



**ENTECH**  
INSTRUMENTS

*See What's Really There™*



# MillionAir

— CTS™ SYSTEM —  
Column Trapping System

***The Next Generation in High Throughput  
Soil Gas & Trace Air Analysis.***

**— NEW —**  
**LN<sub>2</sub> FREE**  
**7200CTS**

# MillionAir-CTS™ System

Advanced injection control

10<sup>6</sup> Concentration Range without Dilution



SHIMADZU

ThermoFisher  
SCIENTIFIC

Agilent Technologies



## Next Generation Air & Gas Analysis

High Throughput Canister Analysis of Air & Soil Gas That Dramatically Improves Your Bottom Line

### Introduction

The 7200CTS / 7650-M combination, also known as the “MillionAir-CTS™ Analysis System,” is the most advanced instrumentation ever developed for the analysis of volatile and light semi-volatile compounds in air and soil gas. Now, analyze any size canister in your inventory with the quality assurance of direct inlet robotics. The 7650-M includes the “SampleSafe” feature that performs rapid screening of samples without exposure to the 7200CTS trapping system, thereby maintaining far superior system hygiene relative to other preconcentration systems.

The MillionAir-CTS™ system gets its name by being able to handle samples with a million fold difference in concentration without pre-dilution. Air labs have always been faced with the dilemma of having to screen potentially high concentration air samples to determine if dilution will be needed, while at the same time preventing the contamination of their analyzer. Rotary valve autosamplers, used by all other manufacturers, expose potentially high concentration samples to inlet lines for hours or even days, creating a background in the system that may take days or even weeks of flushing to eliminate.

With the MillionAir-CTS™ system, contact with the sample is only a few seconds to a few minutes long. The 7650-M contains its own loop valve that can bypass the 7200CTS primary traps altogether, injecting the sample directly to the GCMS either for screening purposes or for quantitative analysis. Samples can be screened in as little as 4–6 minutes using an isothermal analysis to determine levels of TCE, PCE, and BTEX, which are the major contaminants

in soil gas that can raise havoc in other systems when high concentration samples are processed without dilution. With the Entech MillionAir-CTS™ system, both screening and analysis using sample volumes as low as 0.1 cc can extend the calibration curve well into the PPM range, drastically reducing the number of samples that have to be diluted before analysis. The MillionAir-CTS™ system is the ideal solution for today's competitive TO-15 laboratory.

### Introducing the Cryogen-Free 7200CTS

Entech is proud to release the world's first multi-capillary column trapping system (MCCTS - Patent Pending), for the precise concentration of vapor phased volatile chemicals in the boiling point range of -50°C to 230°C without the need for liquid nitrogen or complicated electronic cooling. Evolving from 28 years of continuous improvements and industry feedback on earlier preconcentrators, the 7200CTS is dramatically improving TO15 performance and sample throughput. Many of the important advancements that have led to its unparalleled reproducibility, such as quantitative volumetric measurements utilizing “Accu-Sample Technology,” and digital valve isolation, are left unchanged from its market leading LN2 based 7200 predecessor. The core trapping system, however, has been completely reengineered, giving way to a technology that will likely replace the utilization of packed traps for most, if not all methods requiring the preconcentration of vapor phase volatile organic compounds.

Description	Unit	Part #
<b>7200CTS   7650-M, MillionAir CTS System*</b>		
<b>System Includes:</b>		
7200CTS Preconcentrator (with 1cc Loop) (120VAC)	EA	7200CTS-01
7200CTS Preconcentrator (with 1cc Loop) (240VAC)	EA	7200CTS-01-HV
7650 with Loop Injection (120VAC)	EA	7650-M
7650 with Loop Injection (240VAC)	EA	7650-M-HV

# 7200CTS | 7650-M MillionAir-CTS™ System

## Feature Summary

- Direct Inlet Robotics**  
*The 7650-M features a single inlet with a Silonite-D™ coated transfer line to eliminate stream select rotary valves and multiple inlet lines from the inlet flow path for the best possible sample isolation and analytical accuracy.*
- New! MCCTS (Multi-Capillary Column Trapping) & Cryogen-Free Analysis**  
*Experience precise concentration of vapor phased volatile chemicals in the boiling point range of -50°C to 230°C without the need for liquid nitrogen or complicated electronic cooling.*
- SampleSafe Screening**  
*The 7650-M features SampleSafe that includes the ability to perform rapid screening of samples without exposure to the 7200CTS trapping system, thereby maintaining far superior system hygiene relative to other preconcentration systems.*
- A new standard of system hygiene & uptime.**  
*The elimination of packed traps has led to a system with unrivalled uptime as there is far less trap carry-over, even after high concentration samples.*
- Improved precision and sensitivity.**  
*Full TO15 validation with low %RSDs for most compounds in 0.1- 30PPBv standard curve.*
- Near complete elimination of water!**  
*Water is almost unretained when using capillary traps without the need for cryogen or complex electronic cooling.*
- Quantitative Accuracy**  
*Sampling and analytical precision is not affected by changing matrices (air, humid air, nitrogen, helium, CO2, methane, argon, hydrogen).*

**Now, analyze all sample types, including Tedlar® bags, canisters, and thermal desorption tubes!**  
*(Tube screening and analysis requires the addition of the 5400B Thermal Transfer System)*



24 to 80 Minicans



24 to 80 Bottle-Vac Samplers



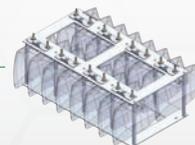
Sampling Media Options



Up to 172 HDS Personal Monitors



Up to 16 Tedlar Bags



7650-M with oven.

Position A Short Tray	Oven
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Position B Long or Extra Long Trays
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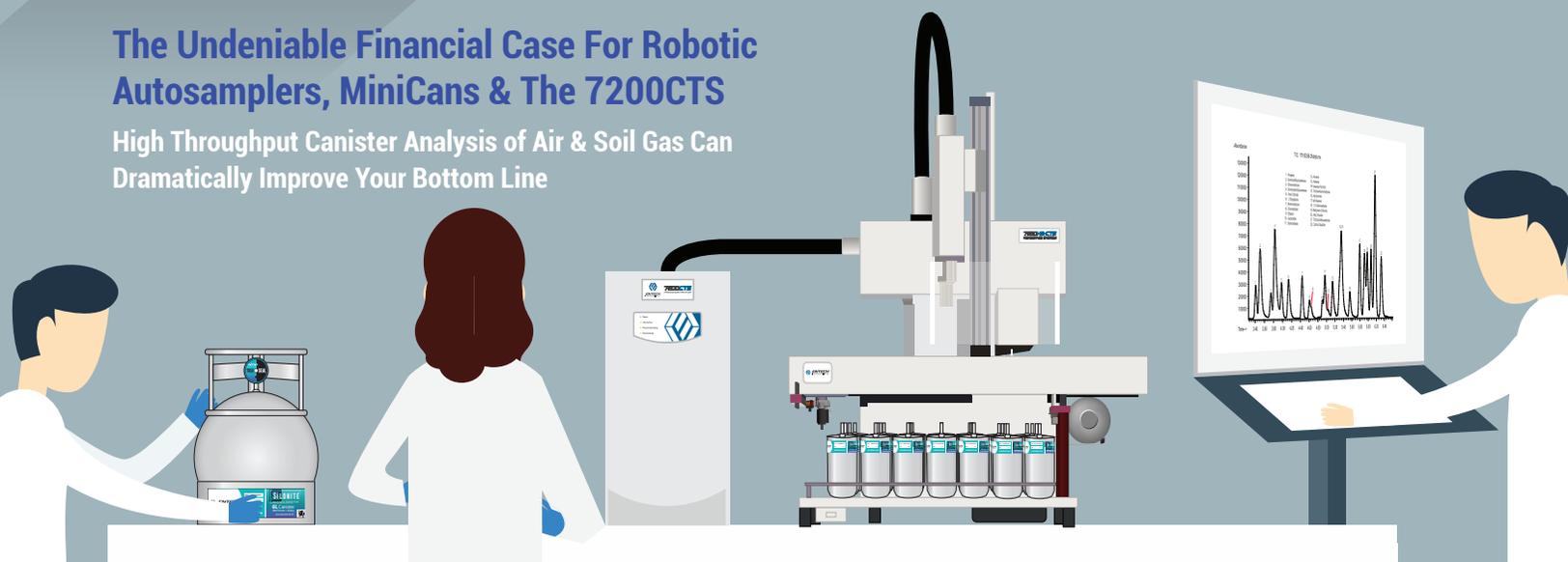
7650-M without oven.

Position A Long or Extra Long Trays
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Position B Long or Extra Long Trays
--

# The Undeniable Financial Case For Robotic Autosamplers, MiniCans & The 7200CTS

High Throughput Canister Analysis of Air & Soil Gas Can Dramatically Improve Your Bottom Line



## New Technologies are Driving Business Model Changes

CTD (Cold Trap Dehydration) systems that utilize packed traps have played a workhorse role in the modern analytical air lab, but technology has evolved and it's important to highlight the recent achievements of Multi-Capillary Column Trapping technology and the significant impact these systems will have on the economics of air and soil gas laboratories. Here we evaluate the efficiency improvements that come with the latest preconcentration and robotics solution, the **MillionAir-CTS™**; including, faster cycle times, rapid screening for high concentration samples, system sample capacity, and even the shipment savings from the utilization of smaller canisters.

## Sample Run Efficiency: CTS vs Packed Trap CTD Systems

The **cycle times** for the LN2 free 7200CTS, from injection to injection, have been improved by as much as 7 minutes over existing CTD systems. The following table highlights the improvements and time savings.

### Time Savings Model of 7200CTS vs 7200 & 7100(x)

Changes	Description	
Cool down.	Elimination of a cool down step after bakeout.	3 min
Cool down.	Elimination of 3rd trap = one less cool down cycle.	1.5 min
Sample Transfer	Sample transfer time from trap 1 to trap 2 reduced by 50%.	2 min
Sample Transfer	LN2 Focusing Trap Eliminated = one less transfer.	3.5 min
Bake Out	Duration significantly shorter.	7 min
<b>Total Procedural Time Savings</b>		<b>17 min</b>
<b>Less initial trapping time difference</b>		<b>-10 min</b>
<b>Total Time Savings Per Run</b>		<b>7 min</b>

If we assume even a 5 minute average, then reducing cycle times from 30 to 25 minutes means a savings of 10 minutes per hour. Considering that **MillionAir-CTS™** automation enables overnight operation, this equates to 240 minutes saved per day or an extra 9 samples processed.

Benefits	
Throughput Improvement	17-20% More Analyses

## Sample Screening & Prevention of Instrument Downtime

The **MillionAir-CTS™** system can play another, and equally important role as a "sample" screener. At just 6 minutes from injection to injection, the **MillionAir-CTS™** can screen 240 samples per day to look for high concentrations that could potentially contaminate and render other rotary valve systems inoperable for days. A single down day for one instrument can cost thousands in productivity and system cleanup can sometimes take 2-3 days. If you contaminate a system at the beginning of a run, you'll also need to repeat those samples.

The value of contamination prevention and system down days can easily equal the cost of a **MillionAir-CTS™** over the course of a year. Just one system can screen enough samples to keep 4-5 other systems safe and productive.

Benefits	
Zero System Down Days	Thousands in Annual Productivity Savings

## Sample Capacity & Automation

The MillionAir-CTS™ system is designed to take automation to a whole new level by supporting unattended analysis of up to (24) of the Entech 1L & 1.4L canisters, perfect solution for low level TO-15 applications, or up to (48) 450mL/600mL canisters for 24hr automated soil gas analysis. For soil gas, this is a capacity increase of 200% when compared to using traditional canister towers. By utilizing 3 dedicated calibration standard or blank positions, the MillionAir-CTS™ can schedule the QC checks every 20 samples or as needed.

### Benefits

200% Capacity Increase

Inline QC

## Single Inlet Advantages

TO15 laboratories have been increasingly asked to analyze canister samples that are at elevated levels, many of which can be as high as several thousand PPM. Canister towers are not optimally designed to handle higher concentration samples due to their longer transfer lines, cold fittings, and use of rotary valves. Canister towers have significantly more surface area than the single inlet line of the 7650 and this can cause significant carryover if not properly managed. For example, with a (16) position inlet, a high concentration sample in the PPM range placed on one of the positions and left overnight would create a residual background level that is much higher than the other autosampler positions, even after substantial backflushing. With robotic autosamplers, exposure to the sample occurs for only a few minutes while the sample is being drawn into the preconcentrator, then the heated line is immediately flushed with helium or nitrogen to minimize exposure time.

### Benefits

Single Inlet  
Minimizes Carryover

Higher Productivity



## Smaller Canisters, Bigger Margins

6L canisters have played an important role in trace level analysis over the last 30 years, but instrumentation has become many times more sensitive over that time and canisters have also become more inert. 1.4L canisters from Entech offer enough sample volume for four, possibly five analysis, all in a compact form that is cheaper to ship, easier to handle, and more efficient to analyze.



## Enjoy Your Hassle-Free and Tool-Free Lab!

Switching to Entech robotics also means you'll be keeping your tools in the drawer. Loading the Micro-QT™ equipped Mini-Cans™ into the 7650 robotics tray takes just seconds versus having to manually attach large canisters onto tower autosamplers using wrenches. Using tools both in the field and in the lab introduces the chance of damaging fittings and causing leaks. The Micro-QT is a next generation air and gas valve offering uncompromising leak-tight performance in an ergonomic design. Once the valve is connected to tubing using compression fittings, mating male and female valve ends is literally just a quick "snap".

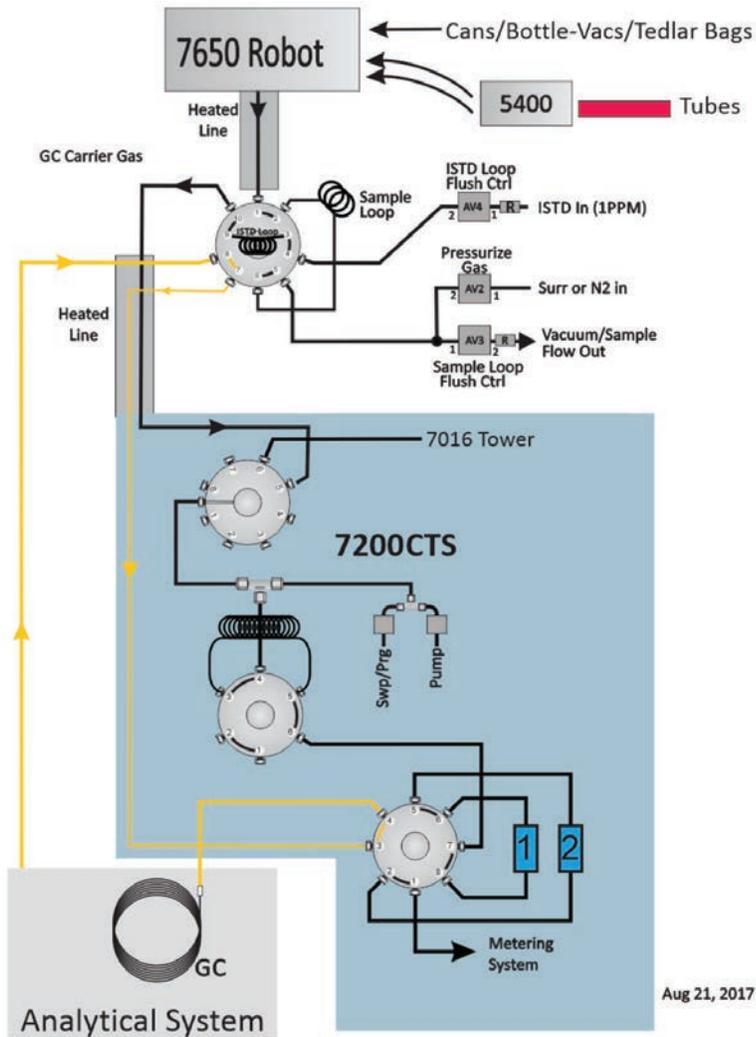
### Benefits

Save 20 - 50% on  
Shipping Cost

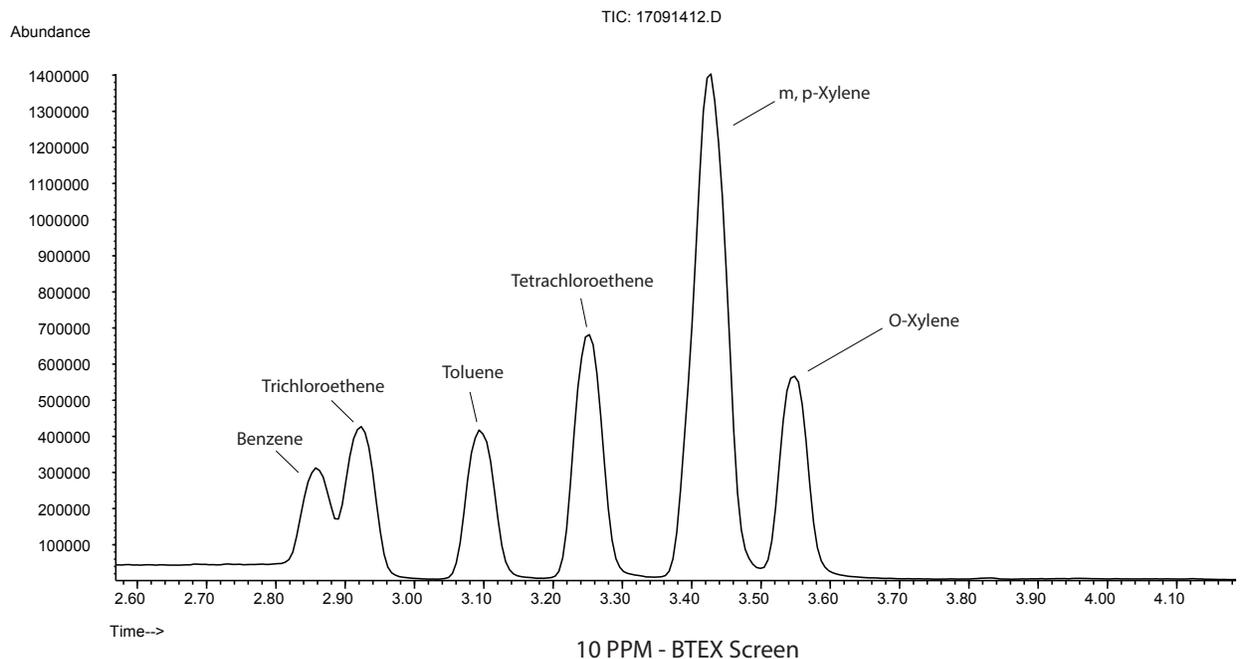
Tool-Free Micro-QT's =  
No More Damaged Valves



# MillionAir 6 Minutes Per Injection Screening to Avoid Contamination



- Small 0.1 cc loop in MillionAir-CTS™ System injects sample directly to the bypass valve and to the GC, avoiding contact with the 7200CTS stage 1 and 2 traps
- Eliminates carryover even when exposing the system to samples 100,000x higher in concentration than the Method Detection Limits (MDLs). Rotary valve autosamplers can be contaminated with concentrations just 100-500x the MDLs.
- Just 6 minutes sample screening runs "injection to injection" are possible using isothermal GCMS operation (150°C Isothermal below)
- Catch high concentration samples before they ruin your day!



# High Concentration Carry-Over Study MillionAir-CTS™ System with 6890/5973 GCMS

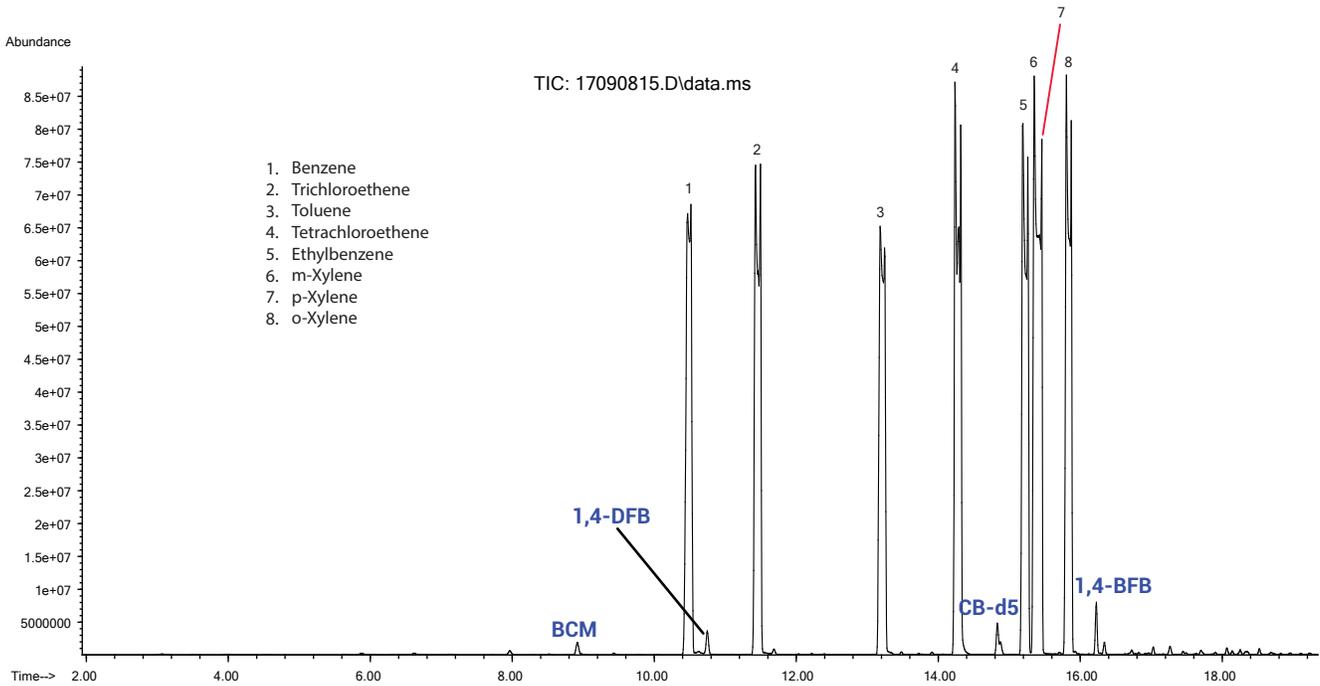


Figure 1 - Carry-Over Study – Chromatogram showing 100cc of 10,000 PPBv TCE, PCE, BTEX standard.

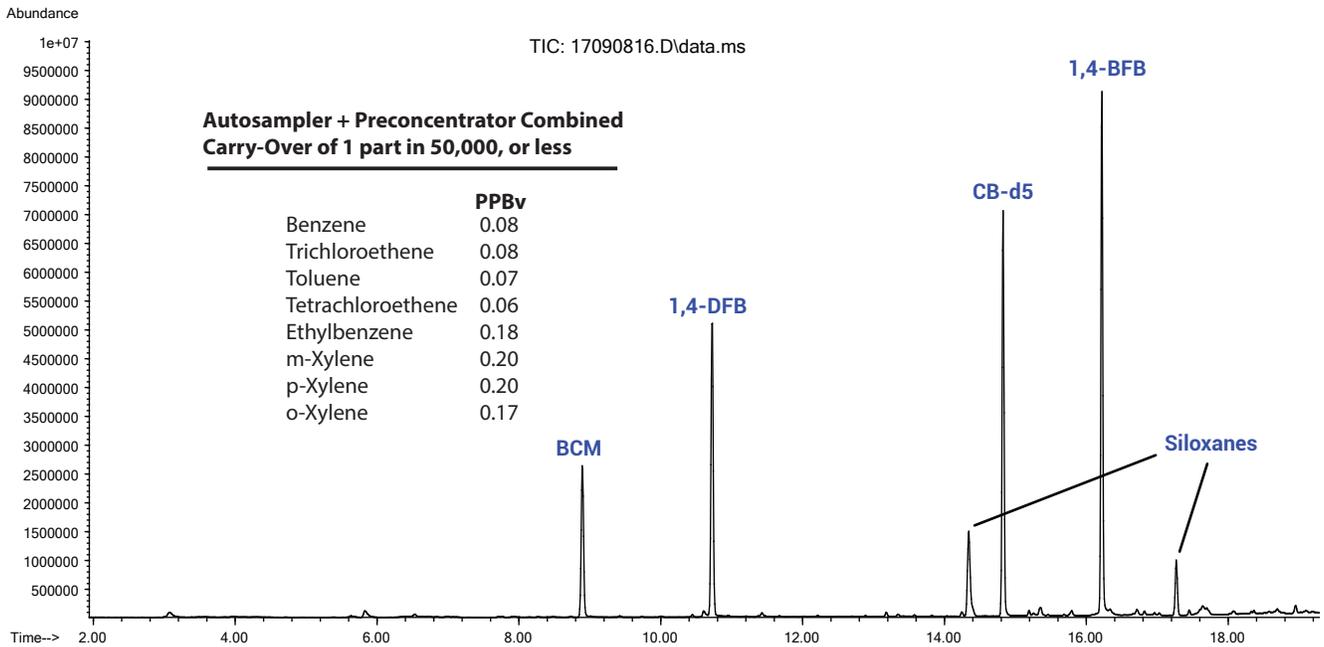
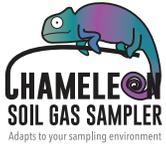


Figure 2 - Carry-Over Study – Chromatogram showing 100cc humidified blank run immediately following 10,000 PPBv Standard.



**CHAMELEON**  
Soil Gas Sampling



**MICRO-QT™**  
Valves



**SILONITE™**  
Coating Advantages



**MCCTS TRAPS**  
Multi-Capillary Column Trap

**FLOW PROFESSOR**  
Calibration System

*Streamline your canister operation by maximizing lab efficiency and productivity while improving the reliability of analytical results.*

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