

**1. Scope and Applicability:**

This method describes the use of a Hf Scientific Chlorine Pocket Photometer for the measurement of free and total residual chlorine in water sample. The stated range of the instrument is 0-6 mg/l within the stated accuracy; however, the instrument can read to 10 mg/l


2. Principle:

The DPD (N,N-diethyl-p-phenylenediamine) has become the most widely used method for determining free and total chlorine in water. The DPD amine is oxidized by chlorine to two oxidation products. When DPD reacts with small amounts of chlorine at a near neutral pH, the Würster dye is formed which produces magenta color. At higher oxidant levels, the formation of the unstable colorless imine is favored — resulting in apparent “fading” of the colored solution. The DPD Würster dye color is measured photometrically at 515nm.

Monochloramine and dichloramine are slow to react directly with DPD at a near neutral pH. To quantify these species, the test is performed in presence of iodide ion. The iodide reacts with the chloramines to form the triiodide ion. The triiodide, in turn, reacts with DPD, forming the Würster oxidation product.

3. Equipments and materials

- i. Hf Scientific Chlorine Pocket Photometer
- ii. DPD powder pop dispenser
- iii. cuvette
- iv. Distilled Water

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|  | KATHMANDU UPATYAKA KHANEPANI LIMITED | CM001 |
| | WATER/WASTE WATER QUALITY ASSURANCE DIVISION | Effective Date: |
| | STANDARD OPERATING PROCEDURE Chlorometer | Revised No. |

v. Tissue paper

4. Sampling and preservation:

Sample collection will be done according to water quality monitoring plan and SOPs for sample collection

5. Procedure

A. Instrument Calibration:

The instrument is calibrated and tested prior to leaving the factory and is suitable for accurate use directly out of the box.

B. Routine Measurement:

1. Turn on the instrument by pressing the ON/OFF button continuously for 1 second until the display light up.



Figure 1 is the depiction of the top of the instrument. The three main components of the instrument are the sample well, the display, and the touch pad

Figure 1



2. STEP 1-ZERO the instrument

a. Rinse a sample cuvette three times with a sample of the water to be measured. After rinsing, fill the cuvette to within ½” of the top. Wipe off any water making sure that the sides and bottom of the cuvette are dry and that the optical sides are clean.

b. Place the cuvette in the optical well with one of the clear optical sides facing the indicating arrow.

c. Press the ZERO button. The screen will display



3. STEP 2 – Add Reagent to the sample

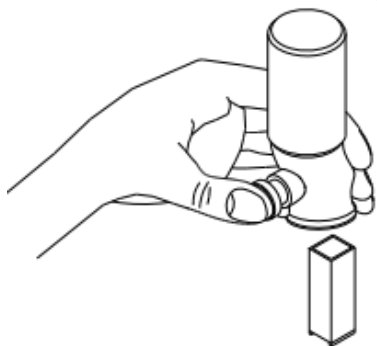


Figure 2

Figure 2 is a depiction of the PPD-2 Powder Pop Dispenser. The Powder Pop Dispenser is an important accessory to the instrument, providing convenient and accurate doses of DPD reagent on demand. To use the Dispenser, simply flip the protective cap out of the way, invert the dispenser and shake gently, place over the top of the cuvette then firmly, depress the Dispenser button to deliver the reagent. The protective cap should be replaced after use.



- a. Remove the cuvette with the sample from the instrument.
- b. Invert the PPD-2 Powder Pop Dispenser and shake gently to ensure that the proper amount of reagent is available. Remove the “snap cap” from the Dispenser bottom; place the Dispenser over the top of cuvette. Fully and firmly, depress the Dispenser button to discharge the reagent.
- c. Mix the reagent in the water sample by capping the cuvette and inverting it at least three times.

4. STEP 3 - Measure the Chlorine Concentration.

- a. Replace the cuvette in the optical well with one of the optical sides facing the indicating arrow.
- b. If testing for Free Chlorine, immediately press the READ button and note the concentration.
- c. If testing for Total Chlorine, wait two minutes for the completion of the chemical reaction between the sample and the reagent. Press the READ button and note the concentration.

6. Reference:

- ❖ Manual Chlorine pocket photometer

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