



Gas Sampling Bags, Pulse Pump III™, Accessories

Application

Cali-5-Bond™ air/gas sampling bags have been specifically designed for easy and reliable collection of air & gas samples. The non-permeable, opaque and chemically inert properties of the bags ensure that the collected gases remain uncontaminated and unaltered.

The sampling bags provide a simple and economical method of collecting and transferring air & gas samples from any collection point to a centrally located test instrument or laboratory for analysis. They are, therefore, ideal for use in hard-to-reach locations.

The bags can also be used to collect vapours, or may be used with odour test panels.

When using gas sampling bags, it may not be necessary to keep track of the precise volume collected or the elapsed time required to obtain the sample. Correct use of the bags results in a collected sample that is representative of the environment or process medium

from which it was collected (taken), either as a "grab sample" or a Time Weighted Average.

Further, using sophisticated expensive, real-time gas analysis techniques to establish concentration levels generally means being restricted to one fixed monitoring point. In contrast, totally portable gas sampling bags permit absolute freedom of movement and measurement over a wide area of sample points. Determining if and where a gas or pollution problem exists becomes an easy and inexpensive task.

Design

Any gas sampling bag technique is dependent upon the quality of the sampling bag used. The construction and materials of the *Cali-5-Bond™* Gas Sampling Bags ensure the physical integrity of any sample taken, and allow it to be stored without change over time. Thus, the collected sample remains truly

representative of its collection environment or medium conditions.

In contrast to other single- or multiple-layer plastic materials in use, these silvery bags are made by a special production process (US Patent) and contain five different layers of materials:

- Polyester (outside)
- Polyvinylidene Chloride
- Aluminium Foil
- Polyamide
- High Density Polyethylene (inside)

The layers are bonded together to form a single flexible material of 0.14 mm thickness.

Pressure & Temperature

Recommended sampling bag inflation pressures are 20 - 140 mbar (0.25 - 2.0 psi). Bags should not be over-inflated, as this may lead to bag failure. When bag samples are air transported, provision should be made for gas expansion at higher flight altitudes.

User Benefits

- Non-permeable
- Opaque - to protect collected gases against ultraviolet light
- Do not chemically interact with gases
- Strong enough to withstand rough and repeated handling
- Do not become brittle or otherwise deteriorate over time
- Simple to maintain and do not require technical training to operate

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Bags should not be used at temperatures higher than 60°-65°C (140°-150° F). All polymer based gas sampling bags should be handled with extra care when used at any temperature above ambient, particularly above 40°-45° C (110°-115° F).

If high-temperature stack gases are to be collected, sample line tubing should be long enough to allow the sampled gas stream to cool before entering the bag.

Bag types and sizes

Cali-5-Bond™ Gas Sampling Bags are available in pillow (= standard) or snout shape. Both shapes are available in standard sizes up to 200 litres. The bags can be manufactured in any shape and size up to 1,000 ltr to meet individual specification.

Standard Equipment

A choice of two valves can be ordered as standard equipment with all bags. These are either:

- Twist-type Valve with hose barb or

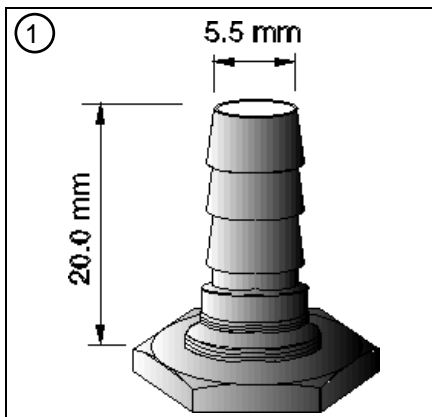
- Straight-through Connection (STC).

A silicone rubber septum can be glued to the bag as an optional item, for syringe-injection or withdrawal of sample gas.

Item No.	Volume ⁽¹⁾ [litres]	Size (approx.)	
		[mm]	[inches]
GSB-P/ 0.1	0.1	76 x 127	3 x 5
GSB-P/ 0.5	0.5	152 x 203	6 x 8
GSB-P/ 1	1.0	203 x 203	8 x 8
GSB-P/ 2	2.0	203 x 305	8 x 12
GSB-P/ 5	5.0	203 x 584	8 x 23
GSB-P/ 10	10	381 x 406	15 x 16
GSB-P/ 15	15	400 x 508	16 x 20
GSB-P/ 22	22	406 x 610	16 x 24
GSB-P/ 44	44	584 x 660	23 x 26
GSB-P/ 60	60	610 x 800	24 x 31.5
GSB-P/ 90	90	800 x 813	31.5 x 32
GSB-P/ 100	100	838 x 800	33 x 31.5
GSB-P/170	170	787 x 1.245	31 x 49
GSB-P/ 200	200	787 x 1.397	31 x 55

(1) Capacity equal or greater than litre volume shown
Minimum volume shown measured @ 17.7 mbar
(0.253 psi; 7.0" WG)

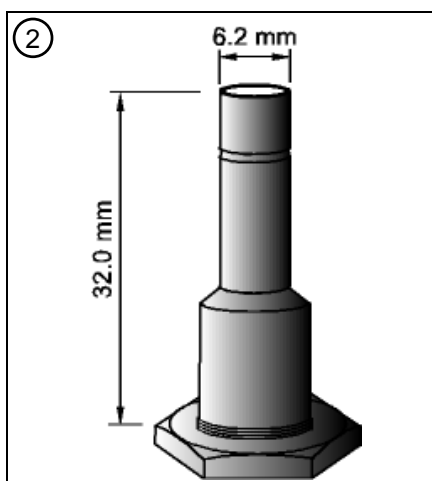
Standard Valves



Twist-Type (V-NPB-1-TT), Figure 1

The Twist-Type Valve (NPB) with hose barb connection can be ordered as a standard feature. Gas flow can be controlled by turning the valve which gradually opens or closes it. The jagged ridge on the hose barb secures the tubing to the stem. To allow gas to flow, the valve must be turned counter-clockwise and, similarly, clockwise to stop the flow.

The thread in the valve stem is not gas tight when the valve is opened. That means that gas can leak through the thread when, for example, a tube is connected to the valve and the valve is opened. Tubing should therefore be cut 90° to its own sidewall. When attached, it should extend far enough down the barbed stem to avoid potential leakage (between the stem and base) but not so far that it prevents the stem from turning.



Straight Through Connection (STC-NPB-F-SR), Figure 2

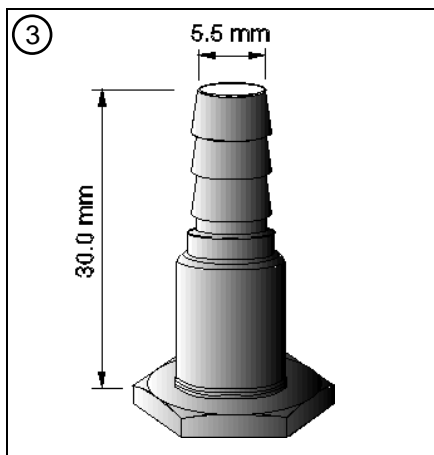
The Straight Through Connection (STC) can be ordered as a standard feature instead of the Twist-Type valve. The Straight-Through Connection (STC) is any unobstructed gas channel connection that does not allow the user to control the flow of gas. Two STC's may be used to allow a continuous flow of gas or liquid through the bag, if the bag is to be used as a buffer. Used in conjunction with another type of valve (inlet port), an STC may also be installed as an outlet purge-port, so as to permit a flow-through purge (cleaning) of the bag after each use. (In this case, for gas sampling, a short piece of tubing must be placed on the STC and a closing device (such as a plastic medical tubing clamp) then placed on this tubing.)

Two types of STC's are available - either as a smooth shaft with swaging (shown in Figure 2) or as a tyre valve with closing stem removed (but with threaded-cap). Both are available in nickel plated brass.

The „swage-ring“ (small circle at the end of the smooth-shaft STC) facilitates the use of a „quick connect“ sample line adapter, and in particular the „Swagelok™“ line of fittings.

Of course, tyre valves can also be provided with their original closing stems installed, see ⇒ „Optional Valves“ ⇒ „Tyre Valves“. An optional 6" length (threaded-twist) sample line connection is also available for use with the tyre valve STC.

Optional Valves



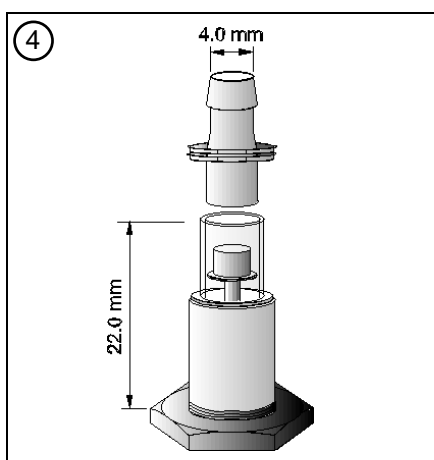
Twist-Type Double-O-Ring (V-NPB-2/OO), Figure 3

The Twist-Type Double-O-Ring Valve operates in the same way as the Twist-Type Valve (Figure 1). However, this valve has the special added feature of a secondary O-ring installed on the valve stem, greatly reducing or eliminating gas loss at recommended inflation pressures.

Luer-Fit Valve™ (V-L/F-1), Figure 4

The Luer-Fit Valve™ is a secure, self-closing valve which cannot be opened or left open accidentally, thus preventing any loss of gas or liquid sample. It is easy to use and requires no turning or twisting of the valve stem.

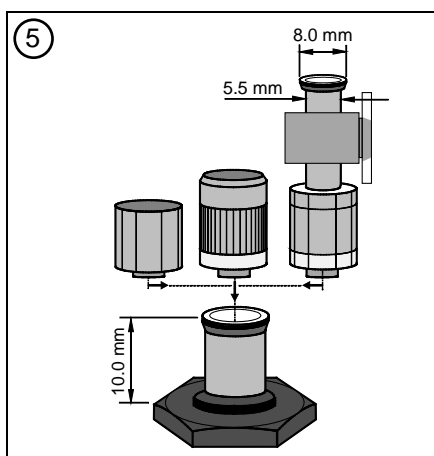
The Luer-taper Quik-Mate™ Connector (shown above the Luer-Fit Valve™), standard with each Luer-Fit Valve™, is a flow-through adapter for instant (push-pull) connection of tubing to the valve. The tapered fitting between the valve stem housing and Quik-Mate™ Connector becomes tighter as pressure is exerted on the Quik-Mate. This ensures a gas-tight fit between the sample line tubing and the Luer-Fit Valve™.



Gases can be inserted or withdrawn through the use of either sample line tubing or a syringe with a Luer-taper barrel fitting. This valve can eliminate the need to work with syringe-needles, if desired. The Luer-Fit Valve™ is also compatible with our full line of sampling accessories, including the Hann-Pump™.

Please Note: Because of its tiny gas channels, the Luer-Fit Valve™ is not suitable for gases with particulate. It also has a lower flow rate than other valve connections at the same pressure. Further, one must be aware of „dead space“ which may occur when using a syringe with a needleless syringe barrel, to withdraw or inject sample gas or liquid through the valve-stem housing.

Stopcock-valve, Figure 5 (from left to right, from top to bottom: STOPCK-DE/1500, STOPCK-SEP, STOPCK-ROT/L1200, STOPBASE-F)

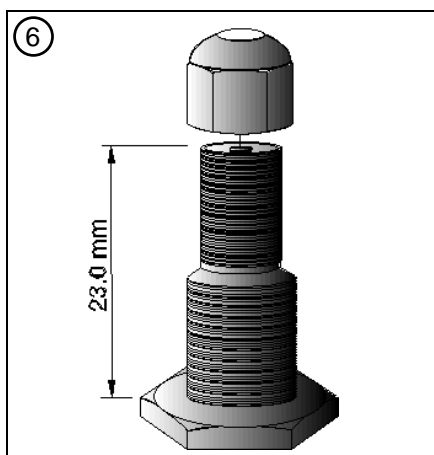


The Stopcock-Valve is one of our most popular valves because of its many different applications. This valve allows the user to control the flow of gas with greater flexibility. It consists of two pieces - a stopcock-base and a stopcock valve assembly which connects independently to the base by means of a rotating locking nut. (Figure left to right: Closing Cap "STOPCK-DE/1500", Stopcock-Septum "STOPCK-SEP", 1-way-Stopcock "STOPCK-ROT/L1200")

The base "STOPBASE-F" can also be used as a Straight-Through Connection (STC) simply by attaching tubing using the Quik-Mate™ Connector. The Stopcock Valve (connected to the base by a clockwise twisting motion) is also compatible with all our Luer-taper collection accessories. Tubing can also be easily fitted to the end of the Stopcock Valve using the Quik-Mate™ Connector.

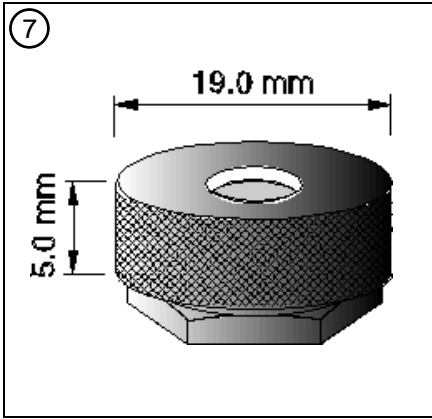
An optional self-sealing Stopcock-Septum, directly connected with a clockwise twisting motion to either the stopcock base alone or to the top of the stopcock-valve assembly, permits direct syringe injection/withdrawal of sample gas or liquid without any dead space effect.

Tyre Valve (V-CHR-S-1.12), Figure 6



The Tyre Valves are used in the same manner as one would use the valve on an automobile tyre. In Figure 6 the Chrome valve is shown. It is also available in a Nickel Plated Brass version (length 29 mm).

An optional 150 mm (6") length (threaded-twist) sample line connection (SLC-PVC/6) is also available for use with the tyre valve.



Replaceable Septum Holder (A-SEPHLD/DEL), Figure 7

When a septum is affixed to a bag with an adhesive, every penetration of it by a syringe makes another hole in the bag. This leads to continued bag deterioration and reduces its useful life. An optional replaceable septum holder allows the user to change the septum as required. Replaceable septum holders are available in the following materials: Delrin, Nickel plated brass, and Polysulfone. Stainless steel is available on special order.

Without figure:

Straight Through Connection 19 mm (0.75") ID

This STC has an inside diameter of 19 mm (0.75") and can be used when an unobstructed, low flow air or gas flow into the bag is required e.g. when collecting breathing air.

Tube Extension (STC-NPB-1/8"OD)

This STC has an outside diameter of 3.2 mm (1/8") and can be used to connect flexible tubes to the gas sampling bag.

Accessories

Pulse Pump III™

This personal air/gas sampling pump is used to fill the sampling bags. The Pulse Pump III™ can be worn by the individual doing the sampling (see Rucksack) or can be mounted at the test site.

The Pulse Pump operates on 2 standard batteries (1.5V, 9V). New batteries provide more than 35 hours of continuous operation and from 75 – 100 hours of pulse operation. Flow rates can be adjusted from 1-85 litres per hour (0.0166 - 1.5 litres per minute). The pump measures approximately 13x8x5 cm (5x3x2 inches) and weighs 400 grammes (13 oz).

Long-Life alkaline batteries are included. Replacement batteries should also be Long-Life alkaline.

Rucksack (1 –10 litre bags only)

The Rucksack is a comfortable lightweight backpack which holds the gas sampling bag. It also has a transparent compartment to hold the sampling pump. This ensures easy workplace monitoring and hands free operation.

Syringes

A standard syringe needle or a deflected point syringe needle can be used in conjunction with the silicone rubber septum to withdraw or inject a specific volume of air/gas. Although the deflected tip needle does puncture the self-sealing silicone rubber septum, the deflected tip needle does not "core-out" the septum as would a standard medical syringe needle.

The Luer-Lok™ syringe, which is compatible with the Luer-taper-fitting, allows the needleless use of a syringe with the Luer-Fit valve™.

Syringe size: 457x38 mm
(18x1.5 inches)
Syringe volumes: 10 cm³ / 50 cm³.
Custom sizes available.

Hann-Pump™

The Hann-Pump™ provides the simplest and most economical method of grab-sampling available. It is foolproof, as the operator only has to squeeze the pump (bulb).

One-way check valves are fitted to each end of the pump. It can be used to move gas samples into or out of sampling bags by attaching the appropriate end of the pump to the bag. The Hann-Pump™ is made from PVC materials and is compatible with the Luer-Fit Valve™, Stopcock Valve, 3/16 inch ID sample tubing and other Luer-taper accessories. Outer diameter of connection nozzle: 4.2 mm & 6.3 mm

Legend

- CHR = Chrome
- NPB = Nickel Plated Brass
- P = Pillow
- PP = Polypropylene
- PCC = Pillow / Corner Cut
- PVC = Polyvinylidene Chloride
- S = Snout
- SS = Stainless Steel
- STC = Straight Through Connection

Luer-Lok™ is a trademark of Becton, Dickinson Company

Swagelok™ is a trademark of SWAGELOK Co., Solon, Ohio, USA

User Check List
<p>Gases to be sampled:</p> <p><input type="checkbox"/> Aggressive</p> <p>_____</p> <p>_____</p> <p>_____</p> <p><input type="checkbox"/> Inert</p> <p>_____</p> <p>_____</p> <p>_____</p>
<p>Pressure:</p> <p><input type="checkbox"/> Maximum _____</p>
<p>Temperature:</p> <p><input type="checkbox"/> Maximum _____</p>
<p>Valves:</p> <p><input type="checkbox"/> Twist-type 1.0" NPB</p> <p><input type="checkbox"/> Twist-type OO-Ring 1.48" NPB</p> <p><input type="checkbox"/> Twist-Type OO-Ring 1.48" SS</p> <p><input type="checkbox"/> Luer-Fit with Quik-Mate</p> <p><input type="checkbox"/> Stopcock</p>
<p>Straight Through Connect.:</p> <p><input type="checkbox"/> NPB 1.38" threaded cap</p> <p><input type="checkbox"/> CHR 1.12" threaded cap</p> <p><input type="checkbox"/> NPB 1.38" swage ring</p> <p><input type="checkbox"/> SS 1.38" swage ring</p> <p><input type="checkbox"/> PP 3/4" ID, 2.5" OD</p>
<p>Accessories:</p> <p><input type="checkbox"/> Pulse Pump III™</p> <p><input type="checkbox"/> Rucksack</p> <p><input type="checkbox"/> Syringes</p> <p><input type="checkbox"/> Hann-Pump™</p>