Gas Sampling Bags

Cost-Effective Alternatives for Air Monitoring

- Ideal for whole air grab sampling at ppm levels.
- ALTEF bags—reliable alternative to Tedlar® for VOCs.
- Multi-layer foil bags—recommended for permanent gases.

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Cost-Effective Alternatives for Air Monitoring

Gas sampling bags are whole air sampling devices useful for monitoring part-per-million (ppm) levels of volatile organic compounds (VOCs) and permanent gases. Sampling bags can be a cost-effective alternative to canisters and solvent desorption tubes and are appropriate for many methods, such as EPA Method 0040 and NIOSH 6603. Applications include industrial hygiene, landfill/biogas, ambient air, indoor air, and stationary source testing.

The chart below provides an overview comparing gas sampling bags and other common techniques. General guidelines and recommended uses for bags are presented on the following pages. Visit www.restek.com/air for complete product specifications and technical resources for air monitoring programs.

Gas Sampling Bags are a Cost-Effective Alternative to Cans and Tubes for Many Applications

	Canister	Gas Sampling Bag	Solvent Desorption 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 hrs	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

General Guidelines for Bag Sampling

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

Before Sampling

- Store unused bags in a clean environment, sealed in an outer bag to prevent adsorption of contaminants.
- Preclean 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.
- 3 L/min. is a typical flow rate.
- 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.

Selecting the Right Bag for Your Applications

Restek offers ALTEF bags and multi-layer foil bags for air monitoring applications. Both are equipped with a single polypropylene combo valve and an eyelet for handling convenience. Gas sampling bags can be a low-cost substitute for canisters and tubes for ppm testing of VOCs and permanent gases. ALTEF bags are a reliable alternative to Tedlar® bags. Product specifications are given below; see the table on page 4 for application recommendations.

Physical Specifications

	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 lbs/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/m² x day	58 cc/m² x day	0.0006 cc/m²/day
Water Vapor Permeability	9-57 g/m² x day	12-15 g/m² x day	0.0006 g/100 sq inches/day
Carbon Dioxide Permeability	172 cc/m² x day	172 cc/m² x day	0.0005 cc/100 square inches/day

ALTEF Gas Sampling Bags

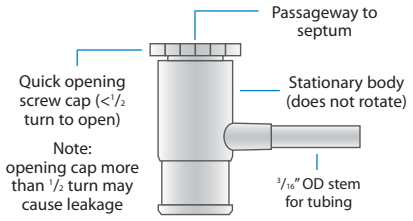
- Excellent low-cost alternative to Tedlar® bags for collection of most VOCs.
- Very low VOC and sulfur background compared to Tedlar® bags.
- Not recommended for ketones, acetates, hydrogen sulfide, or permanent gases.
- PVDF film is abrasion resistant and chemically inert to most acids and organic compounds.
- Contain no additives, fillers, or pigments.

Description	Size	qty.	cat.#
0.5L	6" x 6"	10-pk.	22958
1L	7" x 7"	10-pk.	22959
3L	10" x 10"	10-pk.	22960
5L	12" x 12"	10-pk.	22961
10L	12" x 22"	10-pk.	22962
25L	18" x 24"	5-pk.	22963

Get the convenience of having both a hose connection and a syringe port in a single valve!

Polypropylene Combo Valve

- Inert polypropylene
- 3/16″ diameter valve stem
- Replaceable Teflon®-faced septum



Multi-Layer Foil Gas Sampling Bags

- Good stability for low molecular weight compounds, such as methane, CO, CO_2, and permanent gases.
- Chemically inert with light and moisture protection.
- Not recommended for low ppm VOCs due to background levels.
- 5-layer protective barrier minimizes gas permeability.
  - 60 gauge nylon (outer layer)
  - Metalized aluminum
  - Polyethylene
  - 0.0003" aluminum foil
  - 0.002" polyethylene (inner layer)

Description	Size	qty.	cat.#
1L	7" x 7"	5-pk.	22950
3L	10" x 10"	5-pk.	22951
5L	12" x 12"	5-pk.	22952
10L	12" x 22"	5-pk.	22953

Vacuum Bag Sampler

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

Specifications:

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

22118 CE

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

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Application Recommendations for ALTEF and Multi-Layer Foil Gas Sampling Bags

Sulfur Compounds

Compound	Recommended Sampling Bag Material	
	ALTEF	Multi-Layer Foil
n-Butyl mercaptan		
tert-Butyl mercaptan		
Carbon disulfide*		
Carbonyl sulfide		
Diethyl disulfide		
Diethyl sulfide*		
Dimethyl disulfide		
Dimethyl sulfide*		
2,5-Dimethylthiophene		
Ethyl mercaptan*		
Ethyl methyl sulfide*		
2-Ethylthiophene		
Hydrogen sulfide		
Isobutyl mercaptan*		
Isopropyl mercaptan*		
3-Methylthiophene		
Methyl mercaptan*		
n-Propyl mercaptan*		
Tetrahydrothiophene		
Thiophene*		

= Recommended
= Suitable when used as recommended
= Not suitable

* ALTEF bags can be used to sample these sulfur compounds if the sample is analyzed within 24 hours.

** Multi-layer foil bags can be used to sample most VOCs, but are not recommended for collecting low ppm to high ppb VOCs due to background levels from bag materials.

ALTEF bags are recommended for most VOCs, if analyzed within 48 hours, and for many sulfur compounds, if analyzed within 24 hours.

Multi-layer foil bags are recommended for methane, hydrogen sulfide, carbon monoxide, and carbon dioxide, if analyzed within 48 hours.

VOCs

Compound	Recommended Sampling Bag Material	
	ALTEF	Multi-Layer Foil**
Acetone		
Acetonitrile		
Acrylonitrile		
Allyl chloride		
Benzene		
Bromoethane		
Butyl acetate		
Carbon tetrachloride		
Chloroform		
Carbon dioxide		
Carbon monoxide		
1,2-Dichloroethane		
Dichloropropane		
Ethyl acetate		
Ethylene		
Heptane		
Hexane		
Isooctane		
Isopropyl alcohol		
Methane		
Methyl ethyl ketone		
Methylene chloride		
Methyl *tert*-butyl ether		
Octane		
Perchloroethylene		
Propylene		
Propylene oxide		
Tetrahydrofuran		
Toluene		
1,1,1-Trichloroethane		
Trichloroethylene		
Vinylidene chloride		
p-Xylene		