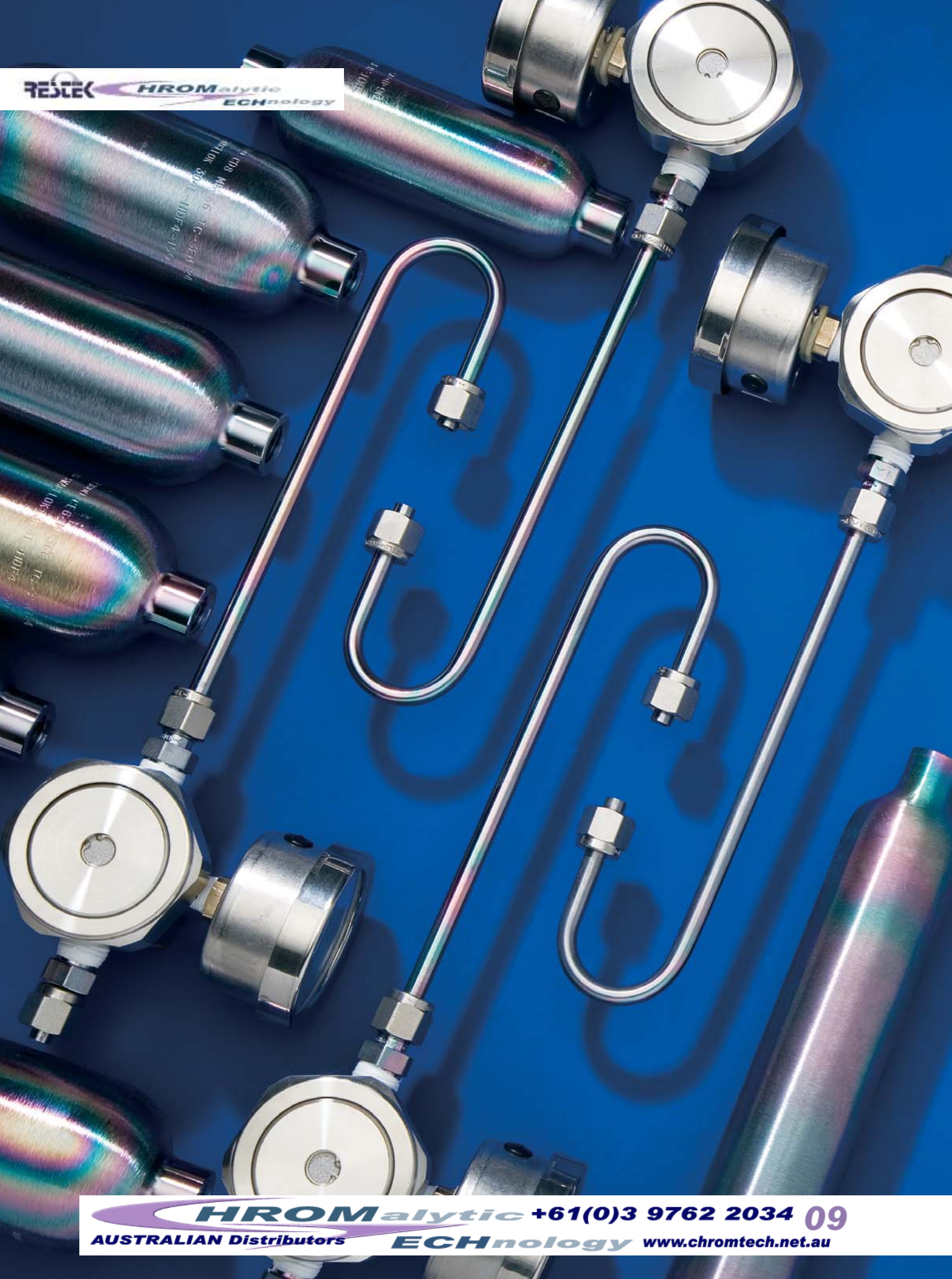

RESTEK
HROMalytic
ECHnology

Air Monitoring

Canisters are the gold standard for ambient VOC monitoring.

SilcoCan® Air Monitoring Canisters
Ideal for low-level reactive sulfur (1-20ppb), TO-14A, or TO-15 compounds

Features	Benefits
Siltek® treated.	High inertness—ensures sample stability.
High-purity, 2/3-turn valve with stainless steel diaphragms.	No sample adsorption at the valve, for more accurate results; easy to use.
Vacuum/pressure gauge (optional).	Ascertain internal conditions at a glance.
Variety of sizes.	Meet extensive range of sampling needs.
Stable to 250°C.	Heat canister to 250°C for superior cleaning.
Siltek® valve available (add suffix "-650" to cat.#).	Completely passive sample pathway for maximum sample stability.

Optional gauge
- Quickly confirm vacuum or pressure inside canister.
- Monitor pressure changes.
- Fully protected by canister frame.
- Can be heated to 90°C during cleaning.

Newest surface technology
To ensure sample stability, SilcoCan® canisters are deactivated with Restek's innovative Siltek® surface treatment, which chemically bonds a fused silica layer to the metal inner surface of the canister. This layer offers unsurpassed inertness for active compounds, including polar and sulfur-containing molecules. It will not crack, chip, or flake off, despite harsh handling in the field or during transport.

Enhanced valve and canister bracket
Canister holder and valve bracket protect canister, tube stub, and valve.

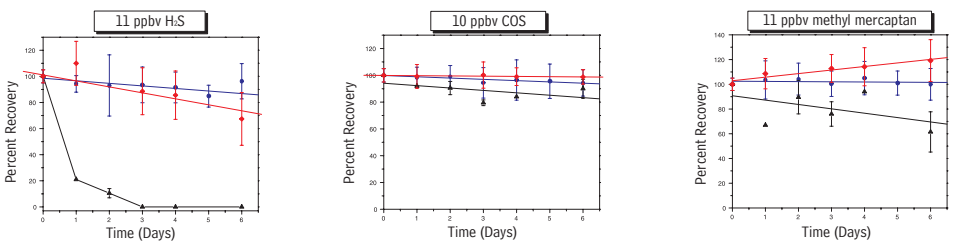
1/4" tube stub
Allows user to interchange valves.

Serial-controlled label
For quick, sure identification.

did you **know**?
SilcoCan® canisters are cleaned prior to shipping.
- Excellent stability for long-term storage of sulfur-containing volatile organic compounds.
- More accurate sampling.

Whether you are monitoring for TO-14A, TO-15, or reactive sulfur compounds, SilcoCan® canisters are your best choice for inertness. In Tedlar® bags, the stability of low-level (100ppbv) sulfur volatile organic compounds (VOCs) is poor, even within 24 hours of sampling. Sulfur compounds react with the metal surface in electropolished canisters, so these canisters are unsuitable for collecting and storing low-level sulfur VOCs. SilcoCan® air monitoring canisters, which feature a Siltek® treated surface, offer excellent storage stability for sulfur VOCs at very low levels (1–20ppbv), under dry or humid conditions. The versatility of the SilcoCan® canister makes it an excellent choice for collecting and storing TO-14A or TO-15 compounds.

Figure 1 SilcoCan® canisters effectively store very low levels of sulfur compounds.



Standards: Dry standards were made by adding 2mL of a 100ppm stock sulfur standard to each precleaned and evacuated canister, then pressurizing to 30psi with ultra-pure nitrogen. The resultant concentrations are listed in Applications Note #59347A (download your free copy from www.restek.com). Humidified standards were made by injecting 100µL of deionized water into the evacuated canisters prior to adding 2mL of stock standard. This produced 50% RH.
GC Column: Rtx®-1 , 60m, 0.53mm ID, 7.0µm; **Detector:** Sievers Model 355 Sulfur Chemiluminescence Detector

SilcoCan® Air Monitoring Canisters

- High quality, metal-to-metal seal, 2/3-turn valve with stainless steel diaphragms.
- Sizes to support a wide range of sampling needs.
- 2-port or 3-port valve available; 3-port valve includes -30" Hg/60psi vacuum/pressure gauge (other gauges available).
- Unsurpassed inertness, even for sulfur-containing or brominated compounds.
- For critical applications, order a Siltek® treated valve—add suffix "-650" to the catalog number of the canister.

		1L Volume		3L Volume*		6L Volume		15L Volume	
Description	qty.	cat.#	price	cat.#	price	cat.#	price	cat.#	price
SilcoCan Canister, 1/4" Valve	ea.	24180		24181		24182		24183	
SilcoCan Canister, Siltek Treated 1/4" Valve	ea.	24180-650		24181-650		24182-650		24183-650	
SilcoCan Canister with Gauge, 1/4" Valve	ea.	24140		24141		24142		24143	
SilcoCan Canister with Gauge, Siltek Treated 1/4" Valve	ea.	24140-650		24141-650		24142-650		24143-650	
SilcoCan Canister without Valve	ea.	22090		22091		22092		22093	

Restek canisters are originally equipped with high-quality Parker Hannifin diaphragm valves. Each valve is helium leak-tested to 4 x 10⁻⁹cc/sec. The all-stainless steel construction eliminates contamination and withstands temperatures from -100°C to 250°C. Other features include a compression outlet fitting and a 1/4" inlet and outlet.
*If attaching any of Restek's passive sampling kits to a 3L canister, use a Siltek treated (cat.# 563646) or stainless steel (cat.# 563647) connector between the two components.

Get the ultimate insurance plan—order your SilcoCan® canister with a Siltek® treated valve.

24182

also available

For additional gauge and valve options, see **page 374.**

Dimensions/Weights of SilcoCan® Air Canisters

Can Volume	Dimensions (height x sphere diameter)		Weight	
1 liter	8.5 x 5.25"	21.6 x 13.3cm	2.5 lbs	1.13kg
3 liter	11.5 x 7.25"	29.2 x 18.4cm	4 lbs	1.81kg
6 liter	12.5 x 9.25"	31.8 x 23.5cm	7 lbs	3.18kg
15 liter	17 x 12.25"	43.2 x 31.1cm	13 lbs*	5.90kg

*16 lbs shipped UPS Air, 22 lbs shipped Fed Ex (USA).

SEE Example Applications p. 607-611

Quickly confirm vacuum or pressure. Request a high-quality gauge mounted on your SilcoCan® or TO-Can® canister.

Alternative Mounted Vacuum/Pressure Gauges

The standard vacuum/pressure range on a SilcoCan® or TO-Can® canister fitted with a gauge is -30" Hg to 60psi. To have a different gauge mounted on your canister, add the appropriate suffix number to the canister catalog number.*

Gauge	Suffix
-30" Hg/15psi	-651
-30" Hg/30psi	-652

*No price difference for these substituted gauges.

Canister Carrying Supplies

Canister Carrying Box Kit

6-liter carrying boxes with plastic handles simplify canister transport. These boxes also accommodate our passive sampling kit. 4 carrying boxes and one shipping box per kit.

Description	qty.	cat.#	price
Canister Carrying Box Kit	kit	24215	


24215

Restek canisters are shipped in boxes with handles for easy transportation.

Canister Carrying Case

- Heavy-duty, all-aluminum design, fits two 6L SilcoCan® or TO-Can® canisters tightly without foam.
- Weight: 9 lbs.
- Inside dimensions: length 18", width 9 1/8", height 12 1/2" (46 x 23 x 32cm).
- No organic contaminants from foam or plastics.

Description	qty.	cat.#	price
Deluxe Canister Carrying Case	ea.	24226	


24226

24173

please **note**

- SUMMA canister equivalent.
- Excellent analyte recovery—even after 14 days of storage.

did you **know**?

TO-Can® canisters are cleaned prior to shipping.

Quickly confirm vacuum or pressure. Request a high-quality gauge mounted on your SilcoCan® or TO-Can® canister.

also **available**

We also offer sampling kits, sampling bags, and a range of gas reference standards to meet your environmental gas sampling requirements.
See **pages 376-389.**

22107

Improved TO-Can® Air Monitoring Canisters (Summa Can Equivalent)

Optimized for EPA Methods TO-14A and TO-15, and ASTM D5466

- Proprietary electropolished surface that maintains compound stability.
- High quality, metal-to-metal seal, $^{2}/_{3}$-turn valve with stainless steel diaphragms.
- 2-port or 3-port valve available; 3-port valve includes -30" Hg/60psi vacuum/pressure gauge (other gauges available).

Features	Benefits
Metal to metal seat, valve with stainless steel diaphragms.	No sample adsorption, for more accurate results.
Vacuum/pressure gauge (optional).	Ascertain internal conditions at a glance.
Stable to 250°C.	Heat canister to 250°C for superior cleaning.

US EPA Compendium of Air Methods TO-14A and TO-15 regulate the collection, storage, and analysis of volatile organic compounds (VOCs) using treated air sampling canisters. Restek offers a complete line of TO-Can® canisters (SUMMA can equivalent), electropolished using a proprietary process and extensively cleaned using an ultrasonic method. This ensures a high-quality, passivated surface that maintains the stability of TO-14A/TO-15 compounds during storage. The frame surrounds the electropolished canister, eliminating the need for weld marks on the sphere, thereby preventing active sites on the canister. The Parker Hannifin metal-to-metal diaphragm valve supports the excellent performance of the canister.

The unique holder attaches the handle and base to the canister without welds, and protects the canister, tube stub, and valve. The $^{2}/_{3}$-turn diaphragm valve has a metal-to-metal seat and a temperature limit of 250°C. We leak check the system with helium to ensure the TO-Can® canister and valve are leak-tight, then pressurize the canister with contaminant-free nitrogen before we ship it.

		1L Volume		3L Volume**		6L Volume		15L Volume	
Description	qty.	cat.#	price	cat.#	price	cat.#	price	cat.#	price
TO-Can Canister, $^{1}/_{4}$" Valve	ea.	24172		24173		24174		24175	
TO-Can Canister with Gauge, $^{1}/_{4}$" Valve	ea.	24176		24177		24178		24179	
TO-Can Canister without Valve	ea.	22094		22095		22096		22097	

Restek canisters are originally equipped with high-quality Parker Hannifin diaphragm valves. Each valve is helium leak-tested to 4 x 10^{-9}cc/sec. The all-stainless steel construction eliminates contamination and withstands temperatures from -100°C to 250°C. Other features include a compression outlet fitting and a $^{1}/_{4}$" inlet and outlet. For additional gauge and valve options, see page 374.

Alternative Mounted Vacuum/Pressure Gauges

The standard vacuum/pressure range on a SilcoCan® or TO-Can® canister fitted with a gauge is -30" Hg to 60psi. To have a different gauge mounted on your canister, add the appropriate suffix number to the canister catalog number.*

Gauge	Suffix
-30" Hg/15psi	-651
-30" Hg/30psi	-652

*No price difference for these substituted gauges.

TO-Can® Canisters with Swagelok® SS4H Bellows-Sealed Valve

- All metal flow path prevents sample adsorption, giving more accurate results.
- Withstands temperatures of up to 300°C.
- Rugged performance in the field.

Valves are bellows-sealed for durability and meet all EPA requirements for air monitoring by methods TO-14A and TO-15.

		1L Volume		3L Volume**		6L Volume		15L Volume	
Description	qty.	cat.	price	cat.	price	cat.	price	cat.	price
TO-Can Canister with $^{1}/_{4}$" Swagelok SS4H Bellows-Sealed Valve	ea.	22105		22106		22107		22108	

Replacement valves are available on page 374.

**If attaching any of Restek's passive sampling kits to a 3L canister, use a Siltek treated (cat.# 563646) or stainless steel (cat.# 563647) connector between the two components.

How to Extend 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 the 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 measurements and the 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.

Canister and Flow Controller Repair Service

Save money and increase performance with Restek's canister and flow controller repair service.

Normal wear and tear on canisters and components can result in damage causing leakage. Restek's repair service allows you to extend the life of your equipment for much less than the cost to replace with new products. Contact Customer Service at 800-356-1688, or your Restek representative, to take advantage of this service. You will be given instructions and an SRV # to return the parts to us.

Sampling Kit/Flow Controller Repair
Includes all new rubber seals in flow controller and orifice and frit replacement

	550131	enquire

Canister Repair
Includes valve replacement, leak test & cleaning

	560838	enquire

24144

Gauges and Valves for Air Monitoring Applications

1/4" Replacement Valves for Air Monitoring Canisters*

- High quality, metal-to-metal seal, 2/3-turn valve with stainless steel diaphragms.
- 2-port or 3-port valve available; 3-port valve includes -30"Hg/60psi vacuum/ pressure gauge (other gauges available).

	Non-Treated Valve			Siltek-Treated Valve		
Description	qty.	cat.#	price	qty.	cat. #	price
1/4" Replacement Valve (2-port)	ea.	24145		ea.	24144	
1/4" Replacement Valve (3-port)	ea.	24147		ea.	24146	

*All Restek canisters are originally equipped with high-quality Parker Hannifin diaphragm valves. Each valve is helium leak-tested to 4 x 10⁻⁹cc/sec. The all-stainless steel construction eliminates contamination and withstands temperatures from -100°C to 250°C. Other features include a compression outlet fitting and a 1/4" inlet and outlet.

24148

Swagelok® SS4H Bellows-Sealed Valve, 1/4-inch, 2-Port, Stainless Steel

- All metal flow path prevents sample adsorption, giving more accurate results.
- Unique serial number on each valve for complete traceability.
- Withstands temperatures of up to 300°C.
- Rugged performance in the field.
- Fast delivery from Restek!

Restek offers Swagelok® SS4H canister valves. These popular, rugged valves are available separately or already assembled on our TO-Can® canisters. Valves are bellows-sealed for durability and meet all EPA requirements for air monitoring by methods TO-14A and TO-15.

Description	qty.	cat.	price
Replacement 1/4" Swagelok SS4H Bellows-Sealed Valve	ea.	24148	

Replacement 1/4" Swagelok SS4H Bellows-Sealed Valves are available on SilcoCan canisters as a custom product. Contact Technical Service for more information.

Replacement Combination Vacuum/Pressure Gauges

2-inch vacuum/pressure gauges, 316 stainless steel with 1/8" NPT fitting and center back mount. Recommended for use with canisters.

24120

Description	qty.	cat.#	price
-30"Hg/15psi Vacuum/Pressure Gauge	ea.	24100	
-30"Hg/30psi Vacuum/Pressure Gauge	ea.	24104	
-30"Hg/60psi Vacuum/Pressure Gauge	ea.	24108	

Vacuum Gauges

High-quality vacuum gauges with 316 stainless steel wetted surfaces. -30" Hg. Recommended for use with passive sampling kits.

Description	qty.	cat.#	price
2-Inch Vacuum Gauge; 1/8" NPT	ea.	24269	
2-Inch Vacuum Gauge; 1/4" NPT	ea.	24270	
1 1/2-Inch Vacuum Gauge; 1/8" NPT	ea.	24120	

NEW!

24285

24268

Ashcroft Test Gauges

- Accurate measurement of vacuum to -30"Hg and pressure to 60psi.
- Available in both analog and digital formats.
- Accuracy to +/- 0.25%.

High accuracy test gauges are recommended for verifying the vacuum/pressure in canisters before and after sampling. The 6-inch face on the analog gauge allows for easy reading. The digital gauge operates on two AAA batteries and offers an unambiguous readout. Both gauges have an accuracy of +/- 0.25% and all metal wetted parts.

Description	qty.	cat.#	price
Analog Test Gauge, 6" diameter, 1/4" NPT	ea.	24285	
Digital Test Gauge, 3" diameter, 1/4" NPT	ea.	24268	

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.#	price
Canister Air Sampling Timer	ea.	24267	

Simplify automated and manaul air sampling with a Sampling Timer (cat.# 24267).

Canister and passive air sampling kit must be purchased separately.

did you **know**?

SilcoCan® and TO-Can® Canisters are Cleaned Prior to Shipping

After assembly, every Restek SilcoCan® and TO-Can® canister is evacuated to 50mTorr, then pressurized with humidified nitrogen to 30psi. The cleaning system is programmed to repeat this cycle two times to ensure thorough cleaning. We ship our canisters clean and under pressure at 30psi with dry nitrogen.

Air Canister Heating Jacket

- Closely simulates oven environment—heats entire canister and valve.
- Two temperature settings, 75°C and 150°C.*
- Prevents sample condensation, for accurate sub-sampling.
- Easily fits canister up to 6 liters.
- Lightweight; comfortable to the touch when heated.
- Connect up to five Canister Heating Jackets to one 15 amp circuit.

Description	qty.	cat.#	price
Air Canister Heating Jacket (110 volt)	ea.	24123	

*Not CE certified.

The ultimate in controlled heating, for reliably cleaning your air canisters!

Humidification Chamber

When cleaning SilcoCan® or TO-Can® canisters, it is important to use humidified air or nitrogen to help remove volatile organic contaminants. We incorporated our humidification chamber into the design of our cleaning system. Restek's humidification chamber is made of acrylic and withstands pressure up to 90psi. The 1/4-inch inlet and outlet compression fittings allow easy connection to pressure lines on your cleaning system. Our humidification chamber also has an easy-to-open lid for filling with water.

Description	qty.	cat.#	price
Humidification Chamber	ea.	24282	

24282

Restek's canister cleaning system with humidification chamber.

Passive Air Sampling Kits

- Provide accurate integrated sampling without a sampling pump.
- Siltek® treated components ensure a very inert surface.
- Excellent for sampling times from 0.5 hour to 125 hours.

Restek's passive air sampling kit incorporates all the hardware necessary to collect air samples, and is easy to assemble for field sampling.* The improved filter design greatly reduces the number of potential leak sites. The passive air sampling kit is available in seven sampling flow ranges, and in stainless steel or Siltek® treated finish. The stainless steel kit is ideal to partner with the Restek TO-Can® air sampling canister for TO-14A and TO-15 methods. Use the Siltek® treated version with the Restek SilcoCan® air sampling canister when collecting low-level volatile sulfur compounds, or other active compounds.

Canister Volume*/Sampling Time					Flow	Orifice	Siltek Treated	Stainless Steel
400cc	1 Liter	3 Liter	6 Liter	15 Liter	(sccm)	size	Sampling Kits	Sampling Kits
8 hour	24 hour	48 hour	125 hour	—	0.5–2	0.0008"	24217	24216
2 hour	4 hour	12 hour	24 hour	60 hour	2–4	0.0012"	24160	24165
1 hour	2 hour	6 hour	12 hour	30 hour	4–8	0.0016"	24161	24166
—	1 hour	4 hour	8 hour	20 hour	8–15	0.0020"	24162	24167
—	—	2 hour	3 hour	8 hour	15–30	0.0030"	24163	24168
—	—	—	1.5 hour	4 hour	30–80	0.0060"	24164	24169
—	—	—	0.5 hour	1 hour	80–340	0.0090"	22101	22100

*Air sampling canisters sold separately.
Note: If attaching any of Restek's passive sampling kits to a 3L canister, use a Siltek treated (cat.# 563646) or stainless steel (cat.# 563647) connector between the two components.

also available

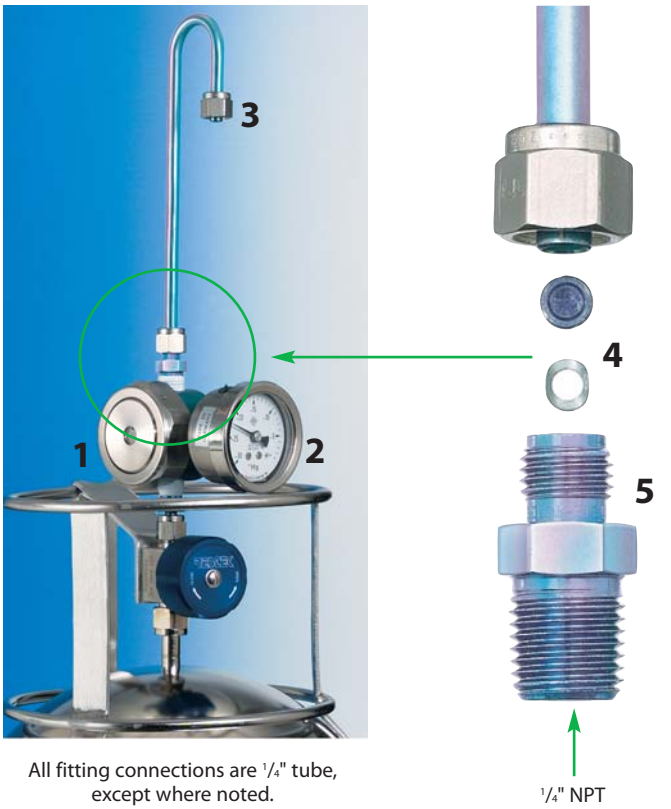
Miniature air sampling kits. See page 379.

Canister and flow controller repair service. See page 373.

1. Veriflo® SC423XL flow controller
This flow controller is the heart of the sampling train. It is a high-quality device designed to maintain a constant mass flow as the pressure changes from -30" Hg to 7" Hg (we recommend you stop sampling at or before 7" Hg of vacuum). All wetted parts of the flow controller can be Siltek® treated.

2. Stainless steel vacuum gauge
Fitted to the flow controller, the gauge monitors canister vacuum change during sampling.

3. 1/4-inch Siltek® sample inlet
The 0.3m x 1/4-inch tubing includes a stainless steel nut on the inlet end, to prevent water droplets from accumulating at the edge of the tubing, where they could be pulled into the sampling train.



All fitting connections are 1/4" tube, except where noted.

4. 2-micron frit filter and washer
Located prior to the critical orifice to prevent airborne particles from clogging the critical orifice. Replaceable. Available in stainless steel, or Siltek® treated for optimum inertness.

5. Interchangeable critical orifice
An interchangeable ruby critical orifice allows you to control the flow with very high precision. To select the correct critical orifice for your sample, see table above. Available in stainless steel, or Siltek® treated for optimum inertness.

please note

For individual components, see page 377.

Buy only the parts you need!

Replacement Orifices

Use these orifices with a Veriflo® 423XL flow controller to change the flow range for alternative sampling times.

Flow (sccm)	Orifice size	Siltek Treated cat.#	price	Stainless Steel cat.#	price
0.5–2	0.0008"	24219		24218	
2–4	0.0012"	24233		24245	
4–8	0.0016"	24234		24246	
8–15	0.0020"	24235		24247	
15–30	0.0030"	24236		24248	
30–80	0.0060"	24237		24249	
80–340	0.0090"	22099		22098	

2µm Frit Filters

For use in critical orifice fitting. Includes washers.

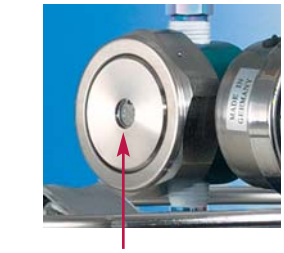
Description	qty.	cat.#	price
Siltek Replacement Frit Filter	3-pk.	24171	
Stainless Steel Replacement Frit Filter	3-pk.	24170	

Veriflo® Flow Controllers

Veriflo® 423XL flow controllers are offered in a Siltek® and stainless steel version. The flow device is available with or without a critical orifice. (Vacuum gauge sold separately. See page 374.)

The critical orifice in a Veriflo® flow controller is interchangeable. Order orifices for alternate sampling times, or replacement orifices, separately.

Flow (sccm)	Orifice size	Siltek Treated cat.#	price	Stainless Steel cat.#	price
0.5–2	0.0008"	24232		24229	
2–4	0.0012"	24255		24260	
4–8	0.0016"	24256		24261	
8–15	0.0020"	24257		24262	
15–30	0.0030"	24258		24263	
30–80	0.0060"	24259		24264	
80–340	0.0090"	22103		22102	
—	without orifice	24238		24239	



7µm In-Line Filter

This 316 stainless steel filter is designed to collect particles larger than 7 microns. We offer a Siltek® and stainless steel version (1/4" compression fitting on both ends).

Description	qty.	cat.#	price
Siltek 7µm In-Line Filter	ea.	24265	
Stainless Steel 7µm In-Line Filter	ea.	24266	

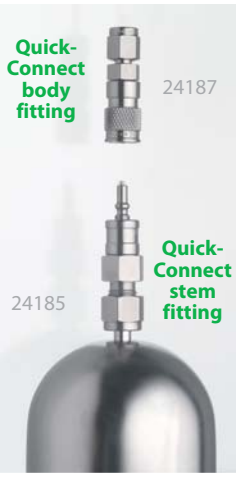
Note: frit is not replaceable.

Sample Inlets

- 1/4" stainless steel compression fitting on each end.
- One end connects to flow controller or canister; nut on other end serves as rain guard.
- Includes nuts and ferrules.
- Two different lengths for use with large canisters and miniature canisters.

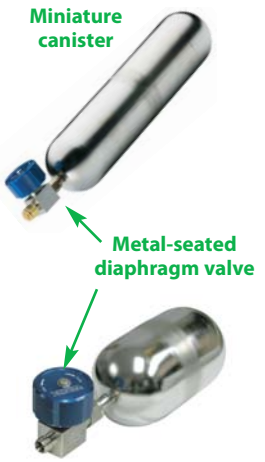
Description	qty.	Siltek Treated cat.#	price	Stainless Steel cat.#	price
Sample Inlet, 6" Length	ea.	26210		26209	
Sample Inlet, 1.5" Length	ea.	26212		26211	

Miniature Air Sampling Canisters



Dimensions:
400cc = 2.75" diameter, 5.35" long (7 x 13.6cm)
1,000cc = 2.75" diameter, 11.92" long (7 x 30cm)

Attach quick-connect body fitting to stem fitting to open canister. Attach quick-connect stem protector to stem fitting when not sampling to prevent canister from accidentally opening.



Miniature Air Sampling Canisters

- Ideal for indoor air, personal, emergency response, or soil gas sampling.
- 400cc or 1,000cc.
- Low pressure applications not exceeding 40psig.
- Available with quick-connect fitting that is compatible with sampling and analysis instruments.
- Also available with nontreated or Siltek® treated valve.

These small canisters are designed for controlled sampling, such as personal air sampling, as an alternative to tube and pump samplers. The 1,000cc canister is suitable for sampling volatile organic compounds in air according to US EPA Methods TO-14A and TO-15.

Restek offers these products in stainless steel or Siltek® treated, for greatest inertness. We continue to offer passive coating technologies that are unmatched in the air sampling industry—try a Siltek® treated canister to achieve the ultimate in analyte stability.

Miniature Air Sampling Canisters with Quick-Connect Stem Fittings

		400cc		1,000cc	
Description	qty.	cat.#	price	cat.#	price
Electro-Polished Miniature Canister with Quick-Connect Stem Fitting	ea.	24188		24194	
Siltek Treated Miniature Canister with Quick-Connect Stem Fitting	ea.	24189		24195	
Siltek Treated Miniature Canister with Siltek Treated Quick-Connect Stem Fitting	ea.	24190		24196	

Quick-Connect Fittings for Miniature Air Sampling Canisters

Connection: 1/4" tube fitting.

Description	qty.	cat.#	price
Quick-Connect Stem Fitting	ea.	24185	
Siltek Treated Quick-Connect Stem Fitting	ea.	24186	
Quick-Connect Stem Protector, Stainless Steel NEW!	ea.	24121	
Quick-Connect Body Fitting	ea.	24187	

Note: Quick-connect body fitting (cat.# 24187) must be ordered separately to sample with quick-connect stem fitting.

Miniature Air Sampling Canisters with Metal-Seated Diaphragm Valve

		400cc		1,000cc	
Description	qty.	cat.#	price	cat.#	price
Electro-Polished Miniature Canister with Metal-Seated Diaphragm Valve	ea.	24191		24197	
Siltek Treated Miniature Canister with Metal-Seated Diaphragm Valve	ea.	24192		24198	
Siltek Treated Miniature Canister with Siltek Treated Diaphragm Valve	ea.	24193		24199	

Miniature Air Sampling Canisters with Nut & Ferrule

		400cc		1,000cc	
Description	qty.	cat.#	price	cat.#	price
Electro-Polished Miniature Canister with Nut & Ferrule	ea.	24205		24206	
Siltek Treated Miniature Canister with Nut & Ferrule	ea.	24207		24208	

Gap Inspection Gauge

- Confirm that fittings are sufficiently tightened.
- For use with 1/4", 3/8", 1/2" Swagelok® fittings.
- For Swagelok® fittings in new installations only.

Description	qty.	cat.#	price
Gap Inspection Gauge	ea.	22624	

Miniature Air Sampling Kits

- Provide accurate integrated sampling without a sampling pump.
- Convenient smaller size connects easily to miniature canisters.
- Available in stainless steel or Siltek® treated components for greater inertness.

26252

Restek's passive air sampling kit incorporates all the hardware necessary to collect air samples, and is easy to assemble for field sampling.* Kit includes flow controller, critical orifice, 2µm frit filter, vacuum gauge, and sample inlet. The gauge (cat.# 24120) and sample inlet (cat.#s 26211, 26212) are downsized for partnering with smaller canisters. Refer to page 376 for sampling kit details and pages 374 and 377 for individual components.

Canister Volume*/Sampling Time		Flow	Orifice	Siltek Treated	Stainless Steel
400cc	1 Liter	(sccm)	size	Sampling Kits	Sampling Kits
8 hour	24 hour	0.5–2	0.0008"	26253	26252
2 hour	4 hour	2–4	0.0012"	26255	26254
1 hour	2 hour	4–8	0.0016"	26257	26256
—	1 hour	8–15	0.0020"	26259	26258

*Air sampling canisters sold separately.

Tedlar® Sampling Bags

- Find the bags you need—we offer sizes from 0.5 liters to 100 liters.
- Unique all-in-one septum and valve fitting make these lightweight and easy to use.
- Polypropylene or stainless steel valve.
- Both valves conveniently connect to $^{3}/_{16}$" ID Teflon® tubing.


22050 22039

	Description	qty.	Polypropylene Valve cat.#	price	Stainless Steel Valve cat.#	price
0.5L	6" x 6"	10-pk.	22049		22038	
1L	7" x 7"	10-pk.	22050		22039	
3L	9.5" x 10"	10-pk.	22051		22040	
5L	12" x 12.5"	10-pk.	22052		22041	
10L	11.75" x 22"	10-pk.	22053		22042	
12L	13" x 24"	10-pk.	22054		22043	
25L	17.5" x 24"	5-pk.	22055		22044	
40L	24" x 24.25"	5-pk.	22056		22045	
80L	28.25" x 32.5"	5-pk.	22057		22046	
100L	28" x 36"	3-pk.	22058		22047	
Teflon Faced Silicone Replacement Septum, 4mm diameter		10-pk.	22104		22048	

tech tip

Use septum puller (cat.# 20117, page 209) to replace septum in sampling bag valve.

Vacuum Bag Sampler

- Fast bag sampling without sample passing through pump.
- Bag capacity up to 10L.

22118

The Model 1062 Vacuum Bag Sampler provides fast sampling with zero cross-contamination. A vacuum created in the box draws air into the sampling bag without drawing it through the vacuum pump first, as is the case with standard air sampling pumps, thereby preventing contamination of the sample. This bag sampler can fill a 10L bag in two minutes with an automatic shut-off switch, which stops the sample bag from overfilling. The filling rate is adjusted with a vent rotometer valve. An external battery recharging port enables continuous operation with battery charger. In addition, the quick exhaust valve allows for fast removal of the sampling bag. The sampler comes with a universal power adapter/charger, battery, instruction manual, and 1-year limited warranty.

Specifications:

Sampling Bag:	1 bag up to 10L size
Running Time:	8 hours
Flow Rate (Fill Rate):	1-5L/min.
Power Requirements:	12V battery, 4.5 Amp
Charge Time:	9 hours
Dimensions:	9" x 14.6" x 21.7"
Weight:	17 lbs

Features:

- Observation window on case lid
- Sample inlet accepts $^{1}/_{4}$" OD tubing
- Case designed for rugged outdoor use
- CE certified

Description	qty.	cat.#	price
Vacuum Bag Sampler Model 1062 (includes power adapter, battery, manual)	ea.	22118	
Replacement Battery for Vacuum Bag Sampler Model 1062	ea.	22119	
Universal Battery Charger for Vacuum Bag Sampler Model 1062 (115/230 VAC)	ea.	22120	

Thermal Desorption Unit Tubes

method applications

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

Specifications

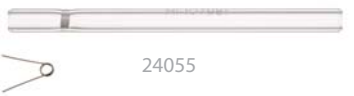
Dimensions: 1/4" OD x 3-1/2" long
Low sampling rates: 0.01-0.20 L/min. (<10L total volume)
Long-term storage caps are supplied with conditioned tubes

24061

24062

24067

24054



24055

24071

24070

24074

Thermal Desorption Unit (TDU) Tubes

- Variety of sorbents to collect a wide range of VOCs, including Tenax® and carbon sorbents.
- 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.

High-quality thermal desorption tubes by Markes International. 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	Vapor Phase Organics Applications
Tenax TA	C6/7 to C26
Graphitized Carbon	C5/6 to C14
Tenax GR/Carbopack B	*n*-C5/6 to *n*-C20 (EPA Methods TO-14A/TO-15/TO-17)
Carbopack B/Carbosieve SIII	*n*-C2/3 to *n*-C12/14 (EPA Methods TO-14A/TO-15/TO-17)
Tenax TA/Graphitized Carbon/Carboxen 1000	C2/3 to C20
Carbopack C/Carbopack B/Carbosieve SIII	*n*-C2/3 to *n*-C16/20 (EPA Methods TO-14A/TO-15/TO-17)

Thermal Desorption Unit Tubes, Unconditioned and Conditioned & Capped

		Unconditioned				Conditioned & Capped			
		Stainless Steel		Glass		Stainless Steel		Glass	
Description	qty.	cat.#	price	cat.#	price	cat.#	price	cat.#	price
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	

Thermal Desorption Unit Tubes, Empty

- Empty tubes for direct desorption of VOCs in liquids, solids, or pastes.
- Stainless steel: front sorbent-retaining gauze fitted, rear gauze and gauze retaining spring supplied.
- Glass: with glass frit positioned 15mm from sampling end.

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

Thermal Desorption Unit Tubes, Calibration

		Stainless Steel		Glass	
Description	qty.	cat.#	price	cat.#	price
TDU Tubes, Calibration, Tenax TA 1cm Bed	10-pk.	24075		24076	

Description	qty.	cat.	price
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.	price
1/4" Brass Cap and PTFE Ferrules	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	

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.

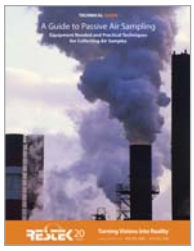
Table I Comparison of thermal desorption tube and canister sampling for VOCs.

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
Methods	US EPA TO-17 ASTM D6196 ISO 16017 ISO 16000-6 NIOSH 2549	US EPA TO-14A, TO-15 ASTM D5466 OSHA PV2120 NIOSH Protocol Draft
	World-wide acceptance	Gold standard for US ambient air market
Applications	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
Handling	Light weight for personal monitoring and general ease of use	Larger and heavier; more costly to ship
Sampling	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
Analysis	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.
Storage	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
Cleaning	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.
Cost	$50-130 each	$200-700 each



free literature

A Guide to Passive Air Sampling: Equipment Needed and Practical Techniques for Collecting Air Samples

Technical Guide
lit. cat.# 59977B

Thermal Desorption Tubes: Versatile Air Sampling for a Wide Range of Applications

Flyer
lit. cat.# EVFL1065

Download your copies from **www.restek.com**.

tech guides

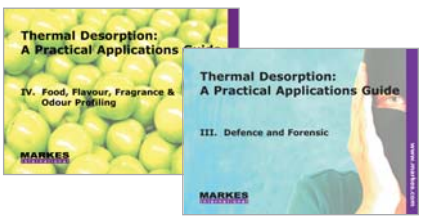
Thermal desorption application guides are available for a broad range of markets. Request your FREE copy today using these part numbers.

Environmental Air Monitoring and Occupational Health & Safety
EVTG1034

Residual Volatiles & Materials Emissions Testing
GNTG1035

Defense & Forensic
CFTG1036

Food, Flavor, Fragrance & Odor Profiling
FFTG1037



Restek's Ultra-Clean resin eliminates the hassle of cleaning and testing resin for air sampling.

Sampling Supplies for Semivolatiles in Air

Everything you need for sampling semivolatile compounds in air: Ultra-Clean resin, PUF sampling cartridges.

Ultra-Clean Resin: Equivalent to XAD-2 Resin; Exclusively from Restek!

- For adsorbing semivolatiles in air.
- Cleaned, GC tested and certified by TO-13A protocol.
- Available in 100 gram quantities.

method applications

Method	Applications
EPA 23	Dioxins
EPA TO-13A	PAHs
ASTM D6209	PAHs

Although resin is an excellent adsorbent for trapping PAHs, it requires extensive clean-up because many of its impurities are PAH compounds. To enable you to eliminate time-consuming clean-up but still meet TO-13A method requirements, we do the cleaning for you! Ultra-Clean resin complies with the specified maximum contamination levels—we test each batch by capillary GC/flame ionization detector to ensure cleanliness.

Description	cat.#	Price-per-bottle 1-4 bottles	5-9 bottles	10+ bottles
Ultra-Clean Resin, 100 grams	24230	/ea.	/ea.	/ea.

SDVB Resin

- Styrene/divinylbenzene, equivalent to XAD-2 resin.
- Untreated, packaged in 1kg plastic containers.
- Spherical, 20 to 60 mesh particles.

Description	qty.	cat.#	price
SDVB Resin	1kg	24053	

22114

22115

Cleaned Polyurethane Foam (PUF) Cartridges

- Precleaned and ready to use for collection of semivolatiles (pesticides, PCBs, PAHs).
- Both large high-volume (220-280L/min.) and small low-volume (1-5L/min.) PUFs available.
- Suitable for ambient, indoor, and industrial hygiene applications.
- PUF/XAD-2 "sandwiches" capture a wider range of semivolatiles.

method applications

Method	Applications	cat.#
EPA TO-10A	Organochlorine and organophosphorous pesticides, carbamate, pyrethrin, triazine, and urea pesticides	22116
EPA IP-7	Polycyclic aromatic hydrocarbons (PAHs)	22114
EPA IP-8	Organochlorine and organophosphorous pesticides, carbamate, pyrethrin, triazine, and urea pesticides	22116
ASTM D4861	Organochlorine and organophosphorous pesticides, PCB	22116
ASTM D4947	Chlordane and heptachlor residues	22116
Research	Pesticides	22117
EPA TO-4A	Organochlorine pesticides, PCBs	22114
EPA TO-9A	Polychlorinated dibenzo-*p*-dioxins (PCDDs)	22114
EPA TO-13A	Polycyclic aromatic hydrocarbons (PAHs)	22114
EPA 600/8-80-038	Organochlorine pesticides, PCBs, PAHs	22115
ASTM D6209	Polycyclic aromatic hydrocarbons (PAHs)	22114

22116

22117

Description	qty.	cat.#	price
Cleaned PUF Plug (7.6cm length, 6cm diameter)	ea.	24295	
Large PUF Cartridge, 65mm OD x 125mm length, 75mm PUF	ea.	22114	
Large PUF/XAD Cartridge, 65mm OD x 125mm length, 25mm PUF/10g XAD-2/50mm PUF	ea.	22115	
Small PUF Cartridge, 22mm OD x 100mm length, 76mm PUF	ea.	22116	
Small PUF/XAD Cartridge, 22mm OD x 100mm length, 30mm PUF/1.5g XAD-2/30mm PUF	ea.	22117	

Environmental Air Monitoring Gas Standards

Our high-quality air monitoring gas calibration standards are provided by Spectra Gases and Scott Specialty Gases—meeting lab requirements for two separate sources of calibration standards. Mixes are produced gravimetrically using NIST (National Institute of Science and Technology) traceable weights. Each comes with a Certificate of Analysis and unique serial number. All cylinders are disposable and do not require rental or demurrage fees. Recertification of cylinders is available directly with our suppliers. All cylinders are drop-shipped from our suppliers to provide fast delivery and the "freshest" standard possible. 12-month stability on all cylinders unless otherwise specified.

TO-14A Calibration Mix (39 components)

benzene
bromomethane
carbon tetrachloride
chlorobenzene
chloroform
chloromethane
1,2-dibromoethane
m-dichlorobenzene
o-dichlorobenzene
p-dichlorobenzene
dichlorodifluoromethane
1,1-dichloroethane
1,2-dichloroethane
1,1-dichloroethene
cis-1,2-dichloroethene
1,2-dichloropropane
cis-1,3-dichloropropene
trans-1,3-dichloropropene
dichlorotetrafluoroethane
ethyl benzene
ethyl chloride
hexachloro-1,3-butadiene
methylene chloride
styrene
1,1,2,2-tetrachloroethane
tetrachloroethylene
toluene
1,2,4-trichlorobenzene
1,1,1-trichloroethane
1,1,2-trichloroethane
trichloroethene
trichlorofluoromethane
1,1,2-trichlorotrifluoroethane
1,2,4-trimethylbenzene
1,3,5-trimethylbenzene
vinyl chloride
m-xylene
o-xylene
p-xylene

1ppm in nitrogen, 104 liters @ 1,800psi
cat. # 34400 (ea.)

1ppm in nitrogen, 110 liters @ 1,800psi (Pi-marked Cylinder)
cat. # 34400-PI (ea.)

100ppb in nitrogen, 104 liters @ 1,800psi
cat. # 34421 (ea.)

100ppb in nitrogen, 110 liters @ 1,800psi (Pi-marked Cylinder)
cat. # 34421-PI (ea.)

TO-14A 41 Component Mix (41 components)

acrylonitrile
benzene
bromomethane
1,3-butadiene
carbon tetrachloride
chlorobenzene
chloroform
chloromethane
1,2-dibromoethane
m-dichlorobenzene
o-dichlorobenzene
p-dichlorobenzene
dichlorodifluoromethane
1,1-dichloroethane
1,2-dichloroethane
1,1-dichloroethene
cis-1,2-dichloroethene
1,2-dichloropropane
cis-1,3-dichloropropene
trans-1,3-dichloropropene
dichlorotetrafluoroethane
ethyl benzene
ethyl chloride
hexachloro-1,3-butadiene
methylene chloride
styrene
1,1,2,2-tetrachloroethane
tetrachloroethylene
toluene
1,2,4-trichlorobenzene
1,1,1-trichloroethane
1,1,2-trichloroethane
trichloroethene
trichlorofluoromethane
1,1,2-trichlorotrifluoroethane
1,2,4-trimethylbenzene
1,3,5-trimethylbenzene
vinyl chloride
m-xylene
o-xylene
p-xylene

1ppm in nitrogen, 104 liters @ 1,800psi
cat. # 34430 (ea.)

1ppm in nitrogen, 110 liters @ 1,800psi (Pi-marked Cylinder)
cat. # 34430-PI (ea.)

100ppb in nitrogen, 104 liters @ 1,800psi
cat. # 34431 (ea.)

100ppb in nitrogen, 110 liters @ 1,800psi (Pi-marked Cylinder)
cat. # 34431-PI (ea.)

TO-14A 43 Component Mix (43 components)

acrylonitrile
benzene
bromomethane
1,3-butadiene
carbon tetrachloride
chlorobenzene
chloroform
chloromethane
3-chloropropene
1,2-dibromoethane
m-dichlorobenzene
o-dichlorobenzene
p-dichlorobenzene
dichlorodifluoromethane
1,1-dichloroethane
1,2-dichloroethane
1,1-dichloroethene
cis-1,2-dichloroethene
1,2-dichloropropane
cis-1,3-dichloropropene
trans-1,3-dichloropropene
dichlorotetrafluoroethane
ethyl benzene
ethyl chloride
4-ethyltoluene
hexachloro-1,3-butadiene
methylene chloride
styrene
1,1,2,2-tetrachloroethane
tetrachloroethylene
toluene
1,2,4-trichlorobenzene
1,1,1-trichloroethane
1,1,2-trichloroethane
trichloroethene
trichlorofluoromethane
1,1,2-trichlorotrifluoroethane
1,2,4-trimethylbenzene
1,3,5-trimethylbenzene
vinyl chloride
m-xylene
o-xylene
p-xylene

1ppm in nitrogen, 104 liters @ 1,800psi
cat. # 34432 (ea.)

1ppm in nitrogen, 110 liters @ 1,800psi (Pi-marked Cylinder)
cat. # 34432-PI (ea.)

100ppb in nitrogen, 104 liters @ 1,800psi
cat. # 34433 (ea.)

100ppb in nitrogen, 110 liters @ 1,800psi (Pi-marked Cylinder)
cat. # 34433-PI (ea.)

it's a **fact**

Higher concentration = **MORE STANDARD** for your money!

cylinder **design**

Spectra 104L Cylinders:

Aluminum construction
Size: 8 x 24 cm
Volume/Pressure:
104 liters of gas
@ 1,800psi
CGA-180
outlet fitting.
Weight:
1.5 lbs/0.7 kg

Scotty 110L Cylinders (Pi-marked Cylinders for EU Regulations):

Aluminum construction
Size: 8.3 x 29.5 cm
Volume/Pressure:
110 liters of gas
@ 1,800psi
CGA-180 outlet fitting.
Weight: 2.2 lbs/1 kg
US DOT Specs: 3AL2216

did you **know**?

Pi-marked Gas Cylinders for EU Countries

Our Pi-marked gas standards from Scott Specialty Gases meet the requirements of Transportable Pressure Equipment Directive (TPED) implemented in 2001 that regulates the safe transport of pressurized containers used throughout the European community.

We can provide the same mix from two suppliers—meeting your need for second source gas standards.

please **note**

Gas standards are subject to hazardous materials shipping fees by most freight carriers.

TO-14A GC/MS Tuning Mix

4-bromofluorobenzene

1ppm in nitrogen, 104 liters @ 1,800psi
cat. # 34406 (ea.)

1ppm in nitrogen, 110 liters @ 1,800psi (Pi-marked Cylinder)
cat. # 34406-PI (ea.)

100ppb in nitrogen, 104 liters @ 1,800psi
cat. # 34424 (ea.)

100ppb in nitrogen, 110 liters @ 1,800psi (Pi-marked Cylinder)
cat. # 34424-PI (ea.)

TO-14A Aromatics Mix (14 components)

benzene
chlorobenzene
m-dichlorobenzene
o-dichlorobenzene
p-dichlorobenzene
ethyl benzene
styrene
toluene
1,2,4-trichlorobenzene
1,2,4-trimethylbenzene
1,3,5-trimethylbenzene
m-xylene
o-xylene
p-xylene

1ppm in nitrogen, 104 liters @ 1,800psi
cat. # 34404 (ea.)

1ppm in nitrogen, 110 liters @ 1,800psi (Pi-marked Cylinder)
cat. # 34404-PI (ea.)

100ppb in nitrogen, 104 liters @ 1,800psi
cat. # 34423 (ea.)

100ppb in nitrogen, 110 liters @ 1,800psi (Pi-marked Cylinder)
cat. # 34423-PI (ea.)

TO-14A Chlorinated Hydrocarbon Mix (19 components)

carbon tetrachloride
chloroform
1,1-dichloroethane
1,2-dichloroethane
1,1-dichloroethene
cis-1,2-dichloroethylene
1,2-dichloropropane
cis-1,3-dichloropropene
trans-1,3-dichloropropene
ethyl chloride
hexachloro-1,3-butadiene
methyl chloride
methylene chloride
1,1,2,2-tetrachloroethane
tetrachloroethylene
1,1,1-trichloroethane
1,1,2-trichloroethane
trichloroethene
vinyl chloride

1ppm in nitrogen, 104 liters @ 1,800psi
cat. # 34402 (ea.)

1ppm in nitrogen, 110 liters @ 1,800psi (Pi-marked Cylinder)
cat. # 34402-PI (ea.)

100ppb in nitrogen, 104 liters @ 1,800psi
cat. # 34422 (ea.)

100ppb in nitrogen, 110 liters @ 1,800psi (Pi-marked Cylinder)
cat. # 34422-PI (ea.)

TO-14A Internal Standard Mix

bromochloromethane
chlorobenzene-d5
1,4-difluorobenzene

1ppm in nitrogen, 104 liters @ 1,800psi
cat. # 34412 (ea.)

1ppm in nitrogen, 110 liters @ 1,800psi (Pi-marked Cylinder)
cat. # 34412-PI (ea.)

100ppb in nitrogen, 104 liters @ 1,800psi
cat. # 34427 (ea.)

100ppb in nitrogen, 110 liters @ 1,800psi (Pi-marked Cylinder)
cat. # 34427-PI (ea.)

TO-14A Internal Standard/Tuning Mix

bromochloromethane
1-bromo-4-fluorobenzene
(4-bromofluorobenzene)
chlorobenzene-d5
1,4-difluorobenzene

1ppm in nitrogen, 104 liters @ 1,800psi
cat. # 34408 (ea.)

1ppm in nitrogen, 110 liters @ 1,800psi (Pi-marked Cylinder)
cat. # 34408-PI (ea.)

100ppb in nitrogen, 104 liters @ 1,800psi
cat. # 34425 (ea.)

100ppb in nitrogen, 110 liters @ 1,800psi (Pi-marked Cylinder)
cat. # 34425-PI (ea.)

TO-15 Subset 25 Component Mix (25 components)

acetone
allyl chloride
benzyl chloride*
bromodichloromethane
bromoform
1,3-butadiene
2-butanone (MEK)
carbon disulfide*
cyclohexane
dibromochloromethane
trans-1,2-dichloroethene
1,4-dioxane
ethyl acetate
4-ethyltoluene
heptane
hexane
2-hexanone (MBK)
4-methyl-2-pentanone
methyl *tert*-butyl ether (MTBE)
2-propanol
propylene
tetrahydrofuran
2,2,4-trimethylpentane
vinyl acetate
vinyl bromide

1ppm in nitrogen, 104 liters @ 1,800psi
cat. # 34434 (ea.)

1ppm in nitrogen, 110 liters @ 1,800psi (Pi-marked Cylinder)
cat. # 34434-PI (ea.)

100ppb in nitrogen, 104 liters @ 1,800psi
cat. # 34435 (ea.)

100ppb in nitrogen, 110 liters @ 1,800psi (Pi-marked Cylinder)
cat. # 34435-PI (ea.)

*Stability of this compound cannot be guaranteed.

TO-15 64 Component Mix (64 components)

acetone
acrolein
benzene
benzyl chloride*
bromodichloromethane
bromoform
bromomethane
1,3-butadiene
2-butanone (MEK)
carbon disulfide*
carbon tetrachloride
chlorobenzene
chloroethane
chloroform
chloromethane
cyclohexane
dibromochloromethane
1,2-dichlorobenzene
1,3-dichlorobenzene
1,4-dichlorobenzene
1,1-dichloroethane
1,2-dichloroethane
1,1-dichloroethene
cis-1,2-dichloroethene
trans-1,2-dichloroethene
1,2-dichloropropane
cis-1,3-dichloropropene
trans-1,3-dichloropropene
1,4-dioxane
ethanol*
ethyl acetate
ethyl benzene
ethylene dibromide
(1,2-dibromoethane)
4-ethyltoluene
trichlorofluoromethane (Freon 11)
dichlorodifluoromethane (Freon 12)
1,1,2-trichloro-1,2,2-trifluoroethane
(Freon 113)
1,2-dichlorotetrafluoroethane
(Freon 114)
heptane
hexachloro-1,3-butadiene
hexane
2-hexanone (MBK)
4-methyl-2-pentanone (MIBK)
methylene chloride
methyl *tert*-butyl ether (MTBE)
methyl methacrylate
2-propanol
propylene
styrene
1,1,2,2-tetrachloroethane
tetrachloroethene
tetrahydrofuran
toluene
1,2,4-trichlorobenzene
1,1,1-trichloroethane
1,1,2-trichloroethane
trichloroethene
1,2,4-trimethylbenzene
1,3,5-trimethylbenzene
vinyl acetate
vinyl chloride
m-xylene
o-xylene
p-xylene

1ppm in nitrogen, 104 liters @ 1,800psi
cat. # 34436 (ea.)

1ppm in nitrogen, 110 liters @ 1,800psi (Pi-marked Cylinder)
cat. # 34436-PI (ea.)

100ppb in nitrogen, 104 liters @ 1,800psi
cat. # 34437 (ea.)

100ppb in nitrogen, 110 liters @ 1,800psi (Pi-marked Cylinder)
cat. # 34437-PI (ea.)

*Stability of this compound cannot be guaranteed.

also **available**

See **page 386** for high-purity regulator.

TO-14A/TO-15/TO-17 Performance Test Standard

Restek is pleased to offer the Performance Testing/VOC Audit Sample Program in cooperation with Spectra Gases. This is an on-going testing program in which laboratories, and/or other users of VOC standards, are able to evaluate their own capabilities, as well as compare their results and accuracy against other laboratories. As a participant in the program, you will receive a disposable cylinder, directly from Spectra Gases, containing multiple unknown TO-14A/TO-15 components at varying concentrations that are to be identified, quantified, and reported via the Spectra Gases P-T Audit Program forms. The results will be published and distributed for peer review. To ensure confidentiality, all participating laboratories will be anonymous, and only the individual laboratory will know their own results. To provide statistical analysis, the audit sample will be shipped to all laboratories at the same time, once a year during the fourth quarter.

cylinder **design**

Performance Test Standard

Size: 5A disposable (3.2" x 12")
Volume/Pressure: 150L @ 1,800psig
CGA 180 outlet fitting
Weight: 2.2 lbs

150 liters @ 1,800psig
cat. # 34560 (ea.)

BTEX Gas Mix

benzene
ethylbenzene
toluene
m-xylene
o-xylene
p-xylene

1ppm in nitrogen, 104 liters @ 1,800psi
cat. # 34414 (ea.)

1ppm in nitrogen, 110 liters @ 1,800psi (Pi-marked Cylinder)
cat. # 34414-PI (ea.)

100ppb in nitrogen, 104 liters @ 1,800psi
cat. # 34428 (ea.)

100ppb in nitrogen, 110 liters @ 1,800psi (Pi-marked Cylinder)
cat. # 34428-PI (ea.)

BTEX and MTBE Gas Mix

benzene
ethylbenzene
methyl *tert*-butyl ether (MTBE)
toluene
m-xylene
o-xylene
p-xylene

1ppm in nitrogen, 104 liters @ 1,800psi
cat. # 34541 (ea.)

1ppm in nitrogen, 110 liters @ 1,800psi (Pi-marked Cylinder)
cat. # 34541-PI (ea.)

100ppb in nitrogen, 104 liters @ 1,800psi
cat. # 34542 (ea.)

100ppb in nitrogen, 110 liters @ 1,800psi (Pi-marked Cylinder)
cat. # 34542-PI (ea.)

Sulfur 5-Component Mix

12-month stability. +/- 10% accuracy.

carbonyl sulfide
dimethyl sulfide
ethyl mercaptan
hydrogen sulfide
methyl mercaptan

1ppm in nitrogen, 110 liters @ 1,800psi
cat. # 34561 (ea.)

1ppm in nitrogen, 110 liters @ 1,800psi (Pi-marked Cylinder)
cat. # 34561-PI (ea.)

Massachusetts APH Mix (26 components)

benzene
1,3-butadiene
butylcyclohexane
cyclohexane
n-decane
2,3-dimethylheptane
2,3-dimethylpentane
n-dodecane
ethylbenzene
n-heptane
n-hexane
isopentane
isopropylbenzene
p-isopropyltoluene
methyl *tert*-butyl ether
1-methyl-3-ethylbenzene
n-nonane
n-octane
toluene
toluene-d8 (IS)
1,2,3-trimethylbenzene
1,3,5-trimethylbenzene
n-undecane
o-xylene
m/*p*-xylene (combined)

1ppm in nitrogen, 104 liters @ 1,800psi
cat. # 34540 (ea.)

1ppm in nitrogen, 21 liters @ 350psig (Pi-marked Cylinder)
cat. # 34540-PI (ea.)

Japan Calibration Mix (9 components)

acrylonitrile
benzene
1,3-butadiene
chloroform
1,2-dichloroethane
dichloromethane
tetrachloroethylene
trichloroethylene
vinyl chloride

1ppm in nitrogen, 104 liters @ 1,800psi
cat. # 34418 (ea.)

1ppm in nitrogen, 110 liters @ 1,800psi (Pi-marked Cylinder)
cat. # 34418-PI (ea.)

cylinder **design**

Spectra 104L Cylinders:

Aluminum construction
Size: 8 x 24 cm
Volume/Pressure: 104 liters of gas @ 1,800psi
CGA-180 outlet fitting.
Weight: 1.5 lbs/0.7 kg

Scotty 110L Cylinders (Pi-marked Cylinders for EU Regulations):

Aluminum construction
Size: 8.3 x 29.5 cm
Volume/Pressure: 110 liters of gas @ 1,800psi
CGA-180 outlet fitting.
Weight: 2.2 lbs/1 kg
US DOT Specs: 3AL2216

please **note**

Gas standards are subject to hazardous materials shipping fees by most freight carriers.

did you **know**?

Pi-marked Gas Cylinders for EU Countries
Our Pi-marked gas standards from Scott Specialty Gases meet the requirements of Transportable Pressure Equipment Directive (TPED) implemented in 2001 that regulates the safe transport of pressurized containers used throughout the European community.

for **reference books**

Visit **www.restek.com**

also **available**

Custom air standards!
Visit **www.restek.com** for our custom air standards ordering form.

Ozone Precursor Mixture/PAMS (57 components)

acetylene	isopropylbenzene
benzene	methylcyclohexane
n-butane	methylcyclopentane
1-butene	2-methylheptane
cis-2-butene	3-methylheptane
trans-2-butene	2-methylhexane
cyclohexane	3-methylhexane
cyclopentane	2-methylpentane
n-decane	3-methylpentane
m-diethylbenzene	*n*-nonane
p-diethylbenzene	*n*-octane
2,2-dimethylbutane	*n*-pentane
2,3-dimethylbutane	1-pentene
2,3-dimethylpentane	*cis*-2-pentene
2,4-dimethylpentane	*trans*-2-pentene
n-dodecane	propane
ethane	*n*-propylbenzene
ethylbenzene	propylene
ethylene	styrene
m-ethyltoluene	toluene
o-ethyltoluene	1,2,3-trimethylbenzene
p-ethyltoluene	1,2,4-trimethylbenzene
n-heptane	1,3,5-trimethylbenzene
n-hexane	2,2,4-trimethylpentane
1-hexene	2,3,4-trimethylpentane
isobutane	*n*-undecane
isopentane	*o*-xylene
isoprene	*m*/*p*-xylene (combined)

1ppm in nitrogen, 104 liters @ 1,800psi
cat. # 34420 (ea.)

1ppm in nitrogen, 30 liters @ 500psi (Pi-marked Cylinder)
cat. # 34420-PI (ea.)

100ppb in nitrogen, 104 liters @ 1,800psi
cat. # 34429 (ea.)

100ppb in nitrogen, 110 liters @ 1,800psi (Pi-marked Cylinder)
cat. # 34429-PI (ea.)

Ozone Precursor/PAMS Mix

(57 components at EPA concentrations: ppbC)

acetylene	40	isopropylbenzene	40
benzene	30	methylcyclohexane	30
n-butane	40	methylcyclopentane	25
1-butene	30	2-methylheptane	25
cis-2-butene	35	3-methylheptane	25
trans-2-butene	25	2-methylhexane	25
cyclohexane	40	3-methylhexane	25
cyclopentane	20	2-methylpentane	20
n-decane	30	3-methylpentane	40
m-diethylbenzene	40	*n*-nonane	25
p-diethylbenzene	25	*n*-octane	30
2,2-dimethylbutane	40	*n*-pentane	25
2,3-dimethylbutane	50	1-pentene	25
2,3-dimethylpentane	50	*cis*-2-pentene	35
2,4-dimethylpentane	40	*trans*-2-pentene	25
n-dodecane	40	propane	40
ethane	25	*n*-propylbenzene	30
ethylbenzene	25	propylene	25
ethylene	20	styrene	40
m-ethyltoluene	25	toluene	40
o-ethyltoluene	30	1,2,3-trimethylbenzene	25
p-ethyltoluene	40	1,2,4-trimethylbenzene	40
n-heptane	25	1,3,5-trimethylbenzene	25
n-hexane	30	2,2,4-trimethylpentane	30
1-hexene	60	2,3,4-trimethylpentane	25
isobutane	25	*n*-undecane	30
isopentane	40	*o*-xylene	25
isoprene	40	*m*/*p*-xylene (combined)	40

20-60ppb C in nitrogen, 104 liters @ 1,800psi
cat. # 34445 (ea.)

20-60ppb C in nitrogen, 110 liters @ 1,800psi (Pi-marked Cylinder)
cat. # 34445-PI (ea.)

NEW!

24129

Small Cylinder Stand

- Supports and stabilizes disposable gas cylinders.
- Fits cylinders up to 3⅜" (8cm) in diameter.
- Adjustable screw secures cylinder in place.

This cylinder stand is designed to support small diameter cylinders, such as 104L and 110L disposable cylinders. It is a simple, safe, and economical way to stabilize the position of small cylinders, while keeping them within close proximity. The stand is constructed of heavyweight painted steel and includes an adjustable screw for safely securing cylinders.

Description	qty.	cat.#	price
Small Cylinder Stand	ea.	24129	

21572

Spectra Gas 7621 High-Purity VOC Regulator

- Single-stage, stainless steel.
- Two pressure gauges and CGA-180 fitting.
- 3,000psig maximum inlet pressure.
- Stainless steel diaphragm and Kel-F® seat.
- ⅛-inch tube compression outlet.
- Low internal volume: 3.03cc.
- Accurate pressure control even at low flow rates.
- Individually tested for leaks and impurities.

Description	qty.	cat.#	price
0–30psig outlet pressure gauge	ea.	21572	
0–100psig outlet pressure gauge	ea.	21572-R100	

Natural Gas and Refinery Gas Standards

- Each available in three varying concentrations.
- Mini-regulator designed specially for these standards.

Natural Gas Standards

Available in three mixes, from lean to rich. Each has an extended list of C6+ components.

	Natural Gas Standard #1 cat.# 34438, ea. 663.70 % each compound**	Natural Gas Standard #2 cat.# 34439, ea. 663.70 % each compound**	Natural Gas Standard #3 cat.# 34440, ea. 663.70 % each compound**
nitrogen	1.000	2.500	5.000
carbon dioxide	0.500	1.000	1.500
methane UHP	94.750	85.250	70.000
ethane UHP	2.000	5.000	9.000
propane	0.750	3.000	6.000
isobutane	0.300	1.000	3.000
n-butane	0.300	1.000	3.000
isopentane	0.150	0.500	1.000
n-pentane	0.150	0.500	1.000
hexanes plus*	0.100	0.250	0.500
Concentration	mole	mole	mole
Volume	13.16L @ 200psig	13.16L @ 200psig	5.5L @ 75psig
Ideal Heating Value (Dry BTU/SCF)	1048 gross	1142 gross	1317 gross

Refinery Gas Standards

Available in three mixes with varying C5 unsaturates or extended C6+ components.

	Refinery Gas Standard #1 cat.# 34441, ea. 942.30 % each compound**	Refinery Gas Standard #2 cat.# 34442, ea. 942.30 % each compound**	Refinery Gas Standard #5 cat.# 34443, ea. 942.30 % each compound**
hydrogen	40.750	12.500	12.500
argon	0.500	1.000	1.000
nitrogen	4.000	37.200	37.200
carbon monoxide	1.000	1.000	1.000
carbon dioxide	3.000	3.000	3.000
methane	8.500	5.000	5.000
ethane	6.000	4.000	4.000
ethylene	2.000	2.000	2.000
acetylene	—	1.000	1.000
propane	7.000	6.000	6.000
propylene	3.000	3.000	3.000
propadiene	0.850	1.000	1.000
cyclopropane	—	0.040	—
isobutane	6.000	5.000	5.000
n-butane	4.000	4.000	4.000
isobutylene	2.000	1.000	1.000
1,3 butadiene	3.000	3.000	3.000
cis-2-butene	2.000	2.000	2.000
trans-2-butene	2.000	3.000	3.000
butene-1	2.000	2.000	2.000
2-methyl-2-butene	—	0.200	0.200
isopentane	1.000	1.000	1.000
n-pentane	1.000	1.000	1.000
cis-2-pentene	—	0.400	0.400
trans-2-pentene	—	0.160	0.200
pentene-1	—	0.400	0.400
n-hexane	0.500	0.100	—
hexanes plus	—	—	0.100
Concentration	mole	mole	mole
Volume	5.2L @ 70psig	4.9L @ 60psig	4.6L @ 60psig

*Contact Restek or your Restek representative for a complete list of hexanes plus.
**Precise concentrations are provided on the data sheet included with each cylinder and may vary slightly from those listed here.

Mini-Regulator for natural gas and refinery gas standards

- 0–300psig inlet pressure range.
- 0–15psig outlet pressure range.
- Supplied with 0–15psig outlet pressure gauge, brass CGA 170 nut and nipple.

Description	qty.	cat.#	price
Mini-Regulator	ea.	22032	

please **note**

Gas standards on this page are not available in Pi-marked cylinders for EU countries.

cylinder **design**

DCG Partnership Cylinders:

Size: 7.6 x 24 cm
CGA-170/110 connection.
US DOT Specs: DOT-4B-240ET

Please note: This cylinder is not approved for use in Canada.

22032

Scott Transportable Pure Gases and Mixtures in 14-, 48-, and 110-Liter Sizes

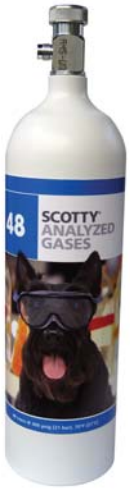
We offer a wide range of Scott Transportable Gases, from pure gases for purging or calibrating to multi-component mixes which are ideal for peak identification work.

The 14-liter container has a CGA 160 connection for more precise integration with analytical systems. The 48-liter cylinder has a CGA 165 connection, and can deliver large volumes of sample. The 110-liter cylinder has a CGA 180 connection.

Scotty® 14
Contents: 14 liters
Pressure: 240psig (17 bar)
Outlet Fitting: CGA 160
Weight: 1.5 lbs/0.7 kg
Dimensions: 3" diameter x 11" height (7.6 x 28cm)
DOT Specifications: 4B240

Please note: this cylinder is not approved for use in Canada.

Scotty® 48
Contents: 48 liters
Pressure: 300psig (21 bar)
Outlet Fitting: CGA 165
Weight: 1.75 lbs/0.8 kg
Dimensions: 4" diameter x 16 ¼" height (10.2 x 41cm)
DOT Specifications: 39 NRC



Scotty® 110 (Pi-marked Cylinders for EU Regulations)
Contents: 110 liters
Pressure: 1800psig (124 bar)
Outlet Fitting: CGA 180
Weight: 2.2 lbs/1 kg
Dimensions: 3.25" diameter x 11.625" height (8.3 x 29.5cm)
DOT Specifications: 3AL2216

Description	Shelf Life	Scotty 14 (14 Liter) cat.#	price	Scotty 48 (48 Liter) cat.#	price	Scotty 110 (110 Liter) cat.#	price
Pure Gases							
Air, zero (THC < 1ppm)	2 yrs.	34448		34449		34449-PI	
Argon, 99.995%	2 yrs.	34457		—	—	34457-PI	
Carbon dioxide, 99.80%	2 yrs.	34451		34452		34452-PI	
Hydrogen, 99.99%	2 yrs.	34453		—	—	34453-PI	
Methane, 99.00%	2 yrs.	34454		—	—	34454-PI	
Oxygen, 99.60%	2 yrs.	34455		—	—	34455-PI	
Two-Component Mixtures							
Benzene in air (1ppm)	1 yr.	—	—	34458		34458-PI	
Benzene in air (100ppm)	1 yr.	—	—	34459		34459-PI	
1,3-Butadiene in nitrogen (10ppm)	2 yrs.	34460		34461		34461-PI	
Carbon dioxide in helium (100ppm)	2 yrs.	34462		—	—	34462-PI	
Carbon dioxide in nitrogen (100ppm)	2 yrs.	34463		34464		34464-PI	
Carbon dioxide in nitrogen (1000ppm)	2 yrs.	34465		34466		34466-PI	
Ethylene in air (8-10ppm)	2 yrs.	34467		34468		34468-PI	
Ethylene in helium (100ppm)	2 yrs.	34489		—	—	34489-PI	
Hydrogen in helium (100ppm)	2 yrs.	34469		—	—	34469-PI	
Hydrogen in nitrogen (1%)	2 yrs.	34471		34472		34472-PI	
Hydrogen in nitrogen (100ppm)	2 yrs.	34473		34474		34474-PI	
Methane in helium (100ppm)	2 yrs.	34476		34477		34477-PI	
Methane in nitrogen (100ppm)	2 yrs.	34478		—	—	34478-PI	
Methane in nitrogen (1%)	2 yrs.	34482		34483		34483-PI	
Nitrogen in helium (100ppm)	2 yrs.	34479		—	—	34479-PI	
Nitrous oxide in nitrogen (1ppm)	2 yrs.	34484		34485		34485-PI	
Oxygen in helium (100ppm)	2 yrs.	34480		—	—	34480-PI	
Oxygen in nitrogen (2%)	2 yrs.	34487		34488		34488-PI	
Oxygen in nitrogen (6%)	2 yrs.	34491		34492		34492-PI	
1,1,1-Trichloroethane in nitrogen (10ppm)	2 yrs.	—	—	34493		34493-PI	
Trichloroethylene in nitrogen (10ppm)	2 yrs.	34494		34495		34495-PI	
Vinyl chloride in nitrogen (1ppm)	2 yrs.	34496		34497		34497-PI	
Vinyl chloride in nitrogen (10ppm)	2 yrs.	34498		34499		34499-PI	
Vinyl chloride in nitrogen (50ppm)	2 yrs.	34500		—	—	34500-PI	
Vinyl chloride in nitrogen (100ppm)	2 yrs.	34501		—	—	34501-PI	
Vinyl chloride in nitrogen (1000ppm)	2 yrs.	34502		—	—	34502-PI	

Description	Shelf Life	Scotty 14 (14 Liter) cat.#	price	Scotty 48 (48 Liter) cat.#	price	Scotty 110 (110 Liter) cat.#	price
Multi-Component Mixtures							
Carbon monoxide, carbon dioxide, hydrogen and oxygen in nitrogen (0.5% each)	2 yrs.	34504		34505		34505-PI	
Carbon monoxide, carbon dioxide, hydrogen and oxygen in nitrogen (1% each)	2 yrs.	34507		34508		34508-PI	
Carbon monoxide, carbon dioxide, methane, ethane, ethylene and acetylene in nitrogen (1% each)	1 yr.	—	—	34511		34511-PI	
Carbon monoxide, carbon dioxide, nitrogen, and oxygen, (5% each) and methane and hydrogen (4% each) in helium	2 yrs.	34512		—	—	34512-PI	
Carbon monoxide (7%), carbon dioxide (15%) and oxygen (5%) in nitrogen	2 yrs.	34514		—	—	34514-PI	
Carbon monoxide (7%), oxygen (4%), carbon dioxide (15%) and methane (4.5%) in nitrogen	2 yrs.	34515		34516		34516-PI	
C1-C6 *n*-Paraffins: methane, ethane, propane, butane, pentane, hexane in nitrogen (15ppm each)	2 yrs.	34518		34519		34519-PI	
C1-C6 *n*-Paraffins: methane, ethane, propane, butane, pentane, hexane in helium (100ppm each)	2 yrs.	34521		34522		34522-PI	
C1-C6 *n*-Paraffins: methane, ethane, propane, butane, pentane, hexane in helium (1000ppm each)	2 yrs.	34524		34525		34525-PI	
C1-C6 *n*-Paraffins: methane, ethane, propane, butane, pentane, hexane in nitrogen (100ppm each)	2 yrs.	34527		34528		34528-PI	
C2-C6 Olefins: ethylene, propylene, 1-butene, 1-pentene, 1-hexene in helium (100ppm each)	2 yrs.	34529		34530		34530-PI	
C2-C6 Olefins: ethylene, propylene, 1-butene, 1-pentene, 1-hexene in nitrogen (100ppm each)	2 yrs.	34531		34532		34532-PI	
Branched Paraffins: 2,2-dimethylbutane, 2,2-dimethylpropane, isobutane, 2-methylbutane, 2-methylpentane, 3-methylpentane in nitrogen (15ppm each)	2 yrs.	34534		—	—	34534-PI	
Methane, ethane, ethylene, acetylene, propane, propylene, *n*-butane, propyne in nitrogen (15ppm each)	1 yr.	—	—	34537		34537-PI	
n-butane, isobutane, *cis*-2-butene, *trans*-2-butene, 1-butene, iso-butylene, 1,3-butadiene, ethyl acetylene in nitrogen (15ppm each)	1 yr.	—	—	34539		34539-PI	

did you **know**?

Pi-marked Gas Cylinders for EU Countries

Our Pi-marked gas standards from Scott Specialty Gases meet the requirements of Transportable Pressure Equipment Directive (TPED) implemented in 2001 that regulates the safe transport of pressurized containers used throughout the European community.

also **available**

Custom air standards!

Visit **www.restek.com** for our custom air standards ordering form.

Regulators for use with 14-liter and 48-liter Scott Transportable Gases

Specifications:
Maximum Inlet Pressure: 300psig
Outlet Pressure Range: 2–10psig
Maximum Delivery Pressure: 25psig
Operating Temperature Range: 35°F to 150°F (2°C to 65°C)
Outlet Connection: 1/4" female NPT

Materials of Construction:
Body: Brass
Diaphragm: Viton®
Seat: Acetal
Seal: Viton®

Use the CGA 160 inlet connection with 14-liter Scott Transportable Gases. Use the CGA 165 inlet connection with 48-liter Scott Transportable Gases.


22690

Description	qty.	cat.#	price
Regulator with CGA 160 Inlet Connection	ea.	22690	
Regulator with CGA 165 Inlet Connection	ea.	22691	

also **available**

Regulators with CGA-180 connections for the 110L cylinders are listed on **page 386**.

Syringe Adapter Kit for Single-Stage VOC Regulator

Use to withdraw sample from a high-pressure cylinder after pressure reduction through the high-purity VOC single-stage regulator.

Kit contains one nickel-plated brass 1/4" NPT to female luer fitting, which can be used with an A-2 Luer syringe (cat.# 20162 or 20163), and one stainless steel 1/4" NPT x 1/8" compression fitting with septum (can be used with any syringe needle).


21118

Description	qty.	cat.#	price
Syringe Adapter Kit	kit	21118	

also **available**

Certificates are available upon request.

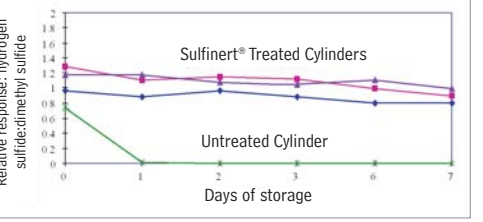
NEW! TPED compliant cylinders now available for shipping into EU countries.

Sulfinert® Treated High Pressure Sample Cylinders

- Sulfinert® coating provides stable storage of sulfur and mercury at ppb levels in petroleum samples.
- Inert coating doesn't flake; more durable than Teflon®.
- TPED compliant cylinders now available for shipping into EU countries.
- All cylinders have 1/4" female NPT threads on both ends.

Sulfur compounds are stable in Sulfinert® treated stainless steel systems.

17ppbv hydrogen sulfide in 500mL cylinders



Refinery and natural gas samples often contain trace amounts of sulfur-containing compounds which can interfere with reactions or poison catalysts in petrochemical processes. Because sulfur compounds quickly react with stainless steel surfaces, accurate determination of these compounds is impossible when samples are collected and stored in untreated sample cylinders. Restek's Sulfinert® passivation technique bonds an inert silica layer into the surface of stainless steel, preventing active compounds from reacting with or adsorbing to the steel. These Swagelok® high pressure sample cylinders are Sulfinert® treated for greater stability of sulfur compounds and mercury. DOT rating to 1,800 and 5,000psig allows sampling at gas wellheads as well as in the refinery. Use of high pressure sample cylinders is cited in ASTM D1265, Standard Practice for Sampling Liquefied Petroleum (LP) Gases, Manual Method.

304L Stainless Steel

		1,800psig			TPED, 1,450psig		
Size	qty.	Swagelok part #	cat.#	price	Swagelok part #	cat.#	price
75cc	ea.	304L-HDF4-75	24130				
150cc	ea.	304L-HDF4-150	24131		304L-HDF4-150-PD	24131-PI	
300cc	ea.	304L-HDF4-300	24132		304L-HDF4-300-PD	24132-PI	
500cc	ea.	304L-HDF4-500	24133		304L-HDF4-500-PD	24133-PI	
1000cc	ea.	304L-HDF4-1000	24134		304L-HDF4-1000-PD	24134-PI	
2250cc	ea.	304L-HDF4-2250	21394		304L-HDF4-2250-PD	21394-PI	

316L Stainless Steel

		5,000psig			TPED, 4,350psig		
Size	qty.	Swagelok part #	cat.#	price	Swagelok part #	cat.#	price
150cc	ea.	316L-50DF4-150	22111		316L-50DF4-150-PD	22111-PI	
300cc	ea.	316L-50DF4-300	22112		316L-50DF4-300-PD	22112-PI	
500cc	ea.	316L-50DF4-500	22113		316L-50DF4-500-PD	22113-PI	

Sulfinert® Treated Alta-Robbins Sample Cylinder Valves

- All wetted parts are Sulfinert® treated for inertness.
- Compatible with Sulfinert® treated Swagelok® sample cylinders.
- Large, durable, Kel-F® seat ensures leak-free operation; temperature range: -40°C to 120°C.
- All valves have 1/4" male NPT inlet fittings.

Description	DOT Pressure Rating	qty.	cat.#	price
1/4" Male NPT Outlet	3,500psig	ea.	21400	
1/4" Male Compression Outlet	3,500psig	ea.	21401	
1/4" Male NPT with Dip Tube*	3,500psig	ea.	21402	enquire
1/4" Male NPT with 2,850psi Rupture Disc	3,500psig	ea.	21403	
1/4" Female NPT Outlet with 2,850psi Rupture Disc	3,500psig	ea.	21404	
1/4" Male NPT Outlet	6,000psig	ea.	22109	
1/4" Female NPT Outlet	6,000psig	ea.	22110	

*To order catalog #21402 (Sulfinert Alta-Robbins Sample Cylinder Valve, 1/4" NPT with Dip Tube), please call Customer Service at 800-356-1688, ext. 3, or contact your Restek representative. Specify dip tube length or % outage when ordering (maximum length = 5.25"/ 13.3cm). Note: End of part will not be treated after cutting tube to length.

Sulfinert® Treated Rupture Disc Tee

2,850psig (19,650kPa) rating; 1/4" NPT connections.

Description	qty.	cat.#	price
Sulfinert Treated Rupture Disc Tee (1/4" NPT connections)	ea.	21396	
Replacement Rupture Disc (not Sulfinert treated)	ea.	24298	


21396

Sulfinert® Treated Gas Sampling Valves and Sample Loops

- Ideal for samples containing low concentrations of sulfur or other active compounds.
- Sample loop sizes from 5µL to 5cc.

Sulfinert® treatment eliminates active sites in the valve or loop, for better recovery of active compounds.


20585

Sulfinert® Treated Gas Sampling Valves (1/16" fittings, 0.40mm port diameter; "W Type" valve)

Description	qty.	cat.#	price
Sulfinert Gas Sampling Valve; 4-Port	ea.	20584	
Sulfinert Gas Sampling Valve; 6-Port	ea.	20585	
Sulfinert Gas Sampling Valve; 10-Port	ea.	20586	

Replacement Rotors (Not Coated)

Description	qty.	cat.#	price
Replacement Rotor for 4-Port Sulfinert Gas Sampling Valve	ea.	20587	
Replacement Rotor for 6-Port Sulfinert Gas Sampling Valve	ea.	20588	
Replacement Rotor for 10-Port Sulfinert Gas Sampling Valve	ea.	20589	

Sulfinert® Treated Gas Sample Loops (1/16" fittings, for "W Type" valves)

Description	Size	qty.	cat.#	price
Sulfinert Sample Loops	5µL	ea.	22840	
Sulfinert Sample Loops	10µL	ea.	22841	
Sulfinert Sample Loops	20µL	ea.	22842	
Sulfinert Sample Loops	25µL	ea.	22843	
Sulfinert Sample Loops	50µL	ea.	22844	
Sulfinert Sample Loops	100µL	ea.	22845	
Sulfinert Sample Loops	250µL	ea.	22846	
Sulfinert Sample Loops	500µL	ea.	22847	
Sulfinert Sample Loops	1mL	ea.	22848	
Sulfinert Sample Loops	2mL	ea.	22849	
Sulfinert Sample Loops	5mL	ea.	22850	

Jumbo Syringe

Clear acrylic syringes, ideal for holding and dispensing large volumes of gas. An adjustable plunger on the O-ring ensures that the syringe is gas-tight over a long period of time. The central port is supplied with a luer-lock fitting; the secondary port is supplied with a septum nut. This enables access to the gas sample for adding standards or removing a subsample. The plunger stem is detachable, making sample storage easy.


21276

	SGE		Restek		
Volume	Model	cat.#	qty.	cat.#	price
500mL	500MAR-LL-GT	009910	ea.	21275	
1000mL	1000MAR-LL-GT	009920	ea.	21276	
2000mL	20000MAR-LL-GT	009930	ea.	21277	

Syringe O-Rings


21279

21278

Syringe Volume	SGE cat.#	qty.	Restek cat.#	price
500mL	032527	ea.	21278	
1000mL	032532	ea.	21279	