

TOTAL HARDNESS TEST KIT FOR BOILER TEST

INSTRUCTIONS FOR LOW RANGE HARDNESS

- 1 Fill the flask to the 100-mL mark with the water to be tested.
- 2 Add two droppersful of Buffer Solution, Hardness 1, to the flask, and swirl to mix.
- 3 Add four drops of ManVer 2 Hardness Indicator, Hardness 2, to the flask. Swirl to mix. A blue color indicates soft water. If a red color develops proceed to Step 4.
- 4 Add Titrant Reagent, Hardness 3, drop by drop to the flask. Swirl the flask constantly as the drops are added. Count each drop as it is added, and continue to add reagent until the color changes from red to blue.
- 5 Each drop of Titrant Reagent, Hardness 3, used to bring about the color change is equal to 1mg/L as calcium carbonate (CaCO₃).

WARNING: The chemicals in this kit may be hazardous to the health and safety of the user if inappropriately handled. Please read all warnings before performing the test and use appropriate safety equipment.

INSTRUCTIONS FOR HIGH RANGE HARDNESS

- 1 Fill the plastic measuring tube level full with the water to be tested. Pour the contents of the tube into the mixing bottle.
- 2 Add three droppersful of Buffer Solution, Hardness 1, to the mixing bottle. Swirl to mix as shown in Figure 1.
- 3 Add one drop of ManVer 2 Hardness Indicator to the mixing bottle. Swirl to mix. A blue color indicates soft water. If a red color develops proceed to Step 4.
- 4 Add Titrant Reagent, Hardness 3, drop by drop to the bottle. Swirl the bottle constantly as the drops are added. Count each drop as it is added and continue to add reagent until the color changes from red to blue.
- 5 Each drop of Titrant Reagent, Hardness 3, used to bring about the color change is equal to 1 grain per gallon hardness expressed as calcium carbonate (CaCO₃).
One grain per gallon (gpg) is equal to 17.1 milligrams per liter (mg/L).

REPLACEMENTS

Cat. No.	Description	Unit
424-32	Buffer Solution, Hardness 1	100 mL MDB*
425-32	ManVer 2 Hardness Indicator, Hardness 2	100 mL MDB*
426-32	Titrant Reagent, Hardness 3	100 mL MDB*
439-06	Bottle, square mixing	pk/6
505-43	Flask, Erlenmeyer, 125mL	each
438-00	Measuring Tube	each
479-49	Hardness Standard Solution 20 gpg as CaCO ₃ (not included in kit)	500 mL