One needed per installation.	SG-SS-AWP-Kit
600mL MiniCan with Micro-QT™ Valve	29-MC600QT
1L Silonite MiniCan	29-MC1LQT



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Chameleon Soil Gas Sampler – 180207 – 7.4