

Taylor's Test for Bleach Solutions

INTRODUCTION

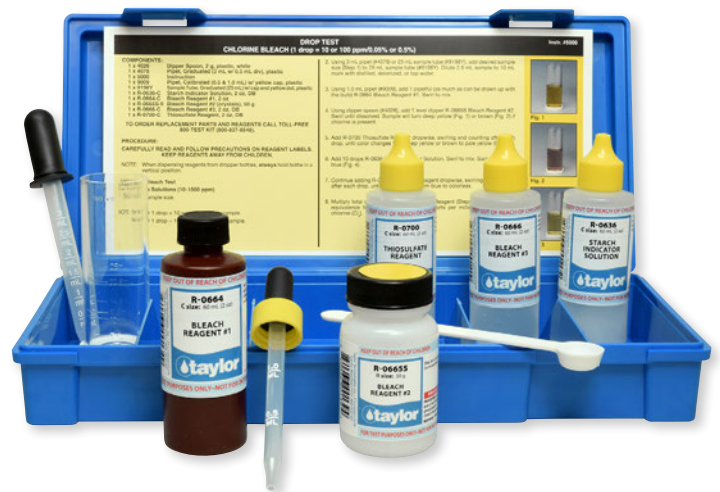
Chlorine or chlorine compounds are routinely used as sanitizers, oxidizers, and bleaching agents in commercial, industrial, and water-utility operations. The treatment may be applied as a gas or as a dry formulation such as a tablet or granules, but for many purposes the liquid bleach **sodium hypochlorite (NaOCl)** is best. Sodium hypochlorite is formed by reacting chlorine with sodium hydroxide. It is sold based on the strength of the product—typically, in these markets, 12–15% available chlorine content.

Liquid, gas, and dry forms of chlorine are used to treat pool water too, so it is sparkling clean and pathogen-free for safe swimming. The most common treatment for regulated pools is also sodium hypochlorite, called “**pool bleach**” by the trade. It's popular because of the convenience of feeding a liquid and because it costs less than other options. The available chlorine content of full-strength pool bleach should be 10–12%, roughly double the strength of household laundry bleach.

However, sodium hypochlorite is not chemically stable and decomposes while in transit and storage. It degrades even faster when exposed to heat and light. As it loses its strength, more has to be applied to achieve the desired residual, thus negating the economy of buying the liquid disinfectant. If you **buy bleach in bulk**, use Taylor's Chlorine Bleach Drop Test (K-1579) at the time of delivery to verify the available chlorine content meets the labeled concentration. Make sure you're getting the full strength you're paying for! As part of routine maintenance, also test stored bleach periodically.

A fieldwork-friendly drop test, the K-1579 is an iodine/starch titration with a distinct endpoint signaled by a color change in the test solution from blue to colorless. Note: Other oxidizers in the test sample such as bromine or ozone will cause positive interference.

The K-1579 is the only single-analyte kit in Taylor's product line designed for measuring the high chlorine concentrations found in sodium hypochlorite bleach solutions. One of our color-matching tests that utilize orthotolidine will go as high as 250 parts per million (ppm) of total chlorine, the K-1401. A wide-range test paper, part #6023 made by Precision Labora-



When you buy bleach solutions in bulk, test to be sure you're getting the full strength you're paying for with Taylor's Chlorine Bleach Drop Test (K-1579).

ories, can be used to approximate total chlorine at 10, 50, 100, and 200 ppm; and an FAS-DPD drop-count titration, K-1515, can measure up to 20 ppm of free or combined chlorine when 1 drop = 0.5 ppm. By comparison, in this bleach kit, **instructions are provided for chlorine concentrations in the range of 10–100 ppm; 1 drop = 10 or 100 ppm/0.05 or 0.5% available chlorine (Cl₂).**

This same bleach test is also included in two combination kits designed for professional laundries. See details on reverse.

This kit is not appropriate for testing the chlorine residual in pool or spa water. Taylor offers tests for this purpose in combination with other routine analyses in our 2000 Series™, Commercial Series™, and Professional Series™ kits for the trade and in our Residential Series™ for consumers.

CHLORINE BLEACH KIT

K-1579

Drop test (**iodometric** method); 1 drop = 10 or 100 ppm/
1 drop = 0.05 or 0.5% available chlorine (Cl₂)

USER BENEFITS

- Titrations do not require the ability to match colors, only the ability to see the **permanent color change** at the end-point of the reaction.
- Test kit **comes complete** with all necessary reagents and equipment.
- **Waterproof instructions** are printed on plastic-impregnated paper that resists fading and tearing.
- Custom-molded, durable plastic case provides **safe storage**.
- Proven chemistries are based on *Standard Methods for the Examination of Water and Wastewater*, APHA, Washington, DC, and/or *American Society for Testing and Materials*, ASTM, Philadelphia, PA. Some methods use proprietary chemistry developed by Taylor Technologies.

ALSO AVAILABLE

- The same bleach test in two combination kits designed for use by **professional laundries**: K-1615 (P/T alkalinity, bleach, total hardness, long-range pH with Color Card) and K-1616 (P/T alkalinity, chlorine spot test with OT plus the iodometric bleach test, total hardness, total iron, long-range pH with test papers in three ranges).
- Chlorine tests for more **dilute solutions**—your choice of OT, DPD, or FAS-DPD method. Taylor is also a reseller of Precision Laboratories' Chlorine Test Paper.
- Tests for **other sanitizers/oxidizers** such as bromine, hydrogen peroxide, ozone, biguanide, and potassium monopersulfate.
- A wide array of single- and multiparameter kits featuring color-matching and/or drop-count tests.
- Taylor's **TTi® Colorimeter (M-3000)**; test 30+ parameters commonly encountered in commercial and industrial settings and transfer results to a PC database.
- Myron L Company portable instruments and calibration solutions (sold separately).
- **Video demonstrations** for new users posted on our website.
- Toll-free technical assistance at **800-TEST KIT**.

REPRESENTATIVE TEST PROCEDURE

Reproduced from K-1579 instruction:

DROP TEST
Instr. #5000

CHLORINE BLEACH (1 drop = 10 or 100 ppm/0.05% or 0.5%)

COMPONENTS:

- 1 x 4026 Dipper Spoon, 2 g, plastic, white
- 1 x 4078 Pipet, Graduated (3 mL w/ 0.5 mL div), plastic
- 1 x 5000 Instruction
- 1 x 9009 Pipet, Calibrated (0.5 & 1.0 mL) w/ yellow cap, plastic
- 1 x 9198Y Sample Tube, Graduated (25 mL) w/ cap and yellow dot, plastic
- 1 x R-0636-C Starch Indicator Solution, 2 oz, DB
- 1 x R-0664-C Bleach Reagent #1, 2 oz
- 1 x R-0665S-II Bleach Reagent #2 (crystals), 50 g
- 1 x R-0666-C Bleach Reagent #3, 2 oz, DB
- 1 x R-0700-C Thiosulfate Reagent, 2 oz, DB

TO ORDER REPLACEMENT PARTS AND REAGENTS CALL TOLL-FREE 800-TEST KIT (800-837-8548).

PROCEDURE:
CAREFULLY READ AND FOLLOW PRECAUTIONS ON REAGENT LABELS. KEEP REAGENTS AWAY FROM CHILDREN.

NOTE: When dispensing reagents from dropper bottles, **always** hold bottle in a vertical position.

Chlorine Bleach Test For Bleach Solutions (10-1000 ppm)

1. Select sample size.

NOTE: For 1 drop = 10 ppm, use 25 mL sample.
For 1 drop = 100 ppm, use 2.5 mL sample.

2. Using 3 mL pipet (#4078) or 25 mL sample tube (#9198Y), add desired sample size (Step 1) to 25 mL sample tube (#9198Y). Dilute 2.5 mL sample to 10 mL mark with distilled, deionized, or tap water.
3. Using 1.0 mL pipet (#9009), add 1 pipetful (as much as can be drawn up with the bulb) R-0664 Bleach Reagent #1. Swirl to mix.
4. Using 2 g dipper spoon (#4026), add 1 level dipper R-0665S Bleach Reagent #2. Swirl until dissolved. Sample will turn deep yellow (Fig. 1) or brown (Fig. 2) if chlorine is present.
5. Add R-0700 Thiosulfate Reagent dropwise, swirling and counting after each drop, until color changes from deep yellow or brown to pale yellow (Fig. 3).
6. Add 10 drops R-0636 Starch Indicator Solution. Swirl to mix. Sample will turn blue (Fig. 4).
7. Continue adding R-0700 Thiosulfate Reagent dropwise, swirling and counting after each drop, until color changes from blue to colorless.
8. Multiply total drops of R-0700 Thiosulfate Reagent (Steps 5 & 7) by desired equivalence factor (Step 1). Record as parts per million (ppm) available chlorine (Cl₂).




Fig. 1




Fig. 2




Fig. 3

NOTE: For 1 drop = 0.05%, use 5 mL sample.
For 1 drop = 0.5%, use 0.5 mL sample.

2. Using 3 mL pipet (#4078), add desired sample size (Step 1) to 25 mL sample tube (#9198Y). Dilute to 10 mL mark with distilled, deionized, or tap water.
3. Using 1.0 mL pipet (#9009), add 1 pipetful (as much as can be drawn up with the bulb) R-0664 Bleach Reagent #1. Swirl to mix.
4. Using 2 g dipper spoon (#4026), add 1 level dipper R-0665S Bleach Reagent #2. Swirl until dissolved. Sample will turn deep yellow (Fig. 1) or brown (Fig. 2) if chlorine is present.
5. Add R-0666 Bleach Reagent #3 dropwise, swirling and counting after each drop, until color changes from deep yellow or brown to pale yellow (Fig. 3).
6. Add 10 drops R-0636 Starch Indicator Solution. Swirl to mix. Sample will turn blue (Fig. 4).
7. Continue adding R-0666 Bleach Reagent #3 dropwise, swirling and counting after each drop, until color changes from blue to colorless.

NOTE: Chlorine concentration is determined as grams per 100 mL (g/100 mL). For less concentrated solutions (less than 5%), this is approximately equal to percent (%). For concentrated solutions (equal to or greater than 5%), divide answer in Step 8 by the specific gravity. Record as actual percent available chlorine (Cl₂).

For example: If 15% available chlorine is calculated in Step 8 and the specific gravity is 1.3, actual percent available chlorine is 11.5% by weight.





Fig. 4

(OVER)



31 Loveton Circle, Sparks, MD 21152 USA
800-TEST KIT (837-8548) • 410-472-4340 083117