

Taylor's Silica Test Kits

INTRODUCTION

The naturally occurring silica content of water is commonly in the 1 to 30 ppm range, although concentrations of 50 to 100 ppm in well waters are not unusual.

In **industrial water systems**, silica scale appears as a dense, glassy material that is very difficult to remove. Concentrations of silica above recommended levels in boiler feedwater can lead to scale formation in the boiler itself; even more problematic in high-pressure boilers is silica that volatilizes into the steam system only to redeposit on turbine blades. In cooling towers, silica is generally kept below 150 ppm to prevent silicate scales.

Municipal water systems often use silica-based treatment programs to establish and maintain passivation films that protect distribution networks from corrosion damage.

Taylor offers two colorimetric field tests employing the heteropoly blue method to analyze silica levels in water.

Note: Observing the full wait times called for in the instructions is essential to proper color development in the treated sample. Also, iron may cause positive interference; sulfide and tannin, negative interference. Diluting the sample with DI water (R-0833) before testing will prevent this.

SILICA KITS

K-1272

Slide comparator (heteropoly blue method); 0–50 ppm SiO₂; 0–250 ppm or 0–500 ppm by dilution

K-1273

Midget comparator (heteropoly blue method); 5–50 ppm SiO₂; 25–250 ppm or 50–500 ppm by dilution

USER BENEFITS

- Slide™ comparators (using nine liquid-color standards molded in impact-resistant plastic) are **designed to compensate for color and turbidity**. Midget™ comparators (using eight liquid-color standards) are the **economical alternative when color and turbidity are not present**.
- Test kits **come complete** with all necessary reagents and equipment.
- These test kits are practical for both **on- and off-site** testing.



Taylor's K-1272 employs a Slide comparator to compensate for color and turbidity in a water sample. It will perform 50 tests for silica at 50 ppm SiO₂. The 50 mL graduated cylinder (shown at right) is used to perform dilutions when silica content exceeds 50 ppm.

- **Waterproof instructions** are printed on plastic-impregnated paper that resists fading and tearing.
- Custom-molded, durable plastic cases provide **safe storage** for all tests.
- **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

- **Deionized (DI) water** (R-0833) for performing dilutions.
- 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 (including two tests for silica: K-8007 and K-8008) commonly encountered in commercial and industrial settings and transfer results to a PC database.
- Myron L Company portable instruments and calibration solutions (sold separately in reagent packs).



the most trusted name in water testing

Taylor Technologies, Inc.
410-472-4340
800-TEST KIT (837-8548)
www.taylortechnologies.com

ISO 9001:2008 Certified

ALSO AVAILABLE (cont'd)

- Testing supplies and kit replacement parts (e.g., burets, flasks, test tubes, and test cells).
- Toll-free technical assistance at **800-TEST KIT**.

REPRESENTATIVE TEST PROCEDURE

Reproduced from K-1272 instruction:

COLOR COMPARISON TEST SILICA (0-50, 0-250, or 0-500 ppm)

COMPONENTS:

SLIDE COMPARATOR: 9264 RANGE: 0-50 ppm

REAGENTS:

R-1305Q-II Silica Reagent #4, 50 g
R-1305U-C Silica Reagent #3*, 2 oz
R-1306T-C Silica Reagent #1**, 2 oz
R-1306U-C Silica Reagent #2, 2 oz

APPARATUS:

1 x 4005 Cylinder, Graduated (50 mL w/ 1.0 mL div), glass (or #4007, 100 mL)
5 x 4023 Test Tube, Calibrated (5 mL), glass
1 x 4026 Dipper Spoon, 2 g, plastic, white
3 x 4030 Pipet, Calibrated (0.5 & 1.0 mL) w/ cap, plastic
1 x 5320 Instruction
1 x 6002 Brush, Test Cell
1 x 6021 Stopper, Test Tube (5 mL, calibrated), rubber
1 x 9190 Base, Slide Comparator (for test tubes)
1 x 9198 Sample Tube, Graduated (25 mL) w/ cap, plastic

OR

3 x 3267 Cap, Test Cell (5 mL), plastic
1 x 4005 Cylinder, Graduated (50 mL w/ 1.0 mL div), glass (or #4007, 100 mL)
3 x 4025 Test Cell, Calibrated (5 mL), plastic
1 x 4026 Dipper Spoon, 2 g, plastic, white
3 x 4030 Pipet, Calibrated (0.5 & 1.0 mL) w/ cap, plastic
1 x 5320 Instruction
1 x 6002 Brush, Test Cell
1 x 9189 Base, Slide Comparator, Enslow (for test cells)
1 x 9198 Sample Tube, Graduated (25 mL) w/ cap, plastic

Instr. #5320
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.

Silica Test

For 0-50 ppm Silica

1. Rinse and fill two 5 mL test tubes (test cells) to 5 mL mark with water to be tested.
2. Wipe dry and place in two holes (slots) adjacent to center hole (slot) of comparator base (#9190 or #9189). Test cells (#4025) must be placed WITH FROSTED SIDE FACING OPERATOR.
3. Rinse and fill 25 mL sample tube (#9198) to 25 mL mark with water to be tested.
4. Using a 1.0 mL pipet (#4030), add 1.0 mL R-1306T Silica Reagent #1. Swirl to mix.
5. Using a separate 1.0 mL pipet, add 1.0 mL R-1306U Silica Reagent #2. Swirl to mix. WAIT 5 MINUTES.
6. Using a separate 1.0 mL pipet, add 1.0 mL R-1305U Silica Reagent #3. Swirl to mix.
7. Using dipper spoon (#4026), add 1 level dipper R-1305Q Silica Reagent #4. Swirl until dissolved. Transfer to third test tube (test cell) to 5 mL mark.
8. Wipe dry and place in center hole (slot) of comparator base. WAIT 1 MINUTE.
9. Place Slide on comparator base. Match color in center test tube (test cell) with a color standard. The Slide is in proper alignment for a color match when a white line on the Slide is directly above the white line on the comparator base. Record as parts per million (ppm) silica (SiO₂).

(OVER)

For 0-250 ppm Silica

1. Rinse and fill graduated cylinder (#4005) to 10 mL mark with water to be tested.
2. Dilute to 50 mL mark with distilled, deionized, or silica-free water. Pour back and forth into 25 mL sample tube (#9198) to mix. Transfer to sample tube to 25 mL mark.
3. Rinse and fill two 5 mL test tubes (test cells) to 5 mL mark with remaining diluted sample.
4. Wipe dry and place in two holes (slots) adjacent to center hole (slot) of comparator base (#9190 or #9189). Test cells (#4025) must be placed WITH FROSTED SIDE FACING OPERATOR.
5. Using a 1.0 mL pipet (#4030), add 1.0 mL R-1306T Silica Reagent #1. Swirl to mix.
6. Using a separate 1.0 mL pipet, add 1.0 mL R-1306U Silica Reagent #2. Swirl to mix. WAIT 5 MINUTES.
7. Using a separate 1.0 mL pipet, add 1 mL R-1305U Silica Reagent #3. Swirl to mix.
8. Using dipper spoon (#4026), add 1 level dipper R-1305Q Silica Reagent #4. Swirl until dissolved. Transfer to third test tube (test cell) to 5 mL mark.
9. Wipe dry and place in center hole (slot) of comparator base. WAIT 1 MINUTE.
10. Place Slide on comparator base. Match color in center test tube (test cell) with a color standard. The Slide is in proper alignment for a color match when a white line on the Slide is directly above the white line on the comparator base. Multiply reading by 5. Record as parts per million (ppm) silica (SiO₂).

For 0-500 ppm Silica

1. Rinse and fill graduated cylinder (#4005) to 5 mL mark with water to be tested.
2. Dilute to 50 mL mark with distilled, deionized, or silica-free water. Pour back and forth into 25 mL sample tube (#9198) to mix. Transfer to sample tube to 25 mL mark.
3. Rinse and fill two 5 mL test tubes (test cells) to 5 mL mark with remaining diluted sample.

Instr. #5320

4. Wipe dry and place in two holes (slots) adjacent to center hole (slot) of comparator base (#9190 or #9189). Test cells (#4025) must be placed WITH FROSTED SIDE FACING OPERATOR.
5. Using a 1.0 mL pipet (#4030), add 1.0 mL R-1306T Silica Reagent #1. Swirl to mix.
6. Using a separate 1.0 mL pipet, add 1.0 mL R-1306U Silica Reagent #2. Swirl to mix. WAIT 5 MINUTES.
7. Using a separate 1.0 mL pipet, add 1 mL R-1305U Silica Reagent #3. Swirl to mix.
8. Using dipper spoon (#4026), add 1 level dipper R-1305Q Silica Reagent #4. Swirl until dissolved. Transfer to third test tube (test cell) to 5 mL mark.
9. Wipe dry and place in center hole (slot) of comparator base. WAIT 1 MINUTE.
10. Place Slide on comparator base. Match color in center test tube (slot) with a color standard. The Slide is in proper alignment for a color match when a white line on the Slide is directly above the white line on the comparator base. Multiply reading by 10. Record as parts per million (ppm) silica (SiO₂).

*WARNING: Silica Reagent #3 (R-1305U) contains 10% oxalic acid, a poison.

**WARNING: Silica Reagent #1 (R-1306T) contains 14.7% (w/v) hydrochloric acid, a corrosive acid.



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