

# Total Hardness ezSample™ Field Titrator (EZ-2338)

20–200 ppm (mg/L) CaCO<sub>3</sub>

## Safety Information

Read the MSDS before performing this test procedure. Wear safety glasses and disposable gloves.

## Sample Pretreatment

If the sample is turbid, it must be filtered prior to performing this test procedure.

## Test Procedure

1. Fill the sample cup to the 25 mL mark with the sample (Figure 1).

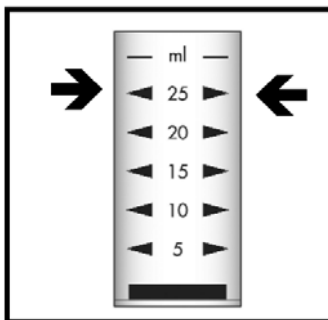


Figure 1

2. Gently snap the tip of the ezSample Snap Vial (ampoule) at the black snap ring (Figure 2).

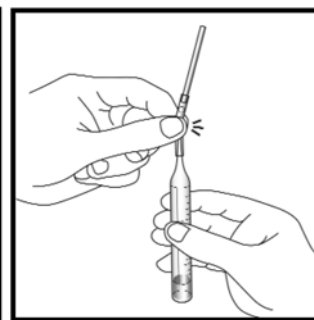


Figure 2

**NOTE:** When the tip is snapped, the flexible tubing will remain in place on the tapered neck of the ampoule.

3. Lift the control bar and insert the ampoule assembly into the titrator (Figure 3).

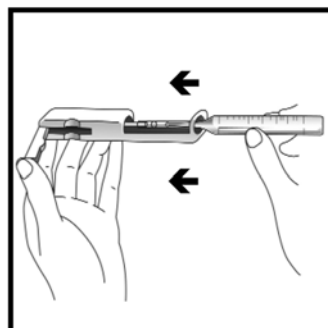


Figure 3

**NOTE:** The rigid sample pipe will extend approximately 1.5 inches beyond the body of the titrator.

4. Hold the titrator with the sample pipe in the sample and press the control bar firmly, but briefly, to pull in a small amount of sample (Figure 4). The contents will turn a **BLUE** color.

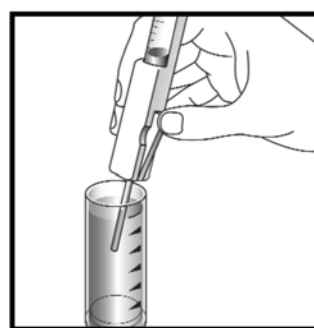


Figure 4

**NOTE:** NEVER press the control bar unless the sample pipe is immersed in the sample.

5. With the sample pipe in the sample, press the control bar again briefly to allow another small amount of sample to be drawn into the ampoule.
6. After each addition, rock the entire assembly to mix the contents of the ampoule. Watch for a color change from **BLUE to PINK**.
7. Repeat steps 6 and 7 until a permanent color change occurs.
8. When the color of the liquid in the ampoule changes to **PINK**, remove the ampoule from the Titrator. Hold the ampoule in a vertical position and read the scale opposite the liquid level (Figure 5).

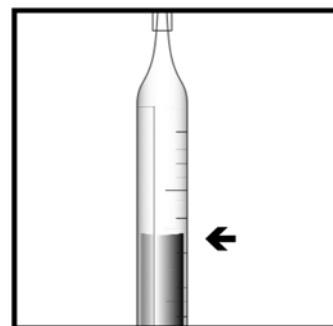


Figure 5

**NOTE:** Divide ppm calcium carbonate by 17.16 to convert results to grains per gallon.

## Test Method Description

The total hardness ezSample test method employs ethylenediaminetetraacetic acid (EDTA) titrimetric chemistry.<sup>1,2</sup> In an alkaline solution, EDTA forms a chelated soluble complex with calcium and magnesium ions. Calmagite is used as the endpoint indicator. Results are expressed as calcium carbonate (CaCO<sub>3</sub>).<sup>1,2,3</sup>

**NOTE:** Because the ampoules have nonlinear scales, the accuracy of the ezSample field titrator kit varies with the analyte concentration. At the low end of the test range, the accuracy is  $\pm 5\%$ . At the high end of the range, the accuracy falls to  $\pm 20\%$ .

## References

1. Method 2340C. APHA Standard Methods, 20th ed., p. 2-37, (1998).
2. Method 130.2. EPA Methods for Chemical Analysis of Water & Wastes. (1983).