

# Taylor's Hardness Test Kits

## INTRODUCTION

**H**ardness in water was originally defined as the ability of soap to lather in water—the more calcium and magnesium ions, the “harder” it is for soap to form suds. Although other polyvalent cations also precipitate soap, they are often in complex forms, frequently with organic constituents, and have a minimal effect on water hardness. Today, total hardness is considered to be the sum of the calcium and magnesium ions present in water, expressed in milligrams per liter (mg/L) or parts per million (ppm) as calcium carbonate ( $\text{CaCO}_3$ ). The amount of hardness in water can range from several parts per million to hundreds.

In industrial boiler applications, hardness is removed from water by pretreatment equipment such as softeners, demineralization units, and reverse osmosis. Treatment chemicals are then applied to the water to prevent any low-level residual hardness from causing deposition problems. In industrial cooling tower water applications, hardness increases in concentration as the water cycles up due to evaporation. Treatment chemicals are often applied here, also, to prevent any scale deposits.

**Wherever it occurs, scale reduces operating efficiency and can lead to premature equipment failure; therefore, it is critical to test hardness levels regularly. Taylor offers several test kits for hardness in sensitivities which range from trace to high-hardness concentrations. All of these kits include metal-interference inhibitors.**

See the video demonstrations posted on our website under the Resource Center tab. Choose “All Markets Except Pool/Spa” to see the hardness test videos. Choose “The Rep Tools” to see our SampleSizer® and SpeedStir® tools in action; these are particularly helpful when performing a hardness drop test.

## HARDNESS KITS

### K-1503

Drop test (EDTA titration); 1 drop = 2 or 10 ppm **total** hardness as  $\text{CaCO}_3$

### K-1504

Drop test (EDTA titration); 1 drop = 0.5 ppm **total** hardness as  $\text{CaCO}_3$



Taylor's hardness kits feature reagent caps color-coded to the instruction plus a picture guide to the color transition in the titration (K-1504 pictured).

### K-1505

Drop test (EDTA titration); 1 drop = 2 or 10 ppm **total** hardness as  $\text{CaCO}_3$  (uses an odorless buffer)

### K-1514

Drop test (EDTA titration); 1 drop = 2 or 10 ppm **calcium** or **total** hardness as  $\text{CaCO}_3$

### K-1567

Drop test (EDTA titration); 1 drop = 10 ppm **calcium** hardness as  $\text{CaCO}_3$

### K-1594

Drop test (EDTA titration); 1 drop = 10 ppm **calcium** or **total** hardness as  $\text{CaCO}_3$

### K-0432

Buret titration reagent pack (EDTA titration); 1 mL = 1 mg **calcium** or **total** hardness as  $\text{CaCO}_3$

## 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.
- Drop test kits are practical for both **on- and off-site** testing.
- Test kits **come complete** with all necessary reagents and equipment.



*the most trusted name in water testing*

**Taylor Technologies, Inc.**  
410-472-4340  
800-TEST KIT (837-8548)  
[www.taylor technologies.com](http://www.taylor technologies.com)

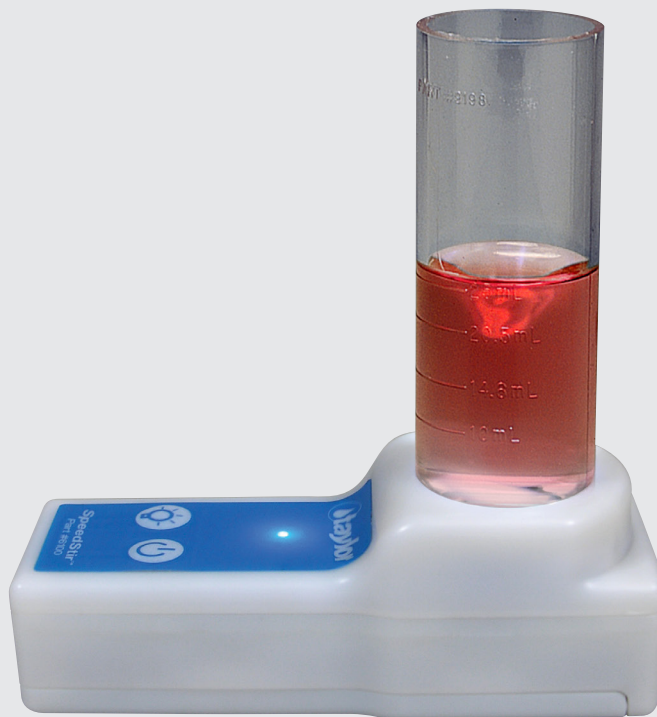
ISO 9001:2008 Certified

## USER BENEFITS (CONT'D)

- **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** 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



- **SampleSizer**® for 10/25 mL test volumes (#6190) and **SpeedStir**® magnetic stirrer (#9265) save time for frequent testers.
- 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 in reagent packs).
- Testing supplies and kit replacement parts (e.g., burets, flasks, test tubes, and test cells).
- **Video demonstrations** for new users posted on our website.
- Toll-free technical assistance at **800-TEST KIT**.



▲ SpeedStir  
4<sup>5</sup>/<sub>8</sub>" l x 1<sup>3</sup>/<sub>4</sub>" w x 1<sup>5</sup>/<sub>8</sub>" h  
(Shown with #9198 sample tube  
supplied in #9265 Start-up Pack)

## REPRESENTATIVE TEST PROCEDURE

Reproduced from K-1504 instruction:

DROP TEST HARDNESS (1 drop = 0.5 ppm)		Instr. #5226
<b>COMPONENTS:</b> 1 x 5226 Instruction 1 x 9198B Sample Tube, Graduated (25 mL) w/ cap & blue dot, plastic 1 x R-0620B-I Hardness Indicator Powder, 10 g w/ blue dot 1 x R-0622-C Trace Hardness Buffer, 2 oz, DB 1 x R-0623-C Trace Hardness Reagent, 2 oz, DB	5. Multiply drops of R-0623 Trace Hardness Reagent by 0.5. Record as parts per million (ppm) hardness as calcium carbonate (CaCO <sub>3</sub> ).	 Fig. 1
<b>TO ORDER REPLACEMENT PARTS AND REAGENTS CALL TOLL-FREE 800-TEST KIT (800-837-8548).</b>		 Fig. 2
<b>PROCEDURE:</b> <b>CAREFULLY READ AND FOLLOW PRECAUTIONS ON REAGENT LABELS. KEEP REAGENTS AWAY FROM CHILDREN.</b>		
<b>NOTE:</b> When dispensing reagents from dropper bottles, <b>always</b> hold bottle in a vertical position.		
<b>Hardness Test</b> 1. Rinse and fill 25 mL sample tube (#9198B) to 25 mL mark with water to be tested. 2. Add 5 drops R-0622 Trace Hardness Buffer. Swirl to mix. 3. Add 1 level dipper R-0620B Hardness Indicator Powder. Swirl to mix. Sample will turn red (Fig. 1) if hardness is present—proceed to Step 4. Sample will turn blue (Fig. 2) if no hardness is present. 4. Add R-0623 Trace Hardness Reagent dropwise, swirling and counting after each drop, until color changes from red to blue (Fig. 2).		



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

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