Instruction Manual

HI 3840
Hardness
Low Range
Test Kit

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Dear Customer,

Thank you for choosing a Hanna Product.

Please read the instructions carefully before using the chemical test kit. It will provide you with the necessary information for a correct use of the kit.

Remove the chemical test kit from the packing material and examine it carefully to make sure that no damage has occurred during shipping. If there is any noticeable damage, notify your Dealer or the nearest Hanna office immediately.

Each kit is supplied with:

- HI 3840-0 Hardness LR Reagent, 1 bottle with dropper (30 mL);
- 1 calibrated plastic vessel (50 mL).

Note: Any damaged or defective item must be returned in its original packing materials.

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SPECIFICATIONS

Range	0 to 150 mg/L (ppm) $CaCO_3$
Smallest Increment	5 mg/L (ppm) $CaCO_3$
Analysis Method	Drop count titration
Sample Size	50 mL
Number of Tests	50 (average)
Case Dimensions	115x105x80 mm (4.5x4.1x3.1")
Shipping Weight	120 g (4.2 oz.)

SIGNIFICANCE AND USE

Historically, water hardness had been defined by the capacity of water to precipitate soap. The ionic species in water causing the precipitation were later found to be primarily calcium and magnesium. Currently, therefore, water hardness is actually a quantitative measure of these ions in the water sample.

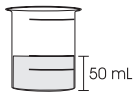
CHEMICAL REACTION

The Hanna Test Kit determines total hardness in water via a titrimetric method. Calcium and magnesium form a complex with EDTA and the reaction end-point is indicated by the change in color of the indicator from red to blue.

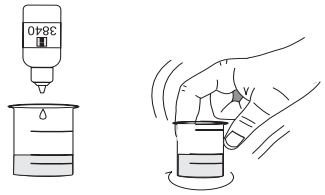
INSTRUCTIONS

READ THE ENTIRE INSTRUCTIONS BEFORE USING THE KIT

- Rinse the plastic vessel with the water sample, and fill it to the 50 mL mark with the sample.



- Add drops of HI 3840-0 reagent until the color changes from pink to blue, while swirling the sample after each



drop and counting the drops needed to obtain the color change.

- Use the Conversion Table or calculate the Hardness:

$$\#\ \text{of DROPS} * 5 = \text{ppm } CaCO_3$$

$$1\ \text{ppm} = 1\ \text{mg/L} = 0.1\,^{\circ}\text{f} = 0.0556\,^{\circ}\text{D} = 0.07\,^{\circ}\text{E}$$

NOTE: ppm : is milligrams $CaCO_3$ per Liter
°f : French Degrees
°D : German Degrees
°E : English Degrees

Store the reagent bottle out of direct sunlight

REFERENCES

Adaptation of the E.P.A. recommended 130.2 method.

HEALTH AND SAFETY

The chemicals contained in this test kit are safe in normal domestic term. Read Health and Safety Data Sheet before performing the test.

TABLE 1
HARDNESS OF WATER

Drops:	
1 - 16	very soft
17 - 32	soft
33	medium

To measure: Hardness Medium Range use HI 3841 Test Kit
Hardness High Range use HI 3842 Test Kit

TABLE 2
CONVERSION DATA

Drops	ppm	°f	°D	°E
1	5	0.5	0.28	0.35
2	10	1.0	0.56	0.70
3	15	1.5	0.83	1.05
4	20	2.0	1.11	1.40
5	25	2.5	1.39	1.75
6	30	3.0	1.67	2.10
7	35	3.5	1.94	2.45
8	40	4.0	2.22	2.80
9	45	4.5	2.50	3.15
10	50	5.0	2.78	3.50
11	55	5.5	3.06	3.85
12	60	6.0	3.33	4.20
13	65	6.5	3.61	4.55
14	70	7.0	3.89	4.90
15	75	7.5	4.17	5.25
16	80	8.0	4.44	5.60
17	85	8.5	4.72	5.95
18	90	9.0	5.00	6.30
19	95	9.5	5.28	6.65
20	100	10.0	5.56	7.00
21	105	10.5	5.83	7.35
22	110	11.0	6.11	7.70
23	115	11.5	6.39	8.05
24	120	12.0	6.67	8.40
25	125	12.5	6.94	8.75
26	130	13.0	7.22	9.10
27	135	13.5	7.50	9.45
28	140	14.0	7.78	9.80
29	145	14.5	8.06	10.15
30	150	15.0	8.33	10.50