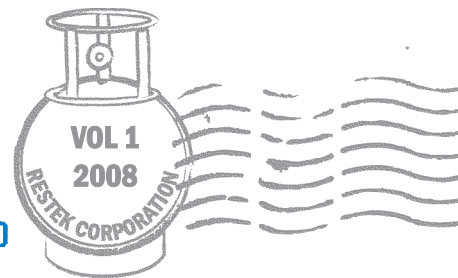


# RESTEK AIRMAIL



## Meet the Air Team!



**Spotlight on:**  
**Silvia Martinez**  
Innovations Chemist

*"At Restek, we strive to introduce innovative and quality products and applications by listening to our customers."*

## How to Prolong Canister Life

What reduces canister performance and longevity? Leakage is the most common reason for canister failure, but contamination and damage to the fused silica lining can also send canisters to the scrap yard prematurely. Here are some tips to protect your investment:

### 1. Prevent leaks

Use proper handling to avoid these 3 leading causes of leaks.

#### a. Particles in the valve

You can prevent particles from entering the valve by always using a 2 or 7µm particulate filter during sampling and on your canister cleaning equipment. Also, protect the valve inlet by replacing brass dust cap when not in use. The EPA-recommended metal-to-metal sealing valves provide the greatest inertness, but tend to be more sensitive to particulate damage than other valve types.

#### b. Galled thread fittings

Avoid galled thread fittings by using a gap gauge to prevent overtightening of compression fittings. Turning only ¼ turn past finger-tight is another rule of thumb to prevent overtightening. Use brass compression fittings on stainless steel, during nonsampling activities, such as cleaning or calibration, to minimize thread damage. Galled threads may also cause a poor connection to vacuum/pressure gauges, resulting in inaccurate measurement and misleading conclusion that canister leakage exists.

#### c. Overtightened valve

Canister valves are designed to close securely with hand tightening only. Overtightening a valve closure with a wrench can damage the valve seat where the seal is made.

### 2. Reduce contamination

a. Segregate high concentration (ppm) cans and trace concentration (ppb) cans. Use dedicated canisters, or gas sampling bags, for ppm level sampling, since it is extremely difficult to remove impurities from ppm sampling to a level suitable for trace sampling.

b. Clean the entire sampling train as you would the can to minimize introduction of contaminants into a clean can. Maximum temperature is 80°C on the gauge and 90°C on Restek's Veriflo flow controller.

c. High temperature (>100°C) humidified air (steam cleaning) provides the most effective way to remove contamination from electropolished cans (TO-Can™ or SUMMA® canisters), but can damage fused silica lined cans. See #3 below for proper cleaning of fused silica lined cans.

### 3. Avoid damage to fused silica lined cans

Be sure to follow method recommendations when cleaning your canisters to avoid damaging the fused silica lining. Cleaning studies of SilcoCan™ canisters using humidified air and heat at 80°C and 125°C have shown reduced recoveries of sulfur compounds, when compared to using nitrogen under the same conditions. This irreversible damage is due to oxidation of the surface, creating active sites that may affect the recovery of reactive or polar compounds. Strong acids and bases may also result in damage to the internal can surface.

## Thermal Desorption Unit (TDU) Tubes



- Variety of sorbents to collect a wide range of VOCs.
- Use glass tubes for maximum inertness in active sampling.
- Choose stainless steel tubes for either active or passive sampling. No sampling pump necessary for passive sampling with diffusion caps!
- Individually etched with unique serial number for convenient sample identification.
- Available unconditioned or preconditioned and ready to sample. Tubes are reusable after thermal desorption.

### method applications

Method	Application
US EPA	TO-17
ASTM	D-6196
NIOSH	2549
DIN EN ISO	16017

### Specifications

Dimensions: 1/4" OD x 3-1/2" long  
 Low sampling rates:  
 0.01-0.20 L/min.  
 (<10L total volume)  
 Long-term storage caps are supplied with conditioned tubes

High-quality thermal desorption tubes by Markes International are now available from Restek. These sorbent tubes are suitable for ppt to ppm concentrations of volatile organic compounds (VOCs) in ambient, indoor, and industrial hygiene environments. Available in both stainless steel and glass (for thermally labile VOCs), they fit Markes ULTRA-UNITY, PerkinElmer, and Shimadzu thermal desorbers. Packed tubes come with a report detailing the total mass of sorbent in the tube; conditioned tubes also include a blank chromatogram.

Thermal Desorption Tube Sorbent	Applications
Tenax® TA	Vapor phase organics from C6/7 to C26
Graphitized Carbon	Vapor phase organics from C5/6 to C14
Tenax® GR/Carbopack™ B	Vapor phase organics from <i>n</i> -C5/6 to <i>n</i> -C20 (EPA Methods TO-14/TO-15/TO-17)
Carbopack™ B/Carbosieve™ SIII	Vapor phase organics from <i>n</i> -C2/3 to <i>n</i> -C12/14 (EPA Methods TO-14/TO-15/TO-17)
Tenax® TA/Graphitized Carbon/Carboxen™ 1000	Vapor phase organics from C2/3 to C20
Carbopack™ C/Carbopack™ B/Carbosieve™ SIII	Vapor phase organics from <i>n</i> -C2/3 to <i>n</i> -C16/20 (EPA Methods TO-14/TO-15/TO-17)

### Thermal Desorption Unit Tubes, Unconditioned and Conditioned & Capped

Description	qty.	Unconditioned		Conditioned & Capped	
		Stainless Steel	Glass	Stainless Steel	Glass
		cat.#	cat.#	cat.#	cat.#
TDU Tubes, Tenax TA	10-pk.	24056	24062	24080	24086
TDU Tubes, Graphitized Carbon	10-pk.	24057	24063	24081	24087
TDU Tubes, Tenax GR/Carbopack B	10-pk.	24058	24064	24082	24088
TDU Tubes, Carbopack B/Carbosieve SIII	10-pk.	24059	24065	24083	24089
TDU Tubes, Tenax TA/Graphitized Carbon/Carboxen 1000	10-pk.	24060	24066	24084	24090
TDU Tubes, Carbopack C/Carbopack B/Carbosieve SIII	10-pk.	24061	24067	24085	24091



Stainless Steel, Conditioned and Capped



Glass, Unconditioned

### Thermal Desorption Unit Tubes, Empty

Description	qty.	Stainless Steel	Glass
		cat.#	cat.#
TDU Tubes, Empty	10-pk.	24054	24055

### Thermal Desorption Unit Tubes, Calibration

Description	qty.	Stainless Steel	Glass
		cat.#	cat.#
TDU Tubes, Calibration, Tenax TA 1cm Bed	10-pk.	24075	24076
Description		qty.	cat.
Calibration Solution Loading Rig		ea.	24077
Calibration Solution Loading Rig 9.5mm Replacement Septa		10-pk.	24078
Certified Reference Standard, 100ng BTX on Tenax TA		10-pk.	24079

### Thermal Desorption Unit Tubes, Accessories

Description	Benefits/Uses	qty.	cat.
1/4" Brass Cap and PTFE Ferrules	Use for long-term storage of blank/sampled tubes.	20-pk.	24068
1/4" PTFE Ferrules	Long-term storage caps.	20-pk.	24069
CapLok Tool	Use for tightening long-term storage caps.	ea.	24070
Pen Clip		10-pk.	24071
TubeMate Tool	Assists with tube packing.	ea.	24072
1/4" Stainless Steel Union and PTFE Ferrules	Use for connecting tubes in series.	10-pk.	24073
Diffusion Caps	Required for diffusive sampling with stainless steel tubes.	10-pk.	24074



Stainless Steel, Unconditioned



CapLok Tool



Diffusion Caps

# Thermal Desorption Tubes vs. Canister Sampling

## Which VOC Sampling Technique is Right for You?

Thermal desorption tubes provide a complementary option to canisters for sampling VOCs. Both techniques have advantages and disadvantages and their features must be evaluated for suitability relative to the sampling environment and analytical capabilities. Table I outlines the similarities and differences between these techniques; use this handy comparison to determine which equipment is best for you.

**Table I** Comparison of thermal desorption tube and canister sampling for VOCs.

### Similarities Between Thermal Desorption Tubes and Canisters

- Reusable sampling device.
- Long product lifetime.
- Long-term sample stability.
- Blank certification required prior to sampling.
- Sample concentration required before GC/MS analysis.
- Dry purge helpful to remove moisture before GC injection.
- Ppt sensitivity.
- Method acceptance.
- Collection of wide range of VOCs with single device.
- Useful for screening of unknowns.
- Leak tightness critical to maintaining sample integrity and preventing contamination of a clean device.

### Differences Between Thermal Desorption Tubes and Canisters

	Thermal Desorption Tubes	Canisters
<b>Methods</b>	US EPA TO-17 ASTM D6196 ISO 16017 ISO 16000-6 NIOSH 2549	US EPA TO-14, TO-15 ASTM D5466 OSHA PV2120 NIOSH Protocol Draft
	World-wide acceptance	Gold standard for US ambient air market
<b>Applications</b>	Ambient air, indoor air, industrial hygiene Material emissions Food & flavor Chemical weapons	Ambient air, indoor air, vapor intrusion, emergency response
	C3 to C30	<C3 to ~C10
<b>Handling</b>	Light weight for personal monitoring and general ease of use	Larger and heavier; more costly to ship
<b>Sampling</b>	Active sampling with sampling pump or diffusive sampling without pump is possible with determined diffusion coefficients for each compound.	Passive sampling, no sampling pump required. Long-term sampling possible without battery to recharge.
	Integrated sampling only	Grab & integrated sampling
	Concentrated sample	Whole air
	Proper sorbent selection recommended in methodology.	N/A
	Must sample below sorbent breakthrough volumes to avoid sample loss and irreversible adsorption on sorbent	N/A
	Large sample volumes >100L	Sample volume is function of canister size, 15L max
<b>Analysis</b>	Tube dimensions are instrument specific	Compatible with all manufacturer sample concentrators
	1 injection, more injections possible for some instrumentation	Multiple sample injections
	Concentration range ppt to ppm	Ppt to ppm
	Some sorbents prone to artifact formation.	Low blanks when properly cleaned.
<b>Storage</b>	Sample storage at 4°C recommended for multi-bed tubes to prevent potential migration of compounds to more retentive sorbent which maybe difficult to recover.	Room temperature
<b>Cleaning</b>	Analytical process automatically cleans tube for reuse. Cleans as it analyzes. Conditioning/cleaning and analysis incorporated in one thermal desorption unit.	Canister cleaning requires separate equipment as additional step prior to background certification and sampling.
<b>Cost</b>	\$50-130 each	\$200-700 each

## tech guides

Thermal desorption application guides are available for a broad range of markets. Request your FREE copy today using these part numbers.

**Environmental Air Monitoring and Occupational Health & Safety**  
EVTG1034

**Residual Volatiles & Materials Emissions Testing**  
GNTG1035

**Defense & Forensic**  
CFTG1036

**Food, Flavor, Fragrance & Odor Profiling**  
FFTG1037

## Hot Topic?

Do you have a question, hot topic, or tech tip you'd like to submit to Air Mail? Simply email [Irene.degraff@restek.com](mailto:Irene.degraff@restek.com)



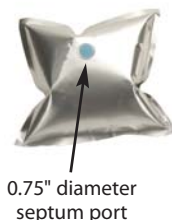
### Canister Air Sampling Timer

- Program up to 12 timed events!
- Capable of both manual and automated operation.
- Perfect for either grab or time-integrated sampling.
- Long battery life; recharges conveniently using the USB port on any PC.
- All stainless steel sample flow path ensures inertness, improving accuracy.

These timers are designed to simplify both automated and manual air sampling. The easy-to-use keypad and graphic display facilitate the programming of up to 12 timed events. They offer the convenience of remote start/stop sampling and permit intermittent sampling throughout a test period. The LCD remains in sleep mode when not in use, greatly extending battery life. Timers are compatible with any canister and flow controller.

Features include: solenoid valve for sampling control, 1/4" Swagelok® inlet and outlet fittings, highly inert stainless steel flow path, and water-proof exterior for outdoor use.

Description	qty.	cat.#
Canister Air Sampling Timer	ea.	24267



### Cali-5-Bond Gas Sampling Bags

- Totally nonpermeable and opaque, providing UV protection.
- Chemically inert—extremely rugged and portable.
- Extra strength—5 mil (0.14mm) thick.
- Easy to use.

Cali-5-Bond air and gas sampling bags provide a simple, reliable, and economic method of collecting air, gas, and liquid samples. The 5-layer construction (made by a patented process) ensures the physical integrity of any sample taken, providing a truly representative sample of the collection environment. Both grab and time-integrated samples can be taken with the use of a sampling pump. The twist-type valve with hose-barb connection enables secure attachment of 3/16" ID sample tubing. The septum port allows easy access via a gas-tight syringe. Bags should not be used at temperatures above 50°C (125°F) and should never be over inflated.

Description	qty.	cat.#
0.5L 6" x 8"	5-pk.	24092
1L 8" x 8"	5-pk.	24093
2L 8" x 12"	5-pk.	24094
5L 8" x 23"	5-pk.	24095
10L 16" x 15"	5-pk.	24096
22L 16" x 25"	5-pk.	24097
44L 24" x 25"	5-pk.	24098

Restek trademarks: Restek logo, SilcoCan, TO-Can.

Other trademarks: Summa (Molex), Tenax (Buchem B.V.), Carboxpack, Carboxieve, Carboxen (Sigma-Aldrich Biotechnology LP).



Lit. Cat.# GNFL1015

© 2008 Restek Corporation.

Restek U.S. • 110 Benner Circle • Bellefonte, PA 16823 • 814-353-1300 • 800-356-1688 • fax: 814-353-1309 • [www.restek.com](http://www.restek.com)

Restek France • phone: 33 (0)1 60 78 32 10 • fax: 33 (0)1 60 78 70 90 • e-mail: [restek@restekfrance.fr](mailto:restek@restekfrance.fr)

Restek Ireland • phone: 44 2890 814576 • fax: 44 2890 814576 • e-mail: [resteurope@aol.com](mailto:resteurope@aol.com)

Thames Restek U.K. LTD • phone: 44 1494 563377 • fax: 44 1494 564990 • e-mail: [sales@thamesrestek.co.uk](mailto:sales@thamesrestek.co.uk)

Restek GmbH • phone: +49 (0) 6172 2797 0 • fax: +49 (0) 6172 2797 77 • e-mail: [info@restekgmbh.de](mailto:info@restekgmbh.de)

