

Sample Preparation

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Solid Phase Extraction Cartridges from Restek

Proven Quality, Superior Cleanliness, and Method-Specific Performance

Resprep® solid phase extraction (SPE) cartridges are manufactured with specially cleaned sorbents and high-purity materials to minimize background and to help eliminate troublesome interference. In order to ensure reproducibility, raw materials and finished products go through rigorous QC testing, targeted to specific applications whenever possible, and an extensive certificate of analysis details the results.

Available with the following sorbents:

- **Silica:** Multipurpose
- **EPH Silica:** Petroleum
- **Florisil® Adsorbent:** Pesticides
- **CarboPrep® Adsorbent:** Dirty Samples
- **Reversed Phase:** Hydrophobic Compounds

www.restek.com/resprep



Resprep® SPE Cartridges (Normal Phase)

Hydrophilic (polar) adsorbents used to extract hydrophilic analytes from nonpolar matrices, such as organic solvents (e.g., polar contaminants from sample extracts).

	3 mL/500 mg (50-pk.)		6 mL/500 mg (30-pk.)		6 mL/1,000 mg (30-pk.)		15 mL/2 g (15-pk.)	
Florisil (EPA SW 846 methods and CLP protocols)	24031	£124.10	24034	£116.25	26228	£85.65		
	24032*	£177.70	26086**	£239.10	26085**	£264.85		
Silica (EPA SW 846 methods)	24035	£122.95			24038	£102.80		
	24036*	£186.60						

*PTFE frits

**Glass tubes with PTFE frits



24031

All cartridges are manufactured using high-density polypropylene and have polyethylene frits unless otherwise noted.

Cartridges may be processed by any one or all of these techniques: positive pressure, sidearm flask, centrifuge, or vacuum manifold.

Resprep® SPE Cartridges (Bonded Reversed Phases)

Hydrophobic (nonpolar) silica-based adsorbents; used to extract hydrophobic analytes from polar matrices, such as water (e.g., pesticides from water).

	1 mL/100 mg (100-pk)		3 mL/200 mg (50-pk.)		3 mL/500 mg (50-pk.)		6 mL/500 mg (30-pk.)		6 mL/1,000 mg (30-pk.)		60 mL/10 g (16-pk.)	
C18 (high load, endcapped)	26030	£176.65	26031	£140.45	24050	£157.10	24052	£108.75	24051	£140.45	26035	£205.50



26030

Closed End SPE Cartridge: Activated Sodium Sulfate

- High quality anhydrous sodium sulfate.
- Approximately 2 grams prepackaged in a convenient capped cartridge with both male and female luer ends for easy connection to a variety of devices or equipment.
- The adsorbent is fully activated and ready to use for removal of excess water from organic solvent solutions, prior to many types of analysis.
- Capped cartridges will remain active for long periods of storage in the lab.

SPE Cartridge	Bed Weight	qty.	cat#	price
Activated Sodium Sulfate	2 g	50-pk.	26207	£319.70



26207

CarboPrep® Reversing SPE Cartridges

- High adsorbent capacity (surface area ~200 m²/g) for large volume sampling.
- Chromatographic grade graphitized carbon provides consistent and quantitative recoveries of a wide variety of semivolatiles, pesticides, and herbicides.
- 500 mg bed weight.

Reversing cartridge design allows convenient inverted elution of strongly retained analytes using minimum solvent volumes. Ideal design for extraction of pesticides in water.¹

SPE Cartridge	Bed Weight	qty.	cat#	price
CarboPrep 200 Reversing Cartridge	500 mg	30-pk.	26206	£277.10

¹Crescenzi, C.; DiCorcia, A.; Guerriero, E.; and Saperi, R. "Development of a Multiresidue Method for Analyzing Pesticide Traces in Water Based on Solid-Phase Extraction and Electrospray Liquid Chromatography Mass Spectrometry", Environmental Science & Technology vol.31, no. 2 (1997) 479-488. (Reference not available from Restek.)



26206



26091

Excellent for Pesticide Residue Cleanup!

Resprep® CarboPrep® SPE Cartridges

- Improved recovery of sulfonylurea herbicides, phenols, carbamates, and triazine herbicides, compared to C18 and C8 cartridges.
- Wide range of selectivity for both analytes and their metabolites or degradation products.
- Rapid sampling flow rates; uncompromised recoveries.
- Maximum capacity for contaminant cleanup.
- Controlled manufacturing improves cleanliness and ensures reproducible performance.
- Excellent performance removing pigments from samples.

CarboPrep® cartridges are manufactured from chromatographic-grade, nonporous, graphitized carbon. Our manufacturing process minimizes variability and improves recovery and cleanup procedures. We offer two types of carbons: CarboPrep® 90 has a surface area of approximately 90 m²/g, and CarboPrep® 200 has a surface area of 200 m²/g. Both have higher capacity than silica-based packings for a variety of compounds.

CarboPrep® cartridges can be used for sample extraction of organic compounds and extract cleanup to remove matrix interferences, including highly pigmented materials.

SPE Cartridge	Tube Volume, Bed Weight	qty.	cat.#	price
CarboPrep 90	3 mL, 250 mg	50-pk.	26091	£205
CarboPrep 90	6 mL, 500 mg	30-pk.	26092	£221.25
CarboPrep 200	3 mL, 250 mg	50-pk.	26088	£183.80
CarboPrep 200	6 mL, 500 mg	30-pk.	26087	£183.80

Pesticide Residue Cleanup SPE Cartridges

- Convenient, multiple adsorbent beds in a single cartridge.
- For use in multiresidue pesticide analysis to remove matrix interferences.
- Excellent for cleanup of dietary supplement extracts.



26194



26128

SPE Cartridge	qty.	cat.#	price
6 mL Combo SPE Cartridge Packed with 500 mg CarboPrep 90/500 mg Aminopropyl, Polyethylene Frits	30-pk.	26193	£308.20
6 mL Combo SPE Cartridge Packed with 500 mg CarboPrep 90/500 mg PSA, Polyethylene Frits	30-pk.	26194	£301.40
6 mL SPE Cartridge Packed with 500 mg PSA, Polyethylene Frits	30-pk.	26195	£129.05
6 mL Combo SPE Cartridge Packed with 200 mg CarboPrep 200 and 400 mg PSA, PTFE Frits	30-pk.	26127	£231.15
6 mL Combo SPE Cartridge Packed with 250 mg CarboPrep 200 and 500 mg PSA, PTFE Frits	30-pk.	26128	£248.85
6 mL Combo SPE Cartridge Packed with 500 mg CarboPrep 200 and 500 mg PSA, PTFE Frits	30-pk.	26129	£297.15

PSA—primary and secondary amine

Method Specific SPE Cartridges

These cartridges have been specifically designed to provide consistent and reproducible results for the method or application stated.

Description	Applications	Tube Volume, Bed Weight	qty.	cat.#	price
EPH Fractionation	Separation of aliphatic and aromatic hydrocarbons into distinct extract fractions. Specially treated to reduce contaminants and increase capacity. Silica packing.	20 mL, 5 g	15-pk.	26065	£143.05
EPA Methods 521 & 522	For use in EPA Method 521: Nitrosamines in Drinking Water and EPA Method 522 for 1,4-Dioxane in Drinking Water. Activated charcoal packing.	6 mL, 2 g	30-pk.	26032	£287.40
EPA Method 548.1	Extraction of endothall from aqueous samples. Weak anion exchange resin (BioRex 5) packing.	6 mL	30-pk.	26063	£592.90
Ultra Quat SPE	For use in HPLC analysis of paraquat/diquat, as an alternative to EPA 549.2. For an HPLC column developed specifically for this application, see page 183.	6 mL, 500 mg	30-pk.	25499	£180.10
Organo Tin	High-capacity cleanup of butyl and phenyl tin compounds from soil, water, and biota. Mixed bed.	60 mL	16-pk.	24049	£217.55
RDX	Extraction of explosive compounds (similar to EPA Method 8095 and 8330 list) from water samples.	6 mL, 500 mg	30-pk.	26093	£299.75

Resprep® SPE Tube Parts & Accessories

Empty Tubes (polypropylene)	Volume	qty.	cat.#	price
	1 mL	50-pk.	26010	£32.85
	3 mL	50-pk.	26011	£36.20
	6 mL	50-pk.	26012	£40.90
	15 mL	50-pk.	26013	£48.40
	sample reservoir, 25 mL	12-pk.	26014	£31.65
	sample reservoir, 60 mL	12-pk.	26015	£40.90
Frits (polyethylene), 20 µm	Fits Tube Volume, Diameter	qty.	cat.#	price
	1 mL, 6 mm	100-pk.	26016	£60.45
	3 mL, 9 mm	100-pk.	26017	£72.55
	6 mL, 1.2 cm	100-pk.	26018	£76
	15 mL, 1.6 cm	100-pk.	26019	£78.90
	25 mL, 2.0 cm*	100-pk.	26020	£84.60
	60 mL, 2.6 cm	100-pk.	26021	£92.10
Tube Caps (polyethylene)	Fits Tube Volume	qty.	cat.#	price
	1 mL	12-pk.	26001	£20.70
	3 mL	12-pk.	26002	£23.05
	6 mL	12-pk.	26003	£26.50
	15 mL	12-pk.	26004	£28.85
	25 mL*	12-pk.	26005	£31.65
Female Luer End Caps (polypropylene)	Fits Tube Volume	qty.	cat.#	price
	universal	12-pk.	26000	£20.70
Connectors (polypropylene)	Fits Tube Volume	qty.	cat.#	price
	1, 3, 6 mL	12-pk.	26007	£113.15
	15, 25 mL*	12-pk.	26008	£124.80
	60 mL	12-pk.	26009	£100.35

*For 20 mL packed tubes.

Resprep® tubes, frits, caps, and connectors for your method development needs.



26012



26018



26000

26003



26007



Solid Phase Extraction Cartridges from Restek
Proven Quality • Superior Cleanliness • Method-Specific Performance

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Manifolds & Replacement Parts



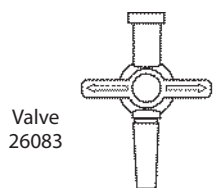
26077

Resprep® 12- or 24-Port SPE Manifolds

- Use with any standard male luer end SPE cartridges.
- Inert, PTFE sample guides reduce cross-contamination and carryover.
- Flexible sample collection rack will accommodate a variety of receiving vessels.
- Quick vacuum-release valve for better system control.
- Individual valves allow vacuum control for each cartridge, improving reproducibility.



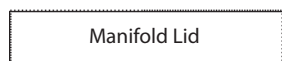
Resprep® Manifold Replacement Parts



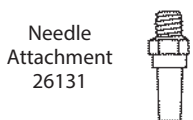
Valve
26083



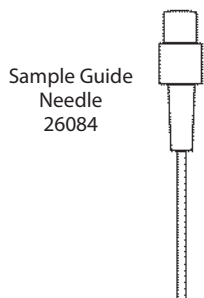
Valve
Attachment
26130



Manifold Lid



Needle
Attachment
26131



Sample Guide
Needle
26084

Description	qty.	cat.#	price
Complete Resprep SPE Manifold, 12-Port (Includes: glass basin with built-in vacuum regulator, polypropylene lid with 12 individual control valves, 12-position collection rack, 12 PTFE sample guides, and waste container.)	kit	26077	£792.90
Complete Resprep SPE Manifold, 24-Port (Includes: glass basin with built-in vacuum regulator, polypropylene lid with 24 individual control valves, 24-position collection rack, and 24 PTFE sample guides.)	kit	26080	£1,140

Resprep® Manifold Replacement Parts

Description	qty.	cat.#	price
Replacement Waste Container, 12-Port	ea.	24014	£21.90
Replacement Vacuum Valve and Gauge Assembly	ea.	24008	£200.80
Glass Vacuum Chamber w/gauge & valve for Resprep manifolds, 6 or 12-Port	ea.	25991	£495.85
Collection Rack			
Collection Rack, 12-Port	ea.	26079	£142.70
Collection Rack, 24-Port	ea.	26082	£179
Manifold Lid			
Replacement Manifold Lid (sample guides not included), 12-Port	ea.	26078	£314.20
Replacement Manifold Lid (sample guides not included), 24-Port	ea.	26081	£500.65
Manifold Lid Replacement Parts			
Valves, 12 or 24-Port	2-pk.	26083	£20.70
Valve Attachment	48-pk.	26130	£48.70
Needle Attachment	48-pk.	26131	£48.70
Sample Guide Needles, 12 or 24-Port	12-pk.	26084	£25.40

*Waste container (shown in tank) and top shelf for round-bottom flasks are not included in 24-port manifold kit (cat.# 26080).



24002

Oil-Free Vacuum/Pressure Station for 12-Port Resprep® SPE Systems

Allows switching from pressure to vacuum in a matter of seconds. Quiet, oil-free unit will not contaminate the extraction system or your samples. Provides 20" Hg (68 kPa) vacuum or 18 psi (124 kPa) pressure.

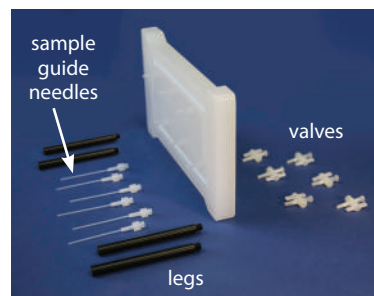
Description	qty.	cat.#	price
Oil-Free Vacuum/Pressure Station, 115VAC, 60Hz, US	ea.	24002	£765.40
Oil-Free Vacuum/Pressure Station, 230VAC, 50Hz, Europe (CE certified)	ea.	24003	£765.40
Vacuum Tubing (10 ft./3 m, 1/4" ID)	ea.	24016	£142.70

Not recommended for use with 24-port manifold.

Warranty period is one year from date of purchase. Evaluation fee is charged for repairs out of warranty.

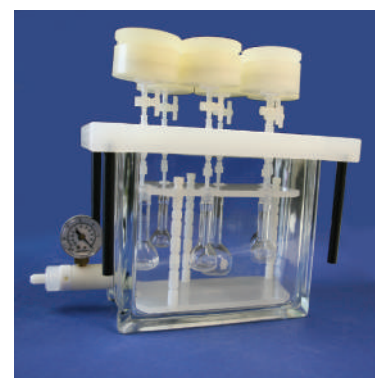
Resprep® 6-Port Disk Manifold Lid

- Low-cost option for disk extraction; fits standard 3 3/4" x 7 1/2" glass vacuum chambers.
- Doubles sample capacity—holds six disks, compared to standard 12-port manifolds, which only hold three.
- Individual vacuum control for each port improves reproducibility.
- Collection plate design secures variety of receiving vessels.
- Inert PTFE sample guides reduce cross-contamination and carryover.
- Compatible with any standard male luer end disk holder.



Description	qty.	cat.#	price
Resprep 6-Port Disk Manifold Lid*			
Includes: polypropylene lid with 6 ports, 6 nylon valves, 6 PTFE needle guides, 4 black lid legs, collection baseplate, collection plate for volumetric flasks, collection plate for concentrator tubes, 3 white collection plate posts, 12 collection plate retaining clips	kit	25992	£509.85
Accessories			
Glass Vacuum Chamber w/gauge & valve for Resprep manifolds, 6 or 12-Port	ea.	25991	£495.85
Manifold Lid Replacement Parts			
Valves, 12 or 24-Port	2-pk.	26083	£20.70
Valve Attachment	48-pk.	26130	£48.70
Needle Attachment	48-pk.	26131	£48.70
Sample Guide Needles, 12 or 24-Port	12-pk.	26084	£25.40
Gasket, 12-port	2-pk.	24011	£18.45

*Vacuum chamber (cat.# 25991) not included.



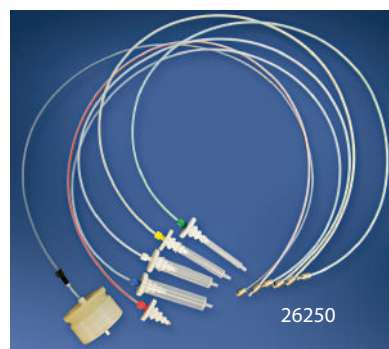
Fully assembled unit shown with glass vacuum chamber (cat.# 25991) and disk holders (cat.# 24020).

Resprep® Sample Delivery System

- Compatible with Resprep® 1, 3, 6, and 15 mL SPE cartridges and Diskcover-47 extraction disk holder (cat.# 24020).
- Six PTFE transfer lines (1/8" OD x 1/16" ID x 36" long); each is banded with a different color for easy sample identification.
- Specified in EPA drinking water methods.
- Tested to pH of 1 to ensure no contaminants leach from system.

Use the Resprep® sample delivery system to transfer large volumes of low viscosity samples directly from a bottle to a solid phase extraction cartridge, or to a disk on a vacuum manifold system for extraction or cleanup. Each unit consists of six transfer lines with a stainless steel weight on one end and a color-coded screw fitting and polyethylene terephthalate (PET) adapter on the opposite end.

Description	qty.	cat.#	price
Resprep Sample Delivery System	6-pk.	26250	£293.50



Disks & Holders



Resprep® disks & flow filters extract analytes of interest at high flow rates and significantly reduce clogging.



26024



26023



24020



24029

Resprep®-C18 and Resprep®-C8 SPE Disks

- Glass fiber disks embedded with C18 or C8 bonded silica.
- Extract semivolatile organic compounds.
- Deep-pore design reduces clogging and allows faster flow rates.
- Meet requirements for EPA Methods 525.1, 506, 550.1, and 549.1.
- Lower cost than PTFE disks.

Description	Diameter	qty.	cat.#	price
Resprep-C8	47 mm	24-pk.	24048	£180.95
Resprep-C18	47 mm	20-pk.	24004	£180.95
Resprep-C18	90 mm	12-pk.	25988	£470.10

Resprep® Oil & Grease SPE Disks

- 47 mm glass fiber disks embedded with specialty bonded silica.
- Meet requirements for EPA Method 1664.*
- Reduce emulsion formation and amount of solvent required by previous EPA methods.
- No chlorofluorocarbons needed.

Description	qty.	cat.#	price
Resprep Oil & Grease SPE Disks	20-pk.	26022	£130.65

*A sodium sulfate drying tube (cat.# 26207, page 397) and a 0.45 µm PTFE syringe filter (cat.# 26145, page 408) also may be used.

Resprep® SPE Flow Filters

- Designed specifically to improve flow when filtering oil and grease samples.
- Use with Resprep® Diskcover-47 reservoir, or any 47 mm glass sample reservoir.

Description	qty.	cat.#	price
Resprep SPE Flow Filters	20-pk.	26024	£41

Resprep® Resin SPE Disks

- 47 mm glass fiber disks embedded with styrene/DVB resin.
- For chlorinated, benzidine-containing, or nitrogen-containing pesticides.
- Meet requirements of EPA Methods 515.2 and 553.

Description	qty.	cat.#	price
Resprep Resin SPE Disks	20-pk.	26023	£207.70

Parts for Diskcover-47 Extraction System

Diskcover-47 Extraction Disk Holder

- Compatible with most vacuum manifold systems that accept 1/8-inch male luer fittings.
- Sample can be automatically introduced via 1/8-inch PTFE tubing or from the optional Diskcover-47 reservoir.

Description	qty.	cat.#	price
Diskcover-47 Extraction Disk Holder	ea.	24020	£184.70
Diskcover-47 Extraction Disk Holder	6-pk.	24021	£1,029
PTFE Tube Luer Adaptors (1/8" OD)	6-pk.	24017	£76
PTFE Sample Tubing (2 ft./0.6 m, 1/8" OD)	6-pk.	24025	£69.05

Diskcover-47 Reservoir*

The Diskcover-47 open-top reservoir allows you to pour up to 125 mL of sample directly onto the filter disk holder. It easily installs on top of the Diskcover-47 extraction disk holder.

Description	qty.	cat.#	price
Diskcover-47 Reservoir	ea.	24029	£112.20
Diskcover-47 Reservoir	6-pk.	24030	£521.85

*Must be used with the Diskcover-47 extraction disk holder.

Sodium Sulfate (Bulk Adsorbent)

- Ideal for removing water from sample extracts.
- Activate by heating to 400 °C for four hours before use.
- Packaged in recloseable 5 kg buckets.

Anhydrous sodium sulfate is the most common drying agent used to remove moisture from sample extracts. We package our 60 mesh material in recloseable buckets.

Description	qty.	cat.#	price
Sodium Sulfate	5 kg	26204	£97.90



Florisol® PR (Bulk Adsorbent)

- Pesticide residue grade.
- Packaged in glass containers.

Florisol® PR is commonly used to remove polar interferences from pesticide residues. This bulk material is ideal for labs packing their own extraction cartridges for pesticide residue extractions.

Description	qty.	cat.#	price
Florisol PR, 60/100 mesh	500 g	26135	£152.50



Granulated Activated Copper (Bulk Adsorbent)

- Convenient form for removing sulfur from environmental extracts.
- Acidified and activated—ready for use.

Activated copper effectively removes elemental sulfur from environmental extracts. Our acid-washed and activated material can be used right out of the package. The 30 mesh granular material eliminates the potential for fine copper particles in filtered extracts.

Description	qty.	cat.#	price
Granulated Activated Copper, 30 mesh	1 kg	26136	£96.65



Ottawa Sand (Bulk Adsorbent)

- Sample medium for matrix spikes and laboratory control blanks.
- Packaged in convenient 5 kg buckets.

Ottawa sand is listed in several U.S. EPA methods as the specified medium for matrix spike and laboratory control blanks.

Description	qty.	cat.#	price
Ottawa Sand	5 kg	26137	£227.25



Diatomaceous Earth (Bulk Adsorbent)

- Improves extraction efficiency.
- Adsorbs moisture from samples.

Diatomaceous earth is used as a filter aid to improve extraction efficiency of densely packed soils, such as clays. By mixing the sample with diatomaceous earth, recoveries can be improved and excess moisture can be absorbed. Packaged in a convenient 1 kg quantity.

Description	Similar to Dionex Part #	qty.	cat.#	price
Diatomaceous Earth, 30/40 mesh	062819	1 kg	26033	£266.30





QuEChERS Products

Ideal for multiresidue pesticide analysis from food and other matrices.

Restek Q-sep® QuEChERS Products






Fast, Simple Sample Prep for Multiresidue Pesticide Analysis

- Ready-to-use tubes, no glassware required.
- Preweighed, ultra-pure sorbents.
- Support original unbuffered, AOAC (2007.01), European (EN 15662), and mini-multiresidue QuEChERS methods.

QuEChERS methods are fast, easy, and cost-effective, and Restek Q-sep® products make QuEChERS procedures even simpler. All extraction salts, sorbents, and sample tubes are included—no specialized equipment or glassware is required. Prepare samples more efficiently with a complete line of QuEChERS supplies from Restek.

	Mini-Luke or Modified Luke Method	QuEChERS	Savings with QuEChERS
Estimated time to process 6 samples (min)	120	30	4x faster
Solvent used (mL)	60-90	10	6-9x less solvent
Chlorinated waste (mL)	20-30	0	Safer, cheaper, greener
Glassware/specialized equipment	capacity for 200 mL, quartz wool, funnel, water bath or evaporator	none	Ready-to-use

Selection Guide for Q-sep® QuEChERS dSPE Tubes

Commodity types and examples	AOAC 2007.01	EN 15662	Mini-multiresidue	Additional products
 <p>Low fat & low pigment fruits & vegetables</p> <ul style="list-style-type: none"> • Celery • Cucumber • Head lettuce • Melon 	<p>2 mL, 100-pk. (cat.# 26124)</p> <p>15 mL, 50-pk. (cat.# 26220)</p>	<p>2 mL, 100-pk. (cat.# 26215)</p> <p>15 mL, 50-pk. (cat.# 26223)</p>	<p>2 mL, 100-pk. (cat.# 26215)</p>	
 <p>Fatty or waxy fruits & vegetables</p> <ul style="list-style-type: none"> • Cereals • Avocado • Nuts & seeds • Dairy 	<p>2 mL, 100-pk. (cat.# 26125)</p> <p>15 mL, 50-pk. (cat.# 26221)</p>		<p>2 mL, 100-pk. (cat.# 26216)</p>	<p>15 mL, 50-pk. (cat.# 26226)</p> <p>2 mL, 100-pk. (cat.# 26242)</p> <p>15 mL, 50-pk. (cat.# 26244)</p>
 <p>Pigmented fruits & vegetables</p> <ul style="list-style-type: none"> • Strawberries • Sweet potatoes • Tomatoes 	<p>15 mL, 50-pk. (cat.# 26222)</p>	<p>2 mL, 100-pk. (cat.# 26217)</p> <p>15 mL, 50-pk. (cat.# 26224)</p>	<p>2 mL, 100-pk. (cat.# 26217)</p>	<p>2 mL, 100-pk. (cat.# 26123)</p>
 <p>Highly pigmented fruits & vegetables</p> <ul style="list-style-type: none"> • Red peppers • Spinach • Blueberries 	<p>2 mL, 100-pk. (cat.# 26219)</p>	<p>2 mL, 100-pk. (cat.# 26218)</p> <p>15 mL, 50-pk. (cat.# 26225)</p>	<p>2 mL, 100-pk. (cat.# 26218)</p>	<p>15 mL, 50-pk. (cat.# 26126)</p>
 <p>Universal use</p> <p>Wide range of commodities, including fatty & pigmented fruits & vegetables.</p>				<p>2 mL, 100-pk. (cat.# 26243)</p> <p>15 mL, 50-pk. (cat.# 26245)</p>
<p>Download free instructions at www.restek.com/quenchers</p>	<p>Instruction sheet# 805-01-002</p>	<p>Instruction sheet# 805-01-001</p>	<p>Instruction sheet# 805-01-001</p>	<p>Generic dSPE 805-01-003</p>

Q-sep® QuEChERS Extraction Salts

- Salt packets eliminate the need for a second empty tube to transfer salts.
- Go green by using packets with reusable tubes.
- Convenient and easy to use.

Description	Material	Methods	qty.	cat.#	price
Q-sep QuEChERS Extraction Kit (Original)	4 g MgSO ₄ , 1 g NaCl with 50 mL Centrifuge Tube	original unbuffered	50 packets & 50 tubes	23991	£155.25
Q-sep QuEChERS Extraction Salt Packets Only (Original)	4 g MgSO ₄ , 1 g NaCl	original unbuffered	50 packets	23992	£123.95
Q-sep QuEChERS Extraction Kit (EN)	4 g MgSO ₄ , 1 g NaCl, 1 g TSCD, 0.5 g DHS with 50 mL Centrifuge Tube	European EN 15662	50 packets & 50 tubes	26235	£167.20
Q-sep QuEChERS Extraction Salt Packets Only (EN)	4 g MgSO ₄ , 1 g NaCl, 1 g TSCD, 0.5 g DHS	European EN 15662	50 packets	26236	£133.45
Q-sep QuEChERS Extraction Kit (AOAC)	6 g MgSO ₄ , 1.5 g NaOAc with 50 mL Centrifuge Tube	AOAC 2007.01	50 packets & 50 tubes	26237	£167.20
Q-sep QuEChERS Extraction Salt Packets Only (AOAC)	6 g MgSO ₄ , 1.5 g NaOAc	AOAC 2007.01	50 packets	26238	£133.45
Empty 50 mL Centrifuge Tube, Polypropylene			50-pk.	26239	£66.50
Empty 50 mL Centrifuge Tube, FEP			2-pk.	23997	£105

TSCD—trisodium citrate dihydrate
 DHS—disodium hydrogen citrate sesquihydrate
 NaOAc—sodium acetate



Q-sep® QuEChERS dSPE Tubes for Extract Cleanup

Packaged in foil subpacks of 10 for enhanced protection and storage stability.

Description	Methods	qty.	cat.#	price
2 mL Micro-Centrifuge Tubes Prefilled with dSPE Materials for Cleanup (1 mL Extract)				
150 mg MgSO ₄ , 25 mg PSA	original unbuffered, mini-multi-residue, European EN 15662	100-pk.	26215	£154.35
150 mg MgSO ₄ , 25 mg PSA, 25 mg C18	mini-multiresidue	100-pk.	26216	£154.35
150 mg MgSO ₄ , 25 mg PSA, 2.5 mg GCB	mini-multiresidue, European EN 15662	100-pk.	26217	£154.35
150 mg MgSO ₄ , 25 mg PSA, 7.5 mg GCB	mini-multiresidue, European EN 15662	100-pk.	26218	£154.35
150 mg MgSO ₄ , 50 mg PSA	AOAC 2007.01	100-pk.	26124	£154.35
150 mg MgSO ₄ , 50 mg PSA, 50 mg C18	AOAC 2007.01	100-pk.	26125	£154.35
150 mg MgSO ₄ , 50 mg PSA, 50 mg GCB	AOAC 2007.01	100-pk.	26123	£154.35
150 mg MgSO ₄ , 50 mg PSA, 50 mg C18, 50 mg GCB	AOAC 2007.01	100-pk.	26219	£154.35
150 mg MgSO ₄ , 50 mg C18	NA	100-pk.	26242	£134.65
150 mg MgSO ₄ , 50 mg PSA, 50 mg C18, 7.5 mg GCB	universal	100-pk.	26243	£134.65

15 mL Centrifuge Tubes Prefilled with dSPE Materials for Cleanup (6 mL and 8 mL Extract)				
1,200 mg MgSO ₄ , 400 mg PSA	AOAC 2007.01	50-pk.	26220	£130.65
1,200 mg MgSO ₄ , 400 mg PSA, 400 mg C18	AOAC 2007.01	50-pk.	26221	£130.65
1,200 mg MgSO ₄ , 400 mg PSA, 400 mg C18, 400 mg GCB	AOAC 2007.01	50-pk.	26222	£237.45
1,200 mg MgSO ₄ , 400 mg C18	similar to AOAC 2007.01	50-pk.	26244	£114.15
900 mg MgSO ₄ , 150 mg PSA	original unbuffered, European EN 15662	50-pk.	26223	£130.65
900 mg MgSO ₄ , 150 mg PSA, 15 mg GCB	European EN 15662	50-pk.	26224	£130.65
900 mg MgSO ₄ , 150 mg PSA, 45 mg GCB	European EN 15662	50-pk.	26225	£130.65
900 mg MgSO ₄ , 150 mg PSA, 150 mg C18	similar to European EN 15662	50-pk.	26226	£130.65
900 mg MgSO ₄ , 300 mg PSA, 300 mg C18, 45 mg GCB	similar to European EN 15662	50-pk.	26245	£114.15
900 mg MgSO ₄ , 300 mg PSA, 150 mg GCB	NA	50-pk.	26126	£213.70

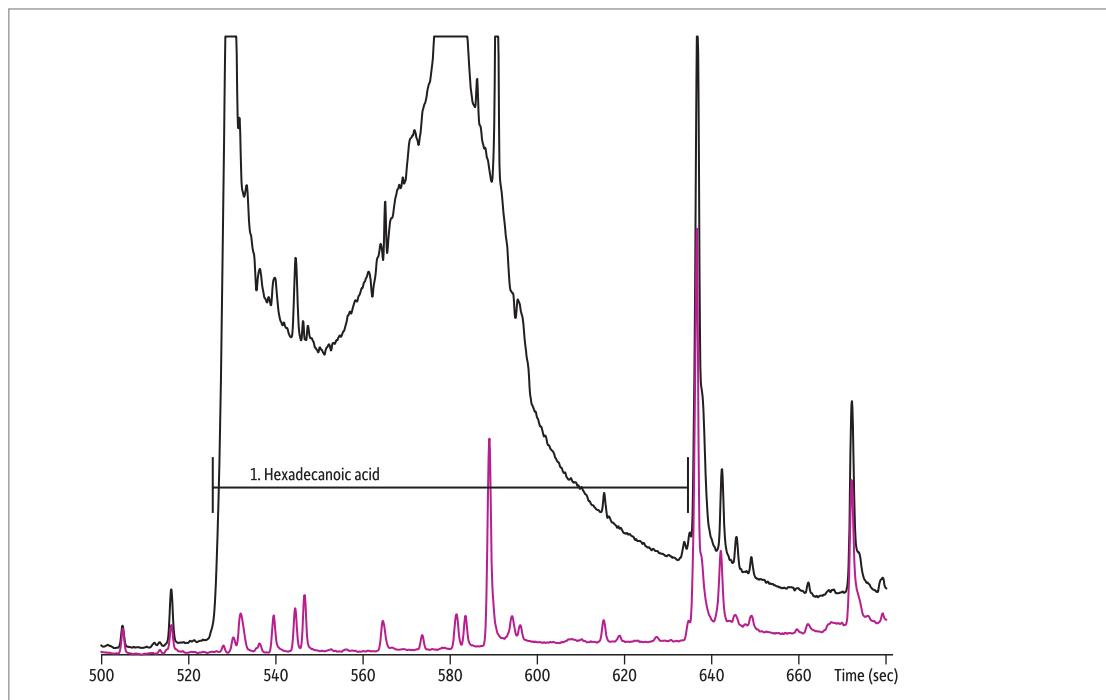
PSA—primary and secondary amine
 GCB—graphitized carbon black



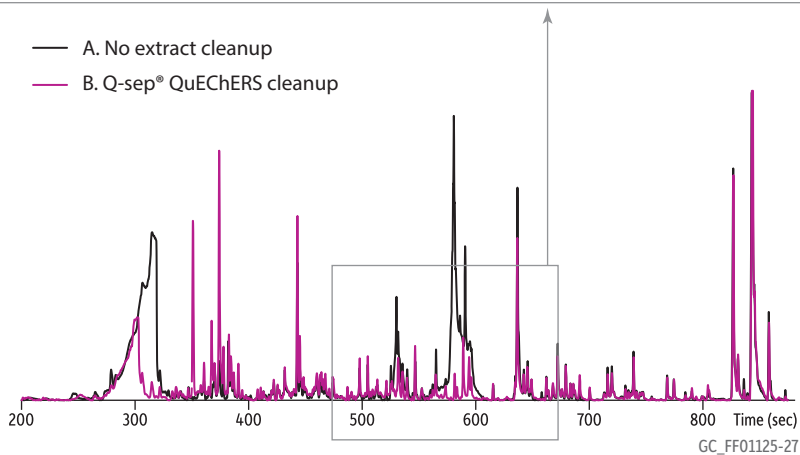
Multiple sorbents are used to extract different types of interferences.

MgSO ₄	removes excess water
PSA	removes sugars, fatty acids, organic acids, and anthocyanine pigments
C18	removes nonpolar interferences
GCB	removes pigments, sterols, and nonpolar interferences

Use Q-sep® QuEChERS tubes to easily remove matrix interferences.



— A. No extract cleanup
 — B. Q-sep® QuEChERS cleanup



Column Rxi®-5Sil MS, 20 m, 0.18 mm ID, 0.18 µm (cat.# 43602)
Sample Sweet potato spiked with pesticide mix and extracted with acetonitrile and Q-sep® QuEChERS EN Method 15662 extraction salts
Injection
 Inj. Vol.: 1.0 µL splitless (hold 1 min)
 Liner: Single taper (4 mm) w/deact. wool (cat.# 22405)
 Inj. Temp.: 250 °C
Oven
 Oven Temp.: 72.5 °C (hold 1 min) to 350 °C at 20 °C/min
Carrier Gas He, constant flow
Flow Rate: 1.2 mL/min
Detector MS
Mode:
 Transfer Line
 Temp.: 300 °C
Analyzer Type: TOF
Ionization Mode: EI
Acquisition Range: 45-550 amu
Instrument Agilent/HP6890 GC
Notes
 A. Extract (without cleanup step) acidified with formic acid to pH 5
 B. Extract with cleanup using Q-sep® QuEChERS dSPE cleanup tube (cat.# 26124) acidified with formic acid to pH 5.

Scan range: m/z 60, 73, 87, 129, 256 plotted

Q-sep® 3000 Centrifuge for QuEChERS

- Meets or exceeds requirements of original unbuffered, AOAC, and European QuEChERS methodology.
- Supports 50 mL, 15 mL, and 2 mL centrifuge tubes.
- Small footprint requires less bench space.
- Safe and reliable—UL, CSA, and CE approved; 1-year warranty.

Priced to fit your laboratory's budget, the Q-sep® 3000 centrifuge is the first centrifuge specifically designed for QuEChERS methodology. This compact, quiet, yet powerful unit spins at the 3,000 g force required by the European method.

Centrifuge includes 50 mL tube carriers (six), 50 mL conical tube inserts (six), 4-place 15 mL tube carriers (six), and 2 mL tube adaptors (24).

Specifications:

Motor Speed and Force Rating:	4,130 rpm, 3,000 xg
Maximum Capacity with 6-Place Horizontal Rotor:	6 x 50 mL tubes, 18 x 15 mL tubes, 24 x 2 mL tubes
Motor:	1/2 H.P. brushless DC
Nominal Acceleration Time:	45 seconds
Nominal Braking Time:	60 seconds
Timer (electronic):	1 to 30 minutes +/-1%
Requirement:	2.0 or 1.0 amps
Current Voltage Requirement:	115 or 230 (+/-10%) volts
Frequency:	50 / 60 Hz
Centrifuge Protection Breaker:	4 amp resettable
Overall Dimensions:	9" h x 14.5" w x 17" d (22.9 cm x 36.8 cm x 43.2 cm)
Weight:	39 lb (17.7 kg)



26230
 CE

Dimensions: 9" h x 14.5" w x 17" d
 (22.9 cm x 36.8 cm x 43.2 cm)

Description	qty.	cat.#	price
Q-sep 3000 Centrifuge, 110V	ea.	26230	£1,903
Q-sep 3000 Centrifuge, 220V	ea.	26231	£2,146
Replacement Accessories			
50 mL Tube Carrier for Q-sep 3000 Centrifuge	2-pk.	26232	£63.95
50 mL Conical Tube Insert for Q-sep 3000 Centrifuge	6-pk.	26249	£53.80
15 mL 4-Place Tube Carrier for Q-sep 3000 Centrifuge (fits four 15 mL tubes)	2-pk.	26233	£63.95
2 mL Tube Adaptors for Q-sep 3000 Centrifuge	4-pk.	26234	£63.95



26232



26233



26234



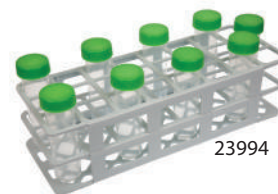
26249



Q-sep® Tube Racks

- Available for 2 mL, 15 mL, and 50 mL tubes.
- Alphanumeric grid reference on top tier for easy identification of samples.
- Easy to assemble; simply fold and snap together securely.

Description	Size	Material	qty.	cat.#	price
Q-sep Tube Rack for 2 mL Centrifuge Tube	Holds 100	Polypropylene, White	ea.	23995	£20.65
Q-sep Tube Rack for 15 mL Centrifuge Tube	Holds 60	Polypropylene, White	ea.	23993	£20.65
Q-sep Tube Rack for 50 mL Centrifuge Tube	Holds 24	Polypropylene, White	ea.	23994	£25.70



23994



23995

Q-sep® Bottle Top Solvent Dispenser

- Adjustment knob offers 56 output volume settings from 2.5 mL to 30 mL per stroke (0.5 mL increments)—ideal for QuEChERS methods!
- Base features 30 mm threads and includes four adaptors (25 mm, 28 mm, 38 mm, and 45 mm).
- Individually calibrated in accordance with ISO 8655 standards (certificate included) and can also be recalibrated by the user.
- PTFE, glass, and polypropylene construction for excellent chemical compatibility and 100% autoclavability.
- Integral safety discharge reduces risk of accidental dispensing, and nozzle cap prevents dripping.
- Easy to disassemble for cleaning and servicing.

Accurately and precisely dispense liquids for QuEChERS extractions with this versatile pump. A quick, simple adjustment lets you set the output volume anywhere from 2.5 mL to 30 mL per stroke, and the included adaptors will accommodate most reagent bottles.

Description	qty.	cat.#	price
Q-sep Bottle Top Solvent Dispenser, 2.5 mL–30 mL	ea.	23990	£322.25



23990
 Bottle not included.

Sample Filtration



Cut costs, not quality!

Syringe Filters with Luer Lock Inlet

- Luer lock inlet offers leak-tight syringe connection.
- Variety of filter types, porosities, and diameters.
- Color coded for easy identification.
- Rugged polypropylene housing.
- Autoclavable to 121 °C for 15 minutes.



Size	Porosity	Color	qty.	cat.#	Price per 100-pack
Cellulose Acetate					
4 mm	0.22 µm	green	100-pk.	23972	£77.55/pk
4 mm	0.45 µm	blue	100-pk.	23973	£77.55/pk
13 mm	0.22 µm	red	100-pk.	26156	£65.30/pk
13 mm	0.45 µm	red	100-pk.	26155	£65.30/pk
25 mm	0.22 µm	red	100-pk.	26158	£76.15/pk
25 mm	0.45 µm	red	100-pk.	26157	£76.15/pk
30 mm	0.22 µm	red	100-pk.	23982	£108.95/pk
30 mm	0.45 µm	red	100-pk.	23983	£108.95/pk
Nylon					
4 mm	0.22 µm	yellow	100-pk.	23970	£77.55/pk
4 mm	0.45 µm	pink	100-pk.	23971	£77.55/pk
13 mm	0.22 µm	pink	100-pk.	26146	£65.30/pk
13 mm	0.45 µm	pink	100-pk.	26147	£65.30/pk
25 mm	0.22 µm	pink	100-pk.	26148	£76.15/pk
25 mm	0.45 µm	pink	100-pk.	26149	£76.15/pk
30 mm	0.22 µm	pink	100-pk.	23980	£108.95/pk
30 mm	0.45 µm	pink	100-pk.	23981	£108.95/pk
PES (polyethersulfone)					
4 mm	0.22 µm	white	100-pk.	23978	£77.55/pk
4 mm	0.45 µm	blue	100-pk.	23979	£77.55/pk
13 mm	0.22 µm	green	100-pk.	23966	£77.55/pk
13 mm	0.45 µm	green	100-pk.	23967	£77.55/pk
25 mm	0.22 µm	green	100-pk.	23968	£90.10/pk
25 mm	0.45 µm	green	100-pk.	23969	£90.10/pk
30 mm	0.22 µm	green	100-pk.	23988	£108.95/pk
30 mm	0.45 µm	green	100-pk.	23989	£108.95/pk
PTFE (polytetrafluoroethylene)					
4 mm	0.22 µm	purple	100-pk.	23974	£77.55/pk
4 mm	0.45 µm	orange	100-pk.	23975	£77.55/pk
13 mm	0.22 µm	white	100-pk.	26142	£65.30/pk
13 mm	0.45 µm	white	100-pk.	26143	£65.30/pk
25 mm	0.22 µm	white	100-pk.	26144	£76.15/pk
25 mm	0.45 µm	white	100-pk.	26145	£76.15/pk
30 mm	0.22 µm	white	100-pk.	23984	£108.95/pk
30 mm	0.45 µm	white	100-pk.	23985	£108.95/pk
PVDF (polyvinylidene fluoride)					
4 mm	0.22 µm	brown	100-pk.	23976	£77.55/pk
4 mm	0.45 µm	red	100-pk.	23977	£77.55/pk
13 mm	0.22 µm	blue	100-pk.	26150	£65.30/pk
13 mm	0.45 µm	blue	100-pk.	26151	£65.30/pk
25 mm	0.22 µm	blue	100-pk.	26152	£76.15/pk
25 mm	0.45 µm	blue	100-pk.	26153	£76.15/pk
30 mm	0.22 µm	blue	100-pk.	23986	£108.95/pk
30 mm	0.45 µm	blue	100-pk.	23987	£108.95/pk

Syringe filters are for laboratory use only.

Membrane selection guide

Membrane	Properties	Applications	Incompatible with
Cellulose Acetate	hydrophilic	aqueous solutions	organic solvents
Nylon	hydrophilic, low protein binding	bases, HPLC solvents, alcohols, aromatic hydrocarbons	acids, aggressive halogenated hydrocarbons, proteins
PES	hydrophilic, low protein binding, fast flow rates	filtration of buffers & culture media	—
PTFE	hydrophobic	organic solvents, acids, alcohols, bases, aromatics	aqueous samples without pre-wetting (to avoid high backpressure)
PVDF	hydrophilic, low protein binding	alcohols, biomolecules	bases, esters, ethers, ketones

Cellulose Acetate, Nylon, PES, PVDF—hydrophilic applications

PTFE—hydrophobic applications

Syringe Filters Compatibility Chart

Group of Substance & Chemical Reagents	Cellulose Acetate	Nylon	PES	PTFE	PVDF
ACIDS					
Acetic, 5%	L	R	R	R	R
Acetic, 10%	L	R	R	R	R
Acetic, 25%	N	L	R	R	R
Acetic, Glacial	N	N	R	R	R
Boric	-	L	-	R	-
Formic 25%	L	N	-	R	-
Hydrochloric 15%	L	L	R	R	L
Hydrochloric 25%	N	N	R	R	-
Hydrochloric concentrated	N	N	L	R	N
Hydrofluoric 10%	N	N	-	-	-
Hydrofluoric 35%	N	N	-	R	-
Nitric 25%	N	N	R	R	-
Nitric 6N, 38%	N	N	L	R	R
Nitric concentrated	N	N	N	R	N
Phosphoric 25%	L	N	R	R	-
Sulfuric 25%	N	N	N	R	-
Sulfuric 6N, 29%	N	N	N	R	-
Sulfuric concentrated	N	N	N	R	N
Trichloroacetic 10%	N	N	-	R	R
ALKALINES					
Ammonium Hydroxide 25%	N	R	R	R	L
Formalin 30%	L	L	R	-	-
Sodium Hydroxide 3N, 12%	N	R	R	R	R
ALCOHOLS					
Amyl Alcohol	L	R	N	R	R
Benzyl Alcohol	L	L	L	L	L
Butyl Alcohol	L	R	L	R	R
Butyl Cellosolve	N	L	-	L	-
Ethanol 70%	L	R	L	R	R
Ethanol 98%	N	R	N	R	R
Ethylene glycol	L	R	R	R	R
Glycerol	L	R	R	R	R
Isobutyl Alcohol	L	L	L	L	L
Isopropanol, <i>n</i> -Propanol	L	R	R	R	R
Methanol 98%	N	R	L	R	R
Methyl Cellosolve	L	L	-	L	-
Propylene glycol	L	-	R	R	R
Phenol, Aqueous 10%	-	R	-	R	R

R = Recommended. No significant change observed in flow rate or bubble point of the membrane, nor visible indication of chemical attack.

L = Limited Recommended Use. Moderate changes in physical properties. The filter may be suitable for short term, non-critical use.

N = Not Recommended. The membrane may be unstable.

- = Insufficient Data. Information is not available. Trial testing is recommended.

Group of Substance & Chemical Reagents	Cellulose Acetate	Nylon	PES	PTFE	PVDF
HYDROCARBONS					
Hexane	L	R	L	R	R
Xylene	L	R	N	R	R
Kerosene, Gasoline	L	R	R	R	R
Tetrakin, Decalin	N	R	-	R	R
Toluene, benzene	L	R	N	R	R
HALOGENATED HYDROCARBONS					
Carbon Tetrachloride	N	N	N	N	N
Chloroform	N	N	N	R	R
Methylene Chloride	N	L	N	R	N
Monochlorobenzene	N	N	-	R	-
Trichloethylene	N	N	N	R	R
KETONES					
Acetone	N	R	N	R	N
Cyclohexanone	N	L	N	R	N
Isopropylacetone	-	R	-	R	N
Methyl Ethyl Ketone	N	R	N	R	N
Methyl Isobutyl Ketone	N	R	-	R	N
ESTERS					
Amyl Acetate	N	R	L	R	-
Amyl Propyl & Butyl Acetate	L	-	-	R	-
Benzyl Benzoate	-	-	-	R	-
Butyl Acetate	N	-	N	-	-
Ethyl Acetate & Methyl Acetate	N	R	N	R	R/L
Isopropyl Myristate	-	-	-	R	-
Methyl Cellosolve Acetate	N	-	-	R	-
Propylene Glycol Acetate	-	-	-	R	-
Tricresyl Phosphate	-	-	-	R	-
Isopropyl Acetate	L	R	-	-	R
OXIDES - ETHERS					
Dimethylsulfoxide (DMSO)	N	R	N	R	N
Dioxane & Tetrahydrofuran	N	R	L	R	L
Ethyl Ether	L	R	R	R	R
Isopropyl Ether	-	-	-	R	R
SOLVENTS WITH NITROGEN					
Acetonitrile	N	R	N	R	N
Aniline	N	-	-	R	-
Diethylacetamide	N	L	N	R	N
Dimethyl Formamide	N	R	N	R	N
Pyridine	N	R	N	R	-
Triethanolamine	-	R	-	R	N
MISCELLANEOUS					
Formaldehyde Solution 30%	L	R	R	R	R
Hydrogen Peroxide 30%	N	L	N	R	R
Pyridine	N	R	N	R	R
Silicone Oil & Mineral Oil	R	R	R	R	R

Sample Filtration



Simply squeeze particulates and contaminants out of your sample!

Thomson SINGLE StEP® Filter Vials

- Easy-to-use vials offer fast sample filtration and require only a squeeze of your fingers.
- Color-coded caps allow easy identification of 0.2 µm or 0.45 µm membranes in PVDF, PTFE, PES, or nylon.
- Pre-slit PTFE/silicone caps help eliminate broken autosampler needles and cored septa.
- Low dead volume units feature rugged polypropylene vial and insert with 450 µL loading capacity.
- Fit most standard 12 x 32 mm autosamplers, including UHPLC instruments.



Now available in convenient 100-pks.



Porosity	Color	qty.	cat.#	price
Nylon				
0.2 µm	black cap	100-pk.	25891	£184.80
0.45 µm	pink cap	100-pk.	25892	£184.80
PES (polyethersulfone)				
0.2 µm	grey cap	100-pk.	25897	£184.80
0.45 µm	orange cap	100-pk.	25898	£184.80
PTFE (polytetrafluoroethylene)				
0.2 µm	green cap	100-pk.	25893	£184.80
0.45 µm	blue cap	100-pk.	25894	£184.80
PVDF (polyvinylidene fluoride)				
0.2 µm	red cap	100-pk.	25895	£184.80
0.45 µm	yellow cap	100-pk.	25896	£184.80

Patent No. 7,790,117

Filter Vials Compatibility Chart

Most solvents and mobile phases used in liquid chromatography are also compatible with SINGLE STEP® filter vials.

Solvent / Mobile Phase	HOUSINGS		FILTERS		
	PP (polypropylene)	PTFE (polytetrafluoroethylene)	PVDF (polyvinylidene fluoride)	PES (polyether sulfone)	NYL (nylon)
Acetic Acid (glacial) <i>acid, organic</i>	L	R	R	R	N
Acetone <i>ketone</i>	R	R	N	N	R
Acetonitrile (ACN) <i>nitrile</i>	R	R	L	N	R
Alconox, 1% <i>surfactant/detergent</i>	L	L	L	L	L
Ammonium Hydroxide <i>caustic</i>	L	R	R	N	L
Ammonium Sulfate (saturated) <i>salt, aqueous solution</i>	R	R	N	L	R
Amyl Acetate <i>ester</i>	L	R	R	R	L
Amyl Alcohol <i>alcohol</i>	R	R	R	R	L
Benzene <i>HC, aromatic</i>	N	R	R	N	R
Benzyl Alcohol <i>HC aromatic/alcohol</i>	N	R	R	L	L
Boric Acid (aqueous solution) <i>acid, inorganic</i>	R	R	L	R	R
Butyl Acetate <i>ester</i>	L	R	L	N	R

Solvent / Mobile Phase	HOUSINGS		FILTERS		
	PP (polypropylene)	PTFE (polytetrafluoroethylene)	PVDF (polyvinylidene fluoride)	PES (polyether sulfone)	NYL (nylon)
Butyl Alcohol <i>alcohol</i>	R	R	R	R	R
Carbon Tetrachloride <i>HC, halogenated</i>	N	R	R	N	L
Cellulosolve (ethyl) <i>glycol ether</i>	R	R	L	R	R
CHAPS (aqueous solution) <i>surfactant/detergent</i>	L	L	L	L	L
Chloroform <i>HC, halogenated</i>	N	R	R	N	N
Cyclohexanone <i>ketone</i>	N	R	N	N	R
Diethyl Pyrocarbonate, 0.2% <i>carboxylic anhydride</i>	L	L	L	L	L
Dimethyl Sulfoxide (DMSO) <i>sulfoxide</i>	R	R	N	N	R
Dimethylacetamide <i>amide</i>	R	R	N	N	N
Dimethylformamide <i>amide</i>	R	R	N	L	R
Dioxane <i>ether</i>	R	R	R	L	R
Ethers <i>ether</i>	N	R	R	L	R

Continued on next page

Filter Vials Compatibility Chart

Continued from previous page

Solvent / Mobile Phase	HOUSINGS				
	PP (polypropylene)	PTFE (polytetrafluoroethylene)	PVDF (polyvinylidene fluoride)	PES (polyether sulfone)	NYL (nylon)
Ethyl Acetate ester	L	R	R	N	R
Ethyl Alcohol alcohol	R	R	R	R	L
Ethylene Glycol glycol	R	R	R	R	R
Formaldehyde aldehyde	R	R	R	L	R
Formic Acid, 50% acid, organic	R	R	R	L	N
Freon® (TF or PCA) HC, halogenated	R	R	R	L	R
Gasoline HC	N	R	R	R	R
Glycerine (Glycerol) glycol	R	R	R	R	R
Guanidine Hydrochloride, 6M salt, aqueous solution	L	R	L	L	L
Guanidine Thiocyanate, 5M salt, aqueous solution	L	R	L	L	L
Helium gas	R	R	L	L	R
Hexane HC, aliphatic	N	R	R	R	R
Hydrochloric Acid, 1N (HCL) acid, inorganic	R	R	R	R	R
Hydrochloric Acid, 6N (HCL) acid, inorganic	L	R	L	R	L
Hydrochloric Acid, conc. (HCL) acid, inorganic	N	R	N	L	N
Hydrofluoric Acid acid, inorganic	N	R	N	N	N
Hydrogen gas	R	R	R	L	R
Hydrogen Peroxide, 3% peroxide	R	R	R	L	R
Hydrogen Peroxide, 30% peroxide	L	R	R	L	L
Hydrogen Peroxide, 90% peroxide	R	R	R	L	N
HYPO (aqueous solution) salt, aqueous solution	R	R	R	L	R
Isobutyl Alcohol alcohol	R	R	R	R	L
Isopropyl Acetate ester	L	R	R	N	R
Isopropyl Alcohol alcohol	R	R	R	R	L
Kerosene HC	L	L	R	R	R
Lactic Acid, 50% acid, organic/alcohol	R	R	L	L	L
Lubrol PX (aqueous solution) surfactant/detergent	L	L	L	L	L
Methyl Ethyl Ketone (MEK) ketone	R	R	N	N	R
Mercaptoethanol, 0.1M alcohol/mercaptan	L	L	L	L	L
Methyl Acetate ester	L	R	N	N	R
Methyl Alcohol alcohol	R	R	R	R	L
Methylene Chloride HC, halogenated	N	R	N	N	L

Solvent / Mobile Phase	HOUSINGS				
	PP (polypropylene)	PTFE (polytetrafluoroethylene)	PVDF (polyvinylidene fluoride)	PES (polyether sulfone)	NYL (nylon)
Methyl Isobutyl Ketone (MIBK) ketone	N	R	N	N	R
Mineral Spirits HC	N	R	R	R	R
Nitric Acid, 6N acid, inorganic	L	R	R	R	N
Nitric Acid (concentrated) acid, inorganic	N	L	N	L	N
Nitrobenzene HC, aromatic	N	R	R	L	R
Nitrogen gas	L	R	R	L	R
Nonidet-P40 (aqueous solution) surfactant/detergent	L	L	L	L	L
Ozone gas	N	R	R	L	N
Paraldehyde aldehyde	L	R	L	L	R
Pentane HC, aliphatic	N	R	R	R	R
Petroleum Ether ether	L	R	R	L	R
Phenol (aqueous solution) phenol	N	R	R	L	N
Potassium Hydroxide, 3N caustic	R	R	R	L	R
Pyridine amine	R	R	N	N	L
Silicone Oils silicone	R	R	R	L	R
Sodium Carbonate (aqueous solution) salt, aqueous solution	R	R	R	L	L
Sodium Chloride (aqueous solution) salt, aqueous solution	R	R	R	L	R
Sodium Dodecyl Sulfate surfactant/detergent	L	L	L	L	L
Sodium Hydroxide, 3N caustic	R	R	R	R	R
Sodium Hydroxide (concentrated) caustic	R	R	R	R	N
Sulfuric Acid (concentrated) acid, inorganic	N	R	L	N	N
TCA (aqueous solution) acid, organic	R	R	R	L	L
Tetrahydrofuran (THF) ether	N	R	N	L	R
Toluene HC, aromatic	N	R	R	R	R
Trichloroethane HC, halogenated	N	R	L	N	L
Trichloroethylene HC, halogenated	N	R	R	N	L
Tween 20 (aqueous solution) surfactant/detergent	L	R	L	L	L
Urea, 8M salt, aqueous solution	R	R	R	L	R
Water (Brine) salt, aqueous solution	R	R	R	L	R
Xylene HC, aromatic	N	R	R	L	R

R = Recommended. No significant change observed in flow rate or bubble point of the membrane, nor visible indication of chemical attack.

L = Limited Recommended Use. Moderate changes in physical properties. The filter may be suitable for short term, non-critical use.

N = Not Recommended. The membrane may be unstable.

- = Insufficient Data. Information is not available. Trial testing is recommended.

Accelerated Solvent Extraction (ASE)

Accelerated solvent extraction is a common technique for fast and reliable extraction of organic materials from solid matrices using EPA SW-846 Method 3545, Pressurized Fluid Extraction (PFE). Restek offers a wide range of replacement parts to keep your extraction system running smoothly. All parts are economically priced to save you money and are designed to meet or exceed the performance of the original manufacturer's parts.

Replacement Parts for ASE® 150/350 Systems, Manufacturer's Design

Extraction Cell Bodies for ASE® 150/350 Systems

- Cell bodies are serialized for easy sample identification.
- Smooth inner surfaces for easier cleaning.



Extraction Cell Body	Similar to Dionex Part #	Stainless Steel		price
		qty.	cat.#	
1 mL for ASE 150/350	068261	ea.	25993	£145.35
5 mL for ASE 150/350	068262	ea.	25994	£145.35
10 mL for ASE 150/350	068263	ea.	25995	£145.35
22 mL for ASE 150/350	068264	ea.	25996	£145.35
34 mL for ASE 100/300 and 150/350	056646	ea.	26176	£88.20
66 mL for ASE 100/300 and 150/350	056696	ea.	26178	£88.20
100 mL for ASE 100/300 and 150/350	056693	ea.	26132	£88.20

Extraction Cell Caps for ASE® 150/350 Systems

- Smooth inner surfaces for easier cleaning.
- Caps include frit, PEEK washer, PTFE O-ring, threaded insert, and snap ring.

Description	Stainless Steel		price
	qty.	cat.#	
Replacement Extraction Cell End Caps for ASE 150/350	2-pk.	25997	£316.30

Q-sep® QuEChERS Products

Quick, Easy, Cheap, Effective, Rugged and Safe!

Standards Available!

Standards for AOAC QuEChERS Method 2007.01

See **page 575** for:

- AOAC IS Solutioncat.# 31963
- AOAC TPP Solutioncat.# 31964
- AOAC QC Spike Mix.....cat.# 31999

www.restek.com/quechers



Replacement Parts for ASE® 200 Systems, Manufacturer's Design

Extraction Cell Bodies for ASE® 200 Systems

- Cell bodies are serialized for easy sample identification.
- Smooth inner surfaces for easier cleaning.

Extraction Cell Body	Similar to Dionex Part #	Stainless Steel		
		qty.	cat.#	price
1 mL for ASE 200	054973	ea.	26110	£101.10
5 mL for ASE 200	054974	ea.	26112	£101.10
11 mL for ASE 200	048820	ea.	26114	£78
22 mL for ASE 200	048821	ea.	26098	£78
33 mL for ASE 200	048822	ea.	26116	£78



Cell bodies are serialized for easy sample identification.

Extraction Cell Caps & Replacement Parts for ASE® 200 Systems

- Smooth inner surfaces for easier cleaning.
- Caps include frit, PEEK washer, PTFE O-ring, threaded insert, and snap ring.

Description	Similar to Dionex Part #	Stainless Steel		
		qty.	cat.#	price
Replacement Extraction Cell End Caps for ASE 200	049450	2-pk.	26096	£272.55
Threaded Cap Inserts for ASE 200	—	2-pk.	26166	£121.55
Replacement Frits for ASE 200	049453	10-pk.	26100	£42.05
Replacement Frits for ASE 200	049453	100-pk.	25959	£375.90



26166

Description	Similar to Dionex Part #	Stainless Steel		
		qty.	cat.#	price
Snap Rings for Caps for ASE 200	049456	10-pk.	26184	£30.75
Funnel for ASE 200	056958	ea.	26180	£80.10
PTFE O-Rings for ASE 200 & ASE 300 Caps	049457	100-pk.	26187	£37.25
Viton O-Rings for ASE 200 & ASE 300 Caps	056325	50-pk.	26188	£24.70

26180



PEEK Washers for ASE® 200 Systems

- Meet original equipment manufacturer's performance.
- Available in four quantities.

Description	Similar to Dionex Part #	Stainless Steel		
		qty.	cat.#	price
PEEK Washers for ASE 200	049454	12-pk.	25256	£73.95
		48-pk.	25257	£287.55
		250-pk.	26120	£957.15
		1,000-pk.	26229	£2,633



25256

20 mm Filters for ASE® 200 Extraction Cells

- Cellulose or glass fiber construction.
- Fit 11 mL, 22 mL, and 33 mL cells.
- Cellulose filters available in economical 1,000-packs.

Description	Similar to Dionex Part #	Stainless Steel		
		qty.	cat.#	price
Cellulose Filters for ASE 200	049458	100-pk.	26118	£19
Cellulose Filters for ASE 200	049458	1,000-pk.	26190	£146.15
Glass Fiber Filters for ASE 200	047017	100-pk.	26119	£34.85



26119

60 mL Sample Collection Vials for ASE® 200 Systems

- Cleaned, assembled, and ready to use.
- Clear or amber glass.
- Caps and PTFE-lined septa included.

Description	Color	Similar to Dionex Part #	Stainless Steel		
			qty.	cat.#	price
60 mL Collection Vials for ASE 200	Clear	048784	72-pk.	26121	£125.70
60 mL Collection Vials for ASE 200	Amber	048781	72-pk.	26122	£162.90
Replacement Septa, 24 mm x 0.125", PTFE-lined silicone	—	—	100-pk.	24694	£34.15



26121

26122



26167



26169



26187



26174



26188



25393



26168



26191



26260

Replacement Parts for ASE® 100/300 Systems, Manufacturer's Design

Extraction Cell Bodies for ASE® 100/300 Systems

- Cell bodies are serialized for easy sample identification.
- Smooth inner surfaces for easier cleaning.

Extraction Cell Body	Similar to Dionex Part #	Stainless Steel qty.	cat.#	price
34 mL for ASE 100/300 and 150/350	056646	ea.	26176	£88.20
66 mL for ASE 100/300 and 150/350	056696	ea.	26178	£88.20
100 mL for ASE 100/300 and 150/350	056693	ea.	26132	£88.20

Extraction Cell Caps & Replacement Parts for ASE® 100/300 Systems

- Smooth inner surfaces for easier cleaning.
- Caps include frit, PEEK washer, PTFE O-ring, threaded insert, and snap ring.

Description	Similar to Dionex Part #	Stainless Steel qty.	cat.#	price
Replacement Extraction Cell End Caps for ASE 300	056921	2-pk.	26170	£339.60
Threaded Cap Inserts for ASE 300	—	2-pk.	26167	£191.65
Replacement Frits for ASE 100/300	—	6-pk.	26174	£39.80

Description	Similar to Dionex Part #	qty.	cat.#	price
Snap Rings for Caps for ASE 100/300	056778	12-pk.	26134	£59.50
Funnel for ASE 100/300	056699	ea.	26169	£80.10
PTFE O-Rings for ASE 200 & ASE 300 Caps	049457	100-pk.	26187	£37.25
Viton O-Rings for ASE 200 & ASE 300 Caps	056325	50-pk.	26188	£24.70

PEEK Washers for ASE® 100/300 Systems

- Meet original equipment manufacturer's performance.
- Available in two quantities.

Description	Similar to Dionex Part #	qty.	cat.#	price
PEEK Washers for ASE 100/300	061687	12-pk.	25393	£69.45
		48-pk.	25394	£266.60

30 mm Filters for ASE® 100/300 Extraction Cells

- Cellulose or glass fiber construction.

Description	Similar to Dionex Part #	qty.	cat.#	price
Cellulose Filters for ASE 100/300	056780	100-pk.	26168	£26.10
Glass Fiber Filters for ASE 100/300	056781	100-pk.	26189	£56.40

250 mL Sample Collection Bottles for ASE® 100/300 Systems

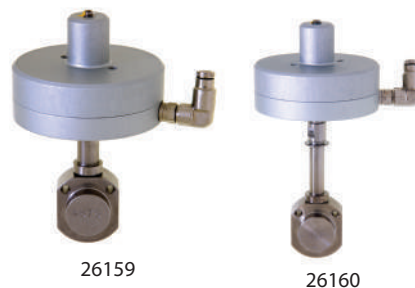
- Cleaned, assembled, and ready to use.
- Clear or amber glass.
- Caps and PTFE-lined septa included.

Description	Color	Similar to Dionex Part #	qty.	cat.#	price
250 mL Collection Bottles for ASE 100/300	Clear	056284	12-pk.	26191	£23.95
250 mL Collection Bottles for ASE 100/300	Amber	—	12-pk.	26260	£39.40
Replacement Septa, 24 mm x 0.125", PTFE-lined silicone	—	—	100-pk.	24694	£34.15

Valves for ASE® 100/200/300 Systems

- Fits ASE® 100, 200, 300 systems.
- Meets original equipment manufacturer's performance.

Description	Similar to		qty.	cat.#	price
	Dionex Part #	price			
Pressure Relief Valve for ASE 100/200/300	048889	ea.	26159	£553.45	
Static Valve for ASE 100/200/300	048778	ea.	26160	£647.60	



Autoseal Tip Assembly for ASE® 200/300 Systems

- Meets original equipment manufacturer's performance.
- Choose original equipment-equivalent stainless steel or Siltek® deactivation for improved inertness and extended lifetime.

Description	Similar to Dionex Part #	Stainless Steel		Siltek Treated		price
		qty.	cat.#	qty.	cat.#	
Autoseal Tip Assembly for ASE 200	048811	ea.	26162	ea.	26161	£75.45
Autoseal Tip Assembly for ASE 300	056641	ea.	26246	ea.	26247	£89.65



Tubing Assembly for ASE® 200/300 Systems

- Great value and improved design.
- Eliminates the need for the adaptor fitting on the static and purge valves.

Description	Similar to		qty.	cat.#	price
	Dionex Part #	price			
Tubing Assembly for ASE 200	049311	ea.	26251	£86.85	
Tubing Assembly for ASE 300	057059	ea.	26248	£75.30	



Cell Organizer for ASE® Parts

- Convenient storage of extraction cell parts and consumables.
- Thirteen open bins provide easy visibility and organization for small and large pieces.
- Small footprint conserves valuable lab bench and drawer space.

Description	qty.	cat.#	price
Cell Organizer for ASE Parts, blue 13-bin unit, 12" l x 12" h x 7.5" d	ea.	23998	£118.15



Carrier Basket for ASE® Cells

- Sturdy stainless steel construction to carry full or empty ASE® cells and caps.
- Can hold twelve complete 33 mL cell assemblies and more of smaller sizes.

Description	qty.	cat.#	price
Carrier Basket for ASE Cells	ea.	23996	£22.55



Accelerated Solvent Extraction (ASE)



Resprep® Tools for ASE® Systems

- Use to insert filter in extraction cell or O-ring in cell cap.
- Fits all extraction cells, except 1 mL size.

Inserting a Filter Using Filter Insertion Attachment on Resprep® Tool Handle (ASE® 100/200/300 systems)



Screw the appropriate size attachment onto the end of the Resprep™ tool handle.



Place a filter at the top of the extraction cell.



Push the filter to the bottom of the extraction cell.

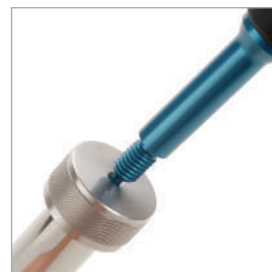
Inserting an O-Ring Using Resprep® Tool Handle (ASE® 100/200/300 systems)



Place the O-ring over the tip of the tool.



Insert the tool into the center hole of the extraction cell cap.



Press the tool firmly inside the cap until the O-ring snaps into place.



Description

Description	qty.	cat.#	price
2-in-1 Filter/O-Ring Insertion Tool Kit for ASE 100/200/300 (includes Resprep Tool Handle and Filter Insertion Attachments)	kit	26181	£87.50
Resprep Tool Handle for ASE 100/200/300	ea.	26182	£62.15
Filter Insertion Attachments (1 mL, 5 mL, 11 mL, 33 mL) for ASE 100/200/300	4-piece set	26183	£37.50



Retaining Ring Pliers for ASE® 100/200/300 Systems

- Can be used for internal or external retaining rings.
- Works to remove retaining ring in all ASE® cell caps.

Description

Description	qty.	cat.#	price
Retaining Ring Pliers for ASE 100/200/300	ea.	26185	£30.75

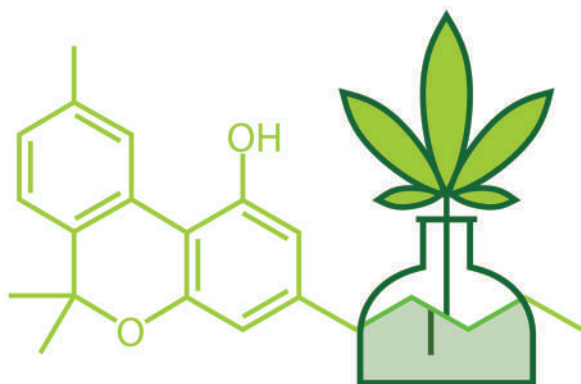


Cell Cleaning Brushes for ASE® 100/200/300 Cells

- Firm nylon bristle brushes for easy cell cleaning and removal of solid samples.
- Range of sizes to fit all extraction cells for ASE® 100, 200, and 300.

Description

Description	qty.	cat.#	price
Cell Cleaning Brushes	3-pk.	23999	£15.55



Growing Analytical Solutions for Medical Cannabis Labs

PRODUCTS AND EXPERTISE FOR **ACCURATE, RELIABLE RESULTS** EVERY TIME

Whether you are an experienced potency testing chemist or a manager starting up a new lab, Restek has the products and expertise you need for successful medical cannabis analyses. We are proud to have helped medical cannabis labs establish sound analytical practices from the beginning, and we will continue to be there for you every step of the way as the testing landscape changes.

- **High-Throughput Methods and Recommended Columns for:**

- Potency Testing
- Terpene Profiling
- Residual Solvents
- Pesticide Residues

- **Certified Reference Materials**

Comprehensive suite of top-quality reference standards helps you report more accurate results.

- **Q-sep® QuEChERS Sample Prep Products**

For fast, easy removal of matrix components that contaminate inlets and columns and interfere with analysis.

- **Trusted Expertise and Technical Support**

Explore our solutions at www.restek.com/cannabis



Air Sampling

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Air Canisters for VOC Sampling

SilcoCan® & TO-Can® Air Sampling Canisters

- Get high-performance canisters from the innovators of silicon coating technology.
- Variety of options available, including SUMMA can equivalent.
- Standard fittings compatible with all instrumentation and accessories.
- Exclusive manufacturer of 1 L spherical canister.
- Repair service available to extend canister life.

Canister Options

Sizes	1, 3, 6, 15 L
Valves	RAVE™ diaphragm, Parker® diaphragm, Swagelok® bellows
Interior Coating	Electropolished, Siltek®-treated
Gauges	3 vacuum/pressure ranges

Applications

Ambient Air	U.S. EPA TO-14A, TO-15, IP-1A, ASTM D5466, OSHA PV 2120, NJ DEP Low Level TO-15
Indoor Air	IP-1A, NJ DEP Low Level TO-15
Vapor Intrusion	
Emergency Response	

Dimensions/Weights of Air Canisters

Can Volume	Dimensions (height x sphere diameter)		Weight	
	1 liter	8.5 x 5.25"	21.6 x 13.3 cm	2.25 lb
3 liter	11.5 x 7.25"	29.2 x 18.4 cm	3.5 lb	1.59 kg
6 liter	12.5 x 9.25"	31.8 x 23.5 cm	5.75 lb	2.61 kg
15 liter	17 x 12.25"	43.2 x 31.1 cm	11.75 lb	5.33 kg



▶ See **pages 421–422** for canister product listings or go to www.restek.com/air for more air sampling products and solutions.

Anatomy of a SilcoCan® Canister

Optional gauge



- Quickly confirm vacuum or pressure inside canister.
- Monitor pressure changes.
- Fully protected by canister frame.
- Can be heated to 110 °C during cleaning.

Newest surface technology

To ensure sample stability, SilcoCan® canisters are deactivated with innovative Siltek® surface treatment, which chemically bonds a silicon 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.

Rugged stainless steel

Canisters and valves are made of 304 and 316 stainless steel to withstand the rigors of field work.



Custom Coatings Available from Restek

- **Siltek®**—The ultimate passivation of treated surfaces, from glass to high-nickel alloys of steel; ideal for sulfurs, automotive exhaust testing, or stack gas sampling.
- **Sulfinert®**—A required treatment for metal components when analyzing for parts-per-billion levels of organo-sulfur compounds.
- **Silcosteel®-CR**—A corrosion-resistant layer that increases the lifetime of system components in acidic environments containing hydrochloric acid, nitric acid, or seawater.



The Latest in Chromatography News and Solutions Sent Right to You

It's quick and easy to have word of our new releases, applications, events, seminars, and so much more sent to you via print or e-mail. Subscribe to Restek and stay on the cutting edge today!

www.restek.com/subscribe

Introduce Your Sampling Canisters to Restek® Air Valve Excellence (RAVE™)



Available options:

- Rugged stainless steel construction with or without Siltek® treatment for added inertness.
- Choose 2 or 3 ports to accommodate optional gauge.
- Diaphragm rebuild kits available to extend the life of your valves.



RAVE™ valves feature proven long life, leak-free performance, and effortless operation. Now standard on our full line of SilcoCan®, TO-Can®, and miniature air sampling canisters, these newly redesigned valves are also great for upgrading existing canisters.

RAVE™ Diaphragm Air Valves

- **Proven long life**—durable design is engineered to exceed 15,000 cycles.
- **Leak-free performance**—every valve is helium leak-tested to 1×10^{-6} mL/sec.
- **Effortless operation**—easily finger-turn to achieve full valve closure (only 10 in-lb).
- **Enhanced damage-resistance**—W-type valve seats are work-hardened and wetted surfaces contain no moving parts.

Turn to your trusted partner for air sampling and chromatography. Order Restek® Air Valve Excellence for your air sampling canisters today.

▶ See pages 421–423.

www.restek.com/air

SilcoCan® Air Sampling Canisters with RAVE™ Valve

Ideal for low-level reactive sulfur (5–20 ppb), TO-14A, or TO-15 compounds

- Siltek®-treated canister with optional Siltek®-treated valve offers unsurpassed inertness, even for sulfur-containing or brominated compounds.
- High-quality, metal-to-metal seal, 2/3-turn valve with stainless steel diaphragms prevent sample adsorption for more-accurate results.
- Canisters and valves made of 304 and 316 stainless steel to withstand the rigors of field work.
- Both 2-port and 3-port valves available; 3-port valve includes -30" Hg/60 psi vacuum/pressure gauge (other gauges available).
- Now featuring the proven long life, leak-free performance, and effortless operation of the new RAVE™ valve. (See page 420 for more information.)

For ultimate inertness, SilcoCan® air sampling canisters feature our unique Siltek® treatment technology. Even highly active components, at low parts-per-billion concentrations, can be readily sampled and stored without loss. The RAVE™ valve is a high-quality, metal-to-metal seal, 2/3-turn valve with metal diaphragms to prevent sample adsorption for more-accurate results. Both stainless steel and Siltek®-treated RAVE™ valves are available, in both the 2-port and 3-port configurations. Each canister is slightly pressurized with contaminant-free nitrogen prior to shipment.

Whether you are sampling 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 (100 ppbv) sulfur volatile organic compounds (VOCs) is poor, even within 24 hours of sampling. Sulfur compounds react with the metal surface in electropolished canisters, so they are unsuitable for collecting and storing low-level sulfur VOCs. SilcoCan® air sampling canisters, which feature a Siltek®-treated surface, offer excellent storage stability for sulfur VOCs at very low levels (5–20 ppbv), 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.



Canisters are the gold standard for ambient VOC sampling.

Volume discounts?

Call Restek® Customer Service or your local Restek® representative!

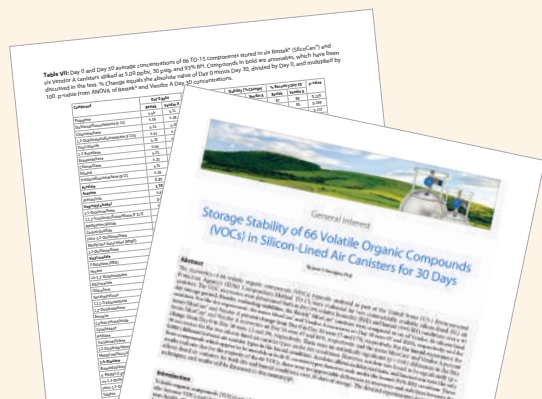
Get the ultimate insurance plan—order your SilcoCan® canister with a Siltek®-treated valve.

Description	1 L Volume		3 L Volume		6 L Volume		15 L Volume	
	cat.#	price	cat.#	price	cat.#	price	cat.#	price
2-Port RAVE Valve	27400	£669.55	27404	£681.85	27408	£706.40	27412	£1,179
2-Port Siltek-Treated RAVE Valve	27401	£749.40	27405	£767.85	27409	£792.40	27413	£1,320
3-Port RAVE Valve with Gauge*	27402	£933.70	27406	£952.10	27410	£976.70	27414	£1,449
3-Port Siltek-Treated RAVE Valve with Gauge*	27403	£1,031	27407	£1,044	27411	£1,068	27415	£1,554
without Valve	22090	£454.55	22091	£481.60	22092	£556.55	22093	£1,098

*Range of standard gauge is -30" Hg to 60 psi.

Do not exceed canister maximum pressure of 40 psig (2.75 bar).

Note: If attaching any of Restek's passive sampling kits to a 3 L canister, use a Siltek®-treated (cat.# 563646) or stainless steel (cat.# 563647) connector between the two components. Please contact Restek® Customer Service or your local Restek® representative to order.



Stable Storage of 66 VOCs for 30 Days With SilcoCan® Air Sampling Canisters

Download the free application note by searching for "EVAN2066-UNV" at

www.restek.com



TO-Can® Air Sampling Canisters with RAVE™ Valve

Optimized for Methods TO-14A, TO-15, IP-1A, ASTM D5466, OSHA PV 2120, and NJ DEP Low Level TO-15

- Proprietary electropolished surface maintains compound stability.
- High-quality, metal-to-metal seal, 2/3-turn valve with stainless steel diaphragms prevent sample adsorption for more-accurate results.
- Both 2-port and 3-port valves available; 3-port valve includes -30" Hg/60 psi vacuum/pressure gauge (other gauges available).
- SUMMA canister equivalent.
- Now featuring the proven long life, leak-free performance, and effortless operation of the new RAVE™ valve. (See page 420 for more information.)

U.S. EPA 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. A frame surrounds the electropolished canister, eliminating the need for weld marks on the sphere, thereby preventing active sites on the canister. The RAVE™ valve supports the excellent performance of the canister.

A 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. Each canister is slightly pressurized with contaminant-free nitrogen prior to shipment.

Quickly confirm vacuum or pressure by ordering your SilcoCan® or TO-Can® canisters with high-quality premounted gauges.

Description	1 L Volume		3 L Volume		6 L Volume		15 L Volume	
	cat.#	price	cat.#	price	cat.#	price	cat.#	price
2-Port RAVE Valve	27416	£534.40	27418	£546.70	27420	£595.85	27422	£1,068
3-Port RAVE Valve with Gauge*	27417	£749.40	27419	£761.70	27421	£804.70	27423	£1,351
without Valve	22094	£445.55	22095	£467.85	22096	£543.85	22097	£1,132

*Range of standard gauge is -30" Hg to 60 psi.

Do not exceed canister maximum pressure of 40 psig (2.75 bar).

also available

Miniature Air Sampling Canisters

See page 435.



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 60 psi. To have a different gauge mounted on your canister, add the appropriate suffix number to the canister catalog number.*

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

*No price difference for these substituted gauges.

free literature

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

In this guide, we focus on collecting whole air samples in canisters, a flexible technique with many applications.

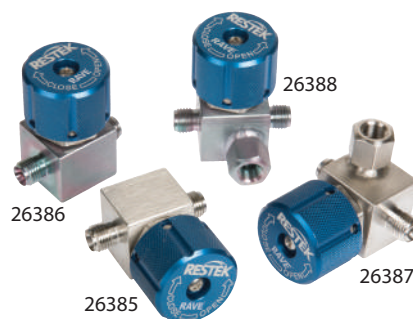
Download your free copy from www.restek.com by searching for "EVTG1073A"



Valves and Gauges for Air Sampling Applications

Replacement RAVE™ Diaphragm Valves

- Proven long life—durable design is engineered to exceed 15,000 cycles.
- Leak-free performance—every valve is helium leak-tested to 1×10^{-6} mL/sec.
- Effortless operation—easily finger-turn to achieve full valve closure (only 10 in-lb).
- Enhanced damage-resistance—W-type valve seats are work-hardened and wetted surfaces contain no moving parts.
- Now standard on our full line of SilcoCan®, TO-Can®, and miniature air sampling canisters.



Description	qty.	Siltek-treated		Stainless Steel	
		cat.	price	cat.	price
1/4" Replacement Diaphragm Valve, RAVE (2-port)	ea.	26386	£268.65	26385	£203.15
1/4" Replacement Diaphragm Valve, RAVE (3-port)	ea.	26388	£321.05	26387	£255.55
RAVE Diaphragm Rebuild Kit (includes: 3 diaphragms)	kit	26390	£52.45	26389	£39.35



Replacement Swagelok® SS4H Bellows Valve

- 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!

Description	qty.	cat.	price
Replacement 1/4" Swagelok SS4H Bellows-Sealed Valve (2-port)	ea.	24148	£254.25

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



24148

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.

Description	qty.	cat.#	price
-30" Hg/15 psi Vacuum/Pressure Gauge	ea.	24100	£117.55
-30" Hg/30 psi Vacuum/Pressure Gauge	ea.	24104	£117.55
-30" Hg/60 psi Vacuum/Pressure Gauge	ea.	24108	£117.55



24108

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 60 psi. To have a different gauge mounted on your canister, add the appropriate suffix number to the canister catalog number.*

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

*No price difference for these substituted gauges.

Vacuum Gauges

High-quality vacuum gauges with 316 stainless steel wetted surfaces. -30" Hg to 0" Hg. Recommended for use with passive sampling kits. All are rear mount.

Description	Fittings	qty.	cat.#	price
2" Vacuum Gauge	1/8" NPT	ea.	24269	£143.45
2" Vacuum Gauge	1/4" NPT	ea.	24270	£143.45
1 1/2" Vacuum Gauge	1/8" NPT	ea.	24120	£122.30



24120



24285



24268

Ashcroft® Test Gauges

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

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	£888.30
Digital Test Gauge, 3" diameter, 1/4" NPT	ea.	24268	£710.10
Ashcroft Gauge Connector to Canister Valve, stainless steel, connects 1/4" male NPT to 1/4" male compression fitting	ea.	22121	£65.45

Choose the Appropriate Device for Your Sampling Needs



	Canister	Gas Sampling Bag	Thermal Desorption Unit (TDU) Tube
Media Type	whole air	whole air	adsorption
Sensitivity	ppb	ppm	ppm
Technique	passive (no pump)	active	active
Sample Type	grab or integrated	grab	integrated
Analyte	wide range of VOCs	wide range of VOCs & permanent gases	sorbent-specific
Applications	ambient, IAQ, emergency response, IH	ambient, IAQ emission	IAQ, IH
Durability	reusable	one-time use	one-time use
Inertness	excellent	fair	fair
Stability	30 day	48 hours	varies by analyte
Sample Volume	0.4–6 L	0.5–100 L	varies by analyte
Sampling Time	minutes to days	minutes to hours	minutes to hours

See pages 421–422 for canisters. See page 436 for gas sampling bags. See page 438 for canister and thermal desorption tube comparison.

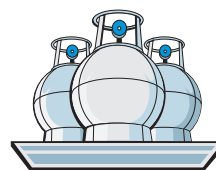
Passive Air Sampling Kits—Integrated (Stainless Steel & Siltek®-Treated)

Superior Performance—an Excellent Restek® Value

- Provide accurate integrated sampling without a sampling pump.
- Siltek®-treated components ensure accurate sampling of active components.
- 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 Size	Siltek-Treated		Stainless Steel	
400 cc	1 Liter	3 Liter	6 Liter	15 Liter			cat.#	price	cat.#	price
8 hour	24 hour	48 hour	125 hour	—	0.5–2 mL/min	0.0008"	24217	£1,140	24216	£981.60
2 hour	4 hour	12 hour	24 hour	60 hour	2–4 mL/min	0.0012"	24160	£1,140	24165	£981.60
1 hour	2 hour	6 hour	12 hour	30 hour	4–8 mL/min	0.0016"	24161	£1,140	24166	£981.60
—	1 hour	4 hour	8 hour	20 hour	8–15 mL/min	0.0020"	24162	£1,140	24167	£981.60
—	—	2 hour	3 hour	8 hour	15–30 mL/min	0.0030"	24163	£1,140	24168	£981.60
—	—	1 hour	1.5 hour	4 hour	30–80 mL/min	0.0060"	24164	£1,140	24169	£981.60
—	—	—	0.5 hour	1 hour	80–340 mL/min	0.0090"	22101	£1,140	22100	£981.60

*Vacuum/pressure gauge included in kit; air sampling canisters sold separately.

also available

- ▶ See **page 434** for miniature air sampling kits.
- ▶ See **page 433** for canister and flow controller repair service.

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, 1/8-inch NPT

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

3. 1/4-inch Siltek® sample inlet

The 0.3 m x 1/4" 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.

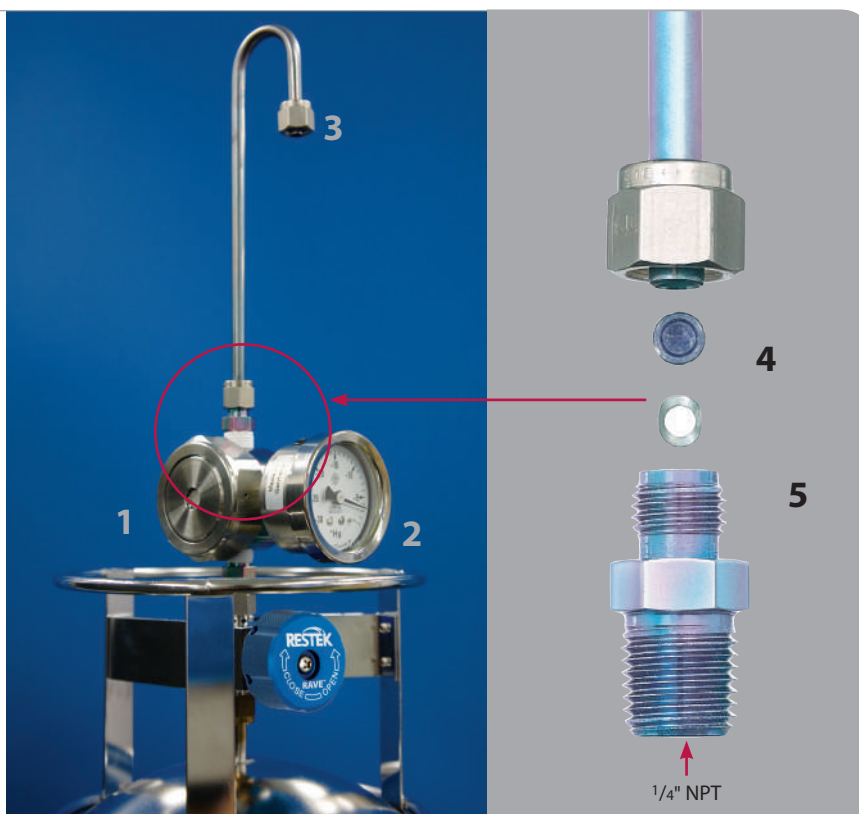
4. 2-micron frit filter and washer

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.

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



Stock up or buy only the parts you need now!



24249

Replacement Orifices

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

Description	Flow	Orifice Size	Siltek Treated cat.#	price	Stainless Steel cat.#	price
Replacement Orifice	0.5–2 mL/min	0.0008"	24219	£212.30	24218	£135
Replacement Orifice	2–4 mL/min	0.0012"	24233	£212.30	24245	£135
Replacement Orifice	4–8 mL/min	0.0016"	24234	£212.30	24246	£135
Replacement Orifice	8–15 mL/min	0.0020"	24235	£212.30	24247	£135
Replacement Orifice	15–30 mL/min	0.0030"	24236	£212.30	24248	£135
Replacement Orifice	30–80 mL/min	0.0060"	24237	£212.30	24249	£135
Replacement Orifice	80–340 mL/min	0.0090"	22099	£212.30	22098	£135



24171

24170

2 µm Frit Filters

For use in critical orifice fitting. Includes washers.

Description	qty.	Siltek Treated cat.#	price	Stainless Steel cat.#	price
Replacement Frit Filter	3-pk.	24171	£68.80	24170	£43

Veriflo® Flow Controllers

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

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



24262

Description	Flow	Orifice Size	Siltek Treated cat.#	price	Stainless Steel cat.#	price
Veriflo Flow Controller	0.5–2 mL/min	0.0008"	24232	£938.45	24229	£792.25
Veriflo Flow Controller	2–4 mL/min	0.0012"	24255	£956.55	24260	£792.25
Veriflo Flow Controller	4–8 mL/min	0.0016"	24256	£956.55	24261	£775.55
Veriflo Flow Controller	8–15 mL/min	0.0020"	24257	£956.55	24262	£792.25
Veriflo Flow Controller	15–30 mL/min	0.0030"	24258	£956.55	24263	£792.25
Veriflo Flow Controller	30–80 mL/min	0.0060"	24259	£956.55	24264	£792.25
Veriflo Flow Controller	80–340 mL/min	0.0090"	22103	£956.55	22102	£792.25
Veriflo Flow Controller	—	without orifice	24238	£864.65	24239	£719.85



24266

7 µm In-Line Filter

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

Description	qty.	Siltek Treated cat.#	price	Stainless Steel cat.#	price
7 µm In-Line Filter	ea.	24265	£182.40	24266	£135.10

Note: frit is not replaceable.



26211

26209

Sample Inlets

- Inlets have 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.

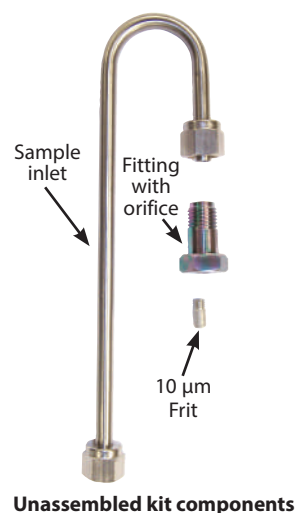
Description	qty.	Siltek Treated cat.#	price	Stainless Steel cat.#	price
Sample Inlet, 6" Length	ea.	26210	£68.15	26209	£54.75
Sample Inlet, 1.5" Length	ea.	26212	£65.95	26211	£51.40

Passive Air Sampling Kits—Grab (Stainless Steel & Siltek®-Treated)

- Use with 1, 3, or 6 L canisters for grab air sampling.
- Variety of orifice sizes for fast sampling from 5 to 60 minutes.
- Connect 1/4" compression fitting directly to canister valve inlet.
- Replaceable frit protects orifice and valve from particulates.
- Sample inlet design minimizes water entry into sampling train.
- Individual replacement components available.

Canister Volume/Sampling Time (min)			Flow	Orifice Size	Siltek-Treated		Stainless Steel	
1 Liter	3 Liter	6 Liter			cat.#	price	cat.#	price
60	—	300	15 mL/min	0.0018"	26280	£211	26263	£173
45	—	240	20 mL/min	0.0020"	26281	£207.05	26264	£173
15	60	120	45 mL/min	0.0030"	26282	£207.05	26265	£173
10	30	60	80 mL/min	0.0040"	26283	£211	26266	£176.95
5	15	30	150 mL/min	0.0055"	26284	£211	26267	£176.95
—	—	15	300 mL/min	0.0080"	26285	£211	26268	£173
—	5	10	390 mL/min	0.0090"	26286	£207.05	26269	£173
—	3	5	>1,000 mL/min	0.0130"	26287	£207.05	26270	£176.95

Air sampling canisters sold separately.



Unassembled kit components

Replacement Fittings for Grab Sampling Kits

Includes fitting and orifice.

Description	Orifice Size	Siltek-Treated cat.#	price	Stainless Steel cat.#	price
Replacement Fitting for Grab Sampling Kit	0.0018"	26288	£154.65	26271	£121.90
Replacement Fitting for Grab Sampling Kit	0.0020"	26289	£154.65	26272	£121.90
Replacement Fitting for Grab Sampling Kit	0.0030"	26290	£154.65	26273	£121.90
Replacement Fitting for Grab Sampling Kit	0.0040"	26291	£154.65	26274	£121.90
Replacement Fitting for Grab Sampling Kit	0.0055"	26292	£154.65	26275	£121.90
Replacement Fitting for Grab Sampling Kit	0.0080"	26293	£154.65	26276	£121.90
Replacement Fitting for Grab Sampling Kit	0.0090"	26294	£154.65	26277	£121.90
Replacement Fitting for Grab Sampling Kit	0.0130"	26295	£154.65	26278	£121.90

Replacement 10 µm Frits for Grab Sampling Kits

Description	qty.	Siltek-Treated cat.#	price	Stainless Steel cat.#	price
10 µm Frit for Grab Sampling Kit	3-pk.	26296	£68.15	26279	£55.05



Assembled kit on canister
Air sampling canisters sold separately.

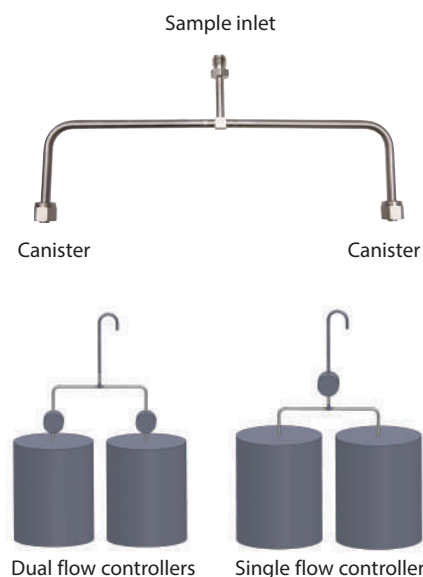
Dual Canister Sampling Manifold (Stainless Steel & Siltek®-Treated)

- Duplicate sampling with all canister sizes using one or two flow controllers.
- Precise dimensions (9.5" wide x 3.5" high) provide accurate splitting of sample between two canisters.
- One-piece design means fewer leaks.
- Thick-walled stainless steel tubing is rugged enough for field use.
- Uses 1/4" compression connections.

Field duplicates of canister samples frequently result in analyte concentrations with high relative standard deviations. In addition, field duplicates do not differentiate laboratory performance from sampling variability. Restek's dual canister sampling manifold (DCSM) minimizes sampling variability through a single sample inlet and flow controller by which the sample is evenly collected between two canisters. Use of a single flow controller eliminates flow rate variability, as well as environmental variables common with collocated samples. The DCSM may also be used with two flow controllers to monitor individual canister vacuum.

Description	qty.	Siltek-Treated cat.#	price	Stainless Steel cat.#	price
Dual Canister Sampling Manifold	ea.	24999	£204.70	24998	£183.80

Note: Do not use the DCSM as a handle to pick up 2 canisters!





22930



Assembled kit on canister

Air sampling canisters sold separately.

Passive Air Sampling Kits—Soil Gas (Stainless Steel & Siltek®-Treated)

This unique grab sampler is specifically designed for soil gas sampling by allowing the connection of tubing coming from the soil gas sample port. The innovative design minimizes connections and leaks and houses a critical orifice in the tee fitting. It also incorporates a vacuum gauge and 2 µm frit filter.

Assembled sampler includes:

- Stainless steel tee with orifice.
- Variety of orifice sizes for sampling from 4 minutes to 10 hours.
- 1 1/2" vacuum gauge (-30" Hg to 0" Hg).
- 2 µm frit filter for insertion into 1/4" compression sample inlet.

The 1/4" compression inlet and outlet allows easy connection to the canister valve and also to the tubing from the sample port. Several orifice sizes provide sampling times from 4 minutes to 10 hours on a 6 L canister. Individual replacement parts are available, providing a cost-effective alternative to replacing the entire sampler.

Canister Volume/Sampling Time		Flow	Orifice Size	Siltek-Treated		Stainless Steel	
1 Liter	6 Liter			cat.#	price	cat.#	price
4 min	20 min	210 mL/min	0.0065"	22935	£402.40	22930	£366.20
6 min	30 min	150 mL/min	0.0055"	22936	£402.40	22931	£366.20
10 min	1 hr	80 mL/min	0.0040"	22937	£402.40	22932	£366.20
30 min	3 hr	30 mL/min	0.0025"	26337	£402.40	26336	£366.20
45 min	4 hr	19 mL/min	0.0020"	22938	£402.40	22933	£359.25
2 hr	10 hr	6 mL/min	0.0014"	22939	£402.40	22934	£366.20

Air sampling canisters sold separately.

Replacement Tees w/Orifice for Soil Gas Sampler Kits

Description	Orifice Size	Siltek-Treated cat.#	price	Stainless Steel cat.#	price
Soil Gas Sampler Replacement Tee w/Orifice	0.0065"	22945	£183.80	22940	£150.40
Soil Gas Sampler Replacement Tee w/Orifice	0.0055"	22946	£179.65	22941	£153.20
Soil Gas Sampler Replacement Tee w/Orifice	0.0040"	22947	£179.65	22942	£150.40
Soil Gas Sampler Replacement Tee w/Orifice	0.0025"	26339	£183.80	26338	£153.20
Soil Gas Sampler Replacement Tee w/Orifice	0.0020"	22948	£179.65	22943	£150.40
Soil Gas Sampler Replacement Tee w/Orifice	0.0014"	22949	£179.65	22944	£153.20



22940

Replacement Parts for Soil Gas Sampler Kits

Description	qty.	cat.#	price
Vacuum Gauge, 1 1/2"	ea.	24120	£122.30
Replacement Frit Filter, Stainless Steel	3-pk.	24170	£43
Replacement Frit Filter, Siltek-Treated	3-pk.	24171	£68.80
Port Connector, 1/4", Siltek/Sulfinert-Treated	ea.	21549	£83.90
Port Connector, 1/4", Stainless Steel	2-pk.	21936	£52.25
Nut & Ferrule Set, 1/4", Stainless Steel	5-pk.	21911	£45.15
Nut, 1/4", Stainless Steel	10-pk.	21902	£48.70



24120



24171

24170

(Frits do not control flow.)

also available

VCO® Fittings

- Use VCO® fittings for rapid assembly to cleaning system.
- Protect canister valves, flow controllers, and cleaning system fittings.

See **page 316**.



Alicat M-Series Flow Calibrators

- Accurate—NIST-traceable and rated at 0.8% of the reading + 0.2% full-scale repeatability; calibration documents provided with each unit.
- Fast—5 ms response speed with no warm-up required.
- Convenient—no computer connection or software required and all data is visible on one screen.
- Tough—stainless steel construction; unaffected by bumps, humidity, or changes in orientation and supported by an Alicat lifetime warranty.*
- Downloadable—data can be recorded on a computer via RS-232 connection (unit has no on-board data logging).
- Long-lasting—portable models with lithium-ion battery offer 5 hours (color) or 18 hours (monochrome) of use between charges; rated for 500 cycles before decline to 85%.**

Quickly and precisely verify flow rates generated by vacuum or pressure before going into the field. These compact, convenient units are ideal for real-time calibration of air flow controllers, passive sampling kits, air canisters, sampling pumps, and more. They measure absolute pressure, mass flow, volumetric flow, and temperature of 30 different gases across a wide range of flows. Choose a lab-based or convenient battery-powered portable model.



26437



26438

Monochrome display shown; also available in color.

Specifications:

Accuracy at Calibration	
Conditions After Tare:	± 0.8% of reading + 0.2% of full scale
High Accuracy at Calibration	
Conditions After Tare:	± 0.4% of reading + 0.2% of full scale
Accuracy for Bidirectional Meters	
at Calibration Conditions After Tare:	± 0.8% of reading + 0.2% of total span from positive full scale to negative full scale
Repeatability:	± 0.2% full scale
Zero Shift and Span Shift:	0.02% full scale / °C / atm
Operating Range / Turndown Ratio:	0.5% to 100% full scale / 200:1 turndown
Maximum Measurable Flow Rate:	128% full scale
Typical Response Time:	10 ms (adjustable)
Warm-Up Time:	<1 second
Operating Temperature:	-10 to +50 °C
Humidity Range (non-condensing):	0 to 100%
Maximum Internal Pressure (static):	145 psig
Wetted Materials:	303 & 302 stainless steel, Viton®, silicone RTV (rubber), glass-reinforced nylon, aluminum
Programmed Gases:	Acetylene, air, argon, butane, carbon dioxide, carbon monoxide, ethane, ethylene (ethene), helium, hydrogen, iso-butane, krypton, methane, neon, nitrogen, nitrous oxide, oxygen, propane, sulfur hexafluoride, xenon, A-25, A-75, A1025, C-2, C-8, C-10, C-25, C-75, P-5, Star29
Dimensions:	cat.#s 26434 & 26438: 3.9" H x 2.4" W x 1.1" D; 0.8 lb cat.#s 26435 & 26439: 4.1" H x 2.4" W x 1.1" D; 1.0 lb cat.#s 26432 & 26436: 6.4" H x 2.4" W x 1.1" D; 1.0 lb cat.#s 26433 & 26437: 6.7" H x 2.4" W x 1.1" D; 1.2 lb

Description	Flow capacity	qty.	Color Display		Monochrome Display	
			cat.#	price	cat.#	price
Portable Mass Flow Calibrator	0-50 sccm	ea.	26432	£2,090	26436	£1,913
Portable Mass Flow Calibrator	0-500 sccm	ea.	26433	£2,090	26437	£1,913
Lab-Based Mass Flow Calibrator	0-50 sccm	ea.	26434	£1,828	26438	£1,565
Lab-Based Mass Flow Calibrator	0-500 sccm	ea.	26435	£1,828	26439	£1,565

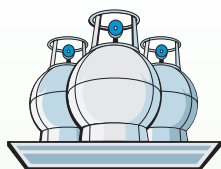
Monochrome display shown; also available in color.

*Restek Recommends: Recalibrate your Alicat flow calibrator once every year to maintain lifetime warranty. Prolonged failure to recalibrate your unit may result in increased error. To always get the most accurate measurements, contact Restek® Customer Service to send in your flow calibrator for service, recertification, and recalibration (cat.# 26462).

** NOTE: Handling, removing, or replacing the battery will void the Alicat warranty.

coming soon
Mesa Labs Flow Calibrators

www.restek.com



Feature	Benefit
Large capacity—holds twelve 6 L cans or twenty-four 1 L cans.	Twice the capacity of other ovens for faster turnaround.
Embedded touch screen controller.	No separate computer needed.
Adjustable oven control up to 110 °C.	Cleans canisters AND valves faster and more completely than heating bands.
Ten user defined methods.	Each cleaning cycle parameter can be configured separately to minimize overall cycle time.
Oil-free Edwards vacuum pump.	Cheaper to run and maintain than 2-pump alternatives; lowers risk of contamination.
Humidifier	Provides humidified nitrogen to improve cleaning process.
Dimensions: 44" H x 48" W x 27" D.	Small footprint saves valuable lab space.
Oven cart available as option.	Saves bench space and provides convenient mobility.

	Restek	Competitor A
Capacity	Twelve 6 L cans	Six 6 L cans
Software	Included	Separate

www.restek.com/air

for more info

Search for **EVTS1186A-UNV** at www.restek.com

Specifications:

TO-Clean Oven

Dimensions: 44" H x 48" W x 27" D
 Weight: 525 lb

Cart

Dimensions: 29" H x 48" W x 30" D
 Weight: 340 lb

Note: Ovens are built on demand; therefore, a ten-week lead time is required on all orders. A limited cancellation and return policy applies to TO-Clean ovens; contact Restek® Customer Service for details.

TO-Clean Canister Cleaning System High capacity, fully automated, easy-to-use canister cleaning oven dramatically increases lab efficiency.

- Oil-free pump lowers risk of contamination.
- EPA Method TO-14A/15 compliant.
- Powerful 6i pump can achieve 50 mTorr in <25 minutes for twelve 6 L canisters; higher power 10i option also available.
- Custom-built trays for different canister sizes.
- Humidifier provides humidified nitrogen to improve cleaning process.
- One-year limited warranty.
- Fully assembled and ready to use.

Cut Cleaning Time in Half

Get finished cleaning faster—the high capacity interior holds twice as many canisters as similar models, which lets you finish cleaning in half the time. EPA Method TO-14A/15 compliant unit holds up to twelve 6-liter or twenty-four 1-liter canisters.



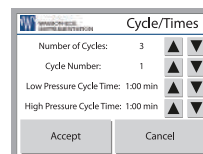
Oven Control at Your Fingertips

Isothermal oven cleans both canisters and valves faster and more completely than a heating band system. Temperature is adjustable up to 110 °C.

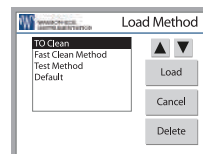
Easily Create Custom Cleaning Programs

Create up to 10 different methods using the on-board touch screen controller. Define the number of cycles, pressure, and soak times; then save the method for later use. Ensures consistent procedures are followed and makes operation as simple as pressing "start".

Easily create custom methods.

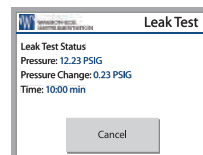


Choose a saved method for a fast start and consistent process.



Ensure Performance with Easy, On-Board Diagnostics

With embedded diagnostic software, you can check for leaks and test valve operation at the touch of a button. Quick and easy system verification ensures effective cleaning. No separate computer needed.



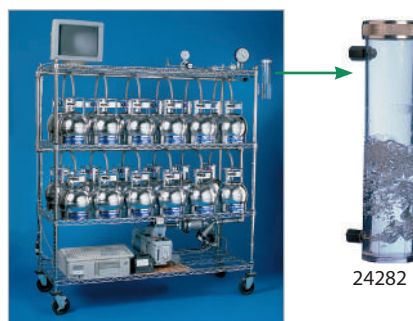
Description	Type	Voltage	qty.	cat.#	price	
TO-Clean Oven w/Oil Free Pump	Edwards nXDS6i Dry Scroll Pump	120 V, 60 hz	ea.	26379	enquire	
TO-Clean Oven w/Oil Free Pump	Edwards nXDS6i Dry Scroll Pump	220/230 V, 50/60 hz	ea.	26380	enquire	
TO-Clean Oven w/Oil Free Pump	Edwards nXDS10i Dry Scroll Pump	120 V, 60 hz	ea.	26381	enquire	
TO-Clean Oven w/Oil Free Pump	Edwards nXDS10i Dry Scroll Pump	220/230 V, 50/60 hz	ea.	26382	enquire	
Optional Accessories (not included with TO-Clean Oven)				qty.	cat.#	price
Oil-free Pump Silencer			ea.	26383	enquire	
Oil-free Pump Exhaust Tubing for customer exhaust (10' PVC tubing, clamps, adapters, O-rings)			ea.	26384	enquire	
Oven Cart, 29" H x 48" W x 30" D, 12 gauge steel, push handle and casters			ea.	22919	enquire	
1 L Option: includes tubing, fittings, and inserts for twenty-four 1 L canisters			ea.	22920	enquire	
3 L Option: includes tubing, fittings, and inserts for twelve 3 L canisters			ea.	22126	enquire	
Mini-Can Option: includes tubing, fittings, and inserts for either forty-eight 400 cc or forty-eight 1,000 cc mini-canisters			ea.	22127	enquire	

Shipping: FedEx Ground, unless otherwise requested. Costs vary depending on ship-to location.

Humidification Chamber

When cleaning SilcoCan® or TO-Can® canisters, it is important to use humidified air or nitrogen to help remove volatile organic contaminants. Restek's humidification chamber is made of acrylic and withstands pressure up to 90 psi. 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	£293.80



Restek's canister cleaning system with humidification chamber.

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" inlet and outlet fittings, highly inert stainless steel flow path, and waterproof exterior for outdoor use.

Description	qty.	cat.#	price
Canister Air Sampling Timer	ea.	24267	£1,996



Simplify automated and manual air sampling with a sampling timer.

Canister and passive air sampling kit must be purchased separately.



Restek's Innovations and Technical Service Groups feature several chemists with hands-on EPA and environmental lab experience, particularly with air sampling and testing—and they are ready to help.



Air canister tripod conveniently holds two air canisters.

Air Canister Tripod

- Lightweight (12 lb) and compact for easy storage and transport.
- Extends from 6' to 9' high.
- Large base provides enhanced stability without additional supports.
- Sturdy, rugged metal design for outdoor sampling and transport.

Restek's air canister tripod holds two canisters simultaneously for collocated ambient air sampling. The custom-designed bracket holds most 1, 3, and 6 L canisters* securely without any tools.



Description	qty.	cat.#	price
Air Canister Tripod	ea.	24151	£417.70

*Air sampling canisters sold separately.



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

Canister Carrying Supplies

Canister Carrying Box Kit

6-liter carrying boxes with plastic handles simplify canister transport. Four carrying boxes and one shipping box per kit.

Description	qty.	cat.#	price
Canister Carrying Box Kit	kit	24215	£39.35

Canister Carrying Case

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



Description	qty.	cat.#	price
Deluxe Canister Carrying Case	ea.	24226	£451.15

How to Extend Canister Life

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

1. Prevent leaks

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

a. Particles in the valve

You can prevent particles from entering the valve by always using a 2 or 7 μm 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 $\frac{1}{4}$ 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 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 may 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 110 °C on the gauge and 130 °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 silicon-lined cans (SilcoCan® canisters).

3. Avoid damage to silicon-lined cans

Be sure to follow method recommendations when cleaning your canisters to avoid oxygen damaging the silicon 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 and 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 Restek® Customer Service or your local Restek® representative to take advantage of this service. You will be given instructions and an RMA # to return the parts and completed health & safety declaration to us.

Sampling Kit/Flow Controller Repair

Includes all new rubber seals in flow controller and orifice and frit replacement
cat.# 550131

Canister Repair

Includes valve replacement, leak test & cleaning
for RAVE™ valve: cat.# 569604
for Parker: cat.# 560838
for Swagelok: cat.# 563801

Replacement Parts..... Page #
 Flow Controller426
 Gauge423
 Orifices426
 Sample Inlet426



Expand Air Sampling with Mini-Cans & Accessories

- Grab and integrated sampling without a sampling pump.
- Possible to perform 8-hour integrated sample with 400 cc mini-can.
- Siltek® coating delivers high level of inertness for H₂S and other reactive compounds.
- Versatile enough for many applications:
 - Indoor air
 - Industrial hygiene
 - Soil gas
 - Emergency response

Miniature Air Sampling Kits (Stainless Steel & Siltek®-Treated)

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

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, 2 µm frit filter, vacuum gauge, and sample inlet. The gauge (cat.# 24120) and sample inlet (cat.#s 26211, 26212) are downsized for use with smaller canisters.

Canister Volume/Sampling Time		Flow	Orifice Size	Siltek-Treated cat.#	price	Stainless Steel	
400 cc	1 Liter					cat.#	price
8 hour	24 hour	0.5–2 mL/min	0.0008"	26253	£925.90	26252	£781.10
2 hour	4 hour	2–4 mL/min	0.0012"	26255	£925.90	26254	£781.10
1 hour	2 hour	4–8 mL/min	0.0016"	26257	£906.90	26256	£781.10
—	1 hour	8–15 mL/min	0.0020"	26259	£925.90	26258	£781.10

*Air sampling canisters sold separately.

Mini-Can Accessories

Sampling Belt:

- Adjustable up to 50".
- Two reclosable hook-and-loop straps securely hold mini-can or other sampling device.
- Straps slide anywhere on belt.
- Versatile design, perfect for personal wear or hang for area sampling.



Sampling belt & personal sample inlet

Personal Sample Inlet:

- 3' long x 1/16" OD all PTFE tubing.
- Convenient clip can be moved along length of tubing for proper attachment in breathing zone.
- PTFE reducing ferrule allows direct connection from 1/16" tubing to 1/4" flow controller without another fitting.

Mini-Can Stand:

- Collapsible for easy storage and transport.
- Two out of three legs move to accommodate uneven surfaces.
- Holds 2 3/4" diameter cans securely.
- Small footprint—12" diameter x 6.5" height.

These accessories enhance mini-can usage and provide flexibility in their application, from personal, to area, to vapor intrusion sampling.



22124
Mini-Can Stand

Mini-Can and Sampling Kit not included.

Description	qty.	cat.#	price
Sampling Belt	ea.	22122	£27.55
Personal Sample Inlet (includes: 3' x 1/16" OD PTFE tubing, Clip, PTFE Reducing Ferrule, 1/4" SS nut)	ea.	22123	£24.90
Mini-Can Stand	ea.	22124	£55.05

Miniature Air Sampling Canisters

- Ideal for indoor air, personal, emergency response, or soil gas sampling.
- Choose 400 cc or 1,000 cc.
- Available with quick-connect fitting that is compatible with sampling and analysis instruments.
- New option: the proven long life, leak-free performance, and effortless operation of the RAVE™ valve.

These small canisters are designed for controlled sampling, such as personal air sampling, as an alternative to tube and pump samplers. The 1,000 cc canister is suitable for sampling volatile organic compounds in air according to methods TO-14A, TO-15, IP-1A, ASTM 5466, OSHA PV 2120, and NJ DEP Low Level TO-15.

Restek offers these products in stainless steel or with Siltek® treatment, 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.

Description	qty.	400 cc		1,000 cc	
		cat.#	price	cat.#	price
Miniature Canister with Quick-Connect Stem Fitting					
Electropolished Stainless Steel Canister with Quick-Connect Stem Fitting	ea.	24188	£321.05	24194	£378.75
Siltek-Treated Canister with Quick-Connect Stem Fitting	ea.	24189	£378.75	24195	£461.30
Siltek-Treated Canister with Siltek-Treated Quick-Connect Stem Fitting	ea.	24190	£745.30	24196	£851.80
Miniature Canister with RAVE Valve					
Electropolished Stainless Steel Canister with RAVE Valve	ea.	26456	£393.15	26459	£452.10
Siltek-Treated Canister with RAVE Valve	ea.	26457	£478.30	26460	£530.75
Siltek Treated Canister with Siltek-Treated RAVE Valve	ea.	26458	£537.30	26461	£609.35
Miniature Canister without Valve					
Electropolished Stainless Steel	ea.	24205	£283.05	24206	£343.35
Siltek-Treated	ea.	24207	£319.75	24208	£387.90

Do not exceed canister maximum pressure of 40 psig.

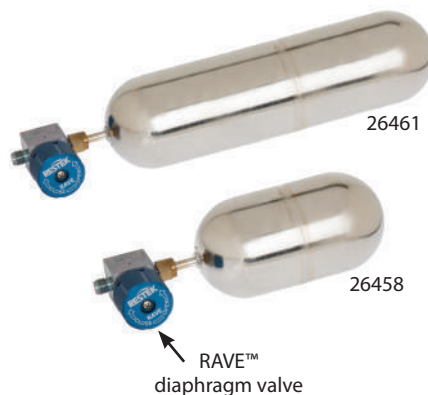
Swagelok® Quick-Connect Fittings for Miniature Air Sampling Canisters

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.

Connection: 1/4" tube fitting.

Description	qty.	cat.#	price
Quick-Connect Stem Fitting	ea.	24185	£169.75
Quick-Connect Stem Fitting, Siltek-Treated	ea.	24186	£360.90
Quick-Connect Stem Protector, Stainless Steel	ea.	24121	£112.80
Quick-Connect Body Fitting	ea.	24187	£226.75

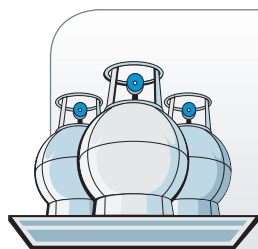
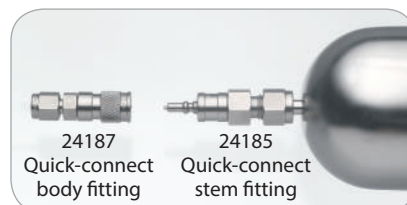
Note: Quick-connect body fitting (cat. # 24187) must be ordered separately to sample with quick-connect stem fitting.



Dimensions:

400 cc = 2.75" diameter, 5.35" long (7 x 13.6 cm), 1.25 lb (0.567 kg)
1,000 cc = 2.75" diameter, 11.92" long (7 x 30 cm), 2.00 lb (0.91 kg)

NEW!



Get Mini! Mini-Can Options

Sizes	400 cc or 1,000 cc
Valves	RAVE™ diaphragm, quick connect
Interior Coating	Electropolished, Siltek®-treated
Sample Inlets	Area, personal
Flow ranges	0.5–15 mL/min

i tech tip

Use a gap inspection gauge to confirm fittings are sufficiently tightened. See page 319.

Gas Sampling Bags

Sampling bags are a low-cost, whole-air sampling device for high-level VOCs and permanent gases. Several EPA, NIOSH, and OSHA methods exist for bag sampling for a variety of applications: stationary sources emissions, workplace atmospheres, ambient, indoor air quality, and breath analysis. Choose the film type appropriate for your application. All our bags feature a polypropylene combo valve with hose connection to fit 3/16" ID tubing and syringe port with replaceable septum. A single eyelet provides handling convenience.

Tedlar® Sampling Bags

- Find the bags you need—we offer sizes from 0.5 L to 100 L.
- 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 PTFE tubing.
- Continuous sampling temperature up to 225 °F (107 °C); short term (1–2 hours) temperature up to 350 °F (176 °C).



Description	Size	qty.	Polypropylene Valve		Stainless Steel Valve	
			cat.#	price	cat.#	price
0.5 L Tedlar Sampling Bag	6" x 6"	10-pk.	22049	£131.05	22038	£338.10
1 L Tedlar Sampling Bag	7" x 7"	10-pk.	22050	£137.60	22039	£351.20
3 L Tedlar Sampling Bag	9.5" x 10"	10-pk.	22051	£192.65	22040	£386.60
5 L Tedlar Sampling Bag	12" x 12.5"	10-pk.	22052	£213.60	22041	£412.80
10 L Tedlar Sampling Bag	11.75" x 22"	10-pk.	22053	£275.20	22042	£482.25
12 L Tedlar Sampling Bag	13" x 24"	10-pk.	22054	£330.25	22043	£448.20
25 L Tedlar Sampling Bag	17.5" x 24"	5-pk.	22055	£262.10	22044	£323.70
40 L Tedlar Sampling Bag	24" x 24.25"	5-pk.	22056	£323.70	22045	£406.25
80 L Tedlar Sampling Bag	28.25" x 30.5"	5-pk.	22057	£501.90	22046	£501.90
100 L Tedlar Sampling Bag	28" x 36"	3-pk.	22058	£344.65	22047	£433.75
Description		qty.	cat.#	price		
PTFE Faced Silicone Replacement Septum, 4 mm diameter		10-pk.	22104	£18.35		

Multi-Layer Foil Gas Sampling Bags

- Good stability for low molecular weight compounds, such as methane, CO, CO₂, and permanent gases.
- Chemically inert with light and moisture protection.
- Not recommended for low ppm VOCs due to background levels.
- Protective 5-layer barrier minimizes gas permeability.
 - 60 gauge nylon (outer layer)
 - Metalized aluminum
 - Polyethylene
 - 0.0003" aluminum foil
 - 0.002" polyethylene (inner layer)
- Continuous sampling temperature up to 190 °F (88 °C) indefinitely; do not exceed 190 °F for any period of time.



Volume	Size	qty.	cat.#	price	
1 L	7" x 7"	5-pk.	22950	£104.85	
3 L	10" x 10"	5-pk.	22951	£116.65	
5 L	12" x 12"	5-pk.	22952	£123.20	
10 L	12" x 22"	5-pk.	22953	£152.05	
12 L	13" x 24"	5-pk.	22966	£165.80	
25 L	18" x 24"	5-pk.	22967	£193.30	
40 L	24" x 24.5"	5-pk.	22968	£219.50	
PTFE Faced Silicone Replacement Septum, 4 mm diameter			10-pk.	22104	£18.35

also available

ALTEF gas sampling bags

www.restek.com/air

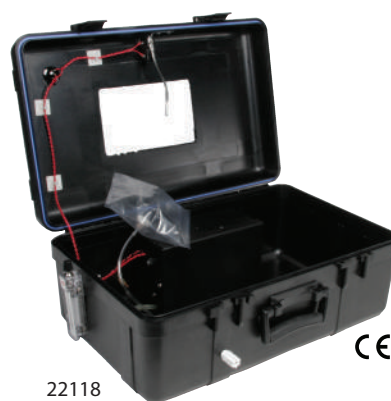
Vacuum Bag Sampler

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

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 10 L 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 adaptor/charger, battery, instruction manual, and 1-year limited warranty.

Specifications:

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



22118

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 adaptor, battery, manual)	ea.	22118	£2,366
Replacement Battery for Vacuum Bag Sampler Model 1062	ea.	22119	£86.40
Universal Battery Charger for Vacuum Bag Sampler Model 1062 (115/230 VAC)	ea.	22120	£90.50

Physical Specifications of Gas Sampling Bags

	Tedlar® bags	ALTEF Bags	Multi-Layer Foil Bags
Composition	polyvinyl fluoride (PVF) polymer resin	Proprietary PVDF film	5-layer
Thickness	0.002"	0.003"	0.005"
Tensile Strength	8,000 psi	6,100 psi	24 lb/inch (CD)
Max. Operating Temp.	204 °C	150 °C	87 °C
Specific Gravity	1.7 g/mL	1.78 g/mL	1.09 g/mL
Oxygen Permeability	50 cc/m ² x day	58 cc/m ² x day	0.0006 cc/m ² /day
Water Vapor Permeability	9-57 g/m ² x day	12-15 g/m ² x day	0.0006 g/100 in ² x day
Carbon Dioxide Permeability	172 cc/m ² x day	172 cc/m ² x day	0.0005 cc/100 in ² x day

General Guidelines for Bag Sampling

Follow these basic considerations for trouble-free air sampling using gas sampling bags.

Before Sampling

- Store unused bags in a clean environment, sealed in an outer bag to prevent adsorption of contaminants.
- Pre-clean bags before use by flushing with high-purity nitrogen.
- For validation, compounds must be stable at >80% for 72 hours.
- Leak rate must not exceed 0.1" Hg/min.

During Sampling

- Be sure the PTFE tubing used for bag connection is clean.
- Use a vacuum box sampler for direct bag filling in order to avoid contamination from a sampling pump.
- Typical flow rate is 3 L/min.
- Do not fill bags more than 80%.

After Sampling

- Bags are intended for a single use due to potential sample adsorption onto the bag film.
- Hold times are typically 48 hours unless validation study demonstrates longer stability.
- Protect samples from direct sunlight and store above 0 °C to prevent condensation.
- Transport in rigid, opaque container to prevent bag puncture; do not ship by air unless samples will be kept in a pressurized area.

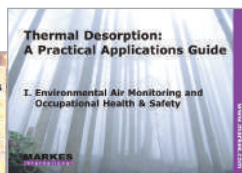
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A Guide to Whole Air
 Canister Sampling:
 Equipment Needed and Practical
 Techniques for Collecting
 Air Samples

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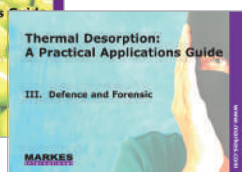
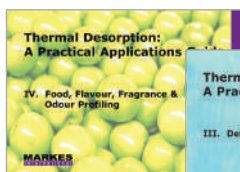
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 search for "GNTG1035"

Defense & Forensic
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Thermal Desorption Unit (TDU) Tubes vs. Canister Sampling
Which VOC Sampling Technique is Right for You?

Thermal desorption unit (TDU) 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	U.S. EPA TO-17 ASTM D6196 ISO 16017 ISO 16000-6 NIOSH 2549	U.S. EPA TO-14A, TO-15 ASTM D5466 OSHA PV2120 NIOSH Protocol Draft
	World-wide acceptance	Gold standard for U.S. 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	Lightweight for personal sampling 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, 15 L max
Analysis	Tube dimensions are instrument specific	Compatible with all manufacturer sample concentrators
	One 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 multitubed tubes to prevent potential migration of compounds to more retentive sorbent, which may be 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.

Thermal Desorption Unit (TDU) Tubes

- Variety of sorbents to collect a wide range of VOCs.
- Use corrosion-resistant glass tubes for excellent inertness; allow monitoring of sorbent bed condition.
- Choose stainless steel tubes for greater durability in the field. No sampling pump necessary for passive sampling with diffusion caps.
- Individually etched with unique serial number for convenient sample identification.
- Robust barcode—the most reliable “code 128” format—on tube for recording and tracking.
- Each tube has an arrow indicating flow direction to reduce errors during use.
- Available unconditioned or preconditioned and ready to sample. Tubes are reusable after thermal desorption for most applications.

High-quality thermal desorption tubes are suitable for ppt to ppm concentrations of volatile organic compounds (VOCs) in ambient, indoor, personal, and industrial hygiene environments. Fit Markes (ULTRA and 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)

Tenax is a trademark of Buchem BV. Carbopack, Carbosieve, and Carboxen are trademarks of Sigma-Aldrich.



method applications

Method	Application
U.S. EPA	TO-17
ASTM	D6196
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 (<10 L total volume)
Long-term storage caps are supplied with conditioned tubes

Thermal Desorption Unit Tubes (Unconditioned and Conditioned & Capped)

Sorbent Description	qty.	Unconditioned		Conditioned & Capped					
		Stainless Steel cat.#	Glass price	Stainless Steel cat.#	Glass price	Stainless Steel cat.#	Glass price		
Tenax TA (35/60 mesh)	10-pk.	24056	£853.50	24062	£903.35	24080	£1,204	24086	£1,277
Graphitized Carbon (20/40 mesh)	10-pk.	24057	£853.50	24063	£903.35	24081	£1,179	24087	£1,253
Tenax GR (35/60 mesh)/ Carbopack B (60/80 mesh)	10-pk.	24058	£841.65	24064	£927.10	24082	£1,196	24088	£1,290
Carbopack B (60/80 mesh)/ Carbosieve SIII (60/80 mesh)	10-pk.	24059	£841.65	24065	£927.10	24083	£1,170	24089	£1,290
Tenax TA (35/60 mesh)/ Graphitized Carbon (40/60 mesh)/ Carboxen 1000 (60/80 mesh)	10-pk.	24060	£841.65	24066	£952	24084	£1,184	24090	£1,315
Carbopack C (60/80 mesh)/ Carbopack B (60/80 mesh)/ Carbosieve SIII (60/80 mesh)	10-pk.	24061	£841.65	24067	£952	24085	£1,184	24091	£1,290

Thermal Desorption Unit Tubes (Empty)

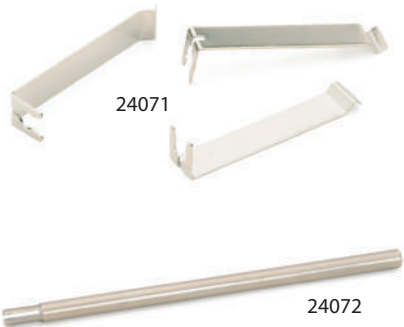
- Empty tubes for direct desorption of VOCs from liquids, solids, or pastes.
- Stainless steel: front sorbent-retaining gauze, rear gauze, and gauze retaining spring supplied; or glass: glass frit positioned 15 mm from sampling end.
- Can be packed with any sorbent to suit any application.

Description	qty.	Stainless Steel cat.#	price	Glass cat.#	price
TDU Tubes, Empty	10-pk.	24054	£466.55	24055	£542.50

Thermal Desorption Unit Tubes (Calibration)

Description	qty.	Stainless Steel cat.#	price	Glass cat.#	price
TDU Tubes, Calibration, Tenax TA 1 cm Bed (35/60 mesh)	10-pk.	24075	£841.65	24076	£1,088
Calibration Solution Loading Rig	ea.			24077	£806
Calibration Solution Loading Rig Replacement Septa, 9.5 mm	10-pk.			24078	£36.80
Certified Reference Standard, 100 ng BTX on Tenax TA	10-pk.			24079	£2,186





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	£153.15
1/4" PTFE Ferrules	Long-term storage caps.	20-pk.	24069	£71.25
CapLok Tool	Use for tightening long-term storage caps.	ea.	24070	£109.25
Pen Clip		10-pk.	24071	£96.15
TubeMate Tool	Assists with tube packing.	ea.	24072	£83.10
1/4" Stainless Steel Union and PTFE Ferrules	Use for connecting tubes in series.	10-pk.	24073	£721.75
Diffusion Caps	Required for diffusive sampling with stainless steel tubes.	10-pk.	24074	£315.75



WORLD-CLASS SERVICE & LOCAL CONNECTIONS

UNITED STATES: www.restek.com

Customer Service

Phone: 1-800-356-1688 or 1-814-353-1300, ext. 3

E-mail: csreps@restek.com

Technical Service

Phone: 1-800-356-1688 or 1-814-353-1300, ext. 4

E-mail: support@restek.com

Sales

Phone: 1-800-356-1688 or 1-814-353-1300, ext. 3

E-mail: salesreps@restek.com

Or visit www.restek.com/USsales

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Customer Service

Phone: 1-814-353-1300, ext. 9

Fax: 1-814-353-1309

E-mail: ics@restek.com

Technical Service

E-mail: intltechsupp@restek.com

FIND A LOCAL DISTRIBUTOR

www.restek.com/distributor



Polyurethane Foam (PUF) Cartridges

- Use for collection of semivolatiles (pesticides, PCBs, PAHs).
- Both large high-volume (220–280 L/min) and small low-volume (1–5 L/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 organophosphorus pesticides, carbamate, pyrethrin, triazine, and urea pesticides	22116
EPA IP-7	Polycyclic aromatic hydrocarbons (PAHs)	22114
EPA IP-8	Organochlorine and organophosphorus pesticides, carbamate, pyrethrin, triazine, and urea pesticides	22116
ASTM D4861	Organochlorine and organophosphorus 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- <i>p</i> -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



22114



22115



22116



22117

Cleaned Polyurethane Foam (PUF) Cartridges

Precleaned and ready to use.

Description	qty.	cat.#	price
Cleaned PUF Plug (7.6 cm length, 6 cm diameter)	ea.	24295	£115.60
Large PUF Cartridge, 65 mm OD x 125 mm length, 75 mm PUF	ea.	22114	£218.60
Large PUF/XAD Cartridge, 65 mm OD x 125 mm length, 25 mm PUF/10 g XAD-2/50 mm PUF	ea.	22115	£378.75
Small PUF Cartridge, 22 mm OD x 100 mm length, 76 mm PUF	ea.	22116	£66.85
Small PUF/XAD Cartridge, 22 mm OD x 100 mm length, 30 mm PUF/1.5 g XAD-2/30 mm PUF	ea.	22117	£128.10



22954



22955

Raw Polyurethane Foam (PUF) Plugs

- Unwashed PUF plugs for both low-volume and high-volume sampling.
- Flame retardant free—making them easier to clean for trace analysis.
- Compliant with EPA and ASTM methods—0.022 g/cm³ density.
- Glass holders sold separately.

Description	Size	qty.	cat.#	price
Large PUF Plug, Unwashed	6 cm OD x 7.6 cm length	10-pk.	22954	£59.90
Large PUF Plug, Unwashed	6 cm OD x 5.1 cm length	10-pk.	22955	£44.60
Large PUF Plug, Unwashed	6 cm OD x 2.5 cm length	10-pk.	22956	£32.05
Small PUF Plug, Unwashed	22 mm OD x 7.6 cm length	10-pk.	22957	£33.45



22957



22956

PUF Glass Holders

Durable and reusable, PUF glass holders reduce waste and are a cost-effective alternative to precleaned packed cartridges.

- Fit either 6 cm or 22 mm OD PUF plug or can be used with bulk SDVB resin.
- Large glass holder fitted with double stainless steel screens for support.
- Small glass holder has stem designed for secure 1/4" ID tubing connection to sampling pump.

Description	Size	qty.	cat.#	price
Large PUF Glass Holder	fits 6 cm OD PUF Plug (4.9" L x 2.5" OD)	ea.	22964	£82.15
Small PUF Glass Holder	fits 22 mm OD PUF Plug (4.4" L x 0.9" OD)	ea.	22965	£47.35



22964



22965



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

method applications

Method	Applications
EPA TO-13A	PAHs in Ambient Air
ASTM D6209	PAHs in Ambient Air
EPA Method 23	Dioxins in Stationary Source Emissions
EPA Method 0010	Semivolatiles in Stationary Source Emissions

Ultra-Clean Resin

Equivalent to XAD-2 Resin—Exclusively from Restek!

- For adsorbing semivolatiles in air.
- Cleaned and GC tested.
- Available in 100 gram quantities.

Frequently Asked Questions

- **Is Restek's Ultra-Clean resin really the same as XAD®-2 resin?**
Yes. Restek's resin has been manufactured to match the original XAD®-2 specifications of composition, pore size, and surface area. You will experience identical sampling performance for all semivolatile compounds.
- **Does Restek's Ultra-Clean resin need to be baked-out prior to use?**
No. Restek's resin is precleaned and prebaked. Unlike other resins, Restek's resin is rigorously cleaned and baked prior to being bottled. When we say our Ultra-Clean resin is precleaned, you can count on it!

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 cleanup, we do the cleaning for you! We test each batch by capillary GC-flame ionization detector (FID) to ensure cleanliness. However, depending on your application, additional cleaning may be required.

Description	cat.#	Price-per-bottle	
		1-9 bottles	10+ bottles
Ultra-Clean Resin, 100 grams	24230	£213.60/btl	£220.15/btl



24053

SDVB Resin

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

Description	qty.	cat.#	price
SDVB Resin	1 kg	24053	£222.80



23388

23389

Midget Glass Impingers

Use with a sampling pump to trap air contaminants into liquid collection media, as specified in OSHA and NIOSH industrial hygiene methods. Both dispersion and fritted nozzles are available as bubblers.

Description	Volume	Taper Size	qty.	cat.#	price
Midget Glass Impinger w/Fritted Tube	30 mL	24/40	kit	23388	£79.95
Midget Glass Impinger w/Dispersion Tube	30 mL	24/40	kit	23389	£70.80

Environmental Air Sampling Gas Standards

Our high-quality air sampling gas calibration standards are provided by Spectra/Linde and Scott/Air Liquide—meeting lab requirements for two separate sources of calibration standards. 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. Minimum 12-month stability on all cylinders.

TO-14A Internal Standard Mix (3 components)

Bromochloromethane Chlorobenzene-d5	1,4-Difluorobenzene
1 ppm in nitrogen, 104 liters @ 1,800 psi cat.# 34412 (ea.) enquire	
1 ppm in nitrogen, 110 liters @ 1,800 psi Blend tolerance: ±10%; Analytical accuracy: ±5% cat.# 26352 (ea.) enquire	
1 ppm in nitrogen, 110 liters @ 1,800 psi (Pi-marked Cylinder) Blend tolerance: ±10%; Analytical accuracy: ±5% cat.# 34412-PI (ea.) £1,140	
100 ppb in nitrogen, 104 liters @ 1,800 psi cat.# 34427 (ea.) enquire	
100 ppb in nitrogen, 110 liters @ 1,800 psi Blend tolerance: ±20%; Analytical accuracy: ±10% cat.# 26353 (ea.) enquire	
100 ppb in nitrogen, 110 liters @ 1,800 psi (Pi-marked Cylinder) Blend tolerance: ±20%; Analytical accuracy: ±10% cat.# 34427-PI (ea.) £1,269	

No data pack available.

TO-14A Internal Standard/Tuning Mix (4 components)

Bromochloromethane 1-Bromo-4-fluorobenzene (4-Bromofluorobenzene)	Chlorobenzene-d5 1,4-Difluorobenzene
1 ppm in nitrogen, 104 liters @ 1,800 psi cat.# 34408 (ea.) enquire	
1 ppm in nitrogen, 110 liters @ 1,800 psi Blend tolerance: ±10%; Analytical accuracy: ±5% cat.# 26354 (ea.) enquire	
1 ppm in nitrogen, 110 liters @ 1,800 psi (Pi-marked Cylinder) Blend tolerance: ±10%; Analytical accuracy: ±5% cat.# 34408-PI (ea.) £1,314	
100 ppb in nitrogen, 104 liters @ 1,800 psi cat.# 34425 (ea.) enquire	
100 ppb in nitrogen, 110 liters @ 1,800 psi Blend tolerance: ±20%; Analytical accuracy: ±10% cat.# 26355 (ea.) enquire	
100 ppb in nitrogen, 110 liters @ 1,800 psi (Pi-marked Cylinder) Blend tolerance: ±20%; Analytical accuracy: ±10% cat.# 34425-PI (ea.) £1,541	

No data pack available.

TO-14A GC-MS Tuning Mix

4-Bromofluorobenzene
1 ppm in nitrogen, 104 liters @ 1,800 psi cat.# 34406 (ea.) enquire
1 ppm in nitrogen, 110 liters @ 1,800 psi Blend tolerance: ±10%; Analytical accuracy: ±5% cat.# 26346 (ea.) enquire
1 ppm in nitrogen, 110 liters @ 1,800 psi (Pi-marked Cylinder) Blend tolerance: ±10%; Analytical accuracy: ±5% cat.# 34406-PI (ea.) £810.35
100 ppb in nitrogen, 104 liters @ 1,800 psi cat.# 34424 (ea.) enquire
100 ppb in nitrogen, 110 liters @ 1,800 psi Blend tolerance: ±20%; Analytical accuracy: ±10% cat.# 26347 (ea.) enquire
100 ppb in nitrogen, 110 liters @ 1,800 psi (Pi-marked Cylinder) Blend tolerance: ±20%; Analytical accuracy: ±10% cat.# 34424-PI (ea.) £918.95

No data pack available.

TO-14A Aromatics Mix (14 components)

Benzene Chlorobenzene <i>m</i> -Dichlorobenzene <i>o</i> -Dichlorobenzene <i>p</i> -Dichlorobenzene Ethyl benzene Styrene	Toluene 1,2,4-Trichlorobenzene 1,2,4-Trimethylbenzene 1,3,5-Trimethylbenzene <i>m</i> -Xylene <i>o</i> -Xylene <i>p</i> -Xylene
1 ppm in nitrogen, 104 liters @ 1,800 psi cat.# 34404 (ea.) enquire	
1 ppm in nitrogen, 110 liters @ 1,800 psi Blend tolerance: ±10%; Analytical accuracy: ±5% cat.# 26348 (ea.) enquire	
1 ppm in nitrogen, 110 liters @ 1,800 psi (Pi-marked Cylinder) Blend tolerance: ±10%; Analytical accuracy: ±5% cat.# 34404-PI (ea.) £1,950	
100 ppb in nitrogen, 104 liters @ 1,800 psi cat.# 34423 (ea.) enquire	
100 ppb in nitrogen, 110 liters @ 1,800 psi Blend tolerance: ±20%; Analytical accuracy: ±10% cat.# 26349 (ea.) enquire	
100 ppb in nitrogen, 110 liters @ 1,800 psi (Pi-marked Cylinder) Blend tolerance: ±20%; Analytical accuracy: ±10% cat.# 34423-PI (ea.) £2,749	

No data pack available.

TO-14A Chlorinated Hydrocarbon Mix (19 components)

Carbon tetrachloride Chloroform 1,1-Dichloroethane 1,2-Dichloroethane 1,1-Dichloroethene <i>cis</i> -1,2-Dichloroethylene 1,2-Dichloropropane <i>cis</i> -1,3-Dichloropropene <i>trans</i> -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
1 ppm in nitrogen, 104 liters @ 1,800 psi cat.# 34402 (ea.) enquire	
1 ppm in nitrogen, 110 liters @ 1,800 psi Blend tolerance: ±10%; Analytical accuracy: ±5% cat.# 26350 (ea.) enquire	
1 ppm in nitrogen, 110 liters @ 1,800 psi (Pi-marked Cylinder) Blend tolerance: ±10%; Analytical accuracy: ±5% cat.# 34402-PI (ea.) £2,206	
100 ppb in nitrogen, 104 liters @ 1,800 psi cat.# 34422 (ea.) enquire	
100 ppb in nitrogen, 110 liters @ 1,800 psi Blend tolerance: ±20%; Analytical accuracy: ±10% cat.# 26351 (ea.) enquire	
100 ppb in nitrogen, 110 liters @ 1,800 psi (Pi-marked Cylinder) Blend tolerance: ±20%; Analytical accuracy: ±10% cat.# 34422-PI (ea.) £2,882	

No data pack available.

▶ See pages 452–453 for cylinder and regulator information.

please note

Gas standards are subject to hazardous materials shipping fees by most freight carriers. All calibration gas standards are nonreturnable due to DOT hazardous shipping requirements.



TO-14A CFC/HCFC Mix (4 components)

Trichlorofluoromethane (Freon 11)
 Dichlorodifluoromethane (Freon 12)
 1,1,2-Trichloro-1,2,2-trifluoroethane (Freon 113)
 1,2-Dichlorotetrafluoroethane (Freon 114)

1 ppm in nitrogen, 104 liters @ 1,800 psig
 cat.# 34410 (ea.) enquire

100 ppb in nitrogen, 104 liters @ 1,800 psig
 cat.# 34426 (ea.) enquire

1 ppm in nitrogen, 110 liters @ 1,800 psi (Pi-marked Cylinder)
 Blend tolerance: ±10%; Analytical accuracy: ±5%
 cat.# 34410-PI (ea.) £1,353

100 ppb in nitrogen, 110 liters @ 1,800 psi
 Blend tolerance: ±20%; Analytical accuracy: ±10%
 cat.# 26356 (ea.) enquire

100 ppb in nitrogen, 110 liters @ 1,800 psi (Pi-marked Cylinder)
 Blend tolerance: ±20%; Analytical accuracy: ±10%
 cat.# 34426-PI (ea.) £1,434

No data pack available.

TO-14A Calibration Mix (39 components)

Benzene	Ethyl chloride
Bromomethane	Hexachloro-1,3-butadiene
Carbon tetrachloride	Methylene chloride
Chlorobenzene	Styrene
Chloroform	1,1,2,2-Tetrachloroethane
Chloromethane	Tetrachloroethylene
1,2-Dibromoethane	Toluene
<i>m</i> -Dichlorobenzene	1,2,4-Trichlorobenzene
<i>o</i> -Dichlorobenzene	1,1,1-Trichloroethane
<i>p</i> -Dichlorobenzene	1,1,2-Trichloroethane
Dichlorodifluoromethane	Trichloroethene
1,1-Dichloroethane	Trichlorofluoromethane
1,2-Dichloroethane	1,1,2-Trichlorotrifluoroethane
1,1-Dichloroethene	1,2,4-Trimethylbenzene
<i>cis</i> -1,2-Dichloroethene	1,3,5-Trimethylbenzene
1,2-Dichloropropane	Vinyl chloride
<i>cis</i> -1,3-Dichloropropene	<i>m</i> -Xylene
<i>trans</i> -1,3-Dichloropropene	<i>o</i> -Xylene
Dichlorotetrafluoroethane	<i>p</i> -Xylene
Ethyl benzene	

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

1 ppm in nitrogen, 110 liters @ 1,800 psi
 Blend tolerance: ±10%; Analytical accuracy: ±5%
 cat.# 26340 (ea.) enquire

1 ppm in nitrogen, 110 liters @ 1,800 psi (Pi-marked Cylinder)
 Blend tolerance: ±10%; Analytical accuracy: ±5%
 cat.# 34400-PI (ea.) £3,359

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

100 ppb in nitrogen, 110 liters @ 1,800 psi
 Blend tolerance: ±20%; Analytical accuracy: ±10%
 cat.# 26341 (ea.) enquire

100 ppb in nitrogen, 110 liters @ 1,800 psi (Pi-marked Cylinder)
 Blend tolerance: ±20%; Analytical accuracy: ±10%
 cat.# 34421-PI (ea.) £3,728

No data pack available.

TO-14A 41 Component Mix (41 components)

Acrylonitrile	Ethyl benzene
Benzene	Ethyl chloride
Bromomethane	Hexachloro-1,3-butadiene
1,3-Butadiene	Methylene chloride
Carbon tetrachloride	Styrene
Chlorobenzene	1,1,2,2-Tetrachloroethane
Chloroform	Tetrachloroethylene
Chloromethane	Toluene
1,2-Dibromoethane	1,2,4-Trichlorobenzene
<i>m</i> -Dichlorobenzene	1,1,1-Trichloroethane
<i>o</i> -Dichlorobenzene	1,1,2-Trichloroethane
<i>p</i> -Dichlorobenzene	Trichloroethene
Dichlorodifluoromethane	Trichlorofluoromethane
1,1-Dichloroethane	1,1,2-Trichlorotrifluoroethane
1,2-Dichloroethane	1,2,4-Trimethylbenzene
1,1-Dichloroethene	1,3,5-Trimethylbenzene
<i>cis</i> -1,2-Dichloroethene	Vinyl chloride
1,2-Dichloropropane	<i>m</i> -Xylene
<i>cis</i> -1,3-Dichloropropene	<i>o</i> -Xylene
<i>trans</i> -1,3-Dichloropropene	<i>p</i> -Xylene
Dichlorotetrafluoroethane	

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

1 ppm in nitrogen, 110 liters @ 1,800 psi
 Blend tolerance: ±10%; Analytical accuracy: ±5%
 cat.# 26342 (ea.) enquire

1 ppm in nitrogen, 110 liters @ 1,800 psi (Pi-marked Cylinder)
 Blend tolerance: ±10%; Analytical accuracy: ±5%
 cat.# 34430-PI (ea.) £3,292

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

100 ppb in nitrogen, 110 liters @ 1,800 psi
 Blend tolerance: ±20%; Analytical accuracy: ±10%
 cat.# 26343 (ea.) enquire

100 ppb in nitrogen, 110 liters @ 1,800 psi (Pi-marked Cylinder)
 Blend tolerance: ±20%; Analytical accuracy: ±10%
 cat.# 34431-PI (ea.) £3,759

No data pack available.



2nd Source TO-14A/TO-15 Gas Calibration Standards

- Standards from TWO manufacturers provide second source on one order.
- 12-month stability in transportable cylinders.
- Drop-shipped for fast delivery and maximum shelf life.

A. Spectra (Linde) 104 L Cylinders
B. Scotty (Air Liquide) 110 L Cylinders
C. Scotty (Air Liquide) 110 L Cylinders (Pi-marked Cylinders for EU Regulations)

▶ See pages 452–453 for cylinder and regulator information.

www.restek.com/air

please note

Gas standards are subject to hazardous materials shipping fees by most freight carriers. All calibration gas standards are nonreturnable due to DOT hazardous shipping requirements.

TO-14A 43 Component Mix (43 components)

Acrylonitrile	Ethyl benzene
Benzene	Ethyl chloride
Bromomethane	4-Ethyltoluene
1,3-Butadiene	Hexachloro-1,3-butadiene
Carbon tetrachloride	Methylene chloride
Chlorobenzene	Styrene
Chloroform	1,1,2,2-Tetrachloroethane
Chloromethane	Tetrachloroethylene
3-Chloropropene	Toluene
1,2-Dibromoethane	1,2,4-Trichlorobenzene
<i>m</i> -Dichlorobenzene	1,1,1-Trichloroethane
<i>o</i> -Dichlorobenzene	1,1,2-Trichloroethane
<i>p</i> -Dichlorobenzene	Trichloroethene
Dichlorodifluoromethane	Trichlorofluoromethane
1,1-Dichloroethane	1,1,2-Trichlorotrifluoroethane
1,2-Dichloroethane	1,2,4-Trimethylbenzene
1,1-Dichloroethene	1,3,5-Trimethylbenzene
<i>cis</i> -1,2-Dichloroethene	Vinyl chloride
1,2-Dichloropropane	<i>m</i> -Xylene
<i>cis</i> -1,3-Dichloropropane	<i>o</i> -Xylene
<i>trans</i> -1,3-Dichloropropane	<i>p</i> -Xylene
Dichlorotetrafluoroethane	

1 ppm in nitrogen, 104 liters @ 1,800 psi

cat.# 34432 (ea.) enquire

1 ppm in nitrogen, 110 liters @ 1,800 psi

Blend tolerance: $\pm 10\%$; Analytical accuracy: $\pm 5\%$

cat.# 26344 (ea.) enquire

1 ppm in nitrogen, 110 liters @ 1,800 psi (Pi-marked Cylinder)

Blend tolerance: $\pm 10\%$; Analytical accuracy: $\pm 5\%$

cat.# 34432-PI (ea.) £3,906

100 ppb in nitrogen, 104 liters @ 1,800 psi

cat.# 34433 (ea.) enquire

100 ppb in nitrogen, 110 liters @ 1,800 psi

Blend tolerance: $\pm 20\%$; Analytical accuracy: $\pm 10\%$

cat.# 26345 (ea.) enquire

100 ppb in nitrogen, 110 liters @ 1,800 psi (Pi-marked Cylinder)

Blend tolerance: $\pm 20\%$; Analytical accuracy: $\pm 10\%$

cat.# 34433-PI (ea.) £4,186

No data pack available.

TO-15 Subset 25 Component Mix (25 components)

Acetone	4-Ethyltoluene
Allyl chloride	Heptane
Benzyl chloride*	Hexane
Bromodichloromethane	2-Hexanone (MBK)
Bromoform	4-Methyl-2-pentanone
1,3-Butadiene	Methyl <i>tert</i> -butyl ether (MTBE)
2-Butanone (MEK)	2-Propanol
Carbon disulfide*	Propylene
Cyclohexane	Tetrahydrofuran
Dibromochloromethane	2,2,4-Trimethylpentane
<i>trans</i> -1,2-Dichloroethene	Vinyl acetate
1,4-Dioxane	Vinyl bromide
Ethyl acetate	

1 ppm in nitrogen, 104 liters @ 1,800 psi

cat.# 34434 (ea.) enquire

1 ppm in nitrogen, 110 liters @ 1,800 psi

Blend tolerance: $\pm 10\%$; Analytical accuracy: $\pm 5\%$

cat.# 26357 (ea.) enquire

1 ppm in nitrogen, 110 liters @ 1,800 psi (Pi-marked Cylinder)

Blend tolerance: $\pm 10\%$; Analytical accuracy: $\pm 5\%$

cat.# 34434-PI (ea.) £2,309

100 ppb in nitrogen, 104 liters @ 1,800 psi

cat.# 34435 (ea.) enquire

100 ppb in nitrogen, 110 liters @ 1,800 psi

Blend tolerance: $\pm 20\%$; Analytical accuracy: $\pm 10\%$

cat.# 26358 (ea.) enquire

100 ppb in nitrogen, 110 liters @ 1,800 psi (Pi-marked Cylinder)

Blend tolerance: $\pm 20\%$; Analytical accuracy: $\pm 10\%$

cat.# 34435-PI (ea.) £2,527

*Stability of this compound cannot be guaranteed.

No data pack available.

TO-15 65 Component Mix (65 components)

Acetone	4-Ethyltoluene
Acrolein	Trichlorofluoromethane (Freon 11)
Benzene	Dichlorodifluoromethane (Freon 12)
Benzyl chloride*	1,1,2-Trichloro-1,2,2-trifluoroethane (Freon 113)
Bromodichloromethane	1,2-Dichlorotetrafluoroethane (Freon 114)
Bromoform	Heptane
Bromomethane	Hexachloro-1,3-butadiene
1,3-Butadiene	Hexane
2-Butanone (MEK)	2-Hexanone (MBK)
Carbon disulfide*	4-Methyl-2-pentanone (MIBK)
Carbon tetrachloride	Methylene chloride
Chlorobenzene	Methyl <i>tert</i> -butyl ether (MTBE)
Chloroethane	Methyl methacrylate
Chloroform	Naphthalene
Chloromethane	2-Propanol
Cyclohexane	Propylene
Dibromochloromethane	Styrene
1,2-Dichlorobenzene	1,1,2,2-Tetrachloroethane
1,3-Dichlorobenzene	Tetrachloroethene
1,4-Dichlorobenzene	Tetrahydrofuran
1,1-Dichloroethane	Toluene
1,2-Dichloroethane	1,2,4-Trichlorobenzene
1,1-Dichloroethene	1,1,1-Trichloroethane
<i>cis</i> -1,2-Dichloroethene	1,1,2-Trichloroethane
<i>trans</i> -1,2-Dichloroethene	Trichloroethene
1,2-Dichloropropane	1,2,4-Trimethylbenzene
<i>cis</i> -1,3-Dichloropropane	1,3,5-Trimethylbenzene
<i>trans</i> -1,3-Dichloropropane	Vinyl acetate
Dichlorotetrafluoroethane	Vinyl chloride
	<i>m</i> -Xylene
	<i>o</i> -Xylene
	<i>p</i> -Xylene

1 ppm in nitrogen, 104 liters @ 1,800 psi

cat.# 34436 (ea.) enquire

1 ppm in nitrogen, 110 liters @ 1,800 psi

Blend tolerance: $\pm 10\%$; Analytical accuracy: $\pm 5\%$

cat.# 26359 (ea.) enquire

1 ppm in nitrogen, 110 liters @ 1,800 psi (Pi-marked Cylinder)

Blend tolerance: $\pm 10\%$; Analytical accuracy: $\pm 5\%$

cat.# 34436-PI (ea.) £6,930

100 ppb in nitrogen, 110 liters @ 1,800 psi

Blend tolerance: $\pm 20\%$; Analytical accuracy: $\pm 10\%$

cat.# 26360 (ea.) enquire

100 ppb in nitrogen, 110 liters @ 1,800 psi (Pi-marked Cylinder)

Blend tolerance: $\pm 20\%$; Analytical accuracy: $\pm 10\%$

cat.# 34437-PI (ea.) £7,323

*Stability of this compound cannot be guaranteed.

No data pack available.

75 Comp TO15 + NJ Mix

(75 components)

Acetone	4-Ethyltoluene
Acrolein	Trichlorofluoromethane (Freon 11)
Benzene	Dichlorodifluoromethane (Freon 12)
Benzyl chloride*	1,1,2-Trichloro-1,2,2-trifluoroethane (Freon 113)
Bromodichloromethane	1,2-Dichlorotetrafluoroethane (Freon 114)
Bromoform	Heptane
Bromomethane	Hexachloro-1,3-butadiene
1,3-Butadiene	Hexane
<i>n</i> -Butane	2-Hexanone (MBK)
2-Butanone (MEK)	4-Methyl-2-pentanone (MIBK)
<i>tert</i> -Butyl alcohol	Methylene chloride
Carbon disulfide*	Methyl <i>tert</i> -butyl ether (MTBE)
Carbon tetrachloride	Methyl methacrylate
Chlorobenzene	Naphthalene
Chloroethane	<i>n</i> -Nonane
Chloroform	<i>n</i> -Pentane
Chloromethane	2-Propanol
3-Chloroprene	<i>n</i> -Propylbenzene
2-Chlorotoluene	Propylene
Cumene	Styrene
Cyclohexane	1,1,2,2-Tetrachloroethane
Dibromochloromethane	Tetrachloroethene
1,2-Dichlorobenzene	Tetrahydrofuran
1,3-Dichlorobenzene	Toluene
1,4-Dichlorobenzene	1,2,4-Trichlorobenzene
1,1-Dichloroethane	1,1,1-Trichloroethane
1,2-Dichloroethane	1,1,2-Trichloroethane
1,1-Dichloroethene	Trichloroethene
<i>cis</i> -1,2-Dichloroethene	1,2,4-Trimethylbenzene
<i>trans</i> -1,2-Dichloroethene	1,3,5-Trimethylbenzene
1,2-Dichloropropane	2,2,4-Trimethylpentane
<i>cis</i> -1,3-Dichloropropene	Vinyl acetate
<i>trans</i> -1,3-Dichloropropene	Vinyl bromide
1,4-Dioxane	Vinyl chloride
Ethanol*	<i>m</i> -Xylene
Ethyl acetate	<i>o</i> -Xylene
Ethyl benzene	<i>p</i> -Xylene
Ethylene dibromide (1,2-dibromoethane)	

1 ppm in nitrogen, 104 liters @ 1,800 psig

Blend tolerance: ±10%; Analytical accuracy: ±5%

cat.# 34396 (ea.) enquire

1 ppm in nitrogen, 110 liters @ 1,800 psig

Blend tolerance: ±10%; Analytical accuracy: ±5%

cat.# 34392 (ea.) enquire

100 ppb in nitrogen, 110 liters @ 1800 psig

Blend tolerance: ±10%; Analytical accuracy: ±5%

cat.# 34393 (ea.) enquire

*Stability of this compound cannot be guaranteed.

No data pack available.

10 Comp NJ Subset Test Mix (10 components)

<i>n</i> -Butane	<i>n</i> -Nonane
<i>tert</i> -Butyl alcohol	<i>n</i> -Pentane
3-Chloroprene	<i>n</i> -Propylbenzene
2-Chlorotoluene	2,2,4-Trimethylpentane
Cumene	Vinyl bromide

1 ppm in nitrogen, 104 liters @ 1,800 psig

Blend tolerance: ±10%; Analytical accuracy: ±5%

cat.# 34398 (ea.) enquire

1 ppm in nitrogen, 110 liters @ 1,800 psig

Blend tolerance: ±10%; Analytical accuracy: ±5%

cat.# 34394 (ea.) enquire

100 ppb in nitrogen, 104 liters @ 1,800 psig

Blend tolerance: ±10%; Analytical accuracy: ±5%

cat.# 34399 (ea.) enquire

100 ppb in nitrogen, 110 liters @ 1,800 psig

Blend tolerance: ±10%; Analytical accuracy: ±5%

cat.# 34395 (ea.) enquire

No data pack available.

74 Comp TO15 + NJ Mix, (no Acrolein)

(74 components)

Acetone	Trichlorofluoromethane (Freon 11)
Benzene	Dichlorodifluoromethane (Freon 12)
Benzyl chloride*	1,1,2-Trichloro-1,2,2-trifluoroethane (Freon 113)
Bromodichloromethane	1,2-Dichlorotetrafluoroethane (Freon 114)
Bromoform	Heptane
Bromomethane	Hexachloro-1,3-butadiene
1,3-Butadiene	Hexane
<i>n</i> -Butane	2-Hexanone (MBK)
2-Butanone (MEK)	4-Methyl-2-pentanone (MIBK)
<i>tert</i> -Butyl alcohol	Methylene chloride
Carbon disulfide*	Methyl <i>tert</i> -butyl ether (MTBE)
Carbon tetrachloride	Methyl methacrylate
Chlorobenzene	Naphthalene
Chloroethane	<i>n</i> -Nonane
Chloroform	<i>n</i> -Pentane
Chloromethane	2-Propanol
3-Chloroprene	<i>n</i> -Propylbenzene
2-Chlorotoluene	Propylene
Cumene	Styrene
Cyclohexane	1,1,2,2-Tetrachloroethane
Dibromochloromethane	Tetrachloroethene
1,2-Dichlorobenzene	Tetrahydrofuran
1,3-Dichlorobenzene	Toluene
1,4-Dichlorobenzene	1,2,4-Trichlorobenzene
1,1-Dichloroethane	1,1,1-Trichloroethane
1,2-Dichloroethane	1,1,2-Trichloroethane
1,1-Dichloroethene	Trichloroethene
<i>cis</i> -1,2-Dichloroethene	1,2,4-Trimethylbenzene
<i>trans</i> -1,2-Dichloroethene	1,3,5-Trimethylbenzene
1,2-Dichloropropane	2,2,4-Trimethylpentane
<i>cis</i> -1,3-Dichloropropene	Vinyl acetate
<i>trans</i> -1,3-Dichloropropene	Vinyl bromide
1,4-Dioxane	Vinyl chloride
Ethanol*	<i>m</i> -Xylene
Ethyl acetate	<i>o</i> -Xylene
Ethyl benzene	<i>p</i> -Xylene
Ethylene dibromide (1,2-dibromoethane)	
4-Ethyltoluene	

100 ppb in nitrogen, 104 liters @ 1,800 psig

Blend tolerance: ±10%; Analytical accuracy: ±5%

cat.# 34397 (ea.) enquire

*Stability of this compound cannot be guaranteed.

No data pack available.



2nd Source TO-14A/TO-15 Gas Calibration Standards



- Standards from TWO manufacturers provide second source on one order.
- 12-month stability in transportable cylinders.
- Drop-shipped for fast delivery and maximum shelf life.

A. Spectra (Linde) 104 L Cylinders
B. Scotty (Air Liquide) 110 L Cylinders
C. Scotty (Air Liquide) 110 L Cylinders (PI-marked Cylinders for EU Regulations)

▶ See pages 452–453 for cylinder and regulator information.

www.restek.com/air

Massachusetts APH Mix (26 components)

Benzene	<i>p</i> -Isopropyltoluene
1,3-Butadiene	Methyl <i>tert</i> -butyl ether
Butylcyclohexane	1-Methyl-3-ethylbenzene
Cyclohexane	Naphthalene
<i>n</i> -Decane	<i>n</i> -Nonane
2,3-Dimethylheptane	<i>n</i> -Octane
2,3-Dimethylpentane	Toluene
<i>n</i> -Dodecane	1,2,3-Trimethylbenzene
Ethylbenzene	1,3,5-Trimethylbenzene
<i>n</i> -Heptane	<i>n</i> -Undecane
<i>n</i> -Hexane	<i>o</i> -Xylene
Isopentane	<i>m/p</i> -Xylene (combined)
Isopropylbenzene	

1 ppm in nitrogen, 104 liters @ 1,800 psi

cat.# 34540 (ea.) enquire

100 ppb in nitrogen, 110 liters @ 1,800 psi

Blend tolerance: ±10%; Analytical accuracy: ±5%

cat.# 26366 (ea.) enquire

100 ppb in nitrogen, 110 liters @ 1,800 psig (Pi-marked cylinder)

Blend tolerance: ±10%; Analytical accuracy: ±5%

cat.# 34540-PI (ea.) £5,438

No data pack available.

▶ See pages 452–453 for cylinder and regulator information.

Ozone Precursor Mixture/PAMS (57 components)

Acetylene	Isopropylbenzene
Benzene	Methylcyclohexane
<i>n</i> -Butane	Methylcyclopentane
1-Butene	2-Methylheptane
<i>cis</i> -2-Butene	3-Methylheptane
<i>trans</i> -2-Butene	2-Methylhexane
Cyclohexane	3-Methylhexane
Cyclopentane	2-Methylpentane
<i>n</i> -Decane	3-Methylpentane
<i>m</i> -Diethylbenzene	<i>n</i> -Nonane
<i>p</i> -Diethylbenzene	<i>n</i> -Octane
2,2-Dimethylbutane	<i>n</i> -Pentane
2,3-Dimethylbutane	1-Pentene
2,3-Dimethylpentane	<i>cis</i> -2-Pentene
2,4-Dimethylpentane	<i>trans</i> -2-Pentene
<i>n</i> -Dodecane	Propane
Ethane	<i>n</i> -Propylbenzene
Ethylbenzene	Propylene
Ethylene	Styrene
<i>m</i> -Ethyltoluene	Toluene
<i>o</i> -Ethyltoluene	1,2,3-Trimethylbenzene
<i>p</i> -Ethyltoluene	1,2,4-Trimethylbenzene
<i>n</i> -Heptane	1,3,5-Trimethylbenzene
<i>n</i> -Hexane	2,2,4-Trimethylpentane
1-Hexene	2,3,4-Trimethylpentane
Isobutane	<i>n</i> -Undecane
Isopentane	<i>o</i> -Xylene
Isoprene	<i>m/p</i> -Xylene (combined)

1 ppm in nitrogen, 104 liters @ 1,800 psi

cat.# 34420 (ea.) enquire

1 ppm in nitrogen, 110 liters @ 1,800 psi

Blend tolerance: ±10%; Analytical accuracy: ±5%

cat.# 26368 (ea.) enquire

1 ppm in nitrogen, 110 liters @ 1,800 psi (Pi-marked Cylinder)

Blend tolerance: ±10%; Analytical accuracy: ±5%

cat.# 34420-PI (ea.) £4,474

100 ppb in nitrogen, 104 liters @ 1,800 psi

cat.# 34429 (ea.) enquire

100 ppb in nitrogen, 110 liters @ 1,800 psi

Blend tolerance: ±20%; Analytical accuracy: ±10%

cat.# 26369 (ea.) enquire

100 ppb in nitrogen, 110 liters @ 1,800 psi (Pi-marked Cylinder)

Blend tolerance: ±20%; Analytical accuracy: ±10%

cat.# 34429-PI (ea.) £4,924

No data pack available.

Japan Calibration Mix (9 components)

Acrylonitrile	Dichloromethane
Benzene	Tetrachloroethylene
1,3-Butadiene	Trichloroethylene
Chloroform	Vinyl chloride
1,2-Dichloroethane	

1 ppm in nitrogen, 104 liters @ 1,800 psi

cat.# 34418 (ea.) enquire

1 ppm in nitrogen, 110 liters @ 1,800 psi

Blend tolerance: ±10%; Analytical accuracy: ±5%

cat.# 26367 (ea.) enquire

1 ppm in nitrogen, 110 liters @ 1,800 psi (Pi-marked cylinder)

Blend tolerance: ±10%; Analytical accuracy: ±5%

cat.# 34418-PI (ea.) £1,925

No data pack available.

Custom Gas Calibration Standards Quote

www.restek.com/customgas



Ozone Precursor/PAMS Mix

(57 components at EPA concentrations: ppbC)

Acetylene	40	Isopropylbenzene	40
Benzene	30	Methylcyclohexane	30
<i>n</i> -Butane	40	Methylcyclopentane	25
1-Butene	30	2-Methylheptane	25
<i>cis</i> -2-Butene	35	3-Methylheptane	25
<i>trans</i> -2-Butene	25	2-Methylhexane	25
Cyclohexane	40	3-Methylhexane	25
Cyclopentane	20	2-Methylpentane	20
<i>n</i> -Decane	30	3-Methylpentane	40
<i>m</i> -Diethylbenzene	40	<i>n</i> -Nonane	25
<i>p</i> -Diethylbenzene	25	<i>n</i> -Octane	30
2,2-Dimethylbutane	40	<i>n</i> -Pentane	25
2,3-Dimethylbutane	50	1-Pentene	25
2,3-Dimethylpentane	50	<i>cis</i> -2-Pentene	35
2,4-Dimethylpentane	40	<i>trans</i> -2-Pentene	25
<i>n</i> -Dodecane	40	Propane	40
Ethane	25	<i>n</i> -Propylbenzene	30
Ethylbenzene	25	Propylene	25
Ethylene	20	Styrene	40
<i>m</i> -Ethyltoluene	25	Toluene	40
<i>o</i> -Ethyltoluene	30	1,2,3-Trimethylbenzene	25
<i>p</i> -Ethyltoluene	40	1,2,4-Trimethylbenzene	40
<i>n</i> -Heptane	25	1,3,5-Trimethylbenzene	25
<i>n</i> -Hexane	30	2,2,4-Trimethylpentane	30
1-Hexene	60	2,3,4-Trimethylpentane	25
Isobutane	25	<i>n</i> -Undecane	30
Isopentane	40	<i>o</i> -Xylene	25
Isoprene	40	<i>m/p</i> -Xylene (combined)	40

20–60 ppbC (parts per billion expressed as carbon) in nitrogen, 104 liters @ 1,800 psi

cat.# 34445 (ea.) enquire

20–60 ppbC (parts per billion expressed as carbon) in nitrogen, 110 liters @ 1,800 psi

Blend tolerance: ±20%; Analytical accuracy: ±10%

cat.# 26370 (ea.) enquire

20–60 ppbC (parts per billion expressed as carbon) in nitrogen, 110 liters @ 1,800 psi (Pi-marked Cylinder)

Blend tolerance: ±20%; Analytical accuracy: ±10%

cat.# 34445-PI (ea.) £4,875

No data pack available.

please note

Gas standards are subject to hazardous materials shipping fees by most freight carriers. All calibration gas standards are nonreturnable due to DOT hazardous shipping requirements.

Sulfur 5-Component Mix (5 components)

Stability is 12 months from date of manufacture.
 +/- 10% accuracy.

Carbonyl sulfide	Hydrogen sulfide
Dimethyl sulfide	Methyl mercaptan
Ethyl mercaptan	

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

1 ppm in nitrogen, 110 liters @ 1,800 psi (Pi-marked Cylinder)

Blend tolerance: ±10%; Analytical accuracy: ±5%
 cat.# 34561-PI (ea.) £2,326

BTEX Gas Mix (6 components)

Benzene (71-43-2)	<i>m</i> -Xylene (108-38-3)
Ethylbenzene (100-41-4)	<i>o</i> -Xylene (95-47-6)
Toluene (108-88-3)	<i>p</i> -Xylene (106-42-3)

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

1 ppm in nitrogen, 110 liters @ 1,800 psi
 cat.# 26361 (ea.) enquire

1 ppm in nitrogen, 110 liters @ 1,800 psi (Pi-marked cylinder)

Blend tolerance: ±10%; Analytical accuracy: ±5%
 cat.# 34414-PI (ea.) £1,151

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

100 ppb in nitrogen, 110 liters @ 1,800 psi
 Blend tolerance: ±20%; Analytical accuracy: ±10%
 cat.# 26362 (ea.) enquire

100 ppb in nitrogen, 110 liters @ 1,800 psi (Pi-marked cylinder)
 Blend tolerance: ±20%; Analytical accuracy: ±10%
 cat.# 34428-PI (ea.) £1,318

No data pack available.

BTEX and MTBE Gas Mix (7 components)

Benzene	<i>m</i> -Xylene
Ethylbenzene	<i>o</i> -Xylene
Methyl <i>tert</i> -butyl ether (MTBE)	<i>p</i> -Xylene
Toluene	

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

1 ppm in nitrogen, 110 liters @ 1,800 psi
 Blend tolerance: ±10%; Analytical accuracy: ±5%
 cat.# 26363 (ea.) enquire

1 ppm in nitrogen, 110 liters @ 1,800 psi (Pi-marked Cylinder)
 Blend tolerance: ±20%; Analytical accuracy: ±10%
 cat.# 34541-PI (ea.) £1,319

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

100 ppb in nitrogen, 110 liters @ 1,800 psi
 Blend tolerance: ±20%; Analytical accuracy: ±10%
 cat.# 26364 (ea.) enquire

100 ppb in nitrogen, 110 liters @ 1,800 psi (Pi-marked Cylinder)
 Blend tolerance: ±10%; Analytical accuracy: ±5%
 cat.# 34542-PI (ea.) £1,477

No data pack available.

Reference Standards Search

Search by compound name, synonym, or CAS #.

www.restek.com/reference



2nd Source TO-14A/TO-15 Gas Calibration Standards

- Standards from TWO manufacturers provide second source on one order.
- 12-month stability in transportable cylinders.
- Drop-shipped for fast delivery and maximum shelf life.

A. Spectra (Linde) 104 L Cylinders
B. Scotty (Air Liquide) 110 L Cylinders
C. Scotty (Air Liquide) 110 L Cylinders (Pi-marked Cylinders for EU Regulations)

See pages 452–453 for cylinder and regulator information.

www.restek.com/air

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. enquire % each compound*	Natural Gas Standard #2 cat.# 34439, ea. enquire % each compound*	Natural Gas Standard #3 cat.# 34440, ea. enquire % 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
<i>n</i> -butane	0.300	1.000	3.000
isopentane	0.150	0.500	1.000
<i>n</i> -pentane	0.150	0.500	1.000
hexanes plus	0.100	0.250	0.500
Concentration	mole	mole	mole
Volume	13.16 L @ 200 psig (1,379 kPa)	13.16 L @ 200 psig (1,379 kPa)	5.5 L @ 75 psig (517 kPa)
Ideal Heating Value (Dry BTU/SCF)	1,048 gross	1,142 gross	1,317 gross

Ideal Heating Value: Dry BTU/SCF @ 14.696 psia & 60 °F.

*Precise concentrations are provided on the data sheet included with each cylinder and may vary slightly from those listed here.

Refinery Gas Standards

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

	Refinery Gas Standard #1 cat.# 34441, ea. enquire % each compound*	Refinery Gas Standard #2 cat.# 34442, ea. enquire % each compound*	Refinery Gas Standard #5 cat.# 34443, ea. enquire % 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
<i>n</i> -butane	4.000	4.000	4.000
isobutylene	2.000	1.000	1.000
1,3 butadiene	3.000	3.000	3.000
<i>cis</i> -2-butene	2.000	2.000	2.000
<i>trans</i> -2-butene	2.000	3.000	3.000
1-butene	2.000	2.000	2.000
2-methyl-2-butene	—	0.200	0.200
isopentane	1.000	1.000	1.000
<i>n</i> -pentane	1.000	1.000	1.000
<i>cis</i> -2-pentene	—	0.400	0.400
<i>trans</i> -2-pentene	—	0.160	0.200
pentene-1	—	0.400	0.400
<i>n</i> -hexane	0.500	0.100	—
hexanes plus	—	—	0.100
Concentration	mole	mole	mole
Volume	5.2 L @ 70 psig (483 kPa)	4.9 L @ 60 psig (414 kPa)	4.6 L @ 60 psig (414 kPa)

*Precise concentrations are provided on the data sheet included with each cylinder and may vary slightly from those listed here.

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
Connection: CGA-170/110
U.S. DOT Specs: DOT-4B-240ET

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

also available

See **page 453** for regulators.





Scotty/Air Liquide Transportable Pure Gases and Mixtures

in 14 L, 48 L, and 110 L Sizes

We offer a wide range of Scotty/Air Liquide transportable gases, from pure gases for purging or calibrating to multicomponent mixes, which are ideal for peak identification work.

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

See **pages 452–453** for cylinder and regulator information.

NOTE: Scotty 14 and Scotty 48 cylinders are not approved for use in Canada.

Description	Product Grade	Shelf Life	Scotty 14 (14 L)		Scotty 48 (48 L)		Scotty 110 (110 L)	
			cat.#	price	cat.#	price	cat.#	price
Pure Gases								
Air, zero	THC < 1 ppm	—	34448	enquire	34449	enquire	34449-PI	£932.85
Argon	99.995%	—	34457	enquire	—	—	34457-PI	£962.10
Carbon dioxide	99.80%	—	34451	enquire	34452	enquire	34452-PI	£932.85
Hydrogen	99.99%	—	34453	enquire	—	—	34453-PI	£962.10
Methane	99.00%	—	34454	enquire	—	—	34454-PI	£962.10
Oxygen	99.60%	—	34455	enquire	—	—	—	—
Two-Component Mixtures								
Benzene in air (1 ppm)	Blend tolerance: ±10%; Analytical accuracy: ±5%	3 yr	—	—	34458	enquire	34458-PI	£969.05
Benzene in air (100 ppm)	Blend tolerance: ±10%; Analytical accuracy: ±5%	3 yr	—	—	34459	enquire	34459-PI	£882.75
1,3-Butadiene in nitrogen (10 ppm)	Blend tolerance: ±10%; Analytical accuracy: ±5%	3 yr	34460	enquire	34461	enquire	34461-PI	£955.15
Carbon dioxide in helium (100 ppm)	Blend tolerance: ±10%; Analytical accuracy: ±5%	3 yr	34462	enquire	—	—	34462-PI	£942.60
Carbon dioxide in nitrogen (100 ppm)	Blend tolerance: ±10%; Analytical accuracy: ±5%	3 yr	34463	enquire	34464	enquire	34464-PI	£923.10
Carbon dioxide in nitrogen (1,000 ppm)	Blend tolerance: ±5%; Analytical accuracy: ±2%	3 yr	34465	enquire	34466	enquire	34466-PI	£905
Ethylene in air (8–10 ppm)	Blend tolerance: ±10%; Analytical accuracy: ±5%	3 yr	34467	enquire	34468	enquire	34468-PI	£871.60
Ethylene in helium (100 ppm)	Blend tolerance: ±10%; Analytical accuracy: ±5%	3 yr	34489	enquire	—	—	34489-PI	£971.85
Hydrogen in helium (100 ppm)	Blend tolerance: ±10%; Analytical accuracy: ±5%	3 yr	34469	enquire	—	—	34469-PI	£998.30
Hydrogen in nitrogen (1%)	Blend tolerance: ±5%; Analytical accuracy: ±2%	3 yr	34471	enquire	34472	enquire	34472-PI	£945.40
Hydrogen in nitrogen (100 ppm)	Blend tolerance: ±10%; Analytical accuracy: ±5%	3 yr	34473	enquire	34474	enquire	34474-PI	£923.10
Methane in helium (100 ppm)	Blend tolerance: ±10%; Analytical accuracy: ±5%	3 yr	34476	enquire	34477	enquire	34477-PI	£937.05
Methane in nitrogen (100 ppm)	Blend tolerance: ±10%; Analytical accuracy: ±5%	3 yr	34478	enquire	—	—	34478-PI	£989.95
Methane in nitrogen (1%)	Blend tolerance: ±5%; Analytical accuracy: ±2%	3 yr	34482	enquire	34483	enquire	34483-PI	£937.05
Nitrogen in helium (100 ppm)	Blend tolerance: ±10%; Analytical accuracy: ±5%	3 yr	34479	enquire	—	—	34479-PI	£925.90
Nitrous oxide in nitrogen (1 ppm)	Blend tolerance: ±10%; Analytical accuracy: ±5%	3 yr	34484	enquire	34485	enquire	34485-PI	£896.65

Description	Product Grade	Shelf Life	Scotty 14 (14 L)		Scotty 48 (48 L)		Scotty 110 (110 L)	
			cat.#	price	cat.#	price	cat.#	price
Two-Component Mixtures								
Oxygen in helium (100 ppm)	Blend tolerance: ±10%; Analytical accuracy: ±5%	3 yr	34480	enquire	—	34480-PI	£942.60	
Oxygen in nitrogen (2%)	Blend tolerance: ±5%; Analytical accuracy: ±2%	3 yr	34487	enquire	34488	34488-PI	£923.10	
Oxygen in nitrogen (6%)	Blend tolerance: ±5%; Analytical accuracy: ±2%	3 yr	34491	enquire	34492	34492-PI	£937.05	
1,1,1-Trichloroethane in nitrogen (10 ppm)	Blend tolerance: ±10%; Analytical accuracy: ±5%	3 yr	—		34493	34493-PI	£907.80	
Trichloroethylene in nitrogen (10 ppm)	Blend tolerance: ±10%; Analytical accuracy: ±5%	3 yr	34494	enquire	34495	34495-PI	£888.30	
Vinyl chloride in nitrogen (1 ppm)	Blend tolerance: ±10%; Analytical accuracy: ±5%	3 yr	34496	enquire	34497	34497-PI	£863.25	
Vinyl chloride in nitrogen (10 ppm)	Blend tolerance: ±10%; Analytical accuracy: ±5%	3 yr	34498	enquire	34499	34499-PI	£863.25	
Vinyl chloride in nitrogen (50 ppm)	Blend tolerance: ±10%; Analytical accuracy: ±5%	3 yr	34500	enquire	—	34500-PI	£916.15	
Vinyl chloride in nitrogen (100 ppm)	Blend tolerance: ±10%; Analytical accuracy: ±5%	3 yr	34501	enquire	—	34501-PI	£971.85	
Vinyl chloride in nitrogen (1,000 ppm)	Blend tolerance: ±5%; Analytical accuracy: ±2%	3 yr	34502	enquire	—	34502-PI	£971.85	
Multi-Component Mixtures								
Carbon monoxide, carbon dioxide, hydrogen, and oxygen in nitrogen (0.5% each)	Blend tolerance: ±5%; Analytical accuracy: ±2%	3 yr	34504	enquire	34505	34505-PI	£950.95	
Carbon monoxide, carbon dioxide, hydrogen, and oxygen in nitrogen (1% each)	Blend tolerance: ±5%; Analytical accuracy: ±2%	3 yr	34507	enquire	34508	34508-PI	£950.95	
Carbon monoxide, carbon dioxide, methane, ethane, ethylene, and acetylene in nitrogen (1% each)	Blend tolerance: ±5%; Analytical accuracy: ±2%	3 yr	—		34511	34511-PI	£962.10	
Carbon monoxide, carbon dioxide, nitrogen, and oxygen (5% each), and methane and hydrogen (4% each) in helium	Blend tolerance: ±5%; Analytical accuracy: ±2%	3 yr	34512	enquire	—	34512-PI*	£981.60	
Carbon monoxide (7%), carbon dioxide (15%), and oxygen (5%) in nitrogen	Blend tolerance: ±5%; Analytical accuracy: ±2%	3 yr	34514	enquire	—	34514-PI	£970.45	
Carbon monoxide (7%), oxygen (4%), carbon dioxide (15%), and methane (4.5%) in nitrogen	Blend tolerance: ±5%; Analytical accuracy: ±2%	3 yr	34515	enquire	34516	34516-PI	£888.30	
C1–C6 <i>n</i> -Paraffins: methane, ethane, propane, butane, pentane, hexane in nitrogen (15 ppm each)	Blend tolerance: ±20%; Analytical accuracy: ±10%	3 yr	34518	enquire	34519	34519-PI	£1,066	
C1–C6 <i>n</i> -Paraffins: methane, ethane, propane, butane, pentane, hexane in helium (100 ppm each)	Blend tolerance: ±10%; Analytical accuracy: ±5%	3 yr	34521	enquire	34522	34522-PI	£969.05	
C1–C6 <i>n</i> -Paraffins: methane, ethane, propane, butane, pentane, hexane in helium (1,000 ppm each)	Blend tolerance: ±5%; Analytical accuracy: ±2%	3 yr	34524	enquire	34525	34525-PI	£969.05	
C1–C6 <i>n</i> -Paraffins: methane, ethane, propane, butane, pentane, hexane in nitrogen (100 ppm each)	Blend tolerance: ±10%; Analytical accuracy: ±5%	3 yr	34527	enquire	34528	34528-PI	£969.05	
C2–C6 Olefins: ethylene, propylene, 1-butene, 1-pentene, 1-hexene in helium (100 ppm each)	Blend tolerance: ±10%; Analytical accuracy: ±5%	3 yr	34529	enquire	34530	34530-PI	£969.05	
C2–C6 Olefins: ethylene, propylene, 1-butene, 1-pentene, 1-hexene in nitrogen (100 ppm each)	Blend tolerance: ±10%; Analytical accuracy: ±5%	3 yr	34531	enquire	34532	34532-PI	£937.05	
Branched Paraffins: 2,2-dimethylbutane, 2,2-dimethylpropane, isobutane, 2-methylbutane, 2-methylpentane, 3-methylpentane in nitrogen (15 ppm each)	Blend tolerance: ±20%; Analytical accuracy: ±10%	3 yr	34534	enquire	—	34534-PI	£988.55	
Methane, ethane, ethylene, acetylene, propane, propylene, <i>n</i> -butane, propyne in nitrogen (15 ppm each)	Blend tolerance: ±10%; Analytical accuracy: ±5%	3 yr	—		34537	34537-PI	£960.70	
<i>n</i> -butane, isobutane, <i>cis</i> -2-butene, <i>trans</i> -2-butene, 1-butene, iso-butylene, 1,3-butadiene, ethyl acetylene in nitrogen (15 ppm each)	Blend tolerance: ±10%; Analytical accuracy: ±5%	3 yr	—		34539	34539-PI	£960.70	

*Cat.# 34512-PI is 30 L at 500 psig (34.5 bar).

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

All calibration gas standards are nonreturnable due to DOT hazardous shipping requirements.



DCG Partnership Cylinders:
 Size: 7.6 x 24 cm
 Connection: CGA-170/110
 U.S. DOT Specs: DOT-4B-240ET

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

Recommended regulator:
 cat.# 22032



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

Aluminum construction
 Size: 8.3 x 29.5 cm
 Volume/Pressure:
 110 liters of gas @ 1,800 psi
 Outlet Fitting: CGA-180
 Weight: 2.2 lb/1 kg
 DOT Specifications: 3AL2216

Recommended regulators:
 cat.# 26371, 26372, 21572, or 21572-R100



Spectra (Linde) 104 L:
 Aluminum construction
 Size: 8 x 24 cm
 Volume/Pressure:
 104 liters of gas
 @ 1,800 psi

Outlet Fitting: CGA-180
 Weight: 1.5 lb/0.7 kg

Recommended regulators:
 cat.# 21572, 21572-R100, 26371, or 26372



Scotty® (Air Liquide) 110 L
 Aluminum construction
 Size: 8.3 x 29.5 cm
 Volume/Pressure:
 110 liters of gas @ 1,800 psi

Outlet Fitting: CGA-180
 Weight: 2.2 lb/1 kg
 DOT Specifications: 3AL2216

Recommended regulators:
 cat.# 26371, 26372, 21572, or 21572-R100



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

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

Recommended regulators:
 cat.# 22690



Scotty® (Air Liquide) 48 L
 Contents: 48 liters
 Pressure: 300 psig (21 bar)
 Outlet Fitting: CGA-165
 Weight: 1.75 lb/0.8 kg
 Dimensions: 4" diameter x 16 1/4" height (10.2 x 41 cm)
 DOT Specifications: 39 NRC

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

Recommended regulators:
 cat.# 22691



24129

Small Cylinder Stand

- Supports and stabilizes disposable gas cylinders.
- Fits cylinders up to 3 3/8" (8 cm) in diameter.
- Adjustable screw secures cylinder in place.

This cylinder stand is designed to support small-diameter cylinders, such as 104 L and 110 L 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	£83.55

Mini-Regulator for natural gas and refinery gas standards

- 0–300 psig inlet pressure range.
- 0–15 psig outlet pressure range.
- Supplied with 0–15 psig outlet pressure gauge, brass CGA 170 nut and nipple, and 1/8-inch compression outlet.

Description	qty.	cat.#	price
Mini-Regulator	ea.	22032	£323.70



22032

High-Purity VOC Regulators

- Single-stage, stainless steel.
- Two pressure gauges and CGA-180 fitting.
- Stainless steel diaphragm and Kel-F® seat.
- Accurate pressure control even at low flow rates.
- Individually tested for leaks and impurities.

Spectra Gas 7621 High-Purity VOC Regulators

Specifications:
Maximum Inlet Pressure: 3,000 psig
Outlet Connection: 1/8" tube compression
Internal Volume: 3.03 cc

Description	qty.	cat.#	price
0–30 psig outlet pressure gauge	ea.	21572	£1,365
0–100 psig outlet pressure gauge	ea.	21572-R100	£1,521



21572

Air Liquide High-Purity VOC Regulators

Specifications:
Maximum Inlet Pressure: 3,000 psig
Outlet Connection: 1/4" NPT female
Internal Volume: 3.03 cc

Description	qty.	cat.#	price
CGA-180 (0–30 psig)	ea.	26371	£1,289
CGA-180 (0–100 psig)	ea.	26372	£1,436



26371

Regulators for use with 14 L and 48 L Scott/Air Liquide transportable gases

Use the CGA-160 inlet connection with 14 L Scott/Air Liquide transportable gases.
Use the CGA-165 inlet connection with 48 L Scott/Air Liquide transportable gases.

Specifications:
Maximum Inlet Pressure: 300 psig
Outlet Pressure Range: 2–10 psig
Maximum Delivery Pressure: 25 psig
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®

Description	qty.	cat.#	price
Regulator, CGA-160 Inlet Connection	ea.	22690	£250.65
Regulator, CGA-165 Inlet Connection	ea.	22691	£250.65

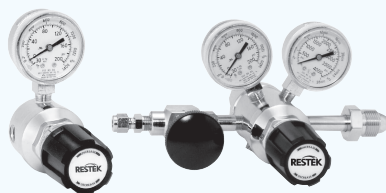


22690

also available

Single-Stage and Dual-Stage
Ultra-High Purity Gas Regulators

See **pages 301–303.**



Syringe Adaptor 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).

Description	qty.	cat.#	price
Syringe Adaptor Kit	kit	21118	£38.05



21118

Gas Sampling

Sample Cylinders.....	454
Sample Cylinder Valves.....	455
Sample Cylinder Accessories.....	456
Gas Sampling Valves & Loops.....	457



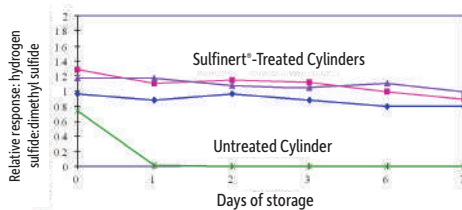
Sample Cylinders

- All cylinders have 1/4" female NPT threads on both ends.
- TPED compliant cylinders available for EU community.

Swagelok® sample cylinders are made of 304L and 316L stainless steel to resist corrosion and DOT rated to 1,800 and 5,000 psig (TPED cylinders rated to 1,450 and 4,350 psig), which allows sampling at gas wellheads as well as on-site refineries. Each cylinder is hydrostatically tested to at least 5/3 the working pressure.

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

17 ppbv hydrogen sulfide in 500 mL cylinders



Applications:

- ASTM D1265
- Hydrocarbon sampling in refineries & petrochemical plants

Analyzing sulfur or mercury?

- Sulfinert® coating provides stable storage of sulfur and mercury at ppb levels.
- Inert coating doesn't flake; more durable than PTFE.

Sample Cylinders, High Pressure (Stainless Steel & Sulfinert®-Treated)

- 304L stainless steel; DOT rating to 1,800 psig (TPED cylinders to 1,450 psig).
- Range of cylinder sizes, 75 cc to 2,250 cc.

Size	1,800 psig (12,411 kPa), 304L SS				TPED, 1,450 psig (9,997 kPa), 304L SS			
	Stainless Steel		Sulfinert-Treated		Stainless Steel		Sulfinert-Treated	
	cat.#	price	cat.#	price	cat.#	price	cat.#	price
75 cc	22921	enquire	24130	enquire	22921-PI	£373.15	24130-PI	£467.85
150 cc	22922	enquire	24131	enquire	22922-PI	£424.70	24131-PI	£556.95
300 cc	22923	enquire	24132	enquire	22923-PI	£494.30	24132-PI	£615.40
500 cc	22924	enquire	24133	enquire	22924-PI	£531.90	24133-PI	£646.05
1,000 cc	22925	enquire	24134	enquire	22925-PI	£1,172	24134-PI	£1,290
2,250 cc	22926	enquire	21394	enquire	22926-PI	£2,144	21394-PI	£2,574

Sample Cylinders, Ultra-High Pressure (Stainless Steel & Sulfinert®-Treated)

- 316L stainless steel; DOT rating to 5,000 psig (TPED cylinders to 4,350 psig).
- Range of cylinder sizes, 150 cc to 500 cc.

Size	5,000 psig (34,474 kPa), 316L SS				TPED, 4,350 psig (29,992 kPa), 316L SS			
	Stainless Steel		Sulfinert-Treated		Stainless Steel		Sulfinert-Treated	
	cat.#	price	cat.#	price	cat.#	price	cat.#	price
150 cc	22927	enquire	22111	enquire	22927-PI	£962.10	22111-PI	£1,016
300 cc	22928	enquire	22112	enquire	22928-PI	£1,349	22112-PI	£1,468
500 cc	22929	enquire	22113	enquire	22929-PI	£1,439	22113-PI	£1,591

also available

Certificates are available upon request.

Sample Cylinder Valves (Stainless Steel & Sulfinert®-Treated)

- Multiple valve configurations, including dip tube and rupture discs.
- Large, durable, Kel-F® seat ensures leak-free operation.
- Temperature range: -40 °C to 120 °C
- 303 stainless steel.

Alta-Robbins' unique valve design incorporates a fully contained soft seat that provides durability and longer lifetime. Tight shut-off is easily achieved with very low torque, yet the valve is rugged enough to withstand overtightening.

Multiple valve configurations are available for both high-pressure and ultra-high-pressure sample cylinders. An outage tube or dip tube provides a headspace above liquefied gases so that, should expansion occur with an increase in temperature, the pressure is not dramatically increased. Outage is expressed as a percent of the total cylinder volume, based on the ratio of the length of headspace to the total length of the cylinder, with a maximum available outage of 50%. The dip tube is welded directly to the male inlet of the valve and cut to a length of up to 5.25 inches. Rupture discs function to protect sample cylinders from over-pressurization by venting to the atmosphere. The pressure rating on the rupture disc should always be lower than the cylinder.

Description	Stainless Steel		Sulfinert-Treated	
	cat.#	price	cat.#	price
3,500 psig (24,132 kPa) DOT Pressure Rating				
1/4" Male NPT x 1/4" Male NPT	26297	£162.90	21400	£309.10
1/4" Male NPT x 1/4" Female NPT	26298	£162.90	26299	£309.10
1/4" Male NPT x 1/4" Male Compression	26300	£172.65	21401	£309.10
1/4" Male NPT x 1/4" Male NPT w/5.25" Dip Tube*	26301	£208.85	21402*	enquire
1/4" Male NPT x 1/4" Male NPT w/1,800 psi (12,411 kPa) Rupture Disc	26302	£328.60	26303	£533.30
1/4" Male NPT x 1/4" Female NPT w/1,800 psi (12,411 kPa) Rupture Disc	26304	£328.60	26305	£533.30
Replacement Rupture Disc, 1,800 psig (12,411 kPa)	26320	£96.10	—	
5,000 psig (34,474 kPa) DOT Pressure Rating				
1/4" Male NPT x 1/4" Male NPT	26306	£235.30	26307	£391.25
1/4" Male NPT x 1/4" Female NPT	26308	£235.30	26309	£391.25
1/4" Male NPT x 1/4" Male Compression	26310	£231.15	26311	£398.20
1/4" Male NPT x 1/4" Male NPT w/5.25" Dip Tube*	26312	£291	26313	£484.55
1/4" Male NPT x 1/4" Male NPT w/2,850 psi (19,650 kPa) Rupture Disc	26314	£395.45	26315	£619.60
1/4" Male NPT x 1/4" Female NPT w/2,850 psi (19,650 kPa) Rupture Disc	26316	£416.30	26317	£619.60
Replacement Rupture Disc, 2,850 psig (19,650 kPa)	26324	£96.10	—	

*To order a sample cylinder valve with dip tube, please call Restek® 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" / 13.3 cm). Note: End of part will not be treated after cutting tube to length.

Rupture Disc Tee (Stainless Steel & Sulfinert®-Treated)

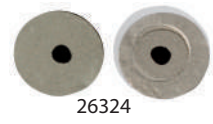
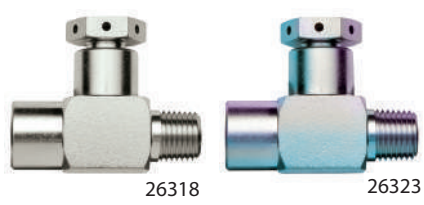
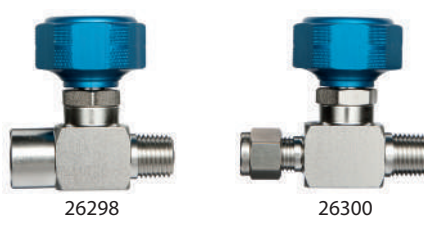
Unlike other designs, Alta-Robbins rupture disc tee is NOT permanently soldered to the disc, making the discs replaceable. Discs are easily changed without removing the valve or tee from the cylinder. These tees are designed to be installed into existing systems to provide reliable over-pressure protection.

Description	Stainless Steel		Sulfinert-Treated	
	cat.#	price	cat.#	price
1,800 psig DOT Pressure Rating				
Rupture Disc Tee, 1/4" Male NPT x 1/4" Female NPT	26318	£203.30	26319	£391.25
Replacement Rupture Disc	26320	£96.10	—	
2,850 psig DOT Pressure Rating				
Rupture Disc Tee, 1/4" Male NPT x 1/4" Female NPT	26322	£203.30	26323	£391.25
Replacement Rupture Disc	26324	£96.10	—	

Metering Control Valves (Stainless Steel & Sulfinert®-Treated)

- Reduces pressure between sample cylinder and GC injector.
- Maintains fine metering control.
- Contains Kel-F® seat.

Description	Stainless Steel		Sulfinert-Treated	
	cat.#	price	cat.#	price
3,500 psig (24,132 kPa) DOT Pressure Rating				
Metering Control Valve, 1/4" Male NPT x 1/4" Male NPT	26326	£306.35	26327	£484.55



Sample Cylinder Accessories

Description	Fittings	qty.	cat.#	price
Sample Cylinder Carrying Handle, 304 SS for 1.9" & 2" OD Cylinders (Includes handle and two attachment rings)	—	ea.	26373	£94.70
Sample Cylinder Carrying Handle, 304 SS for 3.5" & 4" OD Cylinders (Includes handle and two attachment rings)	—	ea.	26374	£117
Sample Cylinder 316 SS End Pipe Plug, Stainless Steel	1/4" Male NPT	ea.	26375	£15.35
Sample Cylinder 316 SS End Pipe Plug, Sulfinert-Treated	1/4" Male NPT	ea.	26376	£55.70
Sample Cylinder 316 SS Hollow Hex Plug	1/4" Male NPT	ea.	26377	£22.30
Sample Cylinder SS Pipe Cap w/Lanyard	1/4" Female NPT & 20" Lanyard	ea.	26378	£40.40
Sample Cylinder SS Pipe Cap, Stainless Steel	1/4" Female NPT	ea.	22969	£22.30
Sample Cylinder SS Pipe Cap, Sulfinert-Treated	1/4" Female NPT	ea.	22970	£55.70

SS=stainless steel

Protecting Your Sulfinert®-Treated Products

Cleaning Tips

When cleaning a treated part, rinse with a solvent that will dissolve probable surface contaminants (i.e., use a nonpolar solvent to remove hydrocarbon contaminants, or a more polar solvent to remove more active contaminants).

Avoid using cleaners containing abrasives as they can scratch the layer. Mild sonication may assist in contaminant removal, but do not oversonicate—this could damage the layer. Solids can be removed with a soft nylon bristle brush using light pressure.

Caution! Do not use basic solutions or soaps with pH>8. Do not steam clean Sulfinert®-treated components or lines as this could damage the layer.

Preventing Galling

As with any threaded fitting, galling may occur when assembling two treated parts. To prevent thread damage, use a PTFE tape.

A scouring pad can be used to remove coating from the threads to reduce galling.

Ferrules used in compression fittings should not be coated—leaks may occur.

Troubleshooting

Under normal use, your treated items should deliver outstanding performance for years to come. However, effective lifetime is dependent on the severity of the environment. Factors that can reduce performance are:

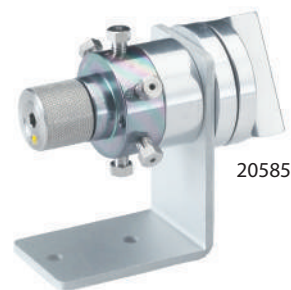
- *Contamination*—Failure to properly clean the surface can allow increased surface activity. If performance changes, thoroughly clean the surface and inspect the layer for damage.
- *Erosion*—Contact with abrasives can accelerate surface wear.
- *Bases*—Contact with a base (pH 8 or higher) can accelerate deterioration of the layer.

Surface finish and color should stay consistent throughout the life of the product. Changes in the finish or color may indicate a partial loss of the layer. To prevent further loss, ensure no exposure to bases or abrasives.

Gas Sampling Valves and Sample Loops (Sulfinert®-Treated)

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

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



20585

Gas Sampling Valves & Replacement Rotors (Sulfinert®-Treated)

(1/16" Fittings, 0.40 mm Port Diameter; "W Type" Valve)

Description	qty.	cat.#	price
Sulfinert Gas Sampling Valve; 4-Port	ea.	20584	£1,949
Sulfinert Gas Sampling Valve; 6-Port	ea.	20585	£2,307
Sulfinert Gas Sampling Valve; 10-Port	ea.	20586	£2,449

Replacement Rotors (Not Coated)

Description	qty.	cat.#	price
Replacement Rotor (not coated) for 4-Port Sulfinert Gas Sampling Valve	ea.	20587	£236.70
Replacement Rotor (not coated) for 6-Port Sulfinert Gas Sampling Valve	ea.	20588	£236.70
Replacement Rotor (not coated) for 10-Port Sulfinert Gas Sampling Valve	ea.	20589	£236.70



20588

Gas Sample Loops (Sulfinert®-Treated)

(1/16" fittings, 1 mm ID, for "W Type" valves)

Description	Size	qty.	cat.#	price
Sample Loops, Sulfinert-Treated	5 µL	ea.	22840	£201.10
Sample Loops, Sulfinert-Treated	10 µL	ea.	22841	£201.10
Sample Loops, Sulfinert-Treated	20 µL	ea.	22842	£201.10
Sample Loops, Sulfinert-Treated	25 µL	ea.	22843	£201.10
Sample Loops, Sulfinert-Treated	50 µL	ea.	22844	£201.10
Sample Loops, Sulfinert-Treated	100 µL	ea.	22845	£201.10
Sample Loops, Sulfinert-Treated	250 µL	ea.	22846	£201.10
Sample Loops, Sulfinert-Treated	500 µL	ea.	22847	£201.10
Sample Loops, Sulfinert-Treated	1 mL	ea.	22848	£201.10
Sample Loops, Sulfinert-Treated	2 mL	ea.	22849	£201.10
Sample Loops, Sulfinert-Treated	5 mL	ea.	22850	£201.10



22848

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

Volume	Model	SGE cat.#	qty.	Restek cat.#	price
500 mL	500MAR-LL-GT	009910	ea.	21275	£692.05
1000 mL	1000MAR-LL-GT	009920	ea.	21276	£692.05
2000 mL	2000MAR-LL-GT	009930	ea.	21277	£1,005

Syringe O-Rings

Syringe Volume	SGE cat.#	qty.	Restek cat.#	price
500 mL	032527	ea.	21278	£33.25
1,000 mL	032532	ea.	21279	£35.65



21279

21278