

PUBLIC HEALTH DIVISION INFORMATION BULLETIN INTERPRETATION MANUAL

TEST KITS / APPROVED TYPES / POOLS AND SPAS

QUESTION:

What is an approved type of manual pool test kit for a pool operator or inspector to use?

BACKGROUND:

1. Pools test kits and equipment come in a wide variety of shapes, sizes, and capabilities. The test kit user has to make a choice of chlorine or bromine test methods. Most test kits use one of 4 methods to test chlorine:
2. DPD (N, N-diethyl-p-phenylenediamine) – is the most commonly accepted method for testing chlorine or bromine in public pools. It turns pink when exposed to the levels of chlorine within the test kits stated range. In colorimetric tests, this is your test block. For titrimetric tests (FAS-DPD), a second reagent is added drop-wise until the solution returns to clear. If when the first reagent is added, if there is no pink color, or if the pink color fades very rapidly it is an indication that the chlorine concentration is above the test kits stated range, or-- in-fact-- there is zero chlorine residual in the water. A dilution test may be required if chlorine concentrations are too high to read accurately.
3. ORP (Oxidation-Reduction Potential) – measures the electrical potential for disinfection and oxidation in the pool water. It measures how much work the sanitizer will do in a pool, depending on the water conditions. This is far superior to measuring the quantity of sanitizer in the water, which does not really relate to the amount of work it will do. An ORP controller will still require manual testing, but the controller will usually turn the sanitizer feeder and pH feeder on and off. This is much more efficient and effective. Ideally, the pool should have an ORP of no less than 700 mV (millivolts).
4. Test Strips – usually quick and easy to use, but often hard to read, making them much less accurate. Using strips that have multiple tests on each one can be cost and time effective when compared to other test kits. They are useful for supplemental testing to assure the water chemistry is not changing on those busy, sunny days. Test strips can be used as an indicator, but the required number of recorded tests must be done with either a DPD kit, and electronic reader, or an accurate ORP reading of 700 mV or greater.
5. OTO (orthotolidine) – this is probably the oldest and easiest test method for chlorine. It does not distinguish between free and total chlorine, and is **not** allowed for public pool testing. It turns yellow when exposed to chlorine.

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6. Test kits 1. through 3. offer various options for measuring the change in color of the test reagent.
 - i. Color comparator kits - This type depends on the color perception of the tester to determine the amount of chemical.
 - ii. Colorimeters – electronic devices that measure the color or intensity for you
 - iii. FAS-DPD titration – where the color is created and the solution neutralized to clear and the amount of neutralizing agent is measured. It is much more accurate than color perception, especially if you are color blind.
7. A test kit has to be reasonably accurate, easy and quick to use, and relatively stable. The kit must contain equipment and reagents for testing all the needed water parameters, including Cl (both free and combined) or bromine. The kit must also test pH, total alkalinity, and calcium hardness.
8. Pools using cyanuric acid or stabilized chlorine compounds (“DiChlor” and “TriChlor”), must also be able to test for cyanuric acid levels.
9. Finally, you and the operator must know if there are any chemicals causing test reading interferences, and have the testing reagents to eliminate that interference. One of the most common is interference with the combined chlorine reading caused by use of monopersulfates (non- chlorine oxidizer).

INTERPRETATION:

The Oregon Health Authority has suggested the Taylor K-2006 FAS-DPD test kit as the basic standard for all local public health authority inspectors. Operators are encouraged to make similar changes due to the increased accuracy of titration method tests.

A test kit must be provided to test the water parameters applicable to the pool. The typical, basic pool test kit should include:

- | | |
|-----------------------------------|---|
| A. Free chlorine or total bromine | D. Total alkalinity (as CaCO ₃) |
| B. Combined Chlorine | E. Calcium hardness |
| C. pH | F. Cyanuric acid (If cyanuric acid (CYA) or stabilized chlorine are used) |

Pools using copper/silver, ozone, or other secondary or supplemental disinfectants, must be able to test for them.

Test kits using dip strips that are not based on a DPD protocol are not approved for required testing. These have been shown to be very difficult to accurately read. They may be used for non-required supplemental testing by pool operators.

Orthotolidine (OTO) is **not** approved for testing public pools.

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Total dissolved solids (TDS) are measured using a conductivity test. This test uses an electronic meter. A pool operator may choose to purchase a meter, but TDS changes slowly enough that only occasional testing is necessary. Testing can be done by taking a sample to a pool service store.

Clarity can be judged visually, and bacteria are tested as needed, by a certified testing laboratory.