

Taylor's Polymer Test Kit

INTRODUCTION

Polymers are widely used today in water treatment programs for both boiler and cooling systems. They are designed to work on hardness salts, iron, and suspended solids. These organic molecules act to increase the solubility of normal reaction products and to disperse solids so they do not accumulate on equipment surfaces. In boiler water the polymer treatment can be used alone or with other conditioners, like phosphates, phosphonates, and chelants. In cooling water the polymer is typically used in conjunction with corrosion inhibitors (such as orthophosphate or zinc) and/or scale inhibitors (such as phosphonates).

Polymer testing in boiler water is critical to the long-term performance of the program, especially when the polymer is used alone. Underdosing allows scale to form. Severely underdosing the polymer in relation to the hardness in the water can lead to calcium polyacrylate scaling. Overdosing not only incurs unwarranted chemical costs, but also can increase corrosion in the boiler system. Moreover, since polymers are organic, they are susceptible to thermal degradation at high cycles of concentration (over 50 cycles). For all these reasons the active polymer concentration should be tested regularly.

In cooling water the polymer can be affected by various stresses in the system, such as a high level of oxidizing biocide or a high Holding Time Index (HTI). **It can be unwise to assume the polymer is present at the required level based on phosphonate and tracer tests that do not directly measure the polymer itself.**

Taylor's polymer test employs a simple turbidimetric method. First, turbidity is filtered out of the sample water with the syringe filter included in the kit. When reagents are then added to the prepared sample, turbidity develops in proportion to the amount of polymer in the water. The degree of turbidity observed after a timed five-minute wait is compared to a set of printed standards and their interpolated values. (See instruction on reverse.) The closest match indicates the concentration in parts per million polyacrylic acid. Interferences listed in the note below should be considered when running this test.



Note: All polymer test apparatus should be disassembled and thoroughly rinsed with distilled, deionized, or tap water between tests. Cationic surfactants and polyphosphates are positive interferences at all levels. Negative interferences include Alkalinity >300 ppm CaCO₃; Anionic Surfactants at all levels; Azoles; Fluoride >20 ppm; Glutaraldehyde >50 ppm; Hardness >700 ppm CaCO₃; Iron; Molybdenum >10 ppm; PBTC, HEDP, and ATMP; Orthophosphate; Silica; Sulfate >1000 ppm; TDS >1500 ppm; Zinc >100 ppm.

POLYMER KIT

K-1190

Turbidimetric test; printed standards for 0, 2, 5, 7, 10 ppm PAA (polyacrylic acid) plus five additional interpolated values



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

USER BENEFITS

- Test kit **comes complete** with all necessary reagents and equipment.
- This test kit is practical for both **on- and off-site testing**.
- **Waterproof instructions** are printed on plastic-impregnated paper that resists fading and tearing.
- Custom-molded, durable plastic case provides **safe storage** for contents.
- **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

- Individual replacement reagents and apparatus, including a 100-count pack of **2.5 µm filter discs** (#6257) for the syringe filtration system.
- Additional stand-alone tests for boiler and cooling waters including **alkalinity, calcium hardness, chelants, orthophosphate, and phosphonates**, as well as kits with standard combinations of tests for both open and closed systems.
- 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**.

REPRESENTATIVE TEST PROCEDURE

Reproduced from K-1190 instruction:

COLOR COMPARISON TEST FREE POLYMER (0–10 ppm)

COMPONENTS:

2 x 4030	Pipet, Calibrated (0.5 & 1.0 mL) w/ cap, plastic
1 x 5190	Instruction (Turbidity Standards)
1 x 5190A	Instruction
1 x 6249	Filter Disc Holder, 25 mm, Millipore™
1 x 6257	Filter Discs, 25 mm diameter, 2.5 µm, Whatman™, 100/box
1 x 6260	Syringe, 30 mL, plastic
1 x 9198	Sample Tube, Graduated (25 mL) w/ cap, plastic
1 x R-0830-C	Free Polymer Reagent #1, 2 oz
1 x R-0831-C	Free Polymer Reagent #2, 2 oz

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: It is important to adhere to the timed waiting periods for accurate results.

NOTE: Positive interferences: Cationic surfactants, Polyphosphates at all levels;
Negative interferences: Alkalinity >300 ppm CaCO₃; Anionic surfactants at all levels;
Azoles >10 ppm; Fluoride >20 ppm; Glutaraldehyde >50 ppm; Hardness >700 ppm;
Iron >10 ppm; Molybdenum >10 ppm; Orthophosphate >100 ppm; Phosphonate
(ATMP, HEDP, PBTC) >100 ppm; Silica >100 ppm; Sulfate >1000 ppm; TDS >1500 ppm;
Zinc >100 ppm.

Free Polymer Test

1. Draw water to be tested into 30 mL syringe (#6260) to 30 mL mark.
2. Remove cap from bottom of a clean, dry sample tube (#9198).

Instr. #5190A

3. Following the instructions below, filter water into sample tube. Do not empty or disassemble syringe filtration system. Retain for later use, if needed.
 - a. Open filter holder (#6249) and place 1 filter disc (#6257) into filter holder. Screw filter holder together.
 - b. Screw filter holder onto syringe being careful not to push on plunger.
 - c. Slowly depress plunger to filter water into sample tube to 25 mL mark.
4. Using a 1.0 mL pipet (#4030), add 2.5 mL R-0830 Free Polymer Reagent #1. Swirl to mix.
5. Using a second 1.0 mL pipet (#4030), add 2.5 mL R-0831 Free Polymer Reagent #2. Swirl to mix.
6. Place sample tube on center dot of turbidity standards (#5190) and WAIT 5 MINUTES.
7. At exactly 5 minutes match the turbidity in the test sample with closest dot on turbidity standards (#5190) by looking down through solution. (Arrows denote interpolated values between standards.) Record results as parts per million (ppm) free polymer as polyacrylic acid (PAA).

NOTE: Clean and thoroughly rinse all apparatus (sample tubes, syringe, filter holder, test cell, and pipets) with distilled, deionized, or tap water between tests. Pipets should be disassembled and all parts thoroughly rinsed.

Syringe and filter holder should be cleaned as follows: Unscrew filter holder from syringe. Open filter holder and discard filter disc. Draw up deionized, distilled, or tap water in syringe. Screw filter holder together and replace on syringe. Depress plunger to clean and rinse. Repeat as necessary.



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