

INSTRUCTIONS

Fisher Scientific Pycnometer Catalog No. 03-247Q

The Fisher Scientific Pycnometer is designed to perform specific gravity determinations of semi-fluids. Specific gravity is the ratio of the density of a sample to the density of water, both measurements taken at the same temperature. The result is a value that is unit-less. Since the volume of the pycnometer is constant, determinations made are based on weight alone.

The pycnometer is made of a lightweight yet strong aluminum alloy. It has been machined from a solid piece of metal to prevent leakage and has a three-piece construction. The cup is the container part of the pycnometer; its upper outside portion has a screw thread. A slightly concave circular lid with a center hole that fits on top of the cup. The cap is a threaded ring that screws down onto the cup and holds the lid in place. The approximate volume of the pycnometer is 11.5 milliliters. However, the exact volume is not important.

This unit is ideal for use with viscous samples such as lotions and greases. With proper care, your Fisher Scientific Pycnometer should provide many years of dependable service.

| Packing List | Part No. |
|--------------|----------|
| Instructions | 103234 |
| Lid | 05226 |
| Threaded cap | 05227 |
| Cup | 05228 |

Formula:

$$\text{Specific Gravity} = \frac{\text{Net weight of sample in grams}}{\text{Net weight of water in grams}}$$

Instructions

Please read and familiarize yourself with these instructions before performing a specific gravity determination.

1. Thoroughly clean and dry all three parts of the pycnometer.
2. Assemble and weigh the empty pycnometer. Record the weight.
3. Remove the cap and lid.
4. Completely fill the cup with de-ionized water or distilled water that has been boiled and cooled.
5. Lay the lid on top of the cup. Screw down the cap. Water should run out from the hole in the center of the lid. This must occur to assure that the pycnometer is completely filled. With a soft, lint free cloth or wiper, wipe the pycnometer dry. Be careful to avoid touching the wiper directly to the hole in the center of the lid. If water is wicked up, the pycnometer will no longer be completely filled.

Re-weigh the assembled pycnometer. Subtract the weight of the empty pycnometer from the weight of the pycnometer that was filled with water. The resulting value is the net weight of the water. This value belongs in the denominator.

6. Disassemble the pycnometer. Pour out the water and dry all parts with a soft, lint free cloth or wiper.
7. It is not necessary to reassemble and re-weigh the empty pycnometer if you have dried the unit thoroughly and maintained cleanliness.
8. Fill the pycnometer with the sample. If the sample does not flow easily, such as grease, take extra care to fill the unit completely to eliminate air pockets. You may need to tap the cup gently on a flat surface. Lay the lid on top of the cup. Screw down the cap. Sample should run out from the hole in the lid's center. With a soft, lint free cloth or wiper, wipe the pycnometer clean and dry. If the sample is easily absorbed, be careful to avoid touching the wiper directly to the hole in the center of the lid.
9. Weigh the filled pycnometer. Subtract the weight of the empty pycnometer from the weight of the sample filled pycnometer. This will give you the net weight of the sample. This value belongs in the numerator.
10. Divide the net weight of the sample (numerator) by the net weight of the water (denominator). The result will be the specific gravity of the sample. This value is always reported at a stated temperature.

Cleaning

The pycnometer should be cleaned with a solvent that dissolves the sample. In some cases this simply may be water. It can also be cleaned with warm soapy water and a soft cloth. The pycnometer may be rinsed with solvents such as alcohol or acetone. Avoid strong acid and bases. Do not use steel wool or any harsh material that may scratch the unit. Allow to air dry.

Notes

- As you gain experience with the pycnometer, you will be able to judge the volume of both water and the sample needed to keep the cleanup before weighing to a minimum.
- Since density (weight per volume) varies with temperature, it is important to make the determination of the sample and water at the same temperature.
- The pycnometer should be handled with clean or gloved hands as oils or dirt deposited on the pycnometer will affect accuracy.
- Please avoid dropping, denting, or scratching the pycnometer. This will affect accuracy.

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