

Soil Phosphate Test Kit Instructions

Standard Range (5 ppm – 20.0 ppm Phosphate)

Introduction

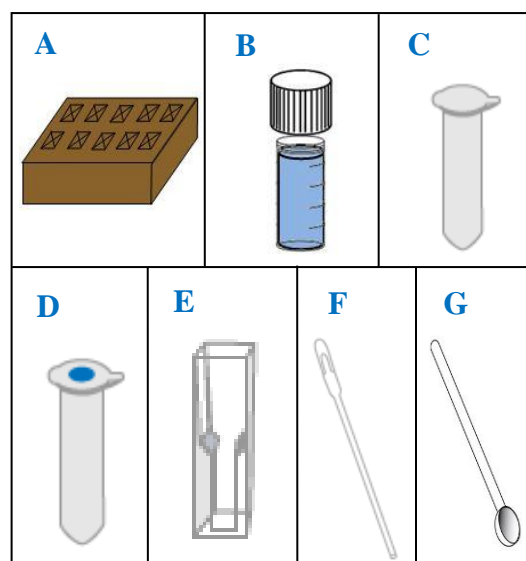
This kit contains everything needed to test soil samples for phosphate concentration. Provided in this kit is a **10 ppm Phosphate standard (D)**, to use as a tool for ensuring that the kit and photometer are working properly. These kits will provide accurate phosphate results within 20-25 minutes. Although we cannot guarantee the precision that a testing lab offers, *you will get accurate results immediately* about the phosphate concentration of your soil samples.

Kit Contents (per 5 samples):

- A.** 1 cardboard cuvette holder
- B.** 5 clear collection tubes with white screw caps containing 5 mL water
- C.** 6 snap cap tubes (contains buffer), 1 has a white dot for "blanking"
- D.** 1 snap cap tube with blue dot (contains **phosphate standard**)
- E.** 7 square reaction cuvettes in sealed foil pouch (contains enzyme)
- F.** 5 plastic pipettes (for transferring each sample to reaction cuvettes)
- G.** 1 large white measuring spoon (for adding soil to tubes [B])

Materials you will need:

- **NECi Handheld Photometer & Android Device for analyzing samples**
- Marker for labeling tubes and cuvette caps



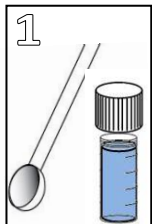
DO:

- ✓ Store this kit refrigerated for up to 1 month. For longer term storage, freeze at -20°C or colder. A standard household freezer is acceptable.
- ✓ Test soil samples soon after collection.
- ✓ Run tests and standard all at once to ensure accuracy.
- ✓ Label collected sample tubes and reaction cuvettes accordingly.
- ✓ Gently shake cuvettes several times throughout reaction without inverting them.

DO NOT:

- *Open sealed packets or mix cuvette contents until ready to use.
- *Add more than *two drops* of sample water to reaction cuvette.

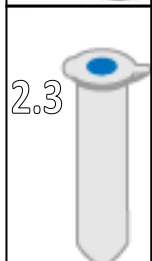
Procedure



Step 1 Collecting Your Samples

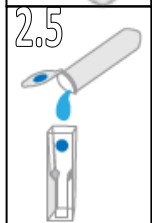
- 1) Collect and prepare soil samples. Use the large white spoon to collect one level scoop of soil.
- 2) Add the scoop of soil to one of the collection tubes filled with distilled water (white cap). (1) Recap the tube.
- 3) Label the tube and record the sample location on the data sheet. Repeat for each soil sample.
- 4) Shake each tube for approximately 1 minute. Set tube upright and allow soil to settle for 10 minutes*.

**If sample isn't clarified after 10 minutes, use a centrifuge or coffee filter. Common with clay and silt samples.*



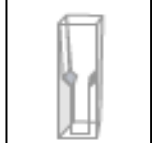
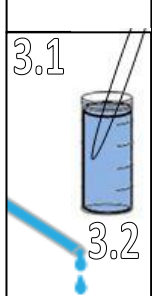
Step 2 Preparing the Reaction Cuvettes

- 1) Remove the 7 square reaction cuvettes from the foil pouch and place them in the cardboard cuvette holder, keeping the ones with the blue dot (phosphate standard) and white dot (blank) separate from the others.
- 2) Tap cuvettes to settle contents, making sure to keep them upright.
- 3) Tap the tube with the blue dot [phosphate standard (2.3)] to settle all liquid, then pour all of the liquid into the cuvette with the blue dot (2.5). Cap the cuvette to completely seal and gently invert 4-6 times to mix.
- 4) Tap the tube with the white dot (blank) to settle all liquid, then pour all of the liquid into the cuvette with the white dot. Cap the cuvette to completely seal and gently invert 4-6 times to mix.
- 5) **Label the cuvette caps** with numbers, letters, or location to match the sample collection tubes.
- 6) Into each of the other 5 cuvettes, tap each snap cap tube to settle all liquid then pour one into each of the remaining cuvettes. Step 3 should be performed within 5 minutes.



Step 3 Adding samples to Reaction Cuvettes

- 1) Within 5 minutes, pick up liquid from near the surface of your settled soil sample with a plastic pipette (3.1).
- 2) Transfer exactly two drops (approximately 100 µl) of this liquid to the corresponding cuvette (Sample 1 into cuvette 1, etc.) making sure not to touch the sides or surface of the liquid with the pipette. (3.2)
- 3) Repeat above steps for the remaining 4 samples, making sure to use a new pipette for each unique sample.
- 4) Recap the cuvettes and gently invert 4 - 6 times to mix.
- 5) Mix samples gently every few minutes. Wait **at least 20 minutes** before proceeding to Step 4 to read results.



Step 4 Evaluating your Results Using the Photometer

- 1) Refer to the photometer manual for complete instructions for the steps below.
 - 2) Blank the photometer with the blank cuvette provided (4.2). This function is located under app settings.
 - 3) When ready to read your results, choose either: take an individual reading, set up a new sample list, or add samples to an existing list. Make sure "phosphate" and "standard range" are selected.
 - 4) Make sure both faces* of the cuvette are clean and free of dirt and fingerprints. Insert the cuvette into the photometer, making sure that the arrow on the cuvette is facing the blue arrow on the top of the photometer.
- *Faces are the surfaces of the cuvette that are flat and do not contain indentations.*
- 5) Read the **phosphate standard** cuvette first. The reading should be about 10 ppm.
 - a. It is OK if the reading is not exactly 10ppm. Variability up to 10% is possible.
 - 6) Repeat step 4 for all of your samples to obtain results.

