



**THE NEXT GENERATION OF SKC**  
**SAMPLE BAGS**

**NEW high-performance materials for target compounds**





## SKC — A Name That Stands for Over 30 Years of Quality Sample Bags

Since 1962, SKC has manufactured quality air sampling equipment and media for occupational and environmental health and safety professionals worldwide. SKC quality products include:

- Sample pumps
- Sorbent tubes
- Sample bags
- Passive samplers
- Size-selective samplers
- Filters



## SKC Sample Bags

SKC, the world leader in sampling technologies, produced its first sample bag in the late 1970s. The bag was made of Tedlar® film and soon became the classic sample bag for VOCs. Over the last 30 years, SKC Tedlar bags have been the number one choice of professionals. In March 2009, DuPont announced its plan to "phase out support" for Tedlar film in the sample bag market. SKC will continue to offer Tedlar bags while supplies last as well as highly inert FluoroFilm FEP bags. During this transition time, SKC announces new high-performance materials — SamplePro FlexFilm, Kynar, and FlexFoil — the next generation of sample bags. These materials provide new standards of performance for storage stability and background in bag sampling applications.

### A Word About Fittings

SKC sample bag fittings are not "off-the-shelf" industrial fittings, but are designed specifically for air sampling. The fittings, offered in a choice of materials, feature an efficient design that combines the hose/valve and septum fitting into one lightweight fitting.



### SKC Bag Materials and Construction

SKC manufactures its sample bags out of ultra-clean top-grade films including SamplePro FlexFilm (SKC proprietary film), Tedlar, FlexFoil, Kynar (PVDF), and FluoroFilm (FEP). Seams are strong, evenly sealed, and leak tested.



### SKC Bag Availability and Price

SKC offers the largest selection of bag materials and sizes. Bags are stocked for immediate delivery. SKC maintains the lowest bag prices.

### SKC — The Future in Sample Bags

SKC has been manufacturing quality sample bags for over 30 years. When Dupont announced its discontinuation of Tedlar bags for air sampling, SKC was able to offer immediately SamplePro FlexFilm bags — the best alternative to Tedlar. SKC continues to actively research sample bag materials and applications to ensure that the bag you need is available when you need it. OEHHS professionals rely on SKC.



## Target the **Right Bag Material** for Your Application

### SamplePro FlexFilm

- Low VOC background
- Good stability for a wide variety of VOCs
- Longer storage stability for many hydrocarbons, compared to other bag materials
- Good stability for CO, CO<sub>2</sub>, and methane
- Acceptable stability for some sulfur compounds (*see table on page 4*)
- Very economically priced

Pages 4-5

A high background for hydrogen sulfide and carbonyl sulfide make FlexFilm unsuitable for sampling these specific compounds. FlexFilm properties require the bags to be kept flat during transport and storage.

### Kynar

- Very low VOC and sulfur background
- Good stability for some VOCs and many hydrocarbons
- Good stability for CO, CO<sub>2</sub>, and methane
- Good 24-hour storage stability for some sulfur compounds (*see table on page 8*)

Page 8

Kynar film does not show good VOC stability for ketones and acetates. Kynar is higher priced than FlexFilm.

### FlexFoil

- Good VOC storage stability
- The only bag that effectively holds hydrogen sulfide!
- Good stability for low molecular weight compounds such as CO, CO<sub>2</sub>, methane, and hydrogen
- Good 48-hour stability for hydrogen sulfide, carbonyl sulfide, and methyl and ethyl mercaptan
- Good for light-sensitive compounds
- Good moisture barrier properties

Pages 6-7

Due to background levels, FlexFoil bags are not suitable for collecting low ppm to high ppb VOCs.

### FluoroFilm

- Very low VOC and sulfur background
- Very inert and mechanically strong

FluoroFilm exhibits poor storage stability for most VOCs and sulfur compounds. Analysis within 24 hours or less is necessary for many compounds. FluoroFilm is more expensive compared to other bag materials.

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# SamplePro FlexFilm Air Sample Bags

Tedlar Alternative for VOCs



- ▶ The best alternative to Tedlar for performance and economy
- ▶ Lower total VOC background than Tedlar
- ▶ Superior storage stability for organic vapors
  - See 2-day storage stability data below
- ▶ Minimal adsorption
- ▶ Low price
- ▶ Choice of fittings
  - **Single combined polypropylene** hose/valve and septum for economy and light weight
  - **Dual stainless steel** for sampling flexibility
- ▶ Stocked in a variety of sizes
- ▶ Custom bags available

SKC **SamplePro**<sup>®</sup> FlexFilm bags are constructed of 3-mil SKC proprietary material ideally suited for collecting air samples of VOCs. Manufactured exclusively for SKC, FlexFilm features lower total VOC background than Tedlar and shows the same sample stability for VOCs as seen with Tedlar. When combined with SKC quality fittings, the result is an economical sample bag with lower background levels and superior storage stability for collected compounds.

## Storage Stability of Collected Compounds in FlexFilm Bags\*

Acceptability criteria:  $\geq 80\%$  recovery at  $\geq 2$  days based on EPA Method 0040 as tested in SKC Laboratories

Compound	% Recovery	
	Day 1	Day 2
Acetone	96.7	88.9
Acetonitrile	69.0	55.1
Acrylonitrile	76.1	62.2
Allyl chloride	95.6	91.9
Benzene	96.0	95.2
Bromoethane	95.2	90.9
Butyl acetate	85.1	91.8
n-Butyl mercaptan	69.5	50.0
tert-Butyl mercaptan	92.5	92.5
Carbon disulfide	80.0	74.1
Carbon tetrachloride	101.0	94.3
Carbonyl sulfide†	114.3	135.7
Chloroform	98.7	95.9
Carbon dioxide	100.0	90.0
Carbon monoxide	100.0	100.0
1,2-Dichloroethane	91.5	82.9
Dichloropropane	86.2	76.7
Diethyl disulfide	68.2	54.1
Diethyl sulfide	88.2	83.9
Dimethyl disulfide	77.3	69.3
Dimethyl sulfide	90.9	89.8
2,5-Dimethylthiophene	68.6	54.7
Ethyl acetate	94.9	95.4
Ethyl mercaptan	81.3	76.9
Ethyl methyl sulfide	88.2	83.9
2-Ethylthiophene	72.2	60.0
Ethylene	104.0	100.0

Compound	% Recovery	
	Day 1	Day 2
Heptane	96.7	106.0
Hexane	99.0	98.9
Hydrogen sulfide	41.5	36.9
Isobutyl mercaptan	81.3	69.2
Isooctane	100.0	97.9
Isopropyl alcohol	99.1	91.7
Isopropyl mercaptan	89.3	86.0
Methane	95.8	92.5
Methyl ethyl ketone (2-Butanone)	96.2	95.8
Methylene chloride	93.2	87.2
Methyl mercaptan	88.9	83.3
Methyl tert-butyl ether	99.2	99.1
3-Methylthiophene	75.9	65.5
Octane	104.0	98.7
Perchloroethylene	94.8	84.9
Propylene	100.0	99.0
Propylene oxide	93.3	90.1
n-Propyl mercaptan	80.0	70.0
Tetrahydrofuran	96.7	93.6
Tetrahydrothiophene	79.6	70.5
Thiophene	81.6	75.9
Toluene	107.0	92.9
1,1,1-Trichloroethane	94.9	93.6
Trichloroethylene	92.4	82.9
Vinylidene chloride	95.6	91.8
p-Xylene	85.9	82.7

\* Bags stored at ambient temperatures during study

† High recovery is due to high background of compound in the bag material.


## FlexFilm and Sulfur Compounds

SamplePro FlexFilm bags provide acceptable storage stability for some sulfur compounds (see table at right).



For bag sampling pumps, see page 15.

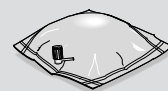
## FlexFilm Bags with Single Polypropylene Fitting

Maximum Capacity (liter)	Cat. No.	Qty.	Fitting
0.5	236-006	10	
	236-006A	ea	
1	236-001	10	
	236-001A	ea	
3	236-002	10	
	236-002A	ea	
5	236-005	10	
	236-005A	ea	
8	236-004	10	
10	236-003	10	
	236-003A	ea	
25	236-007	5	
Replacement Septa	232-01-RS	10	

- ▶ Bags are designed for single use only.
- ▶ Do not use FlexFilm bags at temperatures above 140 F (60 C).
- ▶ In addition to bag material temperature tolerance, maximum bag operating temperature can also depend on O-ring or fitting temperature tolerances. Check individual bag operating instructions for maximum operating temperature. See page 9 for related Tech Tip.
- ▶ Store bags flat. Do not roll or crease bags during storage.
- ▶ Do not ship bags by air unless the cargo cabin is pressurized. Check appropriate regulations.
- ▶ Do not fill bags > 80%.




Incorrect



Correct

## FlexFilm Bags with Dual Stainless Steel Fittings

Maximum Capacity (liter)	Cat. No.	Qty.	Fitting
0.5	237-02	10	
	237-02A	ea	
1	237-01	10	
	237-01A	ea	
3	237-03	10	
	237-03A	ea	
5	237-05	10	
	237-05A	ea	
10	237-08	10	
	237-08A	ea	
25	237-25	5	
Replacement Septa	231-9-04	10	

*Larger FlexFilm bag sizes are available. Contact SKC.*

### The Unique Properties of SamplePro FlexFilm

Water Vapor Transmission:	13.5 g/m <sup>2</sup> x d
Oxygen Permeability:	52.5 cc/m <sup>2</sup> x d
Carbon Dioxide Permeability:	171 cc/m <sup>2</sup> x d
Material Thickness:	3 mil
Temperature Resistance:	140 F (60 C)

### FlexFilm and Tedlar

A poster exhibited at AIHce 2010 showed that SKC SamplePro Flex-Film bags are an ideal alternative to Tedlar.

- 14 compounds tested in FlexFilm showed recoveries of > 80% after two days of ambient storage; the same compounds tested in Tedlar showed very similar results.
- A side-by-side Tedlar and Flex-Film background study showed that FlexFilm has three times lower VOC background than Tedlar.
- FlexFilm exhibits higher levels of hydrogen sulfide and carbonyl sulfide when compared to Tedlar.

See FlexFilm storage stability data on page 4 and FlexFilm Evaluation Poster at [www.skcinc.com/instructions/SKC\\_Bag\\_Poster.pdf](http://www.skcinc.com/instructions/SKC_Bag_Poster.pdf).

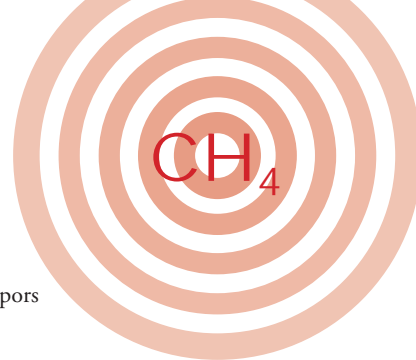


### More Information

Need bags for special applications?  
see [www.skcinc.com/bags.asp](http://www.skcinc.com/bags.asp)

# FlexFoil Gas Sample Bags

## For Methane, Hydrogen Sulfide, CO/CO<sub>2</sub>, and Other Gases



- Superior sample stability for designated gases
  - Not recommended for low ppm to high ppb organic vapors due to background levels from bag constituents
- Holds hydrogen sulfide effectively
- Minimal adsorption and absorption
- Protect light-sensitive compounds
- Choice of fittings
  - **Single combined polypropylene** hose/valve and septum for economy and light weight
  - **Single combined stainless steel** hose/valve and septum
- Strong, flexible, and evenly sealed 4-ply (5-mil) material
  - Water and vapor-proof
- Specified in publication on exhaled breath analysis for volatile sulfur compounds (see box on page 7)
- Stocked in a variety of sizes, custom bags available

FlexFoil® sample bags provide light and moisture protection for low molecular weight compounds such as hydrogen and sulfur compounds that are unstable when collected into standard sample bags for VOCs. Four strong layers prevent permeation in and out of the bag. The inert inside surface minimizes absorption and adsorption of compounds.

### Storage Stability of Collected Compounds in FlexFoil Bags<sup>§</sup>

Acceptability criteria: ≥ 80% recovery at ≥ 2 days based on EPA Method 0040 as tested in SKC Laboratories

Compound	% Recovery	
	Day 1	Day 2
Acetone	99.0	97.8
Acetonitrile	94.2	84.5
Acrylonitrile	98.2	99.5
Allyl chloride	98.5	95.6
Benzene	93.1	98.2
Bromoethane	95.2	98.0
Butyl acetate	88.1	88.7
n-Butyl mercaptan <sup>‡</sup>	47.8	50.0
tert-Butyl mercaptan	82.2	88.9
Carbon dioxide	99.0	101.0
Carbon disulfide <sup>‡</sup>	58.9	54.4
Carbon monoxide	100.0	100.0
Carbon tetrachloride	99.1	95.0
Carbonyl sulfide	111.0	100.0
Chloroform	96.2	97.1
1,2-Dichloroethane	92.0	88.0
Dichloropropane	99.3	98.5
Diethyl disulfide <sup>‡</sup>	11.1	12.2
Diethyl sulfide <sup>‡</sup>	25.6	13.3
Dimethyl disulfide <sup>‡</sup>	42.2	44.4
Dimethyl sulfide	77.8	71.1
2,5-Dimethylthiophene <sup>‡</sup>	14.0	15.5
Ethyl acetate	100.0	97.3
Ethyl mercaptan	91.1	96.7
Ethyl methyl sulfide <sup>‡</sup>	52.2	40.0
Ethylene	108.0	94.0
2-Ethylthiophene <sup>‡</sup>	17.8	17.8

Compound	% Recovery	
	Day 1	Day 2
Heptane	99.2	101.0
Hexane	95.8	99.4
Hydrogen sulfide	104.0	102.0
Isobutyl mercaptan <sup>‡</sup>	62.2	64.4
Isooctane	87.5	86.1
Isopropyl alcohol	101.0	100.0
Isopropyl mercaptan	87.8	93.3
Methane	99.0	100.0
Methyl ethyl ketone (2-Butanone)	96.5	101.0
Methylene chloride	98.7	101.0
3-Methylthiophene <sup>‡</sup>	32.0	32.0
Methyl mercaptan	94.4	103.0
Methyl tert-butyl ether	92.0	88.0
Octane	98.4	93.1
Perchloroethylene	85.3	82.4
n-Propyl mercaptan	77.8	82.2
Propylene	98.6	97.9
Propylene oxide	102.0	101.0
Tetrahydrofuran	101.0	99.3
Tetrahydrothiophene <sup>‡</sup>	0	0
Thiophene <sup>‡</sup>	61.1	62.2
Toluene	90.5	91.5
1,1,1-Trichloroethane	86.5	84.6
Trichloroethylene	93.7	94.6
Vinylidene chloride	98.3	99.5
p-Xylene	97.0	89.0

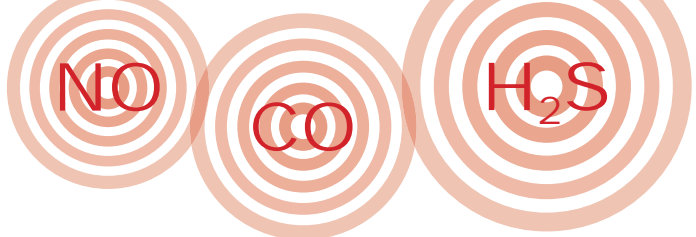
<sup>‡</sup> Sample degradation begins within 3 hours; compound should be analyzed as soon as possible or use alternative method.  
<sup>§</sup> Polypropylene and stainless steel fittings were used in this study.



### More Information

Visit [www.skinc.com/prod/245-01.asp](http://www.skinc.com/prod/245-01.asp) for FlexFoil storage stability reports on the following gases:

- Carbon dioxide
- Carbon monoxide
- Hydrogen
- Hydrogen sulfide (biogas/landfill)
- Methane
- Nitric oxide
- Oxygen (biogas/landfill)



### FlexFoil Bags with Single Polypropylene Fitting

Maximum Capacity (liter)	Cat. No.	Qty.	Fitting
1	245-21 245-21A	5 ea	
3	245-23 245-23A	5 ea	
5	245-25	5	
10	245-28	5	
Replacement Septa	232-01-RS	10	

### FlexFoil Bags with Single Stainless Steel Fitting

Maximum Capacity (liter)	Cat. No.	Qty.	Fitting
1	245-01 245-01A	5 ea	
3	245-03 245-03A	5 ea	
5	245-05	5	
10	245-08	5	
Replacement Septa	233-01-RS	10	

## ABOUT

### FlexFoil Sample Bag Applications\*

- Biogas and landfill gas (LFG) sampling
  - Sewage treatment plants and landfills
  - Emission control
  - Fruit warehouses and fermentation cellars
  - Farms
- Pollution level monitoring
- Site sampling/mobile surveys
- Breath-gas analysis
- Calibration gas transfer
- Calibration mixtures
- Leak/spill exposure assessment
- Indoor air studies (CO, CO<sub>2</sub>)
- CO<sub>2</sub> - OSHA ID-172
- CO<sub>2</sub> - NIOSH 6603
- CO - OSHA ID-210<sup>‡</sup>

\* FlexFoil sample bags are not suitable for collecting low ppm to high ppb VOCs due to the constituents of the FlexFoil material. See pages 4-5 and 8-11 for alternative bag materials.

‡ Specifies 5-layer foil bags. SKC 4-ply FlexFoil bags hold 100 ppm CO for 5 days without loss. See [www.skcinc.com/instructions/1706.pdf](http://www.skcinc.com/instructions/1706.pdf).

### Breath-gas Analysis — A Promising New Diagnostic Technique

#### FlexFoil Best Choice for Storing Breath-gas up to 24 Hours!

A 2008 study, published in the *Journal of Chromatography B*, tested the suitability of polymer bags, including FlexFoil, for storing volatile sulfur compounds (VSCs) identified as important biomarkers in human breath. Increased concentrations of VSCs in exhaled breath have been attributed to impaired liver function, halitosis, organ rejection after lung transplant, lung cancer, cystic fibrosis, or schizophrenia. Study results show that SKC FlexFoil sample bags are the best choice, compared to the other films tested, for up to 24-hour storage of VSCs.

#### New! SKC Exhaled Air Fitted (EAF) FlexFoil Sample Bags

SKC is proud to introduce EAF FlexFoil Sample Bags for breath-gas analysis. SKC offers this new FlexFoil bag with special PVC fitting for easy exhaled breath sampling. See ordering below.

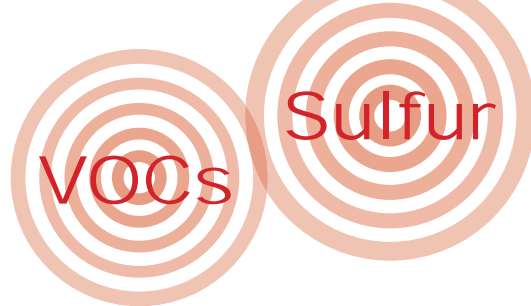


#### Exhaled Air Fitted (EAF) FlexFoil Bags

Maximum Capacity (liter)	Cat. No.	Qty.	Fitting
0.5	239-02	3	
1	239-01	3	

# Kynar Air Sample Bags

## Another Tedlar Alternative from SKC



- Very low background levels of VOCs and sulfur compounds
- Stable storage of many VOCs up to 2 days
- Tough and strong 2-mil material
- Choice of fittings
  - Single combined polypropylene hose/valve and septum for economy and light weight
  - Dual stainless steel for sampling flexibility

Transparent 2-mil Kynar bags (polyvinylidene fluoride [PVDF]) are durable and feature low background levels for VOCs and sulfur compounds. Kynar bags can be used for some sulfur compounds with analysis within 24 hours. SKC offers Kynar sample bags with a single all-in-one polypropylene fitting or dual stainless steel fittings.

### Storage Stability of Collected VOCs in Kynar Bags

Acceptability criteria:  $\geq 80\%$  recovery at  $\geq 2$  days based on EPA Method 0040 as tested in SKC Laboratories

Compound	% Recovery	
	Day 1	Day 2
Acetone	81.6	69.8
Acetonitrile	55.0	36.3
Acrylonitrile	59.0	54.1
Allyl chloride	95.7	90.8
Benzene	94.9	93.9
Bromoethane	94.5	95.4
Butyl acetate	71.6	59.6
Carbon tetrachloride	99.0	95.3
Chloroform	97.5	95.4
Carbon dioxide	100.0	100.0
Carbon monoxide	100.0	90.0
1,2-Dichloroethane	84.0	80.0
Dichloropropane	101.0	99.9
Ethyl acetate	83.5	74.5
Ethylene	101.0	104.0
Heptane	93.0	86.9
Hexane	97.3	101.0

Compound	% Recovery	
	Day 1	Day 2
Isooctane	99.1	96.9
Isopropyl alcohol	97.4	90.5
Methane	99.9	100.8
Methyl ethyl ketone (2-Butanone)	70.4	63.3
Methylene chloride	101.0	94.5
Methyl tert-butyl ether	96.0	98.0
Octane	105.0	91.0
Perchloroethylene	93.0	87.3
Propylene	100.8	97.1
Propylene oxide	91.8	84.4
Tetrahydrofuran	91.8	84.8
Toluene	77.8	76.2
1,1,1-Trichloroethane	96.7	94.6
Trichloroethylene	95.1	89.1
Vinylidene chloride	98.8	96.2
p-Xylene	69.0	49.0

### Storage Stability of Collected Sulfur Compounds in Kynar Bags\*

Acceptability criteria:  $\geq 80\%$  recovery at  $\geq 2$  days based on EPA Method 0040 as tested in SKC Laboratories

Compound	% Recovery	
	Day 1	Day 2
n-Butyl mercaptan	62.5	39.8
tert-Butyl mercaptan	96.8	85.0
Carbon disulfide	88.3	77.7
Carbonyl sulfide	99.0	90.0
Diethyl disulfide	53.3	36.7
Diethyl sulfide	84.2	71.6
Dimethyl disulfide	77.3	59.1
Dimethyl sulfide	89.1	78.3
2,5-Dimethylthiophene	48.9	33.3
Ethyl mercaptan	88.0	75.0
Ethyl methyl sulfide	93.3	78.9
2-Ethylthiophene	65.1	45.8
Hydrogen sulfide	73.1	46.2
Isobutyl mercaptan	81.5	62.0
Isopropyl mercaptan	90.4	77.7
3-Methylthiophene	67.5	50.6
Methyl mercaptan	87.0	73.9
n-Propyl mercaptan	84.6	64.8
Tetrahydrothiophene	71.6	53.4
Thiophene	80.7	64.8

### Kynar Bags with Single Polypropylene Fitting

Maximum Capacity (liter)	Cat. No.	Qty.	Fitting
1	247-01	10	
3	247-03	10	
5	247-05	10	
10	247-10	10	
25	247-25	5	

### Kynar Bags with Dual Stainless Steel Fittings

Maximum Capacity (liter)	Cat. No.	Qty.	Fitting
1	248-01	10	
3	248-03	10	
5	248-05	10	
10	248-10	10	
25	248-25	5	

Larger Kynar bag sizes are available. Contact SKC.

# FluoroFilm FEP Air Sample Bags

## For Low-level Sampling and Analysis in < 1 Day

VOCS

- ▶ FluoroFilm FEP (fluorinated ethylene propylene) is the most chemically inert of all bag material
- ▶ Very low VOC and sulfur background
- ▶ Choice of all-in-one PTFE or stainless steel hose/valve and septum fittings
- ▶ Mechanically strong 2-mil FEP — resists impact and tearing
- ▶ Custom bags available

### Storage Stability of Collected Compounds in FluoroFilm Bags

Acceptability criteria: ≥ 80% recovery at ≥ 2 days based on EPA Method 0040 as tested in SKC Laboratories


Compound	% Recovery	
	Day 1	Day 2
Acetone	89.0	85.0
Acetonitrile	65.0	42.0
Acrylonitrile	77.0	59.0
Allyl chloride	92.0	89.0
Benzene	93.0	79.0
Bromoethane	88.0	86.0
Butyl acetate	72.0	66.0
Carbon dioxide	90.0	50.0
Carbon monoxide	90.0	50.0
Carbon tetrachloride	95.0	91.0
Chloroform	96.0	93.0
1,2-Dichloroethane	89.0	79.0
Dichloropropane	90.0	86.0
Ethyl acetate	94.0	94.0
Ethylene	99.0	94.0
Heptane	88.0	87.0
Hexane	98.0	95.0

Compound	% Recovery	
	Day 1	Day 2
Isooctane	97.0	96.0
Isopropyl alcohol	102.0	98.0
Methane	84.1	71.5
Methyl ethyl ketone (2-Butanone)	90.0	83.0
Methylene chloride	84.0	77.0
Methyl tert-butyl ether	99.0	97.0
Octane	91.0	84.0
Perchloroethylene	81.0	69.0
Propylene	97.0	91.0
Propylene oxide	94.0	89.0
Tetrahydrofuran	90.0	88.0
Toluene	81.0	74.0
1,1,1-Trichloroethane	100.0	97.0
Trichloroethylene	80.0	69.0
Vinylidene chloride	96.0	92.0
p-Xylene	76.0	65.0


### Tech Tips

- ▶ Use only PTFE tubing for bag sampling to prevent sample loss through adsorption to the tubing's inner surface. See page 13 for tubing
- ▶ Sample bag maximum operating temperature can be dictated by the temperature tolerances of the bag material, fitting material, and/or fitting components such as O-rings.
  - SKC single stainless steel, dual stainless steel, and PTFE fittings: Maximum temperature is 225 F (107.2 C) due to the fitting O-ring.
  - SKC single polypropylene fitting: Maximum temperature is 200 F (93.3 C) due to the fitting material.
  - SKC FlexFilm sample bags: Maximum temperature is 140 F (60 C) due to the bag material.

### FluoroFilm Bags with Single Stainless Steel Fitting

Maximum Capacity (liter)	Cat. No.	Qty.	Fitting
0.5	243-02	5	
1	243-01	5	
3	243-03	5	
Replacement Septa	233-01-RS	10	

### FluoroFilm Bags with Single PTFE Fitting

Maximum Capacity (liter)	Cat. No.	Qty.	Fitting
0.5	240-02	5	
1	240-01	5	
3	240-03	5	
Replacement Septa	233-01-RS	10	

# Tedlar Air Sample Bags

A Classic Air Sample Bag for VOCs



- Made of clean top-grade Tedlar film for sample integrity and valid data
- Resist gas permeation into and out of the bag
- Choice of fittings
  - **Single combined polypropylene** hose/valve and septum for economy and light weight
  - **Single combined stainless steel** hose/valve and septum for a lighter weight alternative to dual stainless steel
  - **Dual stainless steel** for sampling flexibility
- Stocked in a variety of sizes
- Specialty bags are available; visit [www.skcinc.com/bags.asp](http://www.skcinc.com/bags.asp)
- Custom bags available for your application

**Tough, flexible** Tedlar film features tensile strength and toughness for many applications. SKC Tedlar bags are rated for continuous use from -98 to 225 F (-72 to 107 C) when used with the appropriately rated fitting material (*see Tech Tip on page 11*). This wide range of operation allows for use in very cold or very hot environments including stacks, vents, and flues.

**Chemically inert** Tedlar film will not react with or alter the composition of a wide range of collected chemicals to assure sample integrity.

## SKC Bags made from Top-grade Tedlar!

The family of Tedlar PVF film products from DuPont includes several formulations of Tedlar for different uses. SKC manufactures its Tedlar sample bags from the top-grade Tedlar available for air sampling applications. The benefits include a strong tear-resistant bag with low permeability and low background levels.

Your samples are too important to trust to inferior grades of Tedlar. Choose SKC quality bags made from top-grade Tedlar.

*SKC — Top-grade Tedlar Bags at the Best Prices*

## A Note about Tedlar Bag Supply

Dupont® has discontinued its supply of Tedlar film for the manufacture of air sample bags. With its large stock of Tedlar, SKC continues to be the world's largest producer of quality Tedlar air sample bags.


**Call SKC for Tedlar bags today!**



*For bag sampling pumps, see page 15.*

**Buy while  
supplies last!**

### Tedlar Bags with Single Polypropylene Fitting

Maximum Capacity (liter)	Cat. No.	Qty.	Fitting
0.5	232-02	10	
1	232-01 232-01A	10 ea	
Replacement Septa	232-01-RS	10	

### Tech Tips


**Q:** Can Tedlar Bags be used at elevated temperatures?

**A:** SKC Tedlar film has a melting point of 374 F (190 C). However, the bag fitting dictates the maximum operating temperature of the sample bag.


- Tedlar bags with stainless steel fittings have a maximum operating temperature of 225 F (107.2 C) based on the temperature tolerances of this fitting's O-rings.
- Tedlar bags with polypropylene fittings have a maximum operating temperature of 200 F (93.3 C) based on the temperature tolerance of the fitting material. Strain on the fitting should be avoided at the maximum temperature.

### Tedlar Bags with Single Stainless Steel Septum Fitting for EPA TCLP Method


Designed for use with a Zero Headspace Extractor (ZHE), the bag attaches to the ZHE with a special stainless steel adaptor (required, see below).

Maximum Capacity (liter)	Cat. No.	Qty.	Fitting
1	231-01-TCLP	10	
Stainless Steel Adapter, required for use with ZHE	231-01-ZHE	ea	

### Tedlar Bags with Single Stainless Steel Fitting

Maximum Capacity (liter)	Cat. No.	Qty.	Fitting
0.5	233-02	10	
1	233-01 233-01A	10 ea	
Replacement Septa	233-01-RS	10	

### Tedlar Bags with Dual Stainless Steel Fittings

Maximum Capacity (liter)	Cat. No.	Qty.	Fitting
1	231-01 231-01A	10 ea	
Replacement Septa	231-9-04	10	

### Select a Fitting

SKC sample bags are stocked with a choice of fitting to meet your applications. SKC bag fittings are not "off-the-shelf" industrial fittings, but are designed specifically for air sampling. Choose from SKC quality fittings including dual stainless steel or all-in-one single polypropylene, stainless steel, or PTFE fittings that combine the hose/valve and septum into one lightweight fitting.





**CUSTOM AIR SAMPLE BAGS**

# MADE TO YOUR SPECIFICATIONS

## Need a special bag size?

SKC provides single or multiple-cell sample bags in the size you need.

## Need a specific combination of fitting and bag material?

SKC offers a wide choice of fittings and bag materials that can be combined to your specifications.

### Fittings:

- Stainless Steel
- Polypropylene
- Nickel-plated brass
- PTFE
- PVC

### Sample bag materials:

- SamplePro FlexFilm (3 mil)
- Top-grade Tedlar (2 mil)
- FluoroFilm FEP (2 mil)
- 4-ply FlexFoil (5 mil)
- Kynar PVDF (2 mil)



**SKC custom sample bags are proven performers!**



Indoor air



Biogas/landfill gas sampling



Soil vapor



Beverage testing

**Contact SKC today for your custom sample bags!**  
[www.skcinc.com](http://www.skcinc.com)

# Vac-U-Tube

## For Quick Bag Samples Without a Pump

- ▶ No electronic pump required
- ▶ Setup takes less than 20 seconds
- ▶ Convenient for testing monitoring wells

The Vac-U-Tube acrylic syringe with removable face plate allows a specially designed 0.7-liter sample bag to be placed inside. The bag is attached to the face plate that is then secured to the syringe. Sample by pulling the plunger or purge by pushing the plunger. The Vac-U-Tube can be used for headspace soil gas sampling.

Description	Cat. No.	Qty.
<b>Vac-U-Tube</b> includes Vac-U-Tube and carry case, requires sample bag 232-945A (not included)	231-945	ea
<b>Vac-U-Tube Bags</b> , 0.7-liter bags	Tedlar 232-945A	10

# PTFE Tubing

## Inert Tubing for Bag Sampling

- ▶ Heat and corrosion resistant
- ▶ Chemically inert
- ▶ Strong

Because it is chemically inert, SKC PTFE tubing is ideal for bag sampling to prevent sample loss through adsorption to the tubing's inner surface. SKC offers PTFE tubing with different diameters to fit over or inside bag fittings.

PTFE Tubing	Cat. No.	Length
<b>Fits over all SKC bag fittings and Grab Air pump fittings</b> 3/16-inch ID, 1/4-inch OD	231-9-23	10 ft
<b>Fits inside bag fitting</b> 1/16-inch ID, 1/8-inch OD	231-9-21	10 ft
<b>Fits Vac-U-Chamber sample inlet and 222 pump fittings</b> 1/4-inch ID, 5/16-inch OD	231-937 231-924	10 ft 50 ft
<b>Twin Port Pocket Pump Tubing Adapter Kit</b> Includes two lengths of silicone tubing: 1/8-inch ID, 1/4-inch OD for bag fitting and 3/16-inch ID, 3/8-inch OD for pump fitting; use with 231-9-23 PTFE tubing (above)	231-926	

### Tech Tip

▶ Use only PTFE tubing for bag sampling to prevent sample loss through adsorption to the tubing's inner surface.

# Vac-U-Chamber

Uses Negative Pressure to Eliminate Pump Contamination



## Vapor Intrusion Monitoring

### Soil Gas Sampling

Soil gas sampling can identify underground contamination and trace the source, extent, and movement of pollutants.

*U.S. EPA Standard Operating Procedure (SOP) # 2042 for Soil Gas Sampling* specifies sample bags as containers inside an airtight chamber (e.g., Vac-U-Chamber). A sample pump creates negative pressure in the chamber, causing soil gas to enter into the bag directly. Stainless steel canisters are an alternative. Samples are analyzed in the field with direct-reading instruments and/or in a qualified laboratory.

*ASTM D5314-92 Standard Guide for Soil Gas Monitoring in the Vadose Zone* recommends collection by a whole air/sorbent method or a bulk soil/water sample for sampling headspace. Per the standard, the whole air/sorbent method is preferable because headspace sampling has significant disadvantages:

- Headspace is not true soil gas; therefore, it is not representative of the true vadose zone.
- It is a poor method for determining compounds that are more volatile.

- **Allows direct filling of air sample bags**
  - Uses negative pressure provided by most personal air sample pumps
  - Designed to contain SKC sample bags
- **Rugged, heavy-duty construction**
  - Will not collapse under vacuum
- **Two sizes available**
  - Large for sample volumes up to 8 liters
  - Small for sample volumes up to 1 liter
- **Protects from contamination**
  - Sample does not pass through the pump
  - Inert surfaces eliminate sample contamination
- **Multiple applications**
  - Groundwater testing
  - Soil gas sampling
  - Stack sampling
  - Ventilation studies
  - Hazmat testing
  - Ambient or indoor air
  - EPA Method 0040

## For Convenient, Reliable Bag Sampling

The SKC Vac-U-Chamber is a rigid air sample box that allows sample bags to be filled directly by using negative pressure provided by most personal air sample pumps. Because the sample does not pass through the pump, both sample and pump contamination are eliminated. All surfaces in contact with the sample are constructed of inert materials. The Vac-U-Chamber's rigid walls will not collapse under vacuum conditions.

## Large Vac-U-Chamber

Description	Cat. No.
<b>Complete Vac-U-Chamber Kit</b> includes PCXR4 sample pump, single PowerFlex charger with cable, large Vac-U-Chamber, and ten 236-004 FlexFilm sample bags <b>100-240 V</b>	224-4115
<b>Large Vac-U-Chamber only</b> with stainless steel fittings (supplied without pump), suitable for use with 236-004 bags	231-939
<b>8-liter FlexFilm Bag</b> with single polypropylene fitting, for use with large Vac-U-Chamber (Cat. No. 231-939), pk/10	236-004

## Small Vac-U-Chamber

Description	Cat. No.
<b>Complete Vac-U-Chamber Kit</b> includes PCXR4 sample pump, single PowerFlex charger with cable, small Vac-U-Chamber, and ten 232-01 Tedlar sample bags <b>100-240 V</b>	224-4124
<b>Small Vac-U-Chamber only</b> with polypropylene fittings (supplied without pump), suitable for use with 236-001 or 232-01 bags	231-940
<b>1-liter Tedlar Bag</b> with single polypropylene fitting, for use with small Vac-U-Chamber (Cat. No. 231-940) and included in 224-4124 kit, pk/10	232-01
<b>1-liter FlexFilm Bag</b> with single polypropylene fitting, for use with small Vac-U-Chamber (Cat. No. 231-940), pk/10	236-001

## Twin Port Pocket Pump — 20 to 225 ml/min

### Programmable Bag Sampling



CE

- ▶ 12-hour run time with rechargeable NiMH battery
- ▶ Constant flows from 20 to 225 ml/min — suitable for other applications
- ▶ Simple 3-button operation or program with a PC using accessory software
- ▶ Continuous sample volume calculations

The twin port Pocket Pump® is ideal for bag sampling and other applications. Operate Pocket Pump from the simple 3-button integral keypad for quick grab samples. Or, program Pocket Pump from a PC using DataTrac® for Pocket Pump Software. Pocket Pump can be programmed for the delayed, intermittent, and repeat sampling that studies can require.

Description	Cat. No.
Twin Port Pocket Pump with NiMH battery pack, requires charger 223-228 (115 V) or 223-229 (230 V); for tubing, see Cat. Nos. 231-9-23 and 231-926 on p. 13	210-1002A

## Grab Air Sample Pump — 1 L/min

### Dedicated Pump for Filling Bags



- ▶ 9-volt alkaline battery for approximately 1000 liters volume on one battery
- ▶ Approximately 1 L/min flow rate

The SKC Grab Air Sample Pump is the best choice for grab-and-go bag sampling using sample bags. Grab Air operates at a fixed flow rate of 1 L/min for up to 1000 liters volume on one 9-volt battery. Simply attach a sample bag to the outlet port and turn on the pump. Simple, quick, reliable — Grab Air.

Description	Cat. No.
Grab Air Pump* with 9-volt alkaline battery; for tubing, see Cat. No. 231-9-23 on p. 13	222-2301
Grab Air Hazmat Kit* includes pump as described above and ten 1-liter bags with single polypropylene fitting (232-01)	222-2111

\* Use in non-explosive environments only. Not UL Listed for intrinsic safety. Not CE marked

## 222 Pump — 50 to 200 ml/min

### Pressure and Suction Applications



CE

UL LISTED

- ▶ Rechargeable NiCad battery for approximately 10 hours run time
- ▶ Adjustable flow rate — suitable for other applications including sorbent tubes

The durable, dependable, and lightweight SKC 222 Sample Pump features a suction port for tube sampling and a pressure port for bag sampling. Simple, reliable stroke counter technology provides for accurate air volume calculation.

Description	Cat. No.
222 Pump, 50 to 200 ml/min, with charger; for tubing, see Cat. No. 231-937 on p. 13	100-240 V 222-3KC

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