

exact® LEADQuick™

SMART PHOTOMETER SYSTEM®

*Ideal for Screening for Lead, Mercury,
and Cadmium in Potable Water
(also includes Lead Soil Method)*



 **Bluetooth®**

**SMART DIGITAL
WATER TESTING**

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WELCOME.

Thank you for your eXact® LEADQuick purchase! This guide will quickly walk you through the technical details of your new photometer. After initial set-up, test procedures, and tips, you will be on your way to digital water testing! Each test will require the use of the testing methods outlined in this manual.

YOUR EXACT® LEADQUICK COMES WITH:

- Carrying Case (Part #486001)
- Cell Cleaning Brush
- eXact® LEADQuick™ Photometer (Part #486900-BT)
- Cell cover
- Four bottles of test strips and liquid reagents.
- Quick Start Guide (this booklet)

WHAT YOU WILL NEED TO GET STARTED:

- Four (4) AAA batteries
- #4 Phillips head screwdriver

Note: This system has been calibrated for use with only our eXact® Micro reagents.

YOUR NEW EXACT® LEADQUICK™ PHOTOMETER IS IDEAL FOR TESTING AND MAINTAINING DRINKING WATER, POOLS, SPAS, PONDS, AQUARIUMS, FOOD PROCESS WATER, ENVIRONMENTAL WATERS, BREWING, AND MORE!

SAMPLE CELL - 4 ML

Built-in plastic 4mL cell for collecting your water sample

LIGHT SOURCE

Uses 525nm or 638nm wavelength, depending on test being run

BLUETOOTH CONNECTED

LCD DISPLAY



CELL COVER

Covers the cell for mixing and bright light situations

exact®
LEADQuick™



LCD DISPLAY

Displays results and test name

READ

READ BUTTON

Starts test timer

MENU

MENU BUTTON

Use to select desired test within Select Group

ZERO/ON

ZERO/ON BUTTON

Powers on the meter and creates a baseline for your water testing


sensafe.com



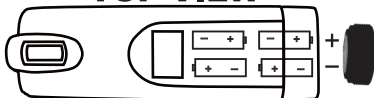
Part no. **486700-BT**

waterproof IP67

Protected against the effects of immersion in water to depth between 15 cm and 1 meter

1. Unscrew the O-ring sealed battery cover counter-clockwise. Use proper sized pliers if necessary. Do not disturb the sealing O-ring.
2. Remove the used batteries and install 4 new AAA batteries following the diagram for correct polarity (see diagram). We recommend high quality AAA alkaline batteries be used.
3. Replace the battery cover. Be sure to tighten the cover securely. This is necessary for meter to ensure it is waterproof.
4. Dispose of the used batteries in accordance with your local regulations.
5. Press  button to confirm the meter turns on.
6. The meter is now ready for operation.

TOP VIEW



Become familiar with the meter and the different tests by reading the instructions carefully.

Observe the dip time (as required for the test) for accurate results.

Be sure the CELL is filled to capacity. Then, tilt meter forward to discard about 0.2mL of the cell volume. This allows for the Pb-2 addition to be performed without overfilling the CELL.

Rinse the CELL with clean water immediately after completing each test. Some test reagents will stain or coat the CELL.

It is recommended that the sample be allowed to sit for 5 minutes or longer in Step 1 to facilitate Acid reaction. Additional time would be recommended if the detection of undissolved Lead or Cadmium particulates are of interest.

Store the meter and all test materials out of direct sunlight and away from chemical storage areas.

Minimize exposure of meter and test reagents to heat. Storage below 80°F (27°C) is recommended. **DO NOT REFRIGERATE TEST REAGENTS.**

Dry the outside of the meter when testing is complete or before storage of the meter.

Each eXact® Strip Micro is valid for **ONLY** one test. Discard strip after single use in regular refuse that is inaccessible to children and pets.

Each bottle of eXact® Strip Micro contains the quantity of strips notated on the bottle. Due to the manufacturing process, you may find one or two strips that are noticeably smaller or larger in width than the normal strips in the bottle. These should be discarded. Using these strips may give unreliable results.

Tests are calibrated at 75°F ± 2°F (24°C ± 1°C). It is recommended that the water sample be warmed before testing if sample temperature is below 60°F / 16°C.

Our lab testing with the LEADQuick meter has shown that zeroing and measuring of the sample does not require any cell cover for accurate results, even in full sunlight.

Remove batteries when meter is not used for more than a month (Warranty Requirement).

It is recommended that for best results this test be done on unpreserved, freshly drawn water samples. Water samples that have been preserved with strong Nitric Acid for lead testing will require alkali neutralization of excess acid to a pH of about 2.5; and the Acid-1 addition can be skipped. After the Pb-2 addition step the pH should be verified if pH issue is a concern; and ideally should be between 9.0 and 9.6 pH.

Ready Snap® are water standards with predetermined values to verify accuracy.

1. Snap open one Ready Snap® 1P Method Verification Standard by twisting the top 180° (Fig. 1).
NOTE: DO NOT CONSUME.

2. Squeeze contents of the plastic ampoule into the 50mL conical tube. Add one drop of ACID-1 to solution in conical tube. Mix and allow to sit for five (5) minutes.

3. Run the test method as you do normally using the correct procedure (pages 6-7), steps 2 through 7.

4. Compare the displayed value against the Assigned Value chart provided below.

5. If your value is within the Acceptable Range, then you are operating the eXact® LEADQuick Photometer correctly.

6. If your value is Borderline, review "For Best Accuracy" on the previous page and verify that you are following the proper procedures. Repeat the test again from Step 1 through Step 6.

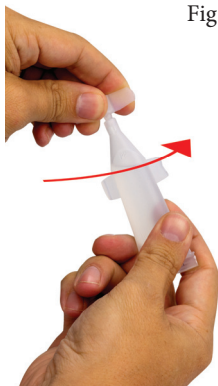


Fig 1.

Assigned Value chart

Menu	Parameter Test	Desired Value	Acceptable Range	Borderline Range
PB	Lead in Water	130 ppb	100 - 160 ppb	90 - 170 ppb

FILL, DIP, READ

6 TOTAL LEAD IN WATER TEST PROCEDURE

1

PREPARE SAMPLE

Add 50mL of water sample to the 50mL conical tube. Then, add five (5) drops of eXact Reagent ACID-1 (Part #486999), mix, and allow to sit for at least 5 minutes.

2

TURN METER ON

Press the **ZERO/ON** button to power on the eXact[®] LEADQuick[™].

3

SELECT TEST

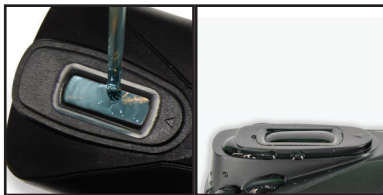
Press and re-press the **MENU** button until the display shows Pb.



4

FILL CELL

Fill and empty the cell 4 times with the TEST SAMPLE prepared in Step 1. Finally, **FILL** cell to capacity to begin test. Tilt meter to allow excess sample to flow out in order to make room for Pb-2 Reagent addition.



5

ADD REAGENT

Add five (5) drops of eXact Reagent Pb-2 (Part #488375-B) to the CELL.

6 **DIP STRIP AND PRESS READ**

DIP the eXact Strip Micro Pb-3 (Part #486997) into the CELL and immediately press **READ**. This starts the 20-second countdown timer. Use a gentle constant back and forth motion (2 strokes per second) until the timer displays "1". Be careful to not spill the sample from the CELL. Remove and discard the strip. The display will begin counting up from 1 to 60. After the 60-second count-up, the meter will automatically zero and display 0µg.



7 **DIP STRIP AND PRESS READ**

DIP the eXact Strip Micro Pb-4 (Part #486995) into the CELL and immediately press **READ**. This starts the 20-second countdown timer. Use a gentle constant back and forth motion (2 strokes per second) until the timer displays "1". Be careful to not spill the sample from the CELL. Remove and discard the strip. The display will begin counting up from 1 to 60. After the 60-second count-up, the meter will display the final results. After testing is complete, rinse the sample cell immediately and clean with brush.



SOLUBLE LEAD PROCEDURE

Collect water sample in 50mL conical tube to the 50mL line. Add two (2) drops of eXact® Reagent Pb-2 (Part #488375-B). TEST SAMPLE is ready for testing. Turn meter on and select test menu PB. Using the TEST SAMPLE from above, fill and empty the CELL four (4) times. Finally, fill cell to capacity with the TEST SAMPLE. Then perform steps 6 and 7 from above.

TIP

To get results as Colloidal Lead, subtract the Soluble Lead value from the Total Lead value.

8 **FILL, DIP, READ** **MERCURY IN WATER TEST PROCEDURE**

1 **PREPARE SAMPLE**

Add 50mL of water sample to the 50mL conical tube. Then, add five (5) drops of eXact Reagent ACID-1 (Part #486999), mix, and allow to sit for at least 5 minutes.

2 **TURN METER ON**

Press the **ZERO/ON** button to power on the eXact[®] LEADQuick[™].

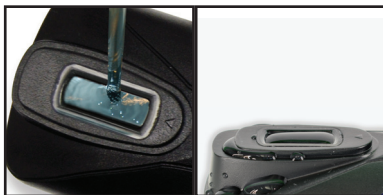
3 **SELECT TEST**

Press and re-press the **MENU** button until the display shows HG.



4 **FILL CELL**

Fill and empty the cell 4 times with the TEST SAMPLE prepared in Step 1. Finally, **FILL** cell to capacity to begin test. Tilt meter to allow excess sample to flow out in order to make room for Pb-2 Reagent addition.



5 **ADD REAGENT**

Add five (5) drops of eXact Reagent Pb-2 (Part #488375-B) to the CELL.

6

DIP STRIP AND PRESS READ

DIP the eXact Strip Micro Pb-3 (Part #486997) into the CELL and immediately press **READ**. This starts the 20-second countdown timer. Use a gentle constant back and forth motion (2 strokes per second) until the timer displays "1". Be careful to not spill the sample from the CELL. Remove and discard the strip. The display will begin counting up from 1 to 60. After the 60-second count-up, the meter will automatically zero and display 0µg.



7

DIP STRIP AND PRESS READ

DIP the eXact Strip Micro Pb-4 (Part #486995) into the CELL and immediately press **READ**. This starts the 20-second countdown timer. Use a gentle constant back and forth motion (2 strokes per second) until the timer displays "1". Be careful to not spill the sample from the CELL. Remove and discard the strip. The display will begin counting up from 1 to 60. After the 60-second count-up, the meter will display the final results. After testing is complete, rinse the sample cell immediately and clean with brush.



FILL, DIP, READ

10 CADMIUM IN WATER TEST PROCEDURE

1

PREPARE SAMPLE

Add 50mL of water sample to the 50mL conical tube. Then, add five (5) drops of eXact® Reagent HCl-1 (Part #486994), mix, and allow to sit for at least 5 minutes.

2

TURN METER ON

Press the **ZERO/ON** button to power on the eXact® LEADQuick™.

3

SELECT TEST

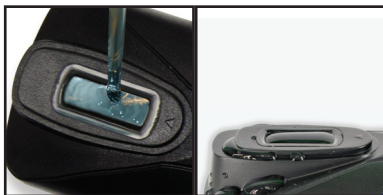
Press and re-press the **MENU** button until the display shows Cd.



4

FILL CELL

Fill and empty the cell 4 times with the TEST SAMPLE prepared in Step 1. Finally, **FILL** cell to capacity to begin test. Tilt meter to allow excess sample to flow out in order to make room for Pb-2 Reagent addition.



5

ADD REAGENT

Add five (5) drops of eXact Reagent Pb-2 (Part #488375-B) to the CELL.

6

DIP STRIP AND PRESS READ

DIP the eXact® Strip Micro Pb-3 (Part #486996) into the CELL and immediately press **READ**. This starts the 20-second countdown timer. Use a gentle constant back and forth motion (2 strokes per second) until the timer displays "1". Be careful to not spill the sample from the CELL. Remove and discard the strip. The display will begin counting up from 1 to 240. After the 240-second count-up, the meter will automatically zero and display 0µg.



7

DIP STRIP AND PRESS READ

DIP the eXact Strip Micro Pb-4 (Part #486995) into the CELL and immediately press **READ**. This starts the 20-second countdown timer. Use a gentle constant back and forth motion (2 strokes per second) until the timer displays "1". Be careful to not spill the sample from the CELL. Remove and discard the strip. The display will begin counting up from 1 to 240. After the 240-second count-up, the meter will display the final results. After testing is complete, rinse the sample cell immediately and clean with brush.



USING THE EXACT IDIP® APP

EXACT IDIP® APP OVERVIEW

Your new meter includes Bluetooth® for connecting to our eXact iDip® app. This is great for storing test results and eliminating data entry.

MENU:

Opens slide-out for easy access to all app features

HOME SCREEN



HISTORY:

Accesses saved results which can be sorted, edited, and emailed. Also accesses History Map



History



Calendar



Customers



Store



Test



Results

CUSTOMERS:

Attaches results to people and/or locations from your smart device contacts

PROFILE:

Change preferred Units of Measure and activate Archiving

CALENDAR:

Displays your schedule/appointments

STORE:

Opens store to unlock additional tests

TEST:
Initiates water testing

RESULTS:
Accesses temporary results that have not been saved to history

BLUETOOTH DEVICE

TEST RESULT SCREEN

LQBT 0037Ev69.02

TESTING PARAMETER

Lead in Water

TEST RESULT

34 µg/L

PARAMETER UNIT OF MEASURE

DOTS INDICATE MULTIPLE UNITS OF MEASURE
Swipe unit of measure values.
(Available for some tests)



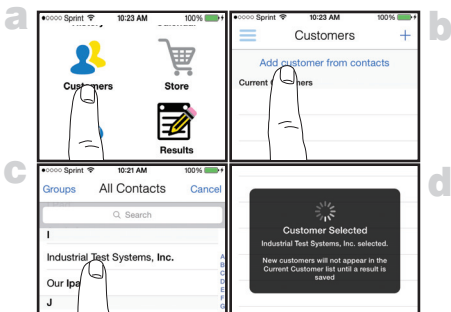
1

SELECT CUSTOMER

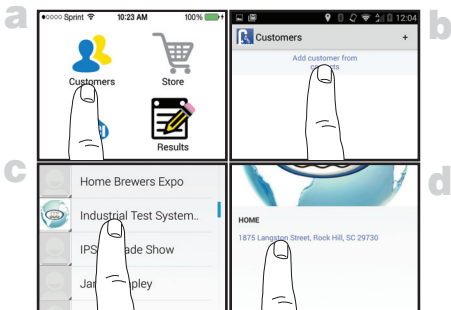
- Select '**Customers**' from the '**Home**' screen.
- Tap '**Add customer from contacts**'.
- Select a contact from your list. After selecting a contact, tap on the customer's address if shown.
- Verify customer has been selected.

Note: In order to take full advantage of the GPS and Data Storage features, each test result is linked to a contact.

Apple



Android



2

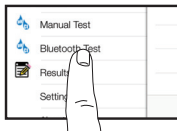
POWER ON EXACT® LEADQUICK™

Press ZERO/ON button to power on the eXact® LEADQuick.

3

SELECT BLUETOOTH® TEST

Tap the menu slide out '☰'
and select 'Bluetooth Test'
from the choices shown.



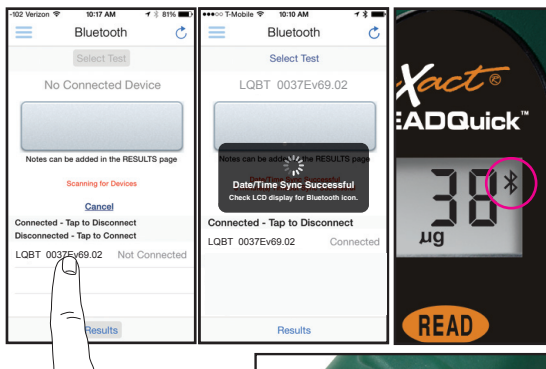
4

CONNECT EXACT® LEADQUICK

The eXact iDip® app will automatically connect to the most recently used smart photometer. If not, select your eXact® LEADQuick from the bottom of the screen.

Note: Ensure you always connect your eXact® LEADQuick photometer via the Bluetooth® connection within the app. To verify connection look for the Bluetooth icon in the upper right corner of your photometer.

If you experience an issue connecting your device, check to ensure that your smartphone/tablet's Bluetooth® function is turned on.



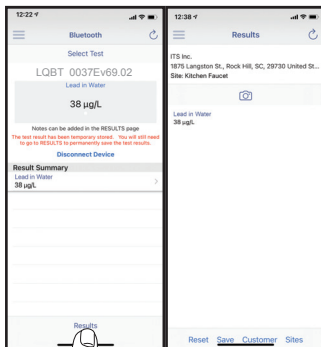
Refer to the back of your eXact® LEADQuick to determine the serial number for your device. This will also be the name for the Bluetooth® connection.



Once connected to the eXact® LEADQuick, you can run tests as usual. Test results will be stored automatically in the Results section of the app.

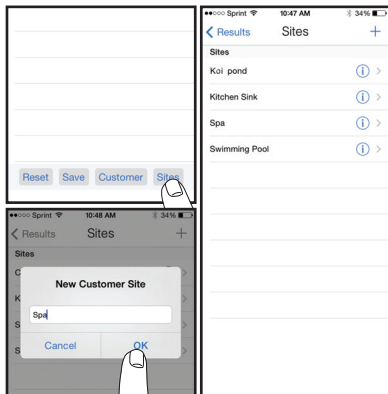
RESULTS

After tests have been performed, tap 'Results' at the bottom of the screen.



ADD SITES

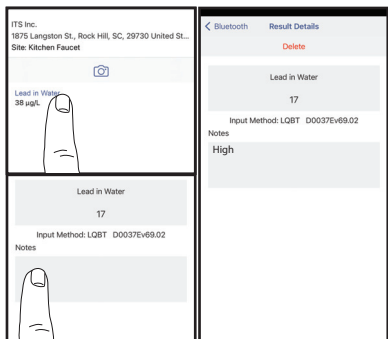
Each set of results must be saved to a customer's 'Site' (water source at the location). Select a site from the list or to add new sites, tap 'Sites', then '+'. Enter a Site name, tap 'OK'.



ADD NOTES

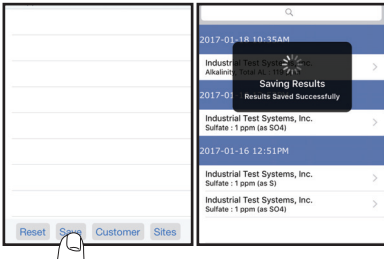
To add notes to each test tap the desired test result.

Type notes in the 'Notes' box, which are automatically saved. Press 'Results' to return to the results menu.



SAVE TO HISTORY

In 'Results' screen, tap 'Save' to store into 'History'. If this step is omitted, test results will not be permanently saved. A 'Saving Results' pop-up appears, verifying that your result is now successfully saved.

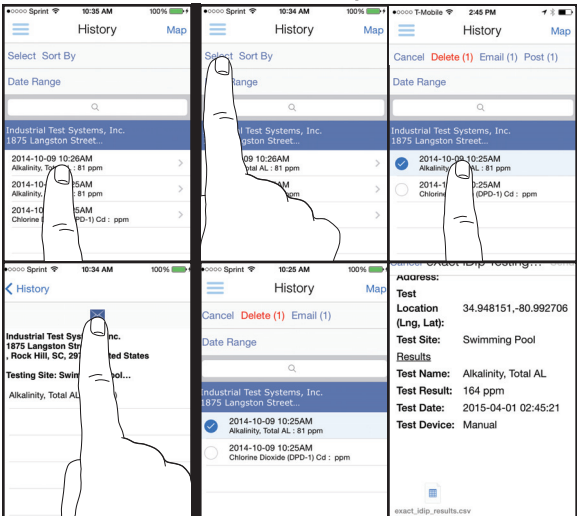


SEND/SHARE VIA EMAIL


In History you can edit, select, and email your results. To email you can either tap an individual result displayed, or use the 'Select' button to access multiple data points. Press the blue envelope icon if you tapped an individual result. Select 'Email' at the top if multiple tests are selected. A .csv (spreadsheet) file will be attached at the bottom of the e-mail.

Individual Result

Multiple Results



Listed below are possible situations that may arise while testing. Please contact one of our knowledgeable customer service representatives if you require further assistance (803) 329-9712.

Subject	Cause	Solution
No response from LEADQuick™	Low battery	Replace batteries
	Chip failure	Contact ITS
Dim screen on LEADQuick™	Low battery	Replace batteries
“ER” on LEADQuick™ LCD	Excessive stray light detected.	Place the cell cover over the CELL for zeroing and reading result.
 in lower left	Low battery (meter may not zero)	Replace batteries or meter may read LO.
“LO” on LEADQuick™ LCD while zeroing	Low battery	Replace batteries
	Dirty cell	Clean cell
	Cloudy sample	Dilute sample or use filter
	Bad LED	Contact ITS
“HI” on LEADQuick™ LCD while reading	Result above detection level	Rerun test to verify result
		Dilute and retest. Dilution kit available (#487200).
“LO” on LEADQuick™ LCD while reading	Result below detection level	Rerun test to verify result
eXact iDip® App not responding	Communication error between device and app	Force close app and restart
Bluetooth® connection lost	LEADQuick™ submerged too far in water	Collect water sample in container and transfer to cell or use Dry Case while testing
Flashing result on LCD	Lost connection to eXact iDip® app	Press ON/ZERO to stop flashing. Remove and replace cell cover if flashing continues.

ABOUT THE BUILT-IN CELL

The built-in CELL is transparent plastic and, when filled to the top, contains 4ml. The sturdy CELL design will last for over 20,000 readings. Scratches on the CELL will not interfere or compromise the accuracy of the readings because of its fixed position. For best accuracy, rinse cell with clean water immediately after a test is completed. Do not use solvents, such as acetone, to clean the cell. When the CELL becomes stained or cloudy from repeated testing, or when the meter does not blank when you press the ZERO/ON button, the cell needs to be cleaned. Clean as follows: Fill cell with clean water and add two drops of Acid-1 or HCl-1. Leave meter undisturbed for 5 minutes. Afterwards, rinse the cell and the meter is ready for use again. Cleaning the cell regularly will not be necessary if you rinse the CELL immediately after the test.

EXACT® LEADQUICK™ ACCURACY

Combined with your smart device, the eXact® LEADQuick™ photometer is designed to test your water for multiple water quality parameters. Download the free eXact iDip® app and sync to your smart device running Bluetooth® Technology.

All tests have been calibrated using certified reference standards and analytical spectrophotometric methods. The eXact® LEADQuick™ photometer has been factory calibrated and will stay valid because of its exceptional quality. We are so confident in the LEADQuick™ photometer, we offer an industry leading 2-year warranty.

We built the LEADQuick™ photometer to be accurate and environmentally friendly. We have achieved this by utilizing our patented eXact® Strip Micro Technology, which uses 60% less water and chemistry than alternative methods. Instead of using a 10mL water sample, eXact® Strip Micro uses a 4mL water sample.

PATENTED SMART PHOTOMETER SYSTEM®

Using eXact® Micro reagents in combination with the app and photometer completes the eXact® LEADQuick™ Smart Photometer System®. Each test will require the use of one of the testing methods outlined in this manual.

This system's unique and innovative technologies have earned the eXact® LEADQuick™ US and international patents (US Patents #7,333,194; Euro Pat No. 1 725 864 DE FR UK, and South African Patent #2007/0628) for underlying technology.

Note: This system has been manufactured only for use with our eXact® Micro reagents.

WARRANTY (2 YEARS)

Registration of your eXact® photometer must be received within 30 days from date of purchase to activate the warranty. The eXact® photometer is warranted to be free from defects in materials and workmanship for a period of two (2) years from the date of purchase by the customer. ITS will repair or replace any part of the product which is deemed to be faulty or otherwise defective. The non-transferable warranty does not cover product damage caused by abuse (such as crushing a tablet in the cell) or improper use. If the meter is faulty or otherwise defective contact ITS by phone (+1-803-329-9712 Ext. 0) or email (its@sensafe.com) to describe the problem and obtain a return authorization form before returning the photometer to ITS. Damage caused by improper packing of the photometer for return shipment to ITS will not be covered by the warranty. Customer is responsible for shipping charges to ITS. ITS pays postage when photometer is returned to customer. A maximum processing fee of \$235 will be charged for repair or replacement of non-registered photometers and damages not covered by this warranty. Registration is available over the phone (+1-803-329-9712 Ext. 0) or on-line at <http://www.sensafe.com/micro/warranty/> (Personal data is kept confidential).

LEAD RECOVERY IN WATER SAMPLES 19

Our laboratory has performed numerous Spiked Recovery tests using water samples from around the world. The water samples were obtained in the locations as identified below. The water was collected in clean plastic bottles and shipped to our lab. The samples were not pre-served by acid and not refrigerated. Each sample was spiked in duplicate at two different spiked concentrations (20µg/L and 50µg/L) giving a total of four spiked tests. Except for two water samples the % recovery of spiked water samples had an acceptable average for the four spiked water tests (within ± 10%). The Highland, NC well water averaged a 74% Recovery and the Seattle, WA municipal water averaged 83.5% Recovery. Water sample lead (Pb⁺²) concentrations found for all samples were below 3ppb, and reported as 0, except for Rock Hill, SC water (exposed to lead).

		<i>Water</i>	<i>Spiked</i>		<i>Spiked</i>	
	<i>Water</i>	<i>Sample</i>	<i>20ppb</i>	<i>%</i>	<i>50ppb</i>	<i>%</i>
<i>Water Origin</i>	<i>Type</i>	<i>µg/L</i>	<i>ppb (µg/L)</i>	<i>Recovery</i>	<i>ppb (µg/L)</i>	<i>Recovery</i>
Vienna, Austria	M	0	21	105	52	104
repeated		0	19	95	51	102
Munich, Germany	M	0	21	105	54	108
repeated		0	19	95	46	92
Kusnacht, Switzerland	M	0	20	100	51	102
repeated		0	19	95	54	108
Paris, France	M	0	19	95	50	100
repeated		0	20	100	45	90
Washington, DC	M	0	23	119	52	104
repeated		0	20	100	49	98
Philadelphia, PA	M	0	17	85	45	90
repeated		0	23	119	43	86
Phoenix, AZ	M	0	20	100	47	94
repeated		0	21	105	47	94
Edgewater, MD	W	0	22	110	50	100
repeated		0	16	80	46	92
Highland, NC	W	0	15	75	36	72
repeated		0	15	75	37	74
Rockwell, NC	W	0	22	110	51	102
repeated		0	23	119	50	100
Las Vegas, NV	M	0	19	95	52	104
repeated		0	17	85	49	98
Chicago, IL	M	0	21	105	51	102
repeated		0	16	80	52	104
Rock Hill, SC	W	0	18	90	47	94
repeated		0	17	85	46	92
Melbourne, Australia	M	0	20	100	47	94
repeated		0	19	95	45	90
Rock Hill, SC (exposed to lead)	M	5	25	100	56	102
repeated		5	26	104	52	95
Weaverly, NC	M	0	16	80	52	104
repeated		0	20	100	46	92
Anaheim, CA	M	0	19	95	53	106
repeated		0	21	105	47	94
Seattle, WA	M	0	16	80	45	90
repeated		0	16	80	42	84
Kilowna, BC, Canada	M	0	19	95	51	102
repeated		0	21	105	53	106

*M = Municipal, W = Well

The Spiked Recovery Test Method (also referred to as Standard Additions Method) is used to verify that LEADQuick™ gives accurate results for your water sample. If you find an unexplained difference in results when compared to another test method it is reasonable that you should resolve the issue. A good way to resolve the issue is by a technique commonly used by analytical chemists every day. This technique is often referred to as Spiked Recovery Test Method for Interferences. The following information explains how to perform the test method. You will need a Lead standard solution. The idea behind this method is as follows:

1. Add a known amount or concentration of Lead standard solution to the questionable sample. This is now the “spiked sample.” It is recommended to add a Standard Solution amount that is at least equivalent to three times the minimum detectable limit of the test (10 µg/L or ppb).
2. Test the spiked and un-spiked (original) samples using the same reagents, instrument and technique or test method. The spiked sample should show an increase equal to the amount of standard added. The value obtained is called the **Recovery**. Ideally the % recovery is 100%. Results are acceptable if the % recovery is +/- 10%. The formula for calculating percent Recovery is below.
3. If the percent recovery is not in the acceptable range there may be interferences. You can consider diluting the sample with lead free water past the point of interference, within the detection limit of the test kit. You can also consider calculating the actual lead in the sample (see below) as long as the %Recovery is above a reasonable level such as 40%. The percent recovery formula is as follows:

$$\% \text{ Recovery} = \frac{100(cs-cu)}{K}$$

Where:

- cs = concentration found through testing of the spiked sample
 cu = concentration found through testing of the un-spiked sample
 (NOTE: result should be adjusted for the dilution of the spike volume if volume change is more than 5%)
 K = concentration of the spike added to the sample

Example 1: An un-spiked questionable sample measures 10 ppb Lead. A separate 10mL portion of the questionable sample was spiked by adding 20 µL of a 10 ppm Lead standard solution. This is the equivalent of adding 20 ppb Lead to the water sample. The spiked solution was measured by the same method as the original sample. The Spiked result was 28 ppb (cs)

- cs = 28 ppb
 cu = 10 ppb
 k = 20 ppb

$$\% \text{ Recovery} = \frac{100(28-10)}{20} = 90\% \quad (\text{Recovery result acceptable})$$

Example 2: In another water sample using a similar spiked method as in Example 1 the results were

cs = 30 ppb

cu = 18 ppb

k = 20 ppb

% Recovery = $\frac{100(30-18)}{20} = 60\%$ (Recovery result unacceptable)

Calculating the Lead: In this example the percent recovery value is low and suggests that, with this test, the water sample gives lead results that are 60% of the actual concentration. To calculate the concentration of lead in this sample divide the expected recovery (100%) by the observed recovery (60%) to get the interference correction factor ($100\% / 60\% = 1.67$). Multiply the interference correction factor by the un-spiked sample result (cu) for the actual concentration of lead in the sample ($1.67 \times 18 \text{ ppb} = 30 \text{ ppb}$).

Lead Test (PB MENU) Interferences			
(Similar interferences can be expected for Mercury and Cadmium Tests.)			
Ion	Level	Ion	Level
Aluminum, Al ³⁺	2 mg/L	Magnesium, Mg ²⁺	200 mg/L
Barium, Ba ²⁺	3 mg/L	Manganese, Mn ²⁺	0.5 mg/L
Bromide, Br ⁻	20 mg/L	Mercury, Hg ²⁺	0.01 mg/L
Cadmium, Cd ²⁺	0.07 mg/L	Nickel, Ni ²⁺	1 mg/L
Calcium, Ca ²⁺	500 mg/L	Nitrogen, Ammonium, NH ₄ ⁺	40 mg/L
Chloride, Cl ⁻	150 mg/L	Nitrogen, Nitrate, NO ₃ ⁻	20 mg/L
Chromium, Cr ³⁺	0.1 mg/L	Nitrogen, Nitrite, N ₂ ⁻	300 mg/L
Cobalt, Co ²⁺	1 mg/L	Phosphate, PO ₄ ³⁻	100 mg/L
Copper, Cu ²⁺	5 mg/L	Sulfate, SO ₄ ²⁻	200 mg/L
Fluoride, F ⁻	40 mg/L	Tin, Sn ²⁺	0.2 mg/L
Iron, Fe ²⁺	0.2 mg/L	Zinc, Zn ²⁺	2 mg/L
Iron, Fe ⁺³	0.1 mg/L	Rev. 07/03/07	

LEAD IN SOIL TEST PROCEDURE

Extraction Method (Pb-1P, 0.1mL scoop, and 50mL Plastic Conical tube are not supplied, but required to perform this test)

Add one level scoop (0.1mL volume scoop, which holds approximately 0.14 grams) of soil sample to a clean 50mL, graduated, plastic conical tube. Add Twenty (20) drops of Pb-1P, Part No. 487925-P15 to the conical tube. Swirl the mixture for a few seconds or until all soil is suspended and mixed well. After five minutes, bring the volume of the sample to 50mL using deionized, distilled, or lead free tap water. Cap and mix this solution. This solution is now identified as the Soil Extraction Solution (SES). Wait one (1) minute, or more, for suspended solids to settle, then perform the test as follows:

Add 1.0mL (1000 μ l) of SES sample to a clean 50mL conical tube. Do not add **Pb-1P, Part No. 487925-P15** to the conical tube. Adjust the volume of the cell to 50mL using lead free tap water. Mix sample. Test Sample is ready for testing.

Press the **ZERO/ON** button to power the meter on; the display will show all annunciators, then the current **MENU** selection, followed by the last reading.

Press and re-press the **MENU** button until the display shows the parameter **Pb**.

Rinse the **CELL** at least 3 times with the Test Sample above. Finally, fill cell to capacity with the Test Sample. Tilt meter forward to allow excess sample to flow out in order to make room for Pb-2 Reagent addition below.

Add five (5) drops of **eXact[®] Reagent Pb-2, Part No. 488375-B**.

Dip the **eXact[®] Strip Pb-3, Part No. 486997** into the **CELL** and immediately press **READ**. This starts the **20 SECOND** countdown timer. During this time move the strip in a gentle back and forth motion. **Remove and discard the strip after "1" on the display disappears.** The display will flash (- - -) and begin immediately counting up from **1 to 60**. After the 60 seconds, the meter automatically zeros. The cursor will move across the display followed by 0 μ g (μ g/L).

Dip the **eXact[®] Strip Pb-4, Part No. 486995** into the **CELL** and immediately press **READ**. This starts the **20 SECOND** countdown timer. During this time move the strip in a gentle back and forth motion. **Remove and discard the strip after "1" on the display disappears.** The display will flash (- - -) and begin

immediately counting up from **1 to 60**. After the 60 seconds, the cursor will move across the display, informing you that it is about to measure the sample as μg ($\mu\text{g/L}$). Record result displayed (this result is automatically stored in **Pb**). After testing is complete discard sample and rinse cell immediately.

To convert the value in step 7 from $\mu\text{g/L}$ to mg/kg use **17.86** as the multiplication factor:

(For example: $65 \mu\text{g/L} \times 17.86 = 1161 \text{ mg/kg}$)

NOTE: If no Lead is found when 1.0mL SES sample is used in Step 1, then try 2mL of the SES for lower detection. If the result reads "HI", then the SES sample should be retested using a 0.01mL sample in Step 1. Pb-1P and Pb-2 drops required for these SES volume variations are listed in the chart below.

SES Volume	Pb-1P Drops	Pb-2 Drops	Multiplication Factor	Range (mg/Kg)	Accuracy %
0.01mL	0	5	1786	up to 300,000	± 40
1mL	0	5	17.86	18 to 3000	± 25
2mL	0	5	8.93	18 to 1500	± 25

LEAD IN WATER RECOMMENDATION FOR "FIRST DRAW SAMPLE"

The EPA 2007 Lead and Copper Rule Revision has a heavy lead testing focus on schools. The sampling is tiered:

1. "First draw sample" - sample a line unused for at least 8 to 18 hours. Draw the first 250mL to test. This measures the lead contribution from fixtures.
2. "Flushed sample" - before any water is used in the morning allow the line to run for 30 seconds, and then collect a 250mL sample. This measures the lead contribution from internal piping.

The June 1991 Lead and Copper Rule Fact Sheet recommended 1 liter of water from a tap unused for 6 hours. This is not mentioned in the 2007 revisions to the rule.

The amount of flushing determines what part of the system is being evaluated for lead. If the volume of water in the system can be determined (e.g. gallons of water/linear ft. of pipe) the amount of flushing can help isolate the source of the lead contamination. It appears that this approach is used by some cities as they do mandated lead testing of their water systems.

eXact® LEADQuick™

SMART PHOTOMETER SYSTEM®

LEADQUICK® TESTS & REAGENTS

PARAMETER / TEST ¹	RANGE (µg/L)	% BEST ACCURACY	# OF TESTS
Lead in Water	1 – 500	6	50
Mercury in Water	10 – 600	6	50
Cadmium in Water	10 – 600	6	50
REAGENT REFILLS	PART #	REAGENTS INCLUDED	
Lead in Water Reagent Set	486901	ACID-1, PB-2, PB-3, PB-4	
Lead in Soil Reagent Set	486902	PB-1P, PB-2, PB-3, PB-4	
Mercury in Water Reagent Set	486901	ACID-1, PB-2, PB-3, PB-4	
Cadmium in Water Reagent Set	486904	HCL-1, Pb-2, PB-3, PB-4	
ACCESSORIES	PART #	DESCRIPTION	
Mini Dilution Kit II	487202	Contains 1 of each: 50 mL Graduated Cylinder with cap, 2.5mL syringe, and dilution instructions.	
Ready Snap 1P	480911	Water standards with predetermined values to verify the accuracy the eXact® LEADQuick™ photometer.	

¹ Value provided represents best possible accuracy under laboratory conditions, but may vary throughout the detection range. For a complete list of accuracies throughout all ranges, please visit sensafe.com/486900-BT/.

All information in this manual is subject to change. Visit us online: sensafe.com/486900-BT/ for up-to-date product information.



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