

**E-Z Chek® Residual Chlorine Test Strips****Instructions for Use****Indications for Use**

K100-0101B E-Z Chek® Residual Chlorine Test Strips provide accurate and convenient means of measuring the concentration of free chlorine remaining in water when rinsing out equipment following disinfection. A rapid screening qualitative method will detect levels above 0.5 ppm (mg/L) while the 30 second semi-quantitative method allows interpolation of concentration between 0 ppm and 5 ppm. The qualitative method can be used to determine that chlorine has been adequately rinsed from the equipment. The semi-quantitative method may be useful when corrective measures are undertaken on equipment retaining higher levels of chlorine for extended periods and for testing any containers disinfected with free chlorine (bleach).

**Test Procedures:****Qualitative Test**

1. Verify the test strips have not expired.
2. Remove a test strip from container and close immediately. Do not allow anything to touch the reagent test pad.
3. Hold the reagent pad of the test strip in the rinse stream for 5 seconds. (Figure 1)
4. The appearance of any pink/purple color on the pad indicates a level of 0.5 ppm or greater. If no color is apparent immediately upon removal, the chlorine level is less than 0.5 ppm. Any pink/purple color on the reagent pad indicates further rinsing is necessary.<sup>1</sup>
5. When using this method, **do not** refer to the color blocks on the bottle label to determine the concentration of residual chlorine.



Figure 1

**Semi-Quantitative Test**

1. Verify the test strips have not expired.
2. Remove a test strip from container and close immediately. Do not allow anything to touch the reagent test pad.
3. Fill standard sample cup with test solution. Discard solution and re-fill (~20mL test sample needed).
4. Immerse reagent pad of test strip in the solution and move the test strip back and forth vigorously for 30 seconds. (Figure 2)
5. Remove the strip and compare to label color chart within 10 seconds. (Figure 3)
6. Concentrations (color development) that fall between color block values should be estimated to the next closest color match.

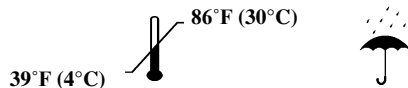


Figure 2



Figure 3

**Note:** Chlorine at low levels is not stable during handling and storage, particularly in the presence of light. Begin the test procedure immediately after collecting a sample. Since chlorine is consumed during testing; in order to retest, empty the sample cup, obtain a fresh sample, new test strip, and repeat the procedure.

**Storage and Handling**

- Keep all unused test strips in the original bottle with lid tightly closed. Replace cap immediately after use.
- Do not use test strips (from an opened or unopened bottle), after the expiration date. The expiration date is the last day of the month printed on the container (year/month/day).
- Do not allow the test strips to contact work surfaces that may be contaminated with interfering substances.
- Do not leave the test strips in areas exposed to chlorine vapors or other oxidizing vapors.



REF K100-0101B

## E-Z Chek® Residual Chlorine Test Strips



### Instructions for Use

#### Limitations

The test will give a positive result with any substance which will oxidize syringaldazine (a specific indicator and colorless compound for free available chlorine) directly or which will oxidize potassium iodide to iodine under neutral pH conditions. These substances include, among others; hypochlorite, chlorine, monochloramine, nitrogen trichloride, ozone, iodine, bromine and peroxide. K100-0101B test strips are **not** suitable for testing chlorine in bicarbonate concentrates. Syringaldazine does not react with many of the substances found in non-purified water such as; sulfate nitrate, chloride, copper, calcium and magnesium. Manganese (IV) and iron (III) give false positive results, while the presence of nitrate will yield a false negative. However, since rinsing of hemodialysis systems is usually done with highly purified water, it is unlikely that these potentially interfering substances will appear in the rinse water.



When used as a medical device, Federal law restricts this device to sale by or on order of a physician.

#### Performance Characteristics

The performance characteristics of the E-Z Chek® Residual Chlorine Test Strips (K100-0101B) are based on analytical studies using samples to which sodium hypochlorite was added to give a range of chlorine levels. The sensitivity and accuracy of the test strip depends on several factors including variability in the user's color perception, the variation in lighting conditions, and the possible presence of interfering substances. Samples with reference chlorine concentrations falling between two color block values will give results ranging between those values. Results will generally be within one color block of reference value. The concentration of chlorine in rinse water is obtained by comparing the color of the reagent pad with color blocks on the label when using the Semi-Quantitative Test Method. The color blocks are identified in terms of chlorine concentration in parts per million (ppm, mg/L). Color blocks are designated as 0, 0.5, 1, 2, and 5 ppm (mg/L) free chlorine. Concentrations (color reaction development) that fall between color block values should be estimated to the next closest color match.

#### Chemical Properties of the Test

E-Z Chek® Residual Chlorine Test Strips (K100-0101B) react with both free chlorine and combined chlorine (monochloramines). Chlorine oxidizes syringaldazine to form a red-purple oxidation product. The reagent pad on the strip is buffered to pH 6.8 and contains potassium iodide. Combined chlorine in the form of monochloramines oxidizes the potassium iodide to iodine which in turn oxidizes syringaldazine to the colored form.<sup>2, 3, 4</sup>

#### Quality Control

RPC performs a quality control test on each lot number of test strips (Certi-Chek™ Field Verification Program). RPC includes a certificate of conformance with each shipment. Certificates of conformance are also available upon request and/or can be downloaded at [www.rpc-rabrenco.com](http://www.rpc-rabrenco.com).

#### References

1. Association for the Advancement of Medical Instrumentation (AAMI; RD62:2006).
2. Sorber, C., W. Cooper, and E. Meier, "Selection of a Field Method for Free Available Chlorine. In: Disinfection: Water and Wastewater, J. D. Johnson, ed. Ann Arbor Science Publ., Ann Arbor, MI, 1975. pp. 91-112.
3. R. Bauer, B. F. Phillips and C.O. Rupe, "A Simple Test for Estimating Free Chlorine", Journal AWWA (November, 1972), pp. 787-789
4. J. Liebermann, N.M. Roscher, E.P. Meier, and W.J. Cooper, "Development of the FACTS Procedure for Combined Forms of Chlorine and Ozone in Aqueous Solutions," Environ Sci Technol 14, (1980), pp. 1395-1400.