



OPERATING MANUAL

Type F Vacuum Pycnometer

SG-15



Rev: 03/01/2013

1.0 UNPACKING:

NOTE: Check your SG-15 Type F Vacuum Pycnometer for damage immediately upon receipt. Your Vacuum Pycnometer was carefully inspected and tested prior to shipping. Please make sure that the instrument and accessories have arrived in good condition. Claims for any damage must be made against the delivering carrier, but Gilson should be notified so we can assist you.

2.0 SPECIFICATIONS:

Sample Size:	Approximately 10L
Reproducibility:	Better than 0.4%
Dimensions:	16 x 10.75in, H x OD
Weight:	3lb

3.0 OPERATING INSTRUCTIONS:

These instructions are intended to cover basic operation and maintenance of the SG-15. For complete specifications and test methods, please refer to ASTM D 2041 or AASHTO T 209.

The following steps outline the operating instructions for the Type F Vacuum Pycnometer.

1. Weigh the empty Vacuum Pycnometer, and record this weight.
2. Load the sample into the Vacuum Pycnometer.
3. Weigh the Vacuum Pycnometer containing the sample to be tested. Calculate and record the initial weight of the sample.
4. Connect the Aspirator to a water faucet and to the Vacuum Pycnometer.
5. Immerse the Water Inlet Hose in a water supply reservoir and connect the other end to the water inlet valve of the Vacuum Pycnometer.
6. Operate the Aspirator by turning on the faucet to create a vacuum of at least 10in of Mercury within the sample chamber.
7. Open the 3-Way Valve by turning the handle to the vertical position.

NOTE: The Water Inlet Valve is designed to be turned only in the clockwise direction.

8. Open the Water Inlet Valve and allow the Vacuum Pycnometer to fill completely from the reservoir, being careful not to turn off the Aspirator.
9. Close the Water Inlet Valve by turning clockwise.
10. Close the 3-Way Valve by turning the handle to horizontal, with the red dot in the 6 o'clock position.
11. Disconnect the Vacuum line at the quick-disconnect on the top of the Vacuum Pycnometer.
12. Disconnect the Water Inlet Hose from the water inlet valve.
13. Weigh the Vacuum Pycnometer and record this final weight.

To determine the Pycnometer volume, follow the above procedure with no sample in the Pycnometer.

4.0 CALCULATIONS (FROM ASTM D 2041):

If the test temperature is within 72°—80°F, Equation 1 may be used to calculate specific gravity with error of 0.001 points or less.

$$\text{Sp. Gr.} = \frac{A}{A + D - E} \quad (1)$$

A = Mass of dry sample in air, g.

D = Mass of container filled with water at 77°F, g.

E = Mass of container filled with water and sample at 77°F, g.

If the test temperature differs significantly from 77°F, correct for thermal effects as follows:

$$\text{Sp. Gr.} = \frac{A}{(A + F) - (G + H)} \times \frac{dw}{0.9970} \quad (2)$$

A = Mass of dry sample in air, g.

F = Mass of Pycnometer filled with water at test temperature, g.

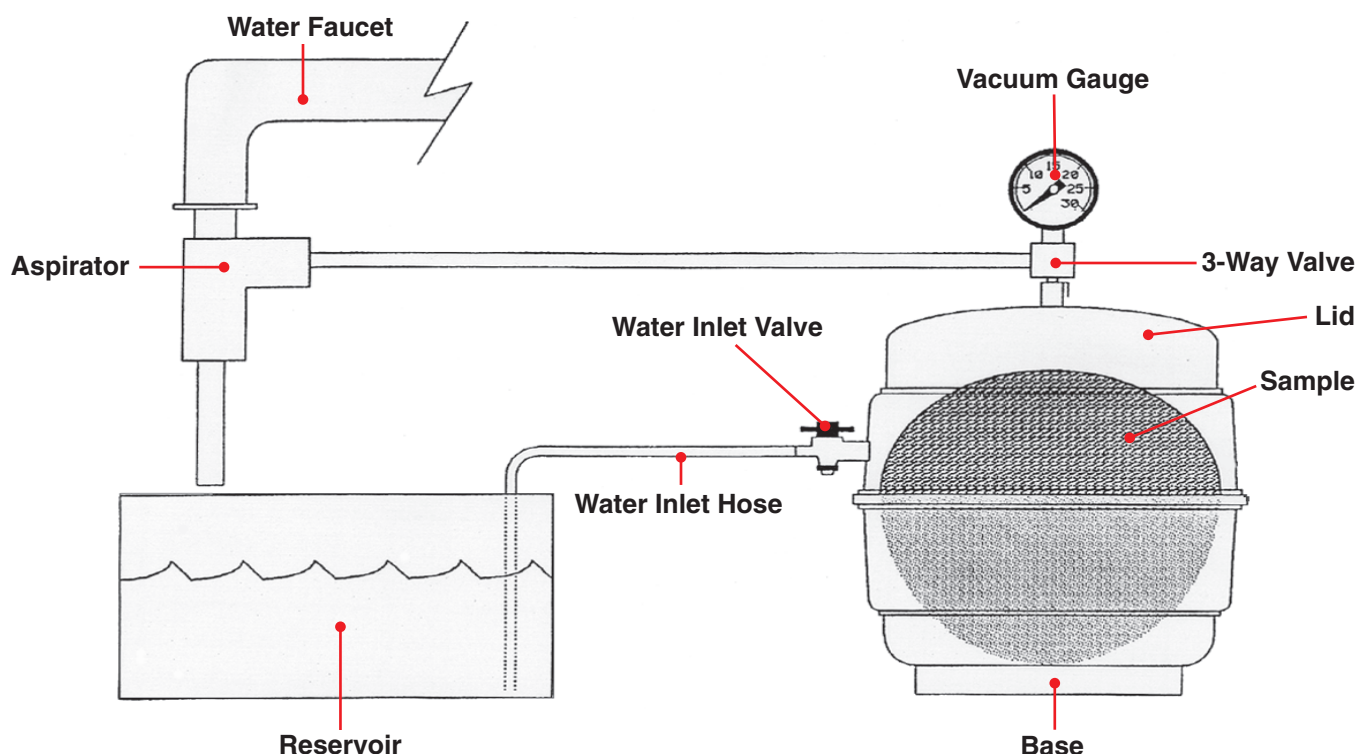
G = Mass of Pycnometer filled with water and sample at test temperature, g.

H = Correction for thermal expansion of bitumen, g.

dw = Density of water at test temperature, Mg/m³.

0.9970 = Density of water at 77°F, Mg/m³.

5.0 PARTS DIAGRAM:



6.0 TROUBLESHOOTING:

1. *Pycnometer Not Holding Vacuum:*

Check O-Ring to make sure it is clean and in good shape. If not, get a replacement O-Ring from your distributor.

Apply a thin film of vacuum grease to the connection of the Water Inlet Valve. Take care to only turn the Water Inlet Valve in a clockwise direction.

If problem persists, contact Gilson for assistance at 800.444.1508.

2. *Too Many Air Bubbles in Water:*

Air bubbles come from dissolved air in water. Check by opening Water Inlet Valve (keeping the Water Inlet Hose connected to the water supply) after you have gone through Step 8 of the operating instructions. The air bubbles should dissolve back in water at atmospheric pressure.

Try filling the pycnometer with boiled water that has been allowed to cool.