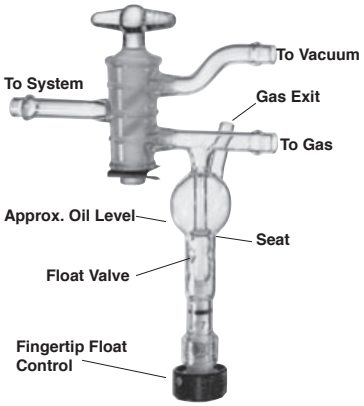
The Firestone* Valve

A rapid Purge Valve for Controlled Atmosphere Work

NO Air suck Back (Liquid Seal) • NO Pressure Monitoring Necessary
NO Mercury Used • NO Reducing Valve Needed on Gas Source
NO High Vacuum Source Necessary • NO Fear of Pressure Buildup
NO Watching Once Purge is Completed



8766 VALVE, Rapid Purge, Firestone* ♠

A rapid, efficient and foolproof Purge Valve for 100% replacement of air in reaction vessels with any desired gas (N_2, H_2, Ar, Cl_2, etc.). [1]No mercury used, no reducing valve needed on gas source, no high vacuum source necessary. No need to watch manometers, hand control gas flow, or install warning systems to prevent accidents. Expensive gases are conserved because once purging is complete, the flow can be cut almost to zero. This valve is so inexpensive, it is possible to run all reactions under nitrogen as easily as not.

*Designed by Dr. Raymond Firestone (U.S. Patent No. 4,131,129)

[1] For ultra dry gas, The Firestone Valve can be used in conjunction with the 7818 ACE-Burlitch Drying Column. Ask for details.

OPERATING INSTRUCTIONS

HOW IT WORKS

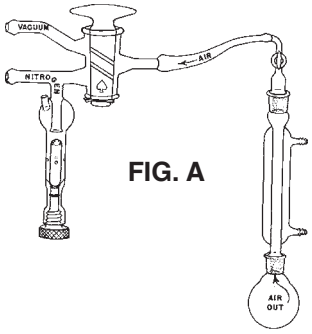


FIG. A

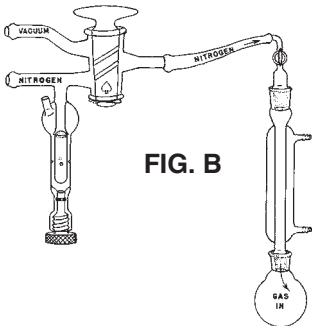


FIG. B

1. Clamp the Firestone Valve securely using standard laboratory clamp
2. If not already assembled, insert fingertip float control into place. Make sure float is NOT against seat. A distance of 1-2 mm is usually adequate depending in oil used, gas flow, etc.
3. Select a non-volatile oil that is somewhat viscous—mineral oil works well. For reactive gases, a fluorocarbon oil can be used. Proper selection of the liquid for the seal allows purging with any gas that does not react with glass. Liquid not supplied.
4. With dropper, add enough oil through gas exit so it rises a few millimeters above the seat. With some heavy oils such as silicone, float may not actually "float". This is not necessary for Valve to operate correctly.
5. Connect reaction vessel, house vacuum, and purge gas to Valve via 10 mm O.D. connections (see Fig. A).
6. Turn stopcock on Valve so bore is open to purge gas line. Start purge gas. Bubbling should occur at float valve as excess gas escapes through gas exit. Start vacuum pump.
7. OPERATION: Turn stopcock 180° to vacuum line (Fig A). Air will be removed from vessel. After a few seconds, turn to purge gas line (Fig. B). The float valve will first close to prevent air from entering system while the purge gas fills the vessel. When filling is complete, float valve automatically opens allowing excess gas to escape, thereby preventing pressure buildup. Thus, a simple half turn of the stopcock alternates the reaction system from vacuum to gas flow as fast as desired.

   In small systems, a complete cycle takes as little as one to two seconds. With only 1/2 atmosphere house vacuum, ten cycles removes all but $.5^{10}$ atmospheres of air. About 70 cycles gets you down to the last molecule of oxygen. After purging, the system is kept under slight positive pressure indefinitely with a low bubbling of the gas to prevent diffusion of air past the joints. If the reaction involves a gas, no pressure builds up, and it may even be collected and measured while maintaining a controlled atmosphere.
8. If excessive oil squirts up the tube during closing of the float valve while going from the vacuum to purge gas, reduce the free play of the float valve slightly by screwing in the fingertip control. If gas has difficulty escaping, increase the free play.
9. To clean, remove fingertip control and flush with solvent. Reassemble using fresh oil.

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