

GLOVEBAG Tips & Uses

GLOVEBAG is:

Convenient - is used like a rigid glove box but has much greater flexibility. It is made of 3 mil thick polyethylene, with integral gloves. Equipment is placed in through the equipment sleeve and the bag is then inflated.

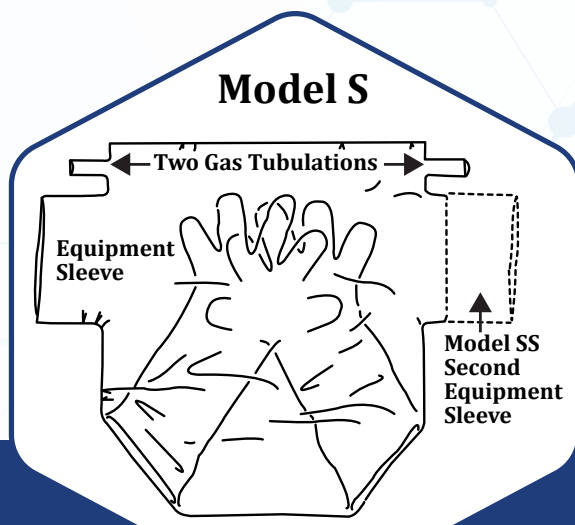
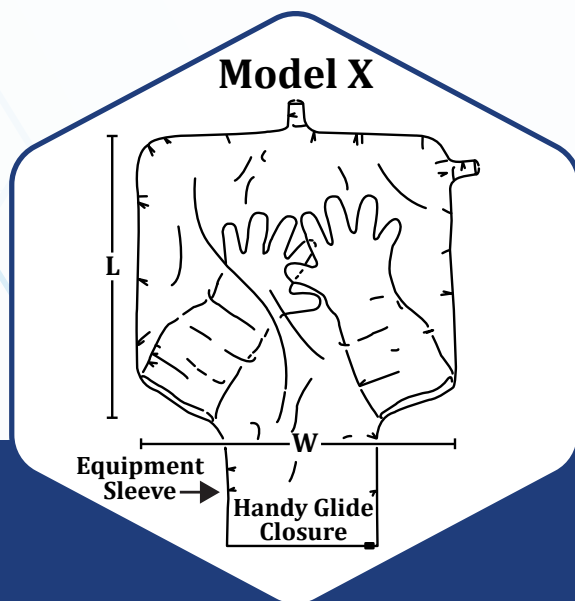
Disposable - is economical enough to be used once and discarded, if contaminated, but it's durable and it can be used over and over if desired.

Versatile - is great for keeping air-sensitive materials from contact with air or moisture. Use it whenever an inert atmosphere is needed in reactions or in handling reagents.

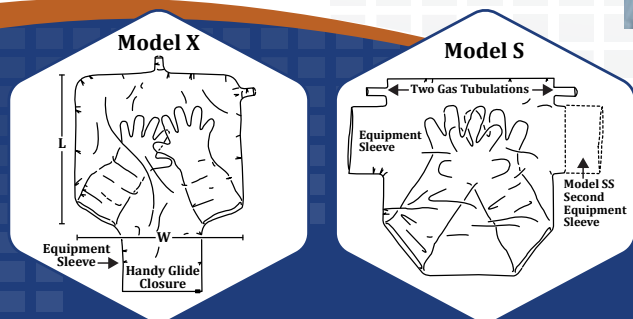
Economical - Even if you have a rigid glove box in your lab, consider the GLOVEBAG. It can be purged faster than a glove box, with less gas, and can be easily adapted to fit your special needs. GLOVEBAG can facilitate any work you are doing with air-sensitive materials.

These tips describe some of the ways GLOVEBAGS can be used as reported to us. Applications include: Anaerobic chamber, botany, dust-free environments, isolation, field sampling, forensics, industrial parts cleaning, sample preparation and many more...

GLOVEBAG is easy to use! Two basic models are show below.



Number of gas tubulations depends on model



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INFLATING – WHAT GAS?

Ordinary “industrial grade” compressed nitrogen is 99.99% pure and is acceptable for most laboratory work requiring an inert atmosphere.

Since a GLOVEBAG holds between 1½ and 5 cubic feet of gas (X-17-17 to X-37-37) you will be able to carry out several experiments with minimal cost.

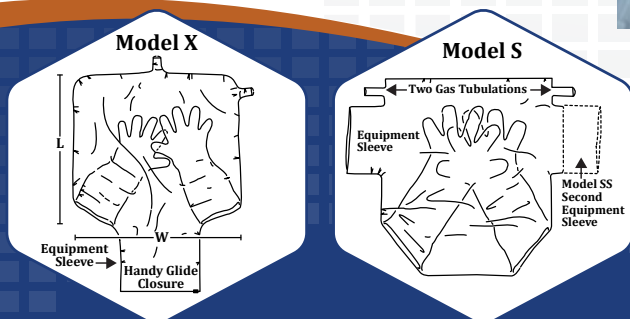
For especially sensitive work you might consider using one of the higher purity grades of nitrogen, which are available from some suppliers. In order of increasing costs, these are called Extra Dry, High Purity, Pre-purified, Ultra High Purity, Zero, and Oxygen-Free.

These grades differ greatly with respect to the impurities, therefore, consider carefully the types of impurities that you do not want, (or that you don’t mind having present): argon, neon, traces of hydrocarbons, oxygen or moisture.

If the chemicals you intend to use in GLOVE BAG are highly moisture sensitive, you may want to consider the following suggestions: use a cylinder of “Extra Dry” nitrogen and pass the nitrogen through a 4-foot column of Drierite. One scientist reports he has also placed a beaker containing fresh drying agent (P2O5) inside the GLOVEBAG to take care of any traces of moisture that might diffuse into the GLOVEBAG.

At the other extreme of moisture content, we have a report of a scientist who uses his GLOVE BAG for work in “moisture saturated” atmosphere.

Since some scientists use GLOVE BAG primarily for dust-free applications – they don’t worry about the presence of either oxygen or moisture, they simply use filtered air!



GLOVEBAG Tips & Uses

INFLATING – WHAT GAS? - (Continued)

One scientist reports that he uses helium gas with the GLOVEBAG for his ordinary lab work. He likes the fact that helium is lighter than air: “It pulls the bag up for nice easy access to the equipment inside.” (Of course any gas will fully inflate GLOVEBAG. Helium may make the top surface rise higher.)

However, some scientists use heavier purging gases. Several scientists we have talked to use Argon.

One correspondent reported that he found an “aquarium pump” (ordinarily used for bubbling air through a small home aquarium) to be a simple, convenient device for inflating GLOVEBAG. This can be very handy if your application calls for inflating GLOVEBAG with ordinary air.

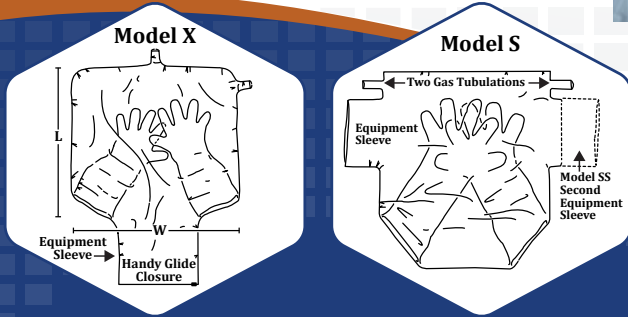
We also have a report from California of CO₂ being used to inflate a GLOVEBAG “out in the field.” In the absence of a cylinder of gas, the scientist used a piece of dry ice inside the GLOVEBAG. As the dry ice evaporated it inflated the chamber and maintained an inert atmosphere.

ANAEROBIC APPLICATION

If you are concerned about the permeability of GLOVEBAG to moisture and/or oxygen, purge continuously as the GLOVEBAG is being used, thus any traces of moisture or oxygen that diffuse through the walls are swept out.

CLOSING UP EQUIPMENT SLEEVE

Even before GLOVEBAG and its contents have been purged and inflated, you should plan on how you intend to close up the equipment entrance sleeve. There are several different methods of closure. They include our Handy- Lok closure, or our Quick-Closing Aluminum Clamp, as well as several improvised arrangements, shown here.



GLOVEBAG Tips & Uses

HANDY-LOK CLOSURES FOR X17-17 and S and SS GLOVEBAG

Our standard closure is the Handy-Lok. It has two parts: (A) the grooved base strip, which is fairly rigid and has a self-adhesive backing, and (B) a flexible spline, which fits into the grooved strip and seals GLOVEBAG.

CLOSING UP EQUIPMENT SLEEVE

Glovebags that are ordered with an HG extension (ex. 108D X-17-17HG) come with a Handy-Glide closure built into the bag. This is a convenient method of sealing the bag after the workload is placed on the bag.

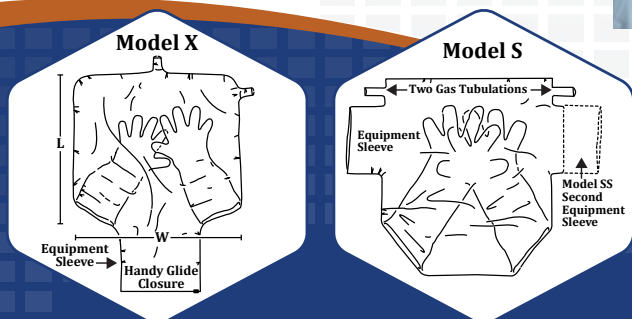


HEAT SEALING

If ever you have an application where it is imperative that GLOVEBAG be tightly sealed, you may wish to heat the sleeve. If you seal the sleeve at some distance from the GLOVEBAG you will be able to cut off the seal and reseal the GLOVEBAG several times. Various hand-operated heat sealers are available for sealing polyethylene bags.

AND FINALLY...

For many applications it is neither necessary nor desirable to achieve a completely tight seal in closing GLOVEBAG. A small leakage out of the GLOVEBAG (if it is nitrogen or other nontoxic gas) is sometimes preferred, since it will result in a continuous flow of fresh gas into the GLOVEBAG.



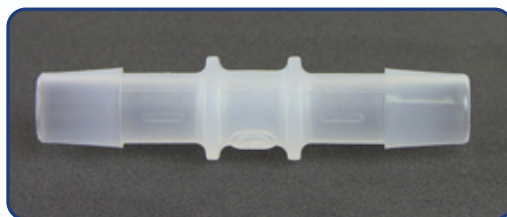
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CONNECTING AND PURGING THE GLOVEBAG

Once the GLOVEBAG is hooked up to the inert gas supply, we suggest that you open the flow control valve slightly and gently purge the empty GLOVEBAG. Then, while still purging, insert your equipment into the GLOVEBAG through the equipment entrance sleeve, if the equipment is bulky and contains an appreciable amount of air, you can save time and purging gas by purging each piece independently before placing it in the GLOVEBAG.

An alternative purging procedure when using bulky apparatus containing residual air is to use a long purging tube that extends into GLOVEBAG through the gas inlet tabulation. Then, when the piece of apparatus is placed inside the GLOVEBAG, you can insert the end of this purging tube into the equipment and purge it directly.

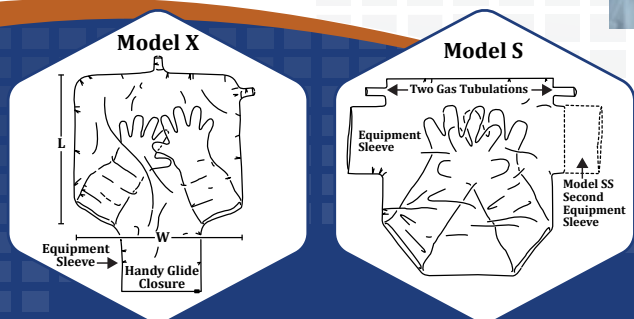
We have another note from the same man, suggesting that you can put the gas-purging control valve (a Hoke valve) inside the GLOVEBAG. You can then control the flow of gas from inside - while you have your hands in the GLOVEBAG manipulating your apparatus. Be sure to connect the Hoke valve to the inert gas supply with tubing, which is able to withstand the supply pressure.



WHAT PRESSURE SHOULD YOU USE?

We are often asked: "What pressure can I use in my GLOVEBAG?" The answer is somewhat surprising. If you put more than 1 cm (of Hg) pressure on the GLOVEBAG, you'll have trouble inserting your arms into the GLOVEBAG sleeves.

Under ordinary conditions, you'll probably use only about 2 or 3 mm (Hg) pressure. Or stating it differently, inflate the GLOVEBAG like a soft pillow - not like a balloon!



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HOLDING GLOVEBAG IN PLACE

While some scientists like the mobility of GLOVEBAG, (and may even hold a GLOVEBAG in their lap) other scientists like the GLOVEBAG to stay put in one place - on the bench. If the bench top is non-porous, you can use two suction-cup Boston clips to hold the GLOVEBAG fixed. We suggest attaching the clips either at the rear corners or front corners of the GLOVEBAG.

Another scientist suggested that you can use double-face Scotch Tape on the underside of the GLOVEBAG so the GLOVEBAG will stick onto the lab bench! Warning: Don't use any more tape than you need; it's sometimes hard to get off.

One scientist reported that he holds down his GLOVEBAG with two "lead bricks" placed in the rear corners.

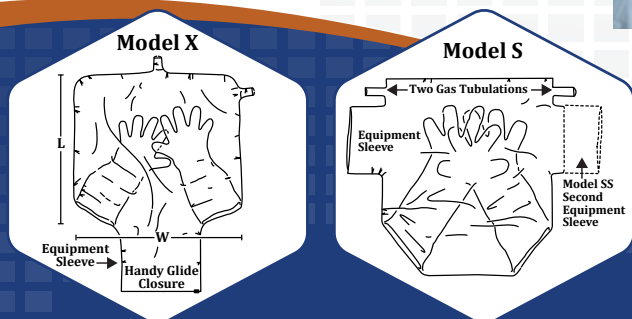
ADD A FLOOR OR BASE

Some people add a floor to their GLOVEBAG to help hold it in place. Different types of floors are used. A soft floor will overcome the effect of a hard bench top. Here are a variety of tips we've received on the subject of floors, bases and mats.

Two different soft floors:

1. Use a rectangle with rounded corners cut out of heavy polyethylene or vinyl matting that you can buy in hardware stores.
2. Or use a rubber mat, such as an automobile floor mat; some sizes are excellent for use with GLOVEBAG.

Note: If you are concerned about traces of residual air in your experiments, better not use a porous mat as a floor within the GLOVEBAG. However, if you really like such soft, porous mats consider using them underneath the GLOVEBAG; you might even attach the mat to the outside of the GLOVEBAG with double-faced tape. This will give you the cushioning effect of the porous foam, without introducing the entrapped air inside the GLOVEBAG.



GLOVEBAG Tips & Uses

OTHER APPARATUS USED IN A GLOVEBAG

Since moisture can affect Cronar film used in electron microscopy, GLOVEBAG can be used in transferring dried film from a film box to cassettes. The film is dried by evacuation in a large vacuum box, and then placed in an X-17-17 GLOVEBAG along with the cassettes. Use of a GLOVEBAG reduces the pumping time and lowers the degree of contamination of the electron microscope.

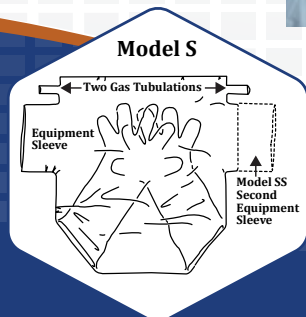
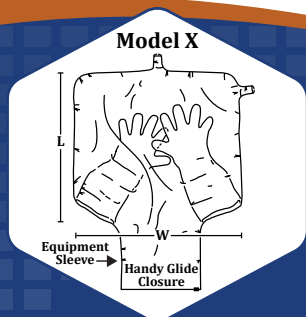
A more prosaic use of GLOVEBAG is to use it when mixing and applying epoxy cement. A nitrogen atmosphere keeps moisture away from the mixture; the epoxy sets up with “glass-like” clarity.

One scientist prepares easily oxidizable compounds, reports that instead of transferring the materials out of the GLOVEBAG and then into a desiccator, he puts his desiccator inside the GLOVEBAG. He is able to do all his preparation and transferring in the nitrogen atmosphere. At the end of the experiment, he removes the desiccator containing his samples from the GLOVEBAG. As he reports, “the compound never comes in contact with oxygen.”

“In order to hold things such as flasks in a GLOVEBAG, use a ring stand which has been cut off to an appropriate height. In addition to being an extra pair of hands in the GLOVEBAG, the short ring stand holds the GLOVEBAG in place with its heavy base.”

A chemist reported that he grinds dried plant materials in a Waring Blender in a GLOVEBAG. (The electric cord was extended through the gas inlet.)

A scientist working with fine mesh alumina, uses GLOVEBAG as a “storage chamber.” He ran into trouble with the powdered alumina spilling and spreading around when he sampled it. His solution was to use a large glass-baking dish to hold the powdered material. A large shallow dish was apparently very convenient when he wanted to scoop up a fresh sample.



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Moving up to larger biological systems, we find GLOVEBAG has been used as a disposable incubator. In work with rabbit fetuses taken by Caesarean section for studies, a scientist found that a battery of four GLOVEBAG could readily maintain as many as 32 rabbit fetuses for periods of up to 72 hours. The advantage of GLOVEBAG for this work is that “it needed neither sterilization nor decontamination and is disposable.”

GLOVEBAG USED BY PHYSICIST

GLOVE BAG goes out into the field with another scientist who uses it in an open boat to protect scientific equipment from salt spray and moisture. GLOVEBAG protects the equipment and yet the gloves allow access “to switches and controls”.

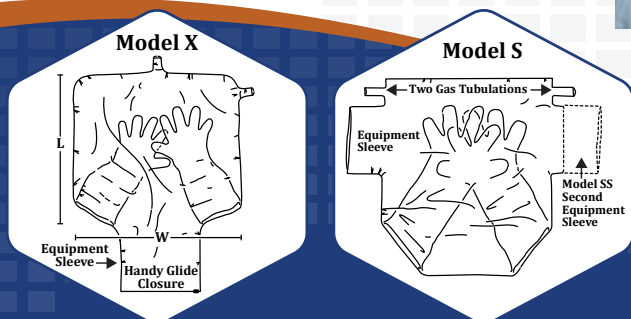
Another physicist reported that he uses GLOVEBAG to enclose welding operations. He “T.I.G.” welds up titanium capsules before they are inserted in a nuclear reactor to have their contents irradiated. The argon from the torch both inflates the GLOVEBAG and maintains an inert atmosphere in it. We questioned our correspondent about the heat from the T.I.G. torch, and he replied, “The heat from the arc is almost entirely radiant, and the polyethylene doesn’t absorb enough to do damage. A large heat sink is used to clamp the titanium capsule.”

Yet another welding report: “GLOVEBAG are currently being used to provide a protective inert gas atmosphere for inert gas welding of parts where multiple pass welds are required, or where back up gas is needed to prevent oxidation of the welded area.”

USE OF GLOVEBAG WITH APPARATUS THAT EXTENDS OUT OF THE GLOVEBAG

So far, we’ve considered apparatus th compact enough to fit inside a GLOVEBAG. Here are some applications involving apparatus that sticks out of a GLOVEBAG:

A GLOVEBAG can also be used for titrations of oxygen sensitive solutions. While one normally thinks in terms of enclosing a complete burette in a large GLOVEBAG, you can use a standard size GLOVEBAG (108D X-17-17H) and have the upper portion of the burette protrude through a small hole. The GLOVEBAG can be fastened to the burette with a rubber band; there is enough room inside a 108D X-17-17H for a magnetic stirrer.



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When distilling moisture-sensitive compounds, it may be convenient to have the distillate receiver mounted in a GLOVEBAG, with the main part of the distilling equipment outside. This makes it possible to change receivers without exposing the apparatus to air. This arrangement has been used in preparing compounds such as VOCl_3 .

USE OF GLOVEBAG WITH MICROSCOPE

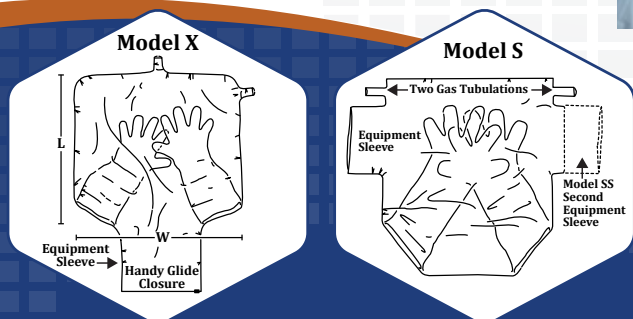
Microscope-peering scientists have found that GLOVEBAG provides a handy chamber for containing a microscope when one wishes to work in a controlled atmosphere.

A scientist who used a microscope in a GLOVEBAG with eyepiece protruding through the polyethylene wall liked this arrangement because he was able to gas-sterilize the whole set up. He used ethylene oxide, propiolactone, or other gaseous sterilizing agents.

Another scientist who works with cathetometer microscopes reported that GLOVEBAG helps him when he is studying cold objects. Having dry nitrogen around the microscope keeps moisture from condensing on the optics.

Another scientist attaches the GLOVEBAG to his binocular microscope. His approach is to remove the complete upper part of the microscope, cut a hole in GLOVEBAG, and then fit the microscope back together with the lower part in the GLOVEBAG and the upper part outside!

A different approach has the microscope outside the GLOVEBAG. In this tip, the user puts a glass window in the GLOVEBAG and has the microscope outside. He recommends using a 45x50 mm cover glass that he tapes to a rectangular hole cut in the GLOVEBAG. He suggests taping both inside and outside in order to withstand the slight internal pressure of the GLOVEBAG.



GLOVEBAG Tips & Uses

MISCELLANEOUS

GLOVE BAG can be a great help for fieldwork. This scientist uses **GLOVEBAG** as a part of his “portable laboratory.” If he encounters a dusty environment, he uses a **GLOVEBAG** to protect parts of his computer and his disk drive for the deleterious effects of the dust... helps keep his computer up and running!

We are told that Helium-Neon lasers “expire” as a function of time whether they are run or not (i.e., just sitting on the shelf). That’s why new units are usually guaranteed for only one year. The common reason for failure is a loss of He gas by diffusion from the laser tubes.

“A He-Ne laser having failed from lack of He, can be restored to normal operation by storing it in a **GLOVE BAG** for 7 to 10 days under a pressure of approximately 1 atmosphere of He gas. The diffusion process is thus reversed, but under these conditions the rate of diffusion of He into the glass envelopes is over 100 times greater than the reverse equilibrium process. This application of a **GLOVEBAG** saves the considerable cost of replacing the laser tube.”

An enterprising chemist developed a clever way of using **GLOVEBAG** for her work with light-sensitive materials. She simply inserted **GLOVEBAG** in a dark trash or garbage bag; when it was absolutely necessary to “peek” at what her hands were doing, she cut a small hole or narrow slit in the outer bag.

Although the great majority of **GLOVEBAG** applications involve working with apparatus inside **GLOVEBAG**, “here’s one for the books!” One scientist protects his notebook from being contaminated in his nasty lab atmosphere by keeping his notebook and a pen inside a **GLOVEBAG**. Since standard **GLOVEBAG** is fairly transparent, he simply slips his hands in the gloves and makes his notebook entries when necessary...sure keeps the pages clean!

WARNING! When handling toxic materials use only in a fume hood or other controlled system to prevent and protect against exposure in case of leakage. When handling any hazardous material all proper personal protective equipment should be employed.