



## TOTAL HARDNESS KIT

DIRECT READING TITRATOR, 0-200 ppm

CODE 4482-DR-LI-01

QUANTITY	CONTENTS	CODE
15 mL	*Hardness Reagent #5	*4483-E
15 mL	*Hardness Reagent #6 Solution	*4485-E
60mL	Hardness Reagent #7	4487DR-H
1	Test Tube, 5-10-12.9-15-20-25 mL, glass, w/cap	0608
1	Direct Reading Titrator, 0-200 Range	0382
1	Pipet, 0.5 mL, plastic	0353

**\*WARNING:** Reagents marked with an \* are considered to be potential health hazards. To view or print a Safety Data Sheet (SDS) for these reagents go to [www.lamotte.com](http://www.lamotte.com). Search for the four digit reagent code number listed on the reagent label, in the contents list or in the test procedures. Omit any letter that follows or precedes the four digit code number. For example, if the code is 4450WT-H, search 4450. To obtain a printed copy, contact LaMotte by email, phone or fax.

Emergency information for all LaMotte reagents is available from Chem-Tel (US, 1-800-255-3924) (International, call collect, 813-248-0585).

To order individual reagents or test kit components, use the specified code number.

**NOTE:** Read the Direct Reading Titrator Instruction Manual before proceeding. The Titrator is calibrated in terms of total hardness expressed as parts per million (ppm) calcium carbonate (CaCO<sub>3</sub>). Each minor division on the Titrator scale equals 4 ppm CaCO<sub>3</sub>.

## **PROCEDURE.**

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1. Fill the test tube (0608) to 12.9 mL line with sample water.
2. Add five drops of \*Hardness Reagent #5 (4483). Swirl to mix.
3. Add five of Hardness Reagent #6 Solution (4485) and swirl to mix. Solution will turn red if hardness is present. If solution is blue, there is no measurable amount of hardness.
4. Fill the Direct Reading Titrator (0382) with Hardness Reagent #7 (4487DR). Insert Titrator in the center hole of the test tube cap.
5. While gently swirling the titration tube, slowly press the plunger to titrate the sample until the red color changes to blue. Read the test result directly from the scale where the large ring on the Titrator meets the Titrator barrel. The result is expressed as Total Hardness in ppm CaCO<sub>3</sub>.

EXAMPLE: Plunger tip is 3 minor divisions below line 80. Test result is 80 plus (3 divisions x 4) equals 92 ppm.6.

6. If the plunger tip reaches the bottom line on the Titrator scale (200 ppm) before the color change occurs, refill the Titrator and continue the titration. When recording the test result, be sure to include the value of the original amount of reagent dispensed (200 ppm).
7. To convert ppm Hardness to grains per gallon (gpg), multiply by 0.058. Record as gpg Hardness as CaCO<sub>3</sub>.

$$\text{gpg CaCO}_3 = \text{ppm CaCO}_3 \times 0.058$$

## **ANALYSIS OF HARDNESS IN SALT WATER**

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When sea and estuarine waters containing very high levels of mineral salts are tested, the sample must be diluted before titration. This test kit contains a calibrated pipet for performing the dilution described below.

1. Use the 0.5 mL pipet (0353) to transfer 0.5 mL of the salt water sample to the test tube (0608).
2. Dilute to the 12.9 mL line with distilled water (a 1 to 25.8 dilution).
3. Follow Steps 2 through 6 above. Multiply the Titrator reading by 25.8. Record as ppm Total Hardness as CaCO<sub>3</sub>.

### **LaMOTTE COMPANY**

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802 Washington Ave · Chestertown · Maryland · 21620 · USA  
800-344-3100 · 410-778-3100 [Outside U.S.A.] · Fax 410-778-6394

Visit us on the web at [www.lamotte.com](http://www.lamotte.com)

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