



ENTECH
INSTRUMENTS

See What's Really There™



2022 CATALOG

Solutions for Chemical Monitoring & Analysis

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President's Letter



Entech Instruments is continuing its tradition of providing the most advanced and accurate sample preparations systems available for headspace and gas sample analysis by GC and GCMS. Our new Multi-Capillary Column Trapping Systems (MCCTS) are transforming the way that gas phase sample preconcentration is performed prior to GC injection, all without the use of liquid nitrogen or even electronic cooling systems. These "fan cooled", extremely robust and reliable multi-stage capillary column traps manage water and CO₂ hundreds of times better than any packed trap system. This means much faster release for better chromatography, supporting "faster" GC methods, while also demonstrating far better immunity to contamination when exposed to high concentration

samples. Our MCCTS traps have been implemented in a full cryogen free TO15 solution with much faster GC injections and shorter run times than other TO15 systems on the market. Other applications using this revolutionary capillary trapping technology will also soon be announced.

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Entech's patent pending Sorbent Pen™ technology takes SPME to the next level by providing enhanced sensitivity, improved quantitation, and greater robustness than its fiber-based predecessor. Sorbent Pens utilize a unique flow through cartridge that forms a seal on a vial allowing a vacuum to be created within the vial. This new technique called VASE (Vacuum Assisted Sorbent Extraction) has been demonstrated to cover the entire range of analytes from the lightest volatile compounds (Freon 12/Vinyl Chloride and others) to very heavy 5-6 ring PAH compounds, while remaining in the headspace to avoid actual contact with the sample matrix. With 50-150x higher phase loading and the use of traditional adsorbents with thousands of times more surface area than SPME, the Sorbent Pen™ can fully extract difficult compounds from complex matrices providing superior sensitivity and reproducibility. Sorbent Pens are also available for performing Diffusive and Active air monitoring, making the Sorbent Pen technique extremely versatile. Our newly released SPR40 -Sample Preparation Rail promises to be a game changer for headspace sample preparation and general thermal desorption methods. Rather than desorbing a TD tube into a completely different instrument with separate traps, transfer lines, and rotary valves to have to clean and maintain, the SPR40 allows thermal desorption of Sorbent Pens directly into a GC or GCMS to allow dramatically improved recovery, consistency, and easy of maintenance. Watch for a new wave of applications coming out in 2019-2020 using the SPR40 Robotic inlet.

Our unmatched Silonite™ surface coatings continue to be perfected, resulting in the most consistent, durable, and inert coatings available for GC inlet systems and for mercury vapor handling without surface interactions. Silonite™ surface treatments play a vital role in achieving our ultimate goal; to provide our customers with complete solutions for "analytical grade" VOC and SVOC handling and inlet systems that can sample, store, and recover virtually all GCMS compatible compounds.

Finally, for US EPA Method TO-15 and China HJ-759, Entech is proud to be the only supplier that manufacturers and supports the complete solution for sampling and analysis of airborne contaminants using Silonite™ coated stainless steel canisters. Entech has assembled an extraordinary and talented team of Chemists and Service Engineers with a combined knowledge of over 200 years of laboratory and field experience – to provide our clients with premier customer service and on-site support. To our valued customers we would like to say thank you for your patronage through the years and we look forward to servicing your analytical needs for many years to come.

Sincerely,
Daniel B. Cardin – President



Entech Instruments is a leading developer and manufacturer of analytical instrumentation that supports professionals around the world in the Environmental, Industrial Hygiene, Food & Beverage, Product Testing, Forensics, and Clinical Analysis markets.

To provide solutions for such a diverse set of industry applications, Entech has assembled an extraordinary and talented team – a combined knowledge of over 200 years of laboratory and field experience – to provide our clients with premier customer service and on-site support. We invite you to share your application challenges and requirements so we can create a customized solution just for you.

~ The Entech Team

Sorbent Pens™ for Quantitative Air Monitoring

Sorbent Pens are Entech's high-tech version of classical thermal desorption tubes. Two different Sorbent Pen versions are used to either collect air samples via diffusion without the aid of a pump (Diffusive Sorbent Pens, or DSPs), or by utilizing a pump or vacuum sampling device to draw a known volume of air through the sorbent (Active Sampling Pens, or ASPs). Unlike the standard thermal desorption tubes that use the same geometry to do either diffusive or active sampling, Sorbent Pens have been optimized to improve performance for both sample collection approaches. In addition, Sorbent Pens have an integrated valve on one end and a tool-free sealing sleeve to seal the other end, which not only simplified their operation, but takes the guess work out of which side to sample into, and which side to desorb out of. With Sorbent Pens, there is no way to get this backwards!!

DSP - Diffusive Sorbent Pens™



1 hour to 2 weeks

Sun	Mon	Tue	Wed	Thu	Fri	Sat
		1	2	3	4	5
6	7	8	9	10	11	12
13	14	15	16	17	18	19
20	21	22	23	24	25	26
27	28	29	30	31		

When To Use?

- Use when sampling for 1 hour to 2 weeks
- When the boiling point range is not too large
example C4-C8
For compounds that are NOT bound to particles (under C16)
- When method calls for diffusive sampling

Benefits?

- Very easy use
- No pumps or vacuum source
- Uptake rate known for dozens of compounds
- Ideal for BTEX monitoring
- Both Environmental and Industrial Hygiene applications

ASP - Active Sorbent Pens™



5 minutes to 8 hours



When To Use?

- Use for faster sample collection: **5 min to 8 hours**
- For wider boiling point ranges:
(-40° C to >500° C)
- When method requires an active sampling

Benefits?

- Multiple adsorbent traps are available which substantially increases the range of recoverable compounds
- Accurate volume collection measurements made using Entech's Accu-Bottle vacuum sampler

ASPs - Active Sampling with Sorbent Pens™

Active sampling dramatically speeds up the sampling process, because rather than sampling at about 0.5cc/min via diffusion, the sampling rates can be increased to several cc's per minute. This is accomplished by providing both a vacuum source to draw the air through the sampler, and a way to measure the total volume of air sampled. Although adding a vacuum device that also measures the collected volume adds complication and cost to the sampling event, there are many advantages to performing active sampling:

1. Samples are collected over a shorter period of time. This is advantageous when the period of investigation for toxicology reasons must be below 8 hours.
2. A much wider range of compounds can be recovered, by using a multi-bed trap.

Multi-bed traps are packed with weak adsorbents at the trap's entrance, and then use stronger adsorbents further into the trap. This creates an adsorbent strength gradient that allows heavier VOCs to be recovered without using extremely high desorption temperatures, while still recovering the lighter compounds that would have otherwise broken through a weak, single bed adsorbent. A typical number of adsorbents in a multi-bed trap is 3, above which there are diminishing returns relative to the difficulty in packing these traps reproducibly.

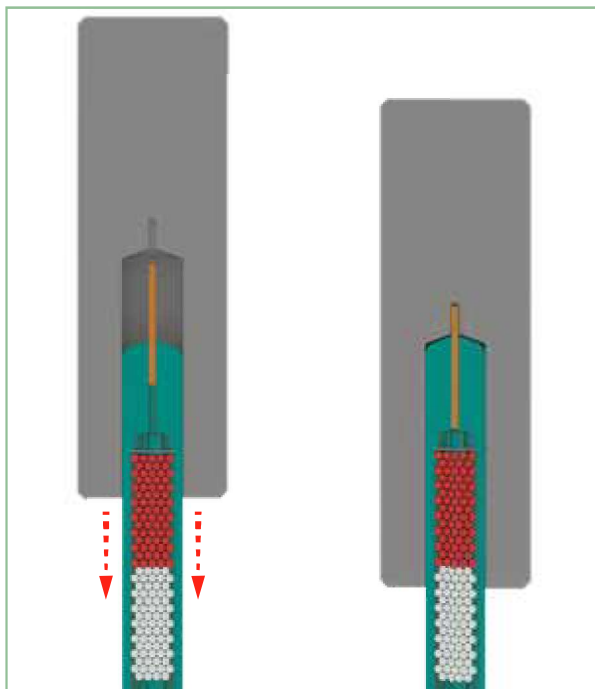
One of the more important disadvantages in active air sampling onto adsorbents can be eliminated by simply collecting air at a slower rate. When sampling at rates that are more than about 20-30 times the diffusion rate, a phenomenon called "channeling" can create inconsistencies in sample penetration into the tubes, and therefore consistency from tube to tube, and even carryover from one sampling event to the next. Like almost all materials, adsorbents expand when they are heated and then contract upon cooling. When adsorbents contract, they leave gaps that are low impedance flow paths that allow chemicals in air to penetrate much further into the tube than if these gaps are not present. Since these gaps are inconsistent from tube to tube, or even one heating cycle to the next, the extent of penetration will also be inconsistent. When the sampling rates are slowed down, the extent of penetration into the tube will decrease, and recoveries between tubes and sampling events will become more consistent, despite a different pattern of channels within each adsorbent tube.

The Active Sorbent Pen has been designed to not only minimize the creation of channels, but they have a very small entrance hole that allows sampling rates to be substantially reduced without the potential for reverse adsorption off the front of the tube. Optimal sampling rates from 0.2 to 20 cc/min are used to trap a very wide range of compounds, from C3 to over C25. Like all Sorbent Pens™, the ASPs are desorbed within about 2cm of the GC column to ensure quantitative delivery to the analyzer. The simple replacement of the 5800 SPDU liner provides a completely new flow path to the GC column, eliminating the potential for degradation of analytical performance over time.

Sorbent Pen Selection Guide

Name / Geometry	Adsorbent	Part #	Label Color	Label	Effective Range	Packing Diagram
Active Sorbent Pens (1/4" OD)	Tenax® TA 35/60	SP-ASP-T3560	White		100°C to > 450°C	
Active Sorbent Pen (1/4" OD)	Glass Beads / Tenax® TA 35/60	SP-ASP-PDMST3560	Red / White		100°C to > 450°C	
Active Sorbent Pens (1/4" OD)	Tenax® / Carboxen™ X	SP-ASP-TCPX	White / Blue		80°C to >450°C	
Active Sorbent Pens (1/4" OD)	Carboxen™ C & B/ Carboxen® 1000	SP-ASP-CPCBC1000	Purple / Green		-60°C to >400°C	
Active Sorbent Pens (1/4" OD)	Blank / Empty	SP-ASP-0	Yellow		NA	
Active Sorbent Pens (1/4" OD)	Tenax® + Carboxen® 1000	SP-ASP-TCBXN	White/Green		-60°C to >450°C	

Active Sorbent Pen 7um Column Insert



After 5-10 samplings, or after sampling in dusty environments, the coated inlet metal capillary column can be replaced simply by pulling it out with a pair of pliers, and then using the calibrated insertion tool to create the perfect press fit every time. Just pre-load the capillary inlet into the ASP Pen, place the insertion tool over the top, and then press down to snap the column into place. The patent pending pre-column ensures that particles containing the heavier SVOCs are maintained in a high flow velocity part of the Pen to greatly improve recovery during thermal desorption into a GCMS.

Description	Unit	Part #
Active Sorbent Pen 7um Column Insert	EA	SP-ASP-CAP07
Column Insert Tool	EA	SP-ASP-CAP-TOOL

Collecting ASP Samples using the "Accu-Bottle Sampler"

Another source of errors when actively sampling air onto adsorbent tubes comes from incorrectly measuring the volume that passes through the tube. Generally, time and flow rate is used to collect a known volume, but flow rates using sampling pumps are not always constant, and pumps that measure and record flow rates are very expensive and can still suffer from flow measurement errors. Entech has developed a simple means of controlling flow and directly measuring trapping volumes that is far more accurate, reliable, and best of all cost effective. Using the Accu-Bottle sampler, a bottle of known volume is evacuated either in the lab or in the field, and then sampling is either performed until the bottle reaches atmospheric pressure, or until a desired pressure increase has occurred. The Accu-Bottle sampler uses precision flow elements to sample at either 10 or 30cc/min, based on volumes and sampling times desired. Again, to avoid channeling and reduced recoveries, the best data will be obtained when sampling at 10cc/min, although 30cc/min is acceptable in some cases. A simple pump can be used to recharge the Accu-Bottle sampler in the field, or samplers can be evacuated in the lab, and will remain under vacuum for weeks awaiting use in the field. With the Accu-Bottle samplers, tube to tube consistency is dramatically improved, allowing active sampling to be a reliable means for quantitative air measurements over a very wide molecular weight range.

Description	Unit	Part #
10cc/min 250mL Accu-Bottle™ Sampler	EA	SP-ABS250-010
10cc/min 500mL Accu-Bottle™ Sampler	EA	SP-ABS500-010
10cc/min 1L Accu-Bottle™ Sampler	EA	SP-ABS1000-010
30cc/min 250mL Accu-Bottle™ Sampler	EA	SP-ABS250-030
30cc/min 500mL Accu-Bottle™ Sampler	EA	SP-ABS500-030
30cc/min 1L Accu-Bottle™ Sampler	EA	SP-ABS1000-030

