



CONSUMABLES AND SUPPLIES

AIR SAMPLING

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Gas Sampling Bags

Gas sampling bags are widely used as whole air sampling devices for monitoring gases in cabin, emission, workplace environments, indoor, etc. The gas sampling method by bags is ideal for many applications because of easy introduction to GC or enrichment by concentration tubes. However the results of analyses may vary depending on the material of the gas sampling bags, which is caused due to permeation or adsorption of gases. In addition, background delivered from the bag materials may disturb the determination of the target compounds. Therefore selecting a right bag material is inevitable for leading your analysis to success.

GL Sciences is proud to introduce "Smart Bag" series of new sampling bags, which were developed based on many years of our experiences and along with some other bags fulfills customer's demanding requirements worldwide.

In accordance with the following directions, select an appropriate bag to achieve highly reliable analytical results.

Select the Appropriate Sampling Bags for your Application

Smart Bag PA

- Polyvinyl alcohol film
- Chemically inert, resistant to heat and permeation
- Low background contamination
- Max. Operating Temp. : 120 °C
- Film thickness: 53 µm

Applications: In-cabin VOC's, Vehicle Emission, Emitted gases from materials, Permanent gases, etc.

Smart Bag 2F

- Polyvinylidene fluoride (PVDF) film
- Chemically inert and resistant to heat
- Max. Operating Temp. : 120 °C
- Film thickness: 50 µm

Applications: In-cabin VOC's, Vehicle Emission, Emitted gases from materials, etc.

Tedlar Bag

- Polyvinyl fluoride (PVF)
- Max. Operating Temp. : 100 °C
- Film thickness : 50 µm

Applications: Permanent gases and organic solvent gases.

ANALYTIC-BARRIER Bag

- Resistant to permeation
- Low background contamination
- Max. Operating Temp. : 70 °C
- Film thickness: 45 µm

Applications: In-cabin VOC's, Vehicle Emission, Permanent Gases, etc.

Fluororesin Bag

- Tetrafluoroethylene hexafluoropropylene copolymer film
- Chemically inert and resistant to heat
- Max. Operating Temp. : 110 °C
- Film thickness: 50 µm

Applications: Organic solvent gases.

Aluminum Bag (5-Layer Foil)

- Aluminum Bag is made of laminated film (from outer: nylon, polyethylene, alum foil and polyethylene, polyethylene)
- Resistant to permeation of permanent gases and methane
- Max. Operating Temp. : 65 °C
- Film thickness: 120 µm

Applications: Permanent gases.

Polyester Bag

- Polyester film
- Resistant to VOC permeation
- Film thickness: 38 µm

Applications: VOC's and malodorous compounds.

SKYPIA Bag

- Ethylene-vinyl alcohol copolymer (EVOH)
- Resistant to permeation
- Low background Contamination
- Max. Operating Temp: 100 °C

Applications: Automobile Interior Material VOC Emissions Testing

As shown above, GL Sciences has a wide variety of sampling bags to offer. It is extremely important to select the appropriate sampling bag depending on the target compound you are required to sample/collect to avoid any sampling error as much as possible. Please select the appropriate sampling bag to achieve highly reliable test results.

How to Choose a Gas Sampling Bag

SAMPLE PREPARATION

LIFE SCIENCE

LC ACCESSORIES

AIR SAMPLING

GC CAPILLARY COLUMNS

GC PACKED COLUMNS

GC ACCESSORIES

CELLS

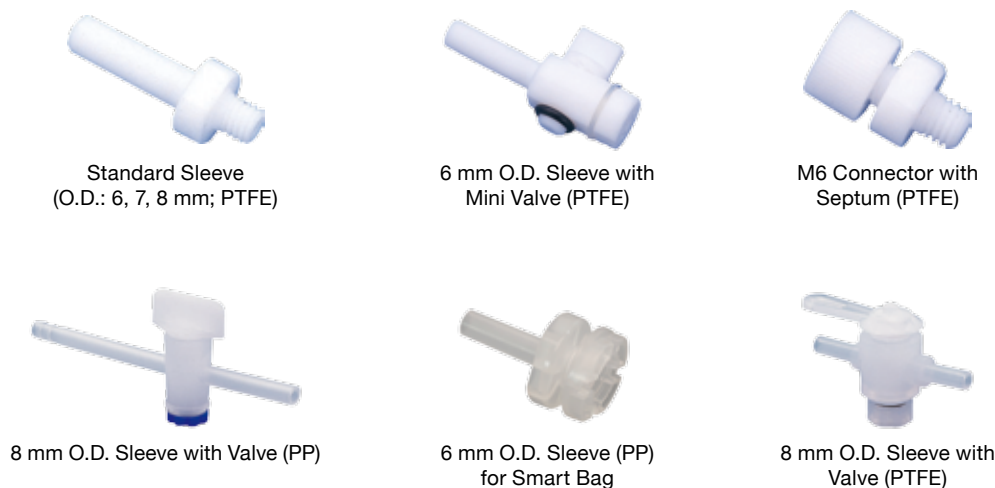
VALVES

(Example) ① Smart Bag PA — ② A — ③ A — ④ 10

※ This is the example for a Smart Bag PA with type A, standard sleeve at one end (6 mm), 10L.

①	Name of Bag	Smart Bag PA / Smart Bag 2F / ANALYTIC-BARRIER Bag Tedlar Bag / Fluororesin Bag / Aluminum Bag / Polyester Bag
②	Type	 □ : Sleeve or sleeve with mini valves ○ : M6 Connector
③	Connector	<p>Standard is: • 6 mm for less than 20 L • 8 mm for not less than 20 L</p> <p> A : Standard sleeve at one end AS : 7 mm sleeve at one end AK : 6 mm sleeve with mini valve at one end B : M6 connector at one end C : Standard sleeves at both ends CS : 7 mm sleeve at both ends CK : 6 mm sleeve with mini valve at both ends D : M6 connectors at both ends E : Standard sleeve at one end + M6 connector at the other end EK : 6 mm sleeve with mini valve at one end + M6 connector at the other end F : PP sleeve at one end (Type A of Smart Bag only available) G : PP sleeve at both ends (Type C of Smart Bag only available) AA8 : 8 mm sleeve at one end AAJ8 : PTFE joint for 8 mm sleeve at one end (Aluminum bag A type only) CCJ8 : PTFE joint for 8 mm sleeve at both ends (Aluminum bag C type only) AAP8 : PTFE joint for 8 mm sleeve at one end + 8 mm sleeve with valve at the other end (Aluminum bag only) </p>
④	Bag Capacity (L)	Standard: 1 L, 2 L, 3 L, 5 L, 10 L Other sizes such as from 0.1 L ~ 500 L can be manufactured upon request.

Connectors for Gas Sampling Bags



Smart Bag PA

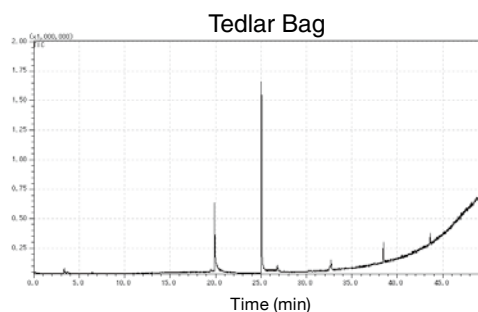
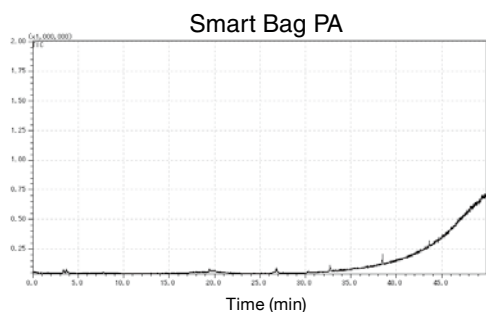
Smart Bag PA is made of poly vinyl alcohol film and delivers superior resistance to solvent gases, heat and adsorption for low back ground contamination. Smart Bag PA also avoids the permeation of most gases. This feature enables a wide range of sampling from permanent gases to organic gases.

Max. Operating Temp. : 120 °C

Blank Test

【Testing Procedure】

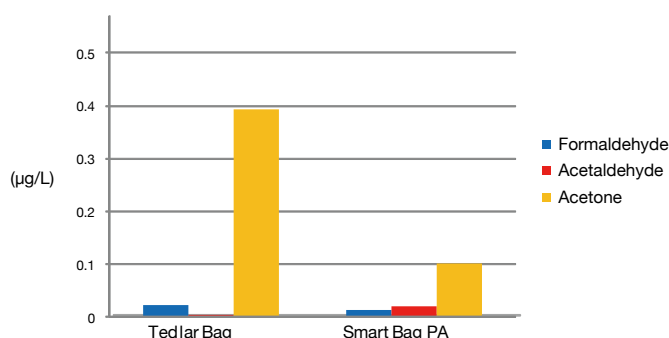
Each sampling bag (1L) was filled with nitrogen and put in an oven at 60 °C. 1 hour later, the each gas in the bags was withdrawn into a gas tight micro syringe and injected directly to a GC/MS. The both bags were not flushed/cleaned in advance.



Aldehydes/Acetone Blank Test

【Testing Procedure】

After being filled with nitrogen, both bags were closed and put in an oven at 60 °C. 1 hour later, each 1L gas in the bags was vacuumed with a pump through a DNPH cartridge and eluted sample was analyzed by HPLC. The both bags were not flushed/cleaned before test.



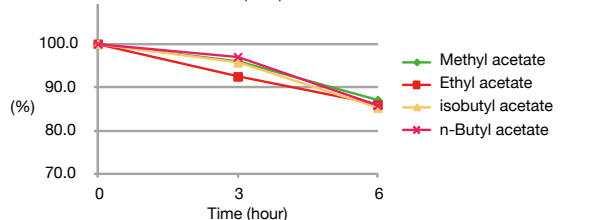
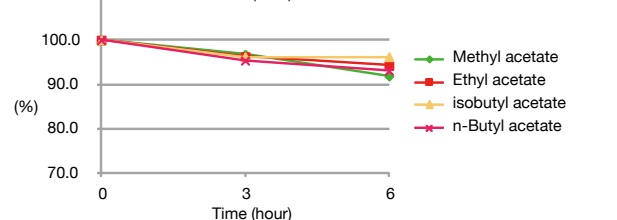
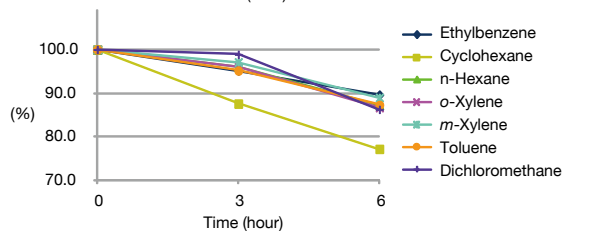
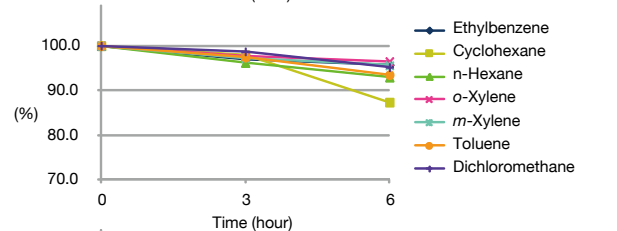
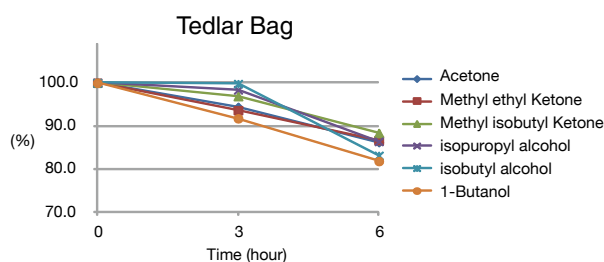
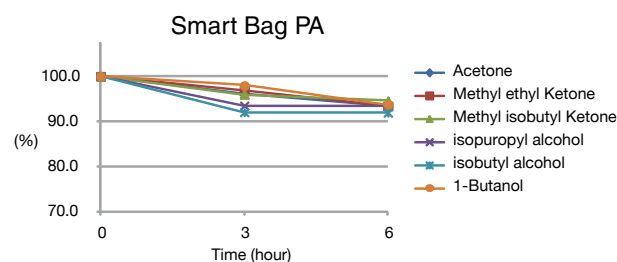
Storage Stability of Organic Solvent Gas in Smart Bag PA and Tedlar Bag

【Testing Procedure】

The same volume with the same constitution of vaporized standards were introduced to each bag. Then nitrogen was added to each bag and concentration changes over time were measured by a GC/FID.

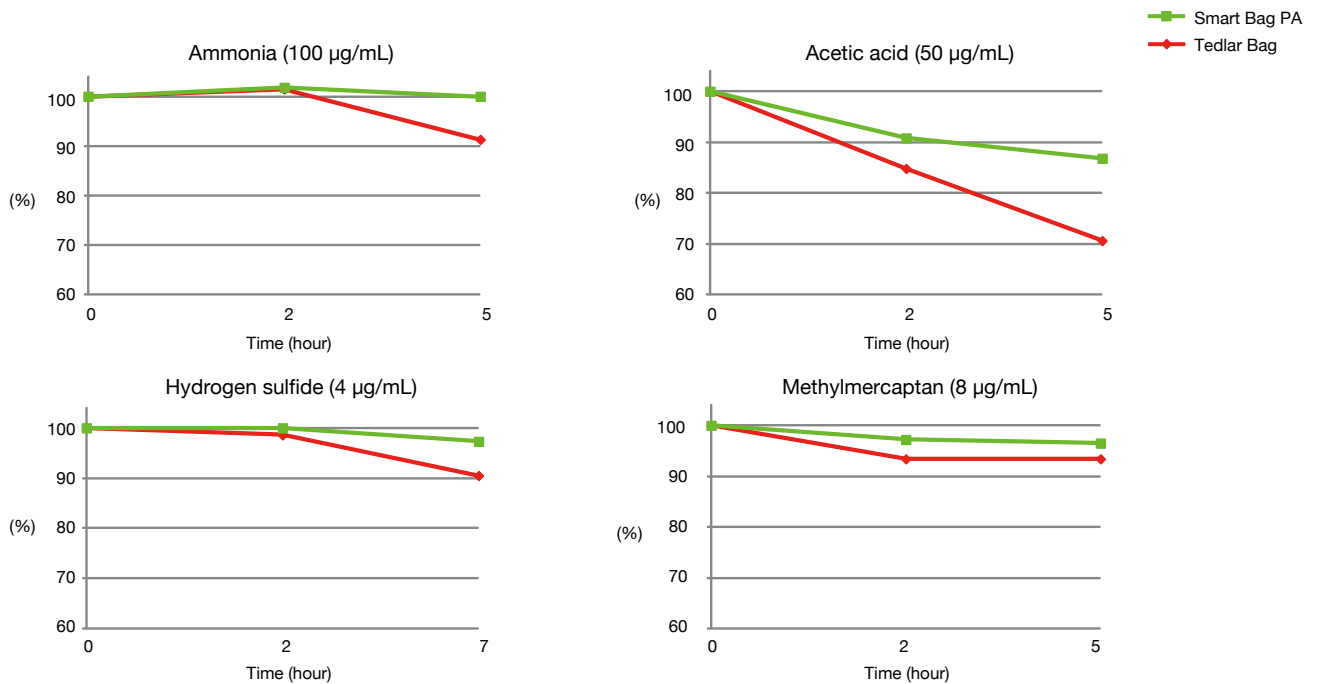
【Standard Compound List】

Acetone, Methyl ethyl ketone, Methyl isobutyl ketone, Isopropyl alcohol, Isobutyl alcohol, 1-Butanol, Ethylbenzene, Cyclohexane, n-Hexane, o-Xylene, m-Xylene, Toluene, Dichloromethane, Methyl acetate, Ethyl acetate, Isobutyl acetate, n-Butyl acetate (50 ng/mL each)



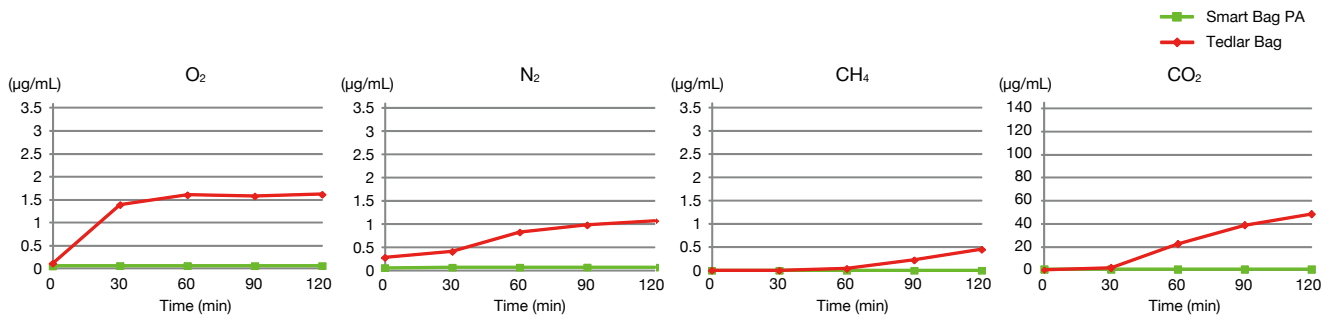
Storage Stability of Malodorous Compounds in Smart Bag PA and Tedlar Bag 【Testing Procedure】

After preparation of each malodorous sample as described below, 5L Smart Bag PA and Tedlar Bag were filled with the sample together with nitrogen gas. Concentration changes over time were calculated with a detecting tube at certain times.



Gas Permeability Test 【Testing Procedure】

Permeation rates of O₂, N₂, CH₄ and CO₂ were measured using a permeation rate measurement system on each sampling bag.



Smart Bag PA

Type	1 L	2 L	3 L	5 L	10 L	20 L	30 L	50 L	100 L
	Cat.No.	Cat.No.	Cat.No.	Cat.No.	Cat.No.	Cat.No.	Cat.No.	Cat.No.	Cat.No.
AF	3008-48101	3008-48102	3008-48103	3008-48105	3008-48110	3008-48120	3008-48130	3008-48150	3008-48160
AA	3008-97101	3008-97102	3008-97103	3008-97105	3008-97110	3008-97120	3008-97130	3008-97150	3008-97160
AAK	3008-97201	3008-97202	3008-97203	3008-97205	3008-97210	3008-97220	3008-97230	3008-97250	3008-97260
CG	3008-48401	3008-48402	3008-48403	3008-48405	3008-48410	3008-48420	3008-48430	3008-48450	3008-48460
CC	3008-97401	3008-97402	3008-97403	3008-97405	3008-97410	3008-97420	3008-97430	3008-97450	3008-97460
CCK	3008-97501	3008-97502	3008-97503	3008-97505	3008-97510	3008-97520	3008-97530	3008-97550	3008-97560
CEK	3008-97701	3008-97702	3008-97703	3008-97705	3008-97710	3008-97720	3008-97730	3008-97750	3008-97760

* Other bag sizes available upon request.

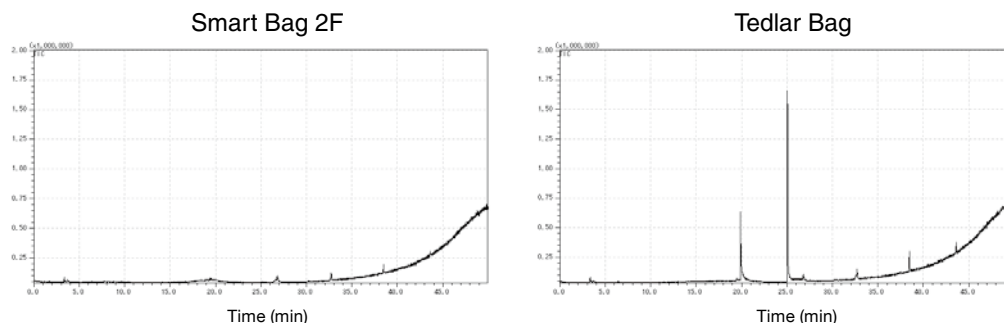
Smart Bag 2F

Smart Bag 2F is made of polyvinylidene fluoride (PVDF) film and delivers superior resistance to solvent gases and heat. In addition, this bag is suitable for sampling of VOC's from in-cabin, indoors, workplace environment, etc. Max. Operating Temp. : 120 °C

Blank Test

【Testing Procedure】

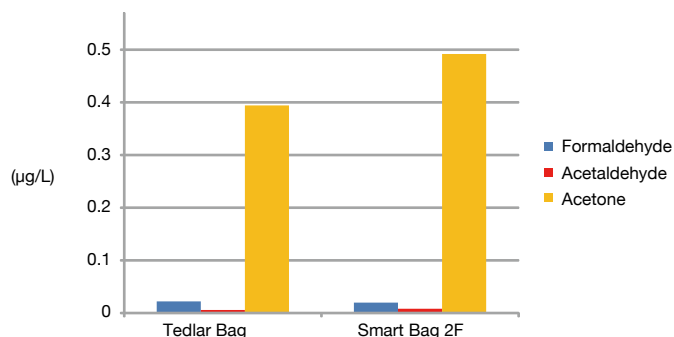
Each sampling bag (1L) was filled with nitrogen and put in an oven at 60 °C. 1 hour later, the each gas in the bags is withdrawn into a gas tight micro syringe and injected directly to a GC/MS. Both bags were not flushed/cleaned with nitrogen.



Aldehydes/Acetone Blank Test

【Testing Procedure】

After being filled with nitrogen, both bags were closed and put in an oven at 60 °C. 1 hour later, each 1L gas in the bags was vacuumed with a pump through a DNPH cartridge and eluted sample was analyzed by HPLC. The both bags were not flushed/cleaned before the test.



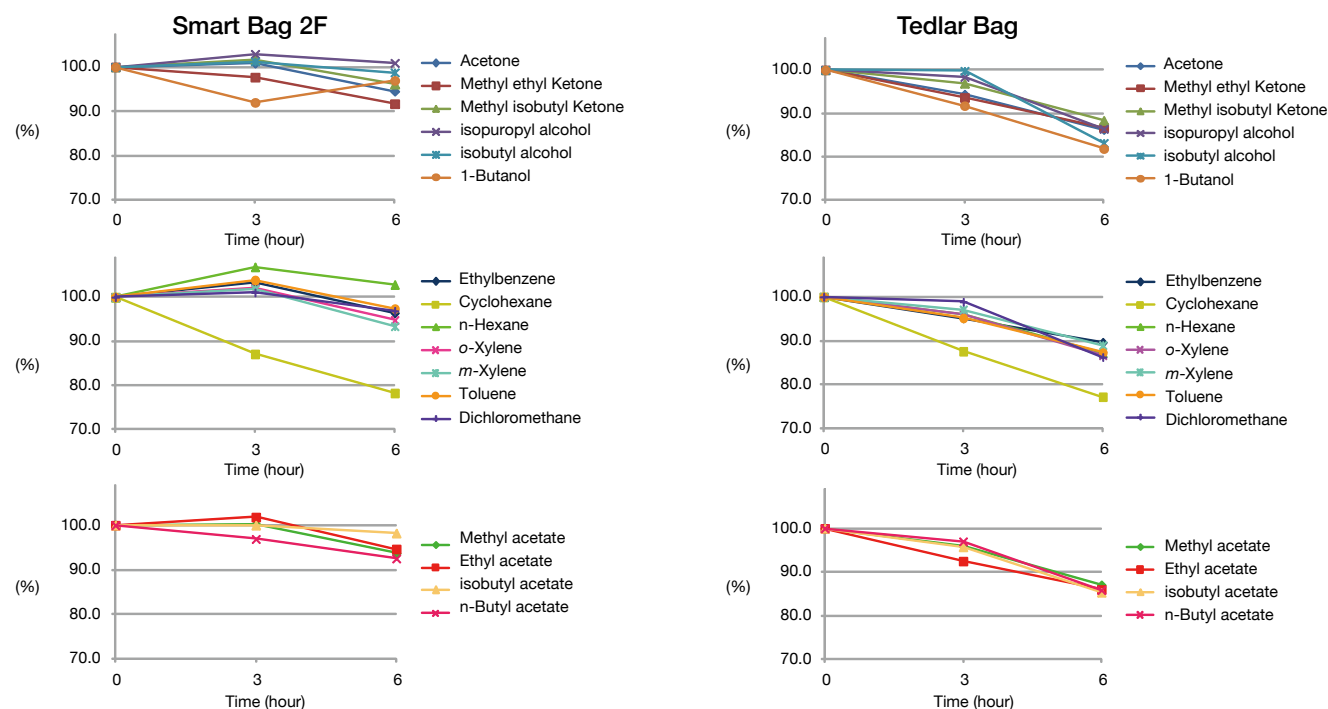
Storage Stability of Organic Solvent Gases in Smart Bag 2F and Tedlar Bag

【Testing Procedure】

The same volume with the same constitution of vaporized standards were introduced to each bag. Then nitrogen was added to each bag and were measured by a GC/FID.

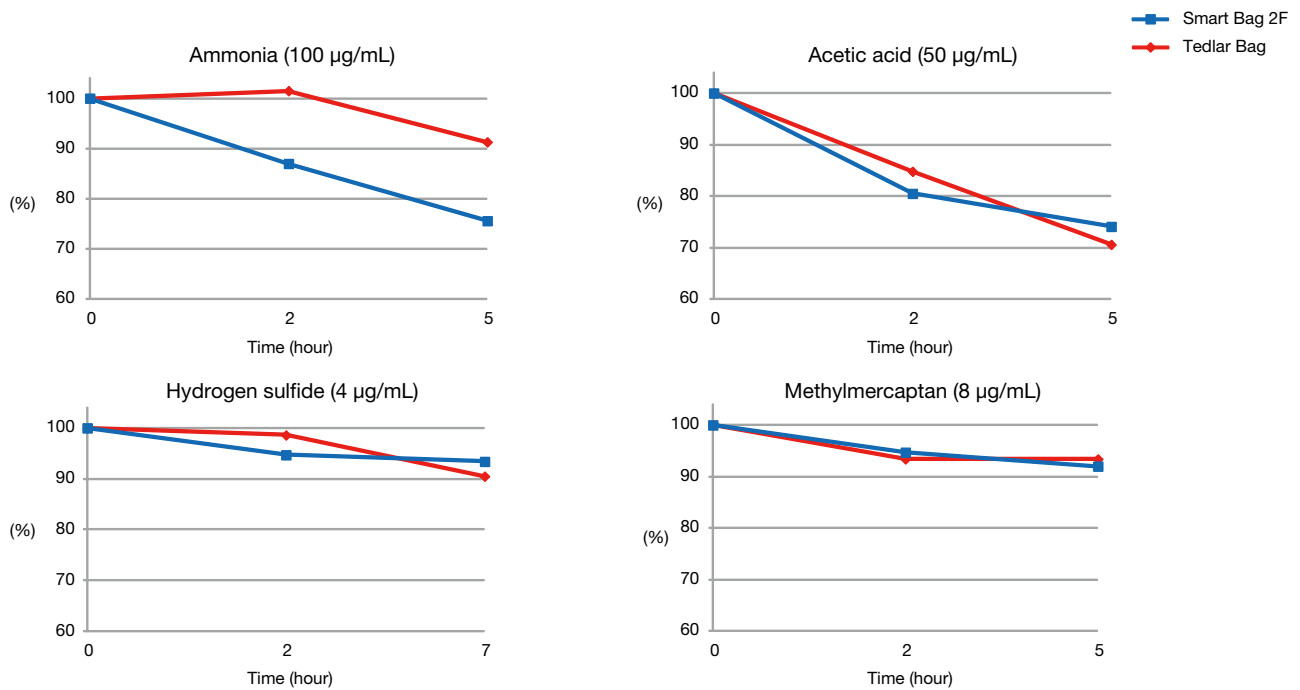
【Standard Compound List】

Acetone, Methyl ethyl ketone, Methyl isobutyl ketone, Isopropyl alcohol, Isobutyl alcohol, 1-Butanol, Ethylbenzene, Cyclohexane, n-Hexane, *o*-Xylene, *m*-Xylene, Toluene, Dichloromethane, Methyl acetate, Ethyl acetate, Isobutyl acetate, n-Butyl acetate (50 ng/mL each)



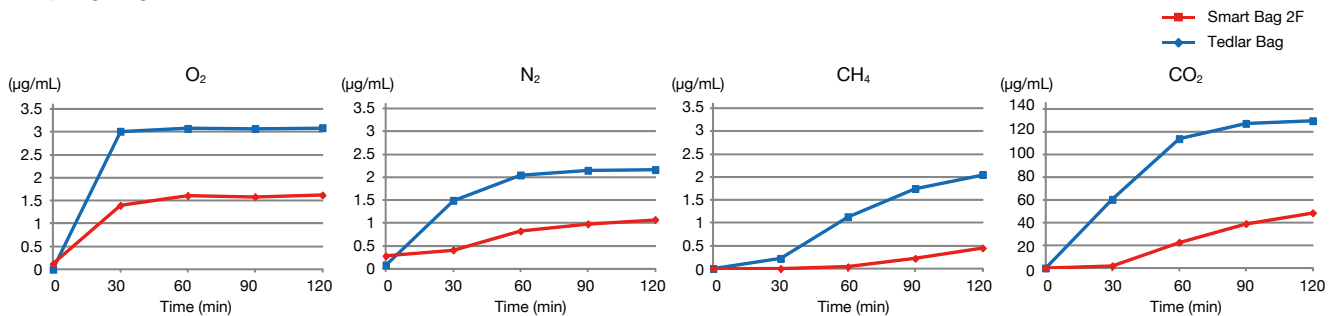
Storage Stability of Malodorous Compounds in Smart Bag 2F and Tedlar Bag 【Testing Procedure】

After preparation of each malodorous sample as described below, 5L Smart Bag 2F and 5 L Tedlar Bag were filled with the sample together with nitrogen gas. Concentration changes over time were calculated with a detecting tube at certain times.



Gas Permeability Test 【Testing Procedure】

Permeation rates of O₂, N₂, CH₄ and CO₂ were measured using a permeation rate measurement system on each sampling bag.



Smart Bag 2F

Type	1 L	2 L	3 L	5 L	10 L	20 L	30 L	50 L	100 L
	Cat.No.	Cat.No.	Cat.No.	Cat.No.	Cat.No.	Cat.No.	Cat.No.	Cat.No.	Cat.No.
AF	3008-49101	3008-49102	3008-49103	3008-49105	3008-49110	3008-49120	3008-49130	3008-49150	3008-49160
AA	3008-98101	3008-98102	3008-98103	3008-98105	3008-98110	3008-98120	3008-98130	3008-98150	3008-98160
AAK	3008-98201	3008-98202	3008-98203	3008-98205	3008-98210	3008-98220	3008-98230	3008-98250	3008-98260
CG	3008-49401	3008-49402	3008-49403	3008-49405	3008-49410	3008-49420	3008-49430	3008-49450	3008-49460
CC	3008-98401	3008-98402	3008-98403	3008-98405	3008-98410	3008-98420	3008-98430	3008-98450	3008-98460
CCK	3008-98501	3008-98502	3008-98503	3008-98505	3008-98510	3008-98520	3008-98530	3008-98550	3008-98560
CEK	3008-98701	3008-98702	3008-98703	3008-98705	3008-98710	3008-98720	3008-98730	3008-98750	3008-98760

* Other bag sizes available upon request.

Tedlar Bag

SAMPLE PREPARATION

Tedlar Bag is made of Polyvinyl fluoride (PVF) film and delivers superior resistance to organic solvent gases, abrasion-resistant and a wide operating temperature range from -70 °C to 100 °C.

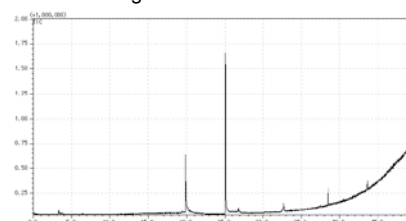
Tedlar Bag is suitable for various compounds from permanent gases to organic solvent gases.

Blank Test

【Testing Procedure】

A Tedlar Bag (1L) was filled with nitrogen gas and put in an oven at 60 °C. 1 hour later, the gas in the bag was withdrawn into a gastight micro syringe and injected directly to a GC/MS. The bag was not flushed / cleaned in advance.

Tedlar Bag

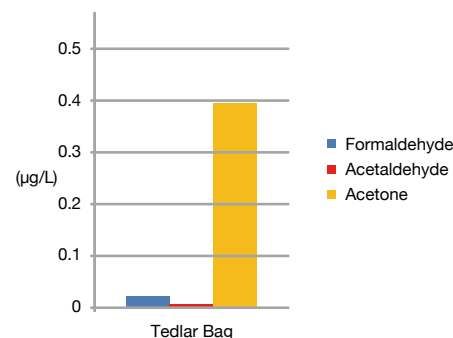


LIFE SCIENCE

Aldehydes/Acetone Blank Test

【Testing Procedure】

After being filled with nitrogen gas, a Tedlar bag was closed and put in an oven at 60 °C. 1 hour later, 1L gas in the bag was vacuumed with a pump through a DNPH cartridge and eluted sample was analyzed by HPLC. These bag was not flushed / cleaned in advance.



LC ACCESSORIES

Storage Stability of Organic Solvent Gases in Tedlar Bag

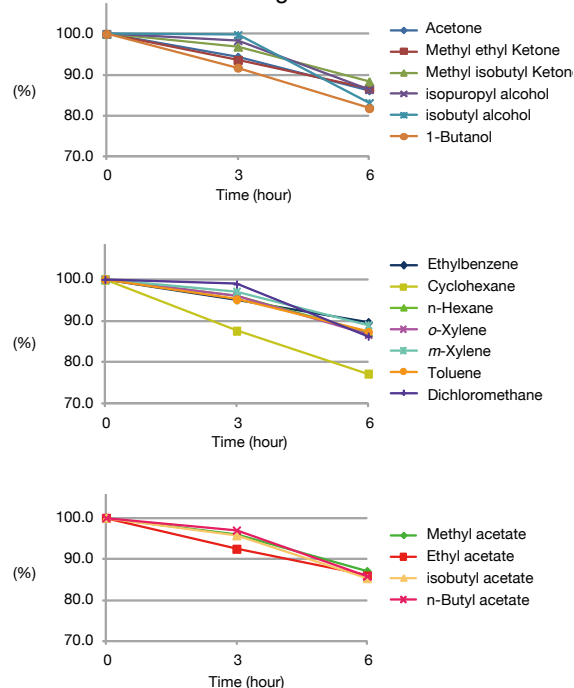
【Testing Procedure】

Vaporized standards as described below were introduced into Tedlar Bags. Then nitrogen gas was added into the Tedlar Bags and were measured by a GC/FID.

【Standard Compound List】

Aceton, Methylethylketone, Methyl isobutyl ketone, Isopropyl alcohol, Isobutyl alcohol, 1-Butanol, Ethylbenzene, Cyclohexane, n-Hexane, o-Xylene, m-Xylene, Toluene, Dicholoromethane, Methyl acetate, Ethyl acetate, Isobutyl acetate, n-Butyl acetate (50ng/mL each)

Tedlar Bag



SAIR SAMPLING

GC CAPILLARY COLUMNS

GC PACKED COLUMNS

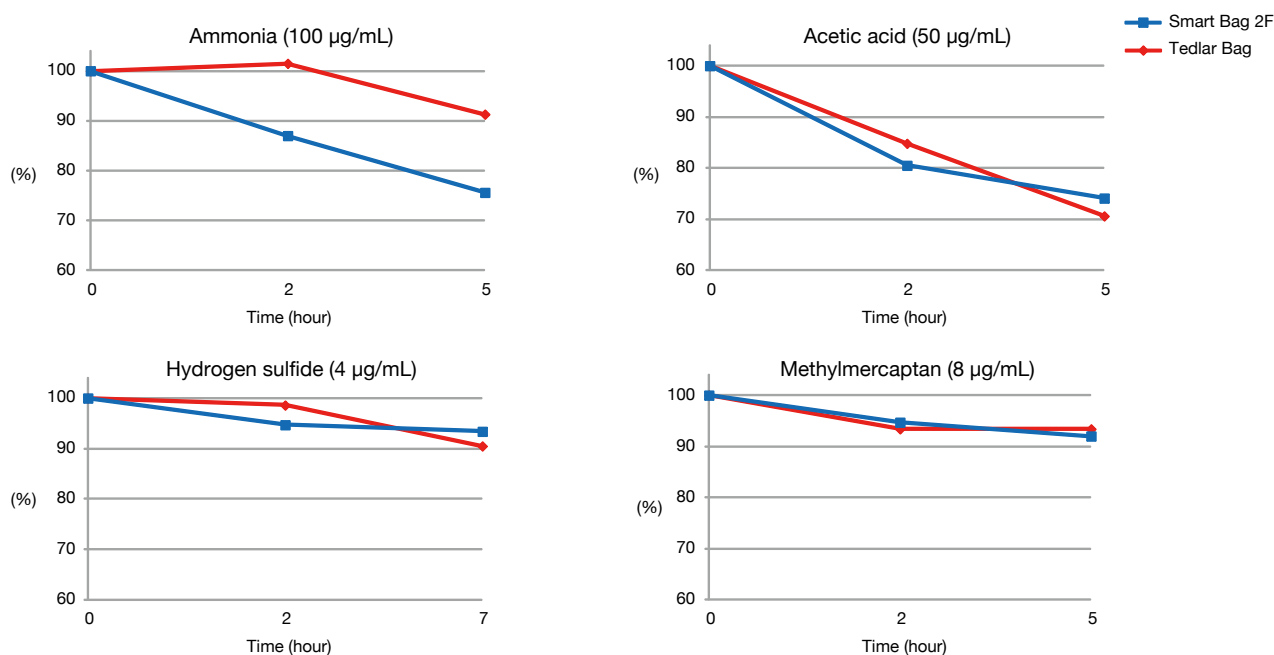
GC ACCESSORIES

CELLS

VIALS

Storage Stability of Malodorous Compounds in Tedlar Bag 【Testing Procedure】

Each concentration of malodorous compound was prepared as described below and filled in a 5L Tedlar Bag together with nitrogen gas. Concentration changes over time were calculated with a detecting tube at certain times.



Gas Permeability Test

Permeation rate of O₂, N₂, CH₄ and CO₂ was measured using a permeation rate measurement system on Tedlar Bag.

(cm³/(m² · 24 h · 1 atm))

Material	Hydrogen	Oxygen	Nitrogen	Carbon dioxide
Tedlar Bag	324.9	20.4	2.9	158.5

Tedlar Bag

Type	1 L	2 L	3 L	5 L	10 L
	Cat.No.	Cat.No.	Cat.No.	Cat.No.	Cat.No.
AA	3008-11101	3008-11102	3008-11103	3008-11105	3008-11110
AAK	3008-91101	3008-91102	3008-91103	3008-91105	3008-91110
AAS	3008-11701	3008-11702	3008-11703	3008-11705	3008-11710
AB	3008-11201	3008-11202	3008-11203	3008-11205	3008-11210
CC	3008-13301	3008-13302	3008-13303	3008-13305	3008-13310
CCK	3008-93301	3008-93302	3008-93303	3008-93305	3008-93310
CCS	3008-13801	3008-13802	3008-13803	3008-13805	3008-13810
CD	3008-13401	3008-13402	3008-13403	3008-13405	3008-13410
CE	3008-13501	3008-13502	3008-13503	3008-13505	3008-13510
CEK	3008-93501	3008-93502	3008-93503	3008-93505	3008-93510
EE	3008-15501	3008-15502	3008-15503	3008-15505	3008-15510
EEK	3008-95501	3008-95502	3008-95503	3008-95505	3008-95510

* Other bag sizes available upon request.

Special large type Tedlar bag, 500 mL, 1000 mL and 2000 mL are available upon request.

ANALYTIC-BARRIER Bag & Fluororesin Bag

■ ANALYTIC-BARRIER Bag

- Good resistance to permeation
- Low background contamination
- Max. Operating Temp. : 70 °C
- Applications: In-cabin VOC, Permanent gases, etc.

Type	1 L	2 L	3 L	5 L	10 L	20 L	30 L	50 L	100 L
	Cat.No.	Cat.No.	Cat.No.	Cat.No.	Cat.No.	Cat.No.	Cat.No.	Cat.No.	Cat.No.
AA	3008-99101	3008-99102	3008-99103	3008-99105	3008-99110	3008-99120	3008-99130	3008-99150	3008-99160
AAK	3008-99201	3008-99202	3008-99203	3008-99205	3008-99210	3008-99220	3008-99230	3008-99250	3008-99260
AB	3008-99301	3008-99302	3008-99303	3008-99305	3008-99310	3008-99320	3008-99330	3008-99350	3008-99360
CC	3008-99401	3008-99402	3008-99403	3008-99405	3008-99410	3008-99420	3008-99430	3008-99450	3008-99460
CCK	3008-99501	3008-99502	3008-99503	3008-99505	3008-99510	3008-99520	3008-99530	3008-99550	3008-99560
CE	3008-99601	3008-99602	3008-99603	3008-99605	3008-99610	3008-99620	3008-99630	3008-99650	3008-99660
CEK	3008-99701	3008-99702	3008-99703	3008-99705	3008-99710	3008-99720	3008-99730	3008-99750	3008-99760

* Other bag sizes available upon request.

■ Fluororesin Bag

- Ethylene-tetrafluoroethylene copolymer film
- Good resistance to chemical compounds and heat
- Max. Operating Temp. : -70 °C ~ 110 °C
- Applications: Organic solvent gases

Type	1 L	2 L	3 L	5 L	10 L
	Cat.No.	Cat.No.	Cat.No.	Cat.No.	Cat.No.
AA	3008-21101	3008-21102	3008-21103	3008-21105	3008-21110
AAK	3008-38101	3008-38102	3008-38103	3008-38105	3008-38110
CC	3008-23301	3008-23302	3008-23303	3008-23305	3008-23310
CCK	3008-38301	3008-38302	3008-38303	3008-38305	3008-38310

* Other bag sizes available upon request.

■ Aluminum Bag(5-Layer Foil)

- Aluminum Bag is made of laminated film (from outer: nylon, polyethylene, alum foil and polyethylene, polyethylene)
- Good permeation resistance to permanent gases, methane
- Shows relatively higher adsorption of high-boiling organic solvents, which background of organic compounds
- Max. Operating Temp. : 65 °C
- Applications: Permanent gases

Type	1 L	2 L	3 L	5 L	10 L
	Cat.No.	Cat.No.	Cat.No.	Cat.No.	Cat.No.
AA	3008-26101	3008-26102	3008-26103	3008-26105	3008-26110
AAK	3008-26201	3008-26202	3008-26203	3008-26205	3008-26210
CCK	3008-26301	3008-26302	3008-26303	3008-26305	3008-26310
CEK	3008-26401	3008-26402	3008-26403	3008-26405	3008-26410

Type	20 L	30 L	50 L	100 L	200 L
	Cat.No.	Cat.No.	Cat.No.	Cat.No.	Cat.No.
AAK	3008-26220	3008-26230	3008-26250	-	-
CCK	3008-26320	3008-26330	3008-26350	-	-
CEK	3008-26420	3008-26430	-	-	-
AA8*	3008-28520	3008-28530	3008-28550	3008-28591	3008-28592

* Other bag sizes available upon request.

ANALYTIC-BARRIER Bag & Fluororesin Bag

■ Polyester Bag

- Polyester film
 - Good permeation resistance to VOC's
 - Compatible with sampling of malodorous compounds at boundary lines for environmental analysis
- Applications: Volatile Organic Compounds, odor analysis

Type	1 L	2 L	5 L	10 L
	Cat.No.	Cat.No.	Cat.No.	Cat.No.
AA	3008-60101	3008-60102	3008-60105	3008-60110
AAK	3008-60201	3008-60202	3008-60205	3008-60210
CCK	3008-60401	3008-60402	3008-60405	3008-60410

Description	Cat.No.
Polyester Bag 20 L 8 mm Sleeve, 10 pcs	3008-62000

* Other bag sizes available upon request.

■ SKYPIA Bag

Skypia bag is made of Ethylene-vinyl alcohol copolymer (EVOH). It is excellent in gas barrier properties, adsorption resistant.

Type	1 L	2 L	3 L	5 L	10 L
	Cat.No.	Cat.No.	Cat.No.	Cat.No.	Cat.No.
AA	3008-21101	3008-21102	3008-21103	3008-21105	3008-21110
AAK	3008-38101	3008-38102	3008-38103	3008-38105	3008-38110
CC	3008-23301	3008-23302	3008-23303	3008-23305	3008-23310
CCK	3008-38301	3008-38302	3008-38303	3008-38305	3008-38310

* Other bag sizes available upon request.

■ Odor Bag

- Polyester Bag
 - Thickness: 25 µm
- Glass Tube: 10 (I.D) x 12 (O.D)mm
 Size: 3L (250 × 280mm)
 10L (390 × 400mm)

Description	Detail	Qty.	Cat.No
Odor Bag 3L	No.1, No.2, No.3	100 pcs	3008-31130
Odor Bag 3L	None No.	100 pcs	3008-31030
Odor Bag 10L	None No.	1 pc	3008-31500
Nose Mask	for odor bag	100 pcs	3008-35300
Silicon Cap	for odor bag	50 pcs	3008-35200

■ Custom Size Gas Sampling Bags



Custom size 300 L sampling bag

Our great deal of experience in this industry enable us to provide custom size gas sampling bags from 0.1 L to 500 L on request.

SAMPLE PREPARATION

LIFE SCIENCE

LC ACCESSORIES

AIR SAMPLING

GC CAPILLARY COLUMNS

GC PACKED COLUMNS

GC ACCESSORIES







CELLS

VALS

Accessories for Sampling Bags

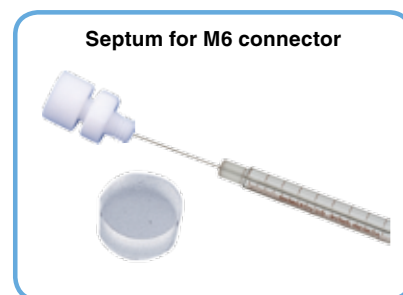
■ Accessories for Sampling Bags

Details of Connectors for Sampling Bags and Availability of Replacement

Description	Standard Sleeve (O.D.: 6, 7, 8 mm)	6 mm O.D. Sleeve	6 mm O.D. Sleeve with Mini Valve	M6 Connector with a Septa	8 mm O.D. Sleeve with Valve	8 mm O.D. Sleeve with Valve
Photo						
Purpose	Easy to connect to the tube.	Sleeve for Smart Bags. Easy to connect to the tube. The special shape avoids the gases to remain inside the bag.	Easy to connect to the tube. The open/close valve avoids gas leak.	The silicon makes this valve suitable for using by syringe.	For Aluminium Bag. The silicon makes this valve suitable for using by syringe.	For Aluminium Bag. The silicon makes this valve suitable for using by syringe.
Material	PTFE	Polypropylene (PP)	PTFE	PTFE	Polypropylene (PP)	PTFE
Replacement	Not available	Not available	3008-39998	3008-39997	3008-29999	3008-29998

Description	Qty.	Cat.No.
6 mm O.D. Sleeve with Mini Valve	1 pc	3008-39998
M6 Connector with Septum	1 pc	3008-39997
8 mm O.D. PP Valve with sleeve	1 pc	3008-29999
8 mm O.D. PTFE Valve with sleeve	1 pc	3008-29998

Accessories for Connector



Description	Qty.	Cat.No.
Plug for 7 and 8 mm O.D. Sleeve	50 pcs	3008-35006
Cap for 6 mm O.D. Sleeve	30 pcs	3008-35105
Septum for M6 Connector	50 pcs	3008-35016

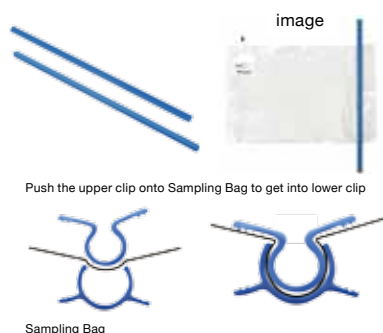
Clip for 10L Sampling Bags

To use with one side open sampling bags.

● Specifications

length : 50 cm

Max. Operating Temp. : 65 °C



Description	Qty.	Cat.No.
Clip for 10L Sampling Bag	1 pc	3008-18000