

# 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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# Gas Sampling Bags

## 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](http://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
<b>Media Type</b>	whole air	whole air	adsorption
<b>Sensitivity</b>	ppb	ppm	ppm
<b>Technique</b>	passive (no pump)	active	active
<b>Sample Type</b>	grab or integrated	grab	integrated
<b>Analyte</b>	wide range of VOCs	wide range of VOCs & permanent gases	sorbent specific
<b>Applications</b>	ambient, IAQ, emergency response, IH	ambient, IAQ emission	IAQ, IH
<b>Durability</b>	reusable	one time use	one time use
<b>Inertness</b>	excellent	fair	fair
<b>Stability</b>	30 day	48 hrs	varies by analyte
<b>Sample Volume</b>	0.4–6 L	0.5–100 L	varies by analyte
<b>Sampling Time</b>	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
<b>Composition</b>	polyvinyl fluoride (PVF) polymer resin	Proprietary PVDF film	5-layer
<b>Thickness</b>	0.002"	0.003"	0.005"
<b>Tensile Strength</b>	8,000 psi	6,100 psi	24 lbs/inch (CD)
<b>Max. Operating Temp.</b>	204 °C	150 °C	87 °C
<b>Specific Gravity</b>	1.7 g/mL	1.78 g/mL	1.09 g/mL
<b>Oxygen Permeability</b>	50 cc/m <sup>2</sup> x day	58 cc/m <sup>2</sup> x day	0.0006 cc/m <sup>2</sup> /day
<b>Water Vapor Permeability</b>	9-57 g/m <sup>2</sup> x day	12-15 g/m <sup>2</sup> x day	0.0006 g/100 sq inches/day
<b>Carbon Dioxide Permeability</b>	172 cc/m <sup>2</sup> x day	172 cc/m <sup>2</sup> 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.

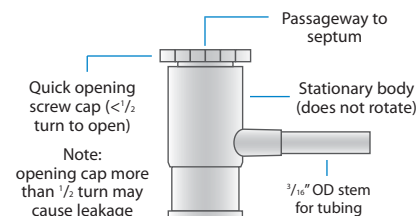


Description	Size	qty.	cat.#
0.5L	6" x 6"	10-pk.	22958
1L	7" x 7"	10-pk.	22959
3L	10" x 10"	10-pk.	22960
5L	12" x 12"	10-pk.	22961
10L	12" x 22"	10-pk.	22962
25L	18" x 24"	5-pk.	22963

**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<sub>2</sub>, 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  
 Running Time: 8 hours  
 Flow Rate (Fill Rate): 1-5L/min.  
 Power Requirements: 12V battery, 4.5 amp

Charge Time: 9 hours  
 Dimensions: 9" x 14.6" x 21.7"  
 Weight: 17 lbs

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
<i>n</i> -Butyl mercaptan	Not suitable	Not suitable
<i>tert</i> -Butyl mercaptan	Recommended	Recommended
Carbon disulfide*	Suitable when used as recommended	Not suitable
Carbonyl sulfide	Recommended	Recommended
Diethyl disulfide	Not suitable	Not suitable
Diethyl sulfide*	Suitable when used as recommended	Not suitable
Dimethyl disulfide	Not suitable	Not suitable
Dimethyl sulfide*	Suitable when used as recommended	Not suitable
2,5-Dimethylthiophene	Not suitable	Not suitable
Ethyl mercaptan*	Suitable when used as recommended	Recommended
Ethyl methyl sulfide*	Suitable when used as recommended	Not suitable
2-Ethylthiophene	Not suitable	Not suitable
Hydrogen sulfide	Not suitable	Recommended
Isobutyl mercaptan*	Suitable when used as recommended	Not suitable
Isopropyl mercaptan*	Suitable when used as recommended	Recommended
3-Methylthiophene	Not suitable	Not suitable
Methyl mercaptan*	Suitable when used as recommended	Recommended
<i>n</i> -Propyl mercaptan*	Suitable when used as recommended	Recommended
Tetrahydrothiophene	Not suitable	Not suitable
Thiophene*	Suitable when used as recommended	Not suitable

- = 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	Not suitable	Suitable when used as recommended
Acetonitrile	Not suitable	Suitable when used as recommended
Acrylonitrile	Not suitable	Suitable when used as recommended
Allyl chloride	Recommended	Suitable when used as recommended
Benzene	Recommended	Suitable when used as recommended
Bromoethane	Recommended	Suitable when used as recommended
Butyl acetate	Not suitable	Suitable when used as recommended
Carbon tetrachloride	Recommended	Suitable when used as recommended
Chloroform	Recommended	Suitable when used as recommended
Carbon dioxide	Recommended	Suitable when used as recommended
Carbon monoxide	Recommended	Suitable when used as recommended
1,2-Dichloroethane	Recommended	Suitable when used as recommended
Dichloropropane	Recommended	Suitable when used as recommended
Ethyl acetate	Not suitable	Suitable when used as recommended
Ethylene	Recommended	Suitable when used as recommended
Heptane	Recommended	Suitable when used as recommended
Hexane	Recommended	Suitable when used as recommended
Isooctane	Recommended	Suitable when used as recommended
Isopropyl alcohol	Recommended	Suitable when used as recommended
Methane	Recommended	Suitable when used as recommended
Methyl ethyl ketone	Not suitable	Suitable when used as recommended
Methylene chloride	Recommended	Suitable when used as recommended
Methyl <i>tert</i> -butyl ether	Recommended	Suitable when used as recommended
Octane	Recommended	Suitable when used as recommended
Perchloroethylene	Recommended	Suitable when used as recommended
Propylene	Recommended	Suitable when used as recommended
Propylene oxide	Recommended	Suitable when used as recommended
Tetrahydrofuran	Recommended	Suitable when used as recommended
Toluene	Not suitable	Suitable when used as recommended
1,1,1-Trichloroethane	Recommended	Suitable when used as recommended
Trichloroethylene	Recommended	Suitable when used as recommended
Vinylidene chloride	Recommended	Suitable when used as recommended
<i>p</i> -Xylene	Not suitable	Suitable when used as recommended

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