

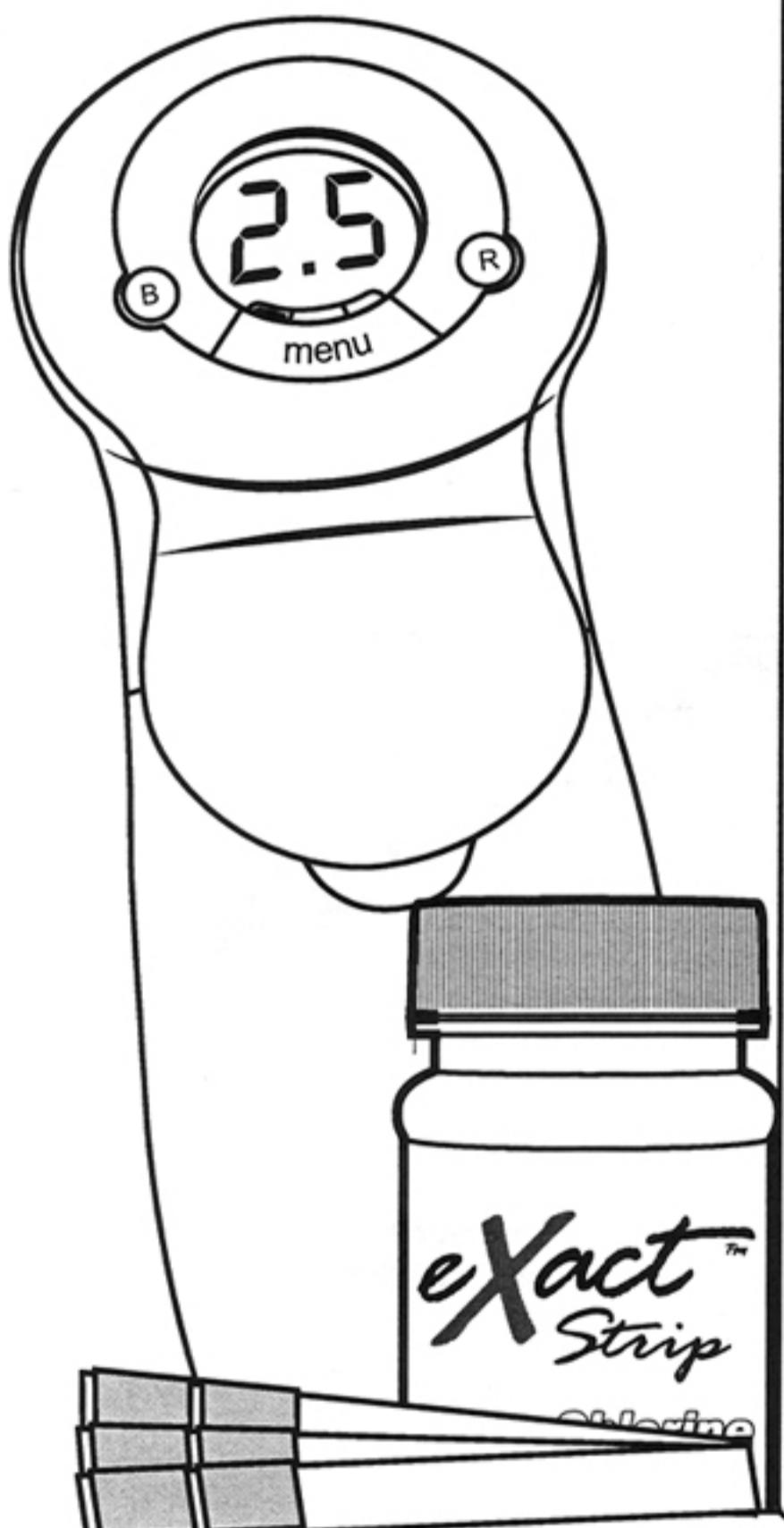
Ideal for Water Quality, Pool & Spa,  
Environmental, & Educational Testing

Kit Number 486662-M

# eXact™ Xtra™ Micro ECONOMICAL PHOTOMETRIC SYSTEM

## Instruction Manual

U.S. Patent Pending; International Patent Appln. No.  
PCT/US2005/033985; and European Patent Appln. No. 05799710.8



TESTS FOR:	
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Free Chlorine	4
pH	4
Total Chlorine	5
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Acid pH*	15
Alkali pH*	15
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\*Conversion table required / included



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U.S. Patent Pending; International Patent Appln. No. PCT/US2005/033985; and  
European Patent Appln. No. 05799710.8

Revision 06/01/06



Thank you for purchasing the eXact™ Xtra MICRO Economical Photometric System.

This system gives you the power to do water testing that is normally performed in analytical laboratories. This system yields meaningful analytical colorimetric and turbidimetric results. Tests that usually require expensive equipment and hazardous reagents can be performed more safely and more easily, with minimal effort.

Virtually any type of water can be used for analysis including, but not limited to: tap water, well water, pool & spa water, pond water, marsh water, waste water, bottled water, stream water, river water, bay water, and mineral water.

This economical photometric system is also very attractive for classroom student activities because of the simple, scientific principles employed. Engaging students is easy and quick. Using the resources below (reference materials, graded activities, and various educational links) and a minimal amount of research, the classroom uses for this kit are unlimited.

Web Address / Organization	Comment
<a href="http://www.epa.gov/safewater/kids/">www.epa.gov/safewater/kids/</a> US Environmental Protection Agency (USEPA)	Activities by grade level, K-12
<a href="http://www.awwa.org/Advocacy/learn">www.awwa.org/Advocacy/learn</a> American Water Works Association	Consumer water center with fact sheets, information about the public water supply, and youth education activities
<a href="http://www.theteacherscorner.net/thematicunits/">www.theteacherscorner.net/thematicunits/</a> The Teacher's Corner.net	About 17 links to educational and informational resource materials; about 30 water activities, grades K-9 (has several dead links)
<a href="http://www.chemistry.org/kids">www.chemistry.org/kids</a> American Chemical Society	Click on "Wondernet" and "View All Topics" to find three (3) water activities under "The Wonder of Water"
<a href="http://www.wef.org/LearnAboutWater/ForThePublic">www.wef.org/LearnAboutWater/ForThePublic</a> Water Environmental Federation	Click on link for "Aquaventurer"
<a href="http://www.c3.org">www.c3.org</a> The Chlorine Chemistry Council	Click on "Teacher Education Materials" and follow links to free activities
<a href="http://www.ed.gov/free">www.ed.gov/free</a> US Department of Education	Click on "Science" then "Earth Science" and browse pages for water activities and resources (e.g. items 62-66 on page 4)
<a href="http://media.nasaexplores.com/lessons/03-064/5-8_2.pdf">media.nasaexplores.com/lessons/03-064/5-8_2.pdf</a> NASA	Click on "Science" then "Earth Science" and browse pages for water activities and resources (e.g. items 62-66 on page 4)

Science educators have the responsibility to teach by example and to help students understand the need for safe work habits and interaction with the environment. The eXact™ Xtra system allows for safe engagement of chemical and environmental investigation inside and outside the classroom.

# About Your Instrument

eXact™ was designed to offer the user simplicity in testing. Most test procedures are uniform in test time (20 second eXact™ Strip dip time) – see instructions for exceptions. In order to save power, the meter is designed to turn off after 2 minutes (timed from the last button pressed). If the meter turns off in the middle of performing a test, take the spare **MICRO VIAL** and fill with fresh water. Remove the current **VIAL** and replace with the fresh water **VIAL**. Re-blank the meter according to the test procedure. Remove the fresh water **VIAL** and replace the testing **VIAL** into the test chamber. Continue the test procedure in order to get your reading. All eXact™ tests have been designed to give a result using end-point chemistry (this means that the photometric reaction has ended). Reacted water samples can be read up to 3 minutes after the reaction time called for with minimal error.

## About Detection Range:

If the parameter being measured is below the detection range, the display will show "Lo". If the parameter being measured is above the detection range, the display will show "Hi". Specifications are valid for most types of water samples (pool, drinking, pond, well, etc.).

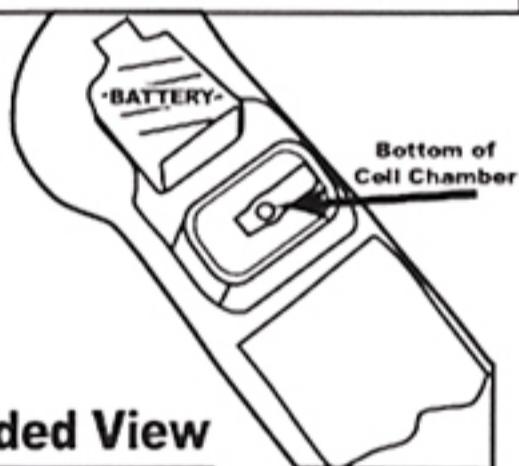
## Important information about cleaning your **MICRO VIAL**:

When the **MICRO VIAL** becomes stained or cloudy from repeated testing, use the following cleaning procedure:

1. Add **ONLY ONE** of the following soaking reagents to the **VIAL**
  - A) 1 part bleach mixed with 9 parts water (equates to apx. 5000 ppm chlorine)
  - B) 1 part concentrated sulfuric acid mixed with 3 parts water (5 Normal)
  - C) 1 part concentrated Hydrochloric Acid (Muriatic Acid) mixed with 3 parts water (3 Normal)
2. Allow soaking reagent to sit in the **VIAL** for 20 seconds.
3. Discard soaking reagent safely and in compliance with local laws.
4. Rinse **VIAL** with clean water several times and dry.

## **CAUTION: Only use one of the soaking reagents listed above. DO NOT MIX SOAKING SOLUTIONS!**

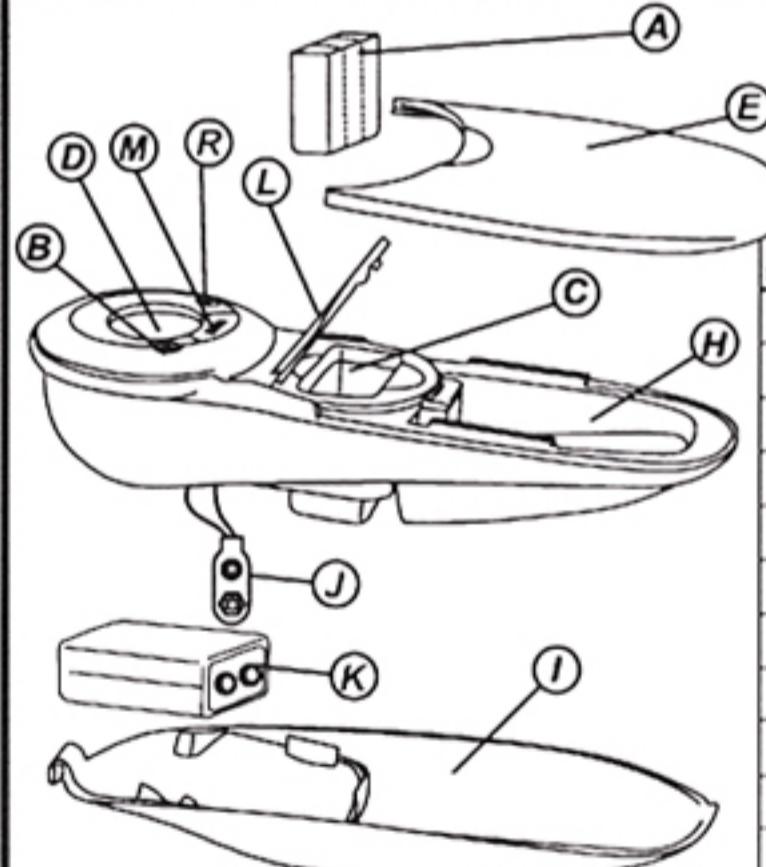
**NOTE:** The test chamber is designed to conveniently elevate the **MICRO VIAL** when the chamber lid is opened. If the **MICRO VIAL** does not elevate, remove the bottom cover and CAREFULLY / GENTLY push against the spring to release the **MICRO VIAL**(see illustration).



## eXact™ Xtra **MICRO VIAL** Details

Available for use with eXact™ Xtra meter is the **MICRO VIAL**, which uses only a 3.3 ml water sample. This exclusive feature from ITS offers several benefits: When you use a smaller water sample you use less reagent; there is less environmental impact with each test; cost per test is reduced; the **MICRO VIAL** has "quick-fill" feature that only requires 2 seconds to sample the 3.3 ml; and your Xtra meter has an expanded menu of tests. In addition to the 21 tests listed here, the following additional tests are available: Alkali pH (8.0 - 11.0), Nitrite, Nitrate, Sulfate, Fluoride, Potassium, Magnesium Hardness, Protein, Zinc, Aluminum, & Beryllium. Additional parameters and meters will be available. Please contact ITS at 1-803-329-9712 (press 1 for sales) for more information.

## eXact™ Xtra **MICRO Exploded View**



ITEM PICTURED	COMPONENT NAME
A	MICRO Vial (3.3ml)
E	Vial Storage Lid
C	Test Chamber
R	"R" Read Button
M	Menu Pad
D	LCD Display
B	"B" Blank Button
H	Vial Storage Area
I	Bottom Cover
J	9-Volt Battery Connector
K	9-Volt Battery
L	Chamber Lid

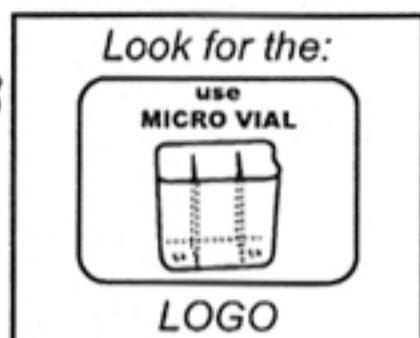
Note: Although the eXact™ Xtra meter is not waterproof, the electronics area is water resistant.

# eXact™ Xtra MICRO (3.3mL) Test Procedure

**FOR BEST RESULTS, BE SURE TO READ THE ENTIRE MANUAL BEFORE BEGINNING ANY TESTS**

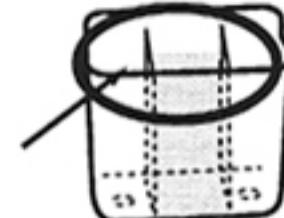
**For ALL 3.3ml Samples Using the MICRO VIAL**

**BE SURE TO USE A FRESH WATER SAMPLE FOR EACH TEST.**

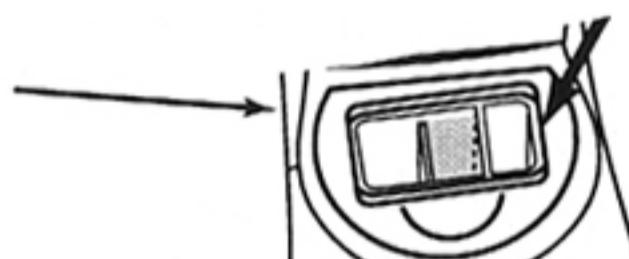


1..... Remove one eXact™ Strip from the bottle. Recap the bottle immediately. Set strip in a dry and convenient place for use in Step 6.

2..... Fill and empty the **MICRO VIAL** 2 or 3 times with sample. Fill center section to capacity with water sample (3.3ml). *(Rinsing minimizes potential cross contamination from previous test)*

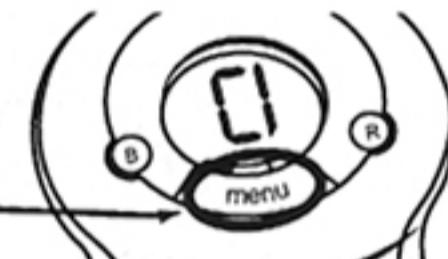


3..... Dry outside of **MICRO VIAL** with paper towel or soft absorbent cloth. Lift the chamber lid and insert the **MICRO VIAL** into test chamber. Close chamber lid.



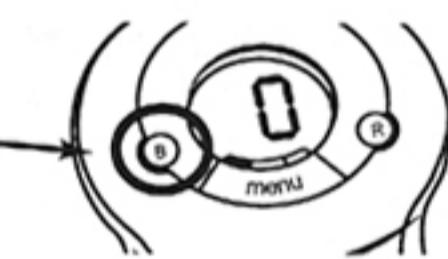
4..... Press the "Menu" pad until the symbol you want appears:

**Cl - for Free Chlorine (DPD-1), Total Chlorine (DPD-3), Total Chlorine (DPD-4)**  
**pH - for pH**  
**tr - for Bromine, Copper, Calcium Hardness, Iron, Cyanuric Acid, Total Hardness, Chloride, Total Alkalinity, Iodine, Chlorine Dioxide, Ozone, Turbidity, & all other parameters**



5..... Press the "B" button to blank the meter to 0 (zero).

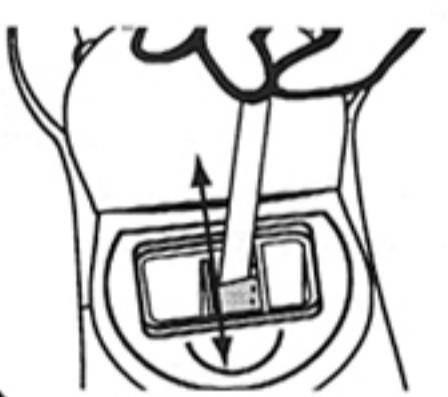
6..... Open the chamber lid and dip the eXact™ Strip **MICRO** into the **MICRO VIAL** for **20 seconds** with gentle back and forth motion. Be sure the end of the strip touches the bottom of the **MICRO VIAL** during this step.



NOTE: Cyanuric Acid test procedure is slightly different. See procedure as outlined in this manual.

7..... Remove and discard the strip.

8..... Immediately close the lid and press the "R" button. Read the result on display.



After Free Chlorine test, do not discard the sample, if you want the Total Chlorine result. Continue immediately to Step 11.

9..... Record your result.

10..... Rinse the **MICRO VIAL** with clean water immediately after testing is completed.



for **Cl** read as ppm (or mg/L)  
for **pH** read as pH units  
for **tr** read as Transmittance

NOTE: for ALL tests, EXCEPT Free Chlorine, Total Chlorine, & pH, use the **tr** setting and refer to the appropriate conversion table.

# eXact™ Xtra MICRO (3.3mL) Total Chlorine Test Procedure

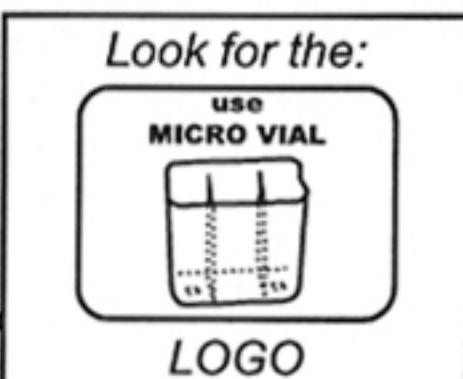
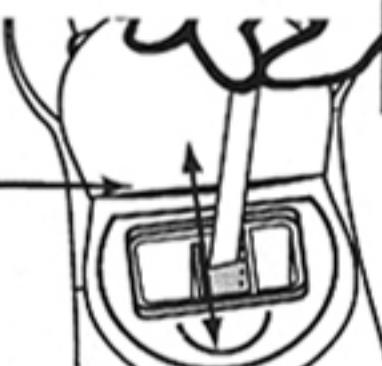
This is a continuation, using the Free Chlorine test sample. Total Chlorine can also be determined with eXact™ Strip MICRO DPD-4 (486670).

11. .... Remove one eXact™ Strip MICRO DPD-3 (Total Chlorine) from the bottle.  
Recap the bottle immediately.

12. .... Open the chamber lid and dip the eXact™ Strip MICRO DPD-3 into the **MICRO VIAL** for **20 seconds** with gentle back and forth motion.

13. .... Remove and discard the strip.

14. .... Immediately close the lid and press the "R" button. Read the display for Total Chlorine in ppm (parts per million). Press the "R" button every 30 seconds until reading does not change, and use this as your Total Chlorine value.\*



\*NOTE: Standard Method (4500-Cl G, simplified procedure for total chlorine) requires the reading to be made after a 2 minute wait. From experience, water samples above 68°F, generally, do not require the full 2 minute wait.

15. .... Record your result as ppm (mg/L) and rinse **MICRO VIAL** immediately.

## eXact™ Strip MICRO DPD Interferences (part nos. 486637, 486638, & 486670)

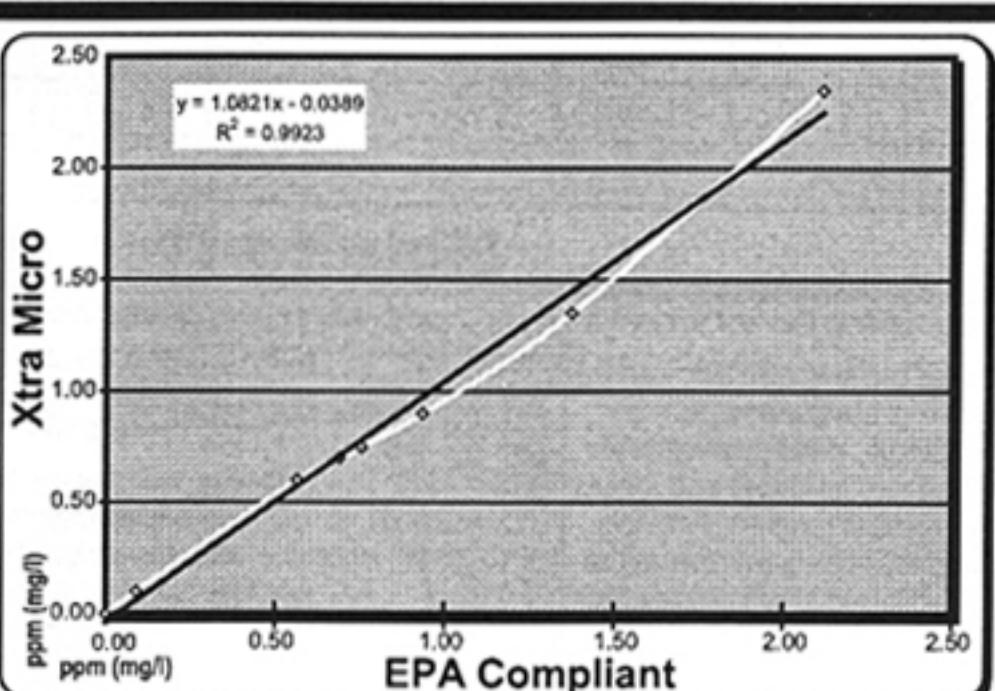
Interfering Substance	Interfering Levels & Treatments
Acidity	If sample acidity is above 150mg/L, test may not develop full color. Neutralize to pH 6.0 to 7.0 with 0.5N Sodium hydroxide.
Alkalinity	If sample alkalinity is above 250mg/L, CaCO <sub>3</sub> test may not develop full color. Neutralize to pH 6.0 to 7.0 with 0.5N Sulfuric acid.
Bromine & Bromamines, Br <sub>2</sub> Chlorine Dioxide, ClO <sub>2</sub> Iodine, I <sub>2</sub> Ozone, O <sub>3</sub>	Color similar to free chlorine reaction at all levels.
Copper as Cu <sup>2+</sup>	Color development is reduced above 10 ppm (mg/L).
Manganese, oxidized (Mn <sup>4+</sup> , Mn <sup>7+</sup> ) or Chromium, oxidized (Cr <sup>6+</sup> )	See AWWA procedure 4500-CL F, 1(d) for removal of interferences.
Monochloramines (NH <sub>2</sub> Cl)	If monochloramine is present in the sample it interferes in the free chlorine test similar as found with other DPD reagent systems. This interference is dependent on water temperature and monochloramine concentration. Prompt reading of free chlorine using the <b>STANDARD TEST PROCEDURE</b> will minimize interference.
Peroxides	Interference is possible.
pH	Typical pH samples of potable water with a pH of 6.0 to 10.0 are OK. If outside this range adjust to pH 6.0 to 7.0 using acid (0.5N Sulfuric acid) or base (0.5N Sodium hydroxide).

## eXact™ Strip MICRO DPD Comparison to EPA-Compliant DPD Test

The data demonstrates comparable results of the eXact Xtra MICRO Economical Photometer System versus EPA-Compliant meter (mfg. by Hach® Company)

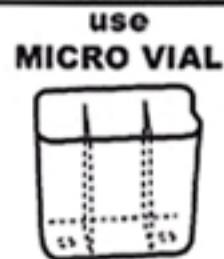
Sample	Xtra Micro Meters			EPA Compliant Meters		
	meter 1	meter 2	mean	meter 1	meter 2	mean
1	0	0	0	0	0	0
2	0.1	0.1	0.1	0.09	0.09	0.09
3	0.7	0.7	0.7	0.66	0.72	0.69
4	1.3	1.4	1.35	1.31	1.44	1.375
5	0.9	0.9	0.9	0.89	0.98	0.935
6	0.7	0.8	0.75	0.72	0.79	0.755
7	0.6	0.6	0.6	0.54	0.59	0.565
8	2.3	2.4	2.35	2.03	2.2	2.115

All results reported in ppm (mg/l)



## eXact™ Xtra MICRO Ozone (O<sub>3</sub>) Table (3.3mL)

Ozone results require the table below. Follow eXact™ Xtra MICRO Test Procedure (page 4) using eXact™ Strip MICRO DPD-4, Part No. 486670



Find the "tr" result in the table below to determine the Ozone concentration in ppm (parts per million) and record your result. (Example: "tr" result of 85 equals a Ozone value of 0.17 ppm).

eXact™ Strip Micro DPD-4, Part No. 486634 - for 3.3mL Samples, USE MICRO VIAL										
tr	9	8	7	6	5	4	3	2	1	0
90	0.01	0.02	0.03	0.04	0.05	0.06	0.07	0.09	0.10	0.11
80	0.12	0.13	0.14	0.16	0.17	0.18	0.19	0.20	.21	0.23
70	0.24	0.25	0.26	0.27	0.28	0.30	0.31	0.32	0.33	0.34
60	0.35	0.37	0.38	0.39	0.40	0.41	0.42	0.44	0.45	0.46
50	0.47	0.48	0.49	0.50	0.53	0.55	0.58	0.63	0.63	0.65
40	0.68	0.71	0.74	0.76	0.79	0.82	0.85	0.88	0.91	0.94
30	0.97	1.00	1.03	1.06	1.10	1.13	1.16	1.19	1.23	1.26
20	1.30	1.33	1.37	1.40	1.44	1.48	1.51	1.55	1.55	1.63
10	1.70	1.78	1.85	1.93	2.00	>2.00	>2.00	>2.00	>2.00	>2.00
0	>2.00	>2.00	>2.00	>2.00	>2.00	>2.00	>2.00	>2.00	>2.00	----

Rev. 022106 O3

## eXact™ Xtra MICRO Permanganate (MnO<sub>4</sub>) Table (3.3mL)

Permanganate results require the table below. Follow eXact™ Xtra MICRO Test Procedure (page 4) using eXact™ Strip MICRO DPD-1, Part No. 486637



Find the "tr" result in the table below to determine the Permanganate concentration in ppm (parts per million) and record your result. (Example: "tr" result of 85 equals a Permanganate value of 0.13 ppm).

eXact™ Strip Micro DPD-1, Part No. 486637 - for 3.3mL Samples, USE MICRO VIAL										
tr	9	8	7	6	5	4	3	2	1	0
90	<0.0005	0.005	0.01	0.02	0.03	0.04	0.05	0.06	0.07	0.08
80	0.09	0.10	0.11	0.12	0.13	0.14	0.15	0.16	0.17	0.18
70	0.19	0.20	0.21	0.22	0.23	0.24	0.25	0.26	0.27	0.28
60	0.29	.30	0.31	0.32	0.33	0.34	0.35	0.36	0.37	0.38
50	0.39	0.40	0.41	0.42	0.43	0.44	.45	0.47	0.47	0.48
40	0.49	0.50	0.51	0.52	0.53	0.54	0.55	0.57	0.59	0.61
30	0.63	0.66	0.68	0.70	0.73	0.75	0.78	0.80	0.83	0.85
20	0.88	0.91	0.94	0.96	0.99	1.02	1.05	1.08	1.09	1.13
10	1.16	1.20	1.25	1.30	1.35	1.41	1.48	1.55	1.63	1.71
0	1.80	1.90	2.00	2.12	2.24	2.37	2.51	2.66	2.82	----

Rev. 022106 MnO4

## How to Use the Table

After completing the test procedure in "tr" mode, use the two (2) digits displayed as follows:

- Take the first digit and add a zero (0) to the end. For example, if the display reads 85, take the 8 and add a zero to make it read 80. Find the corresponding number in the left column.

eXact™ Strip Table										
tr	9	8	7	6	5	4	3	2	1	0
90	0	0	0	0	0	0	0	0	0	0
80	0	0	0	0	0	0	0	0	0	0
70	0	0	0	0	0	0	0	0	0	0
60	0	0	0	0	0	0	0	0	0	0
50	0	0	0	0	0	0	0	0	0	0
40	0	0	0	0	0	0	0	0	0	0
30	0	0	0	0	0	0	0	0	0	0
20	0	0	0	0	0	0	0	0	0	0
10	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0

- Next, take the second digit on the display and find the corresponding number on the top row. For example, if the display reads 85, take the 5 and find the corresponding number in the top row.

tr	9	8	7	6	5	4	3
90	0	0	0	0	0	0	0

- Draw a line from the left column to your right and from the top row down. Where the two lines intersect is your final concentration value.

tr	9	8	7	6	5	4	3
90	0	0	0	0	0	0	0

## eXact™ Xtra MICRO Chlorine Dioxide (ClO<sub>2</sub>) Table (3.3mL)

Chlorine Dioxide results require the table below. Follow eXact™ Xtra MICRO Test Procedure (page 4) using eXact™ Strip MICRO DPD-1, Part No. 486637



Find the "tr" result in the table below to determine the Chlorine Dioxide concentration in ppm (parts per million) and record your result. (Example: "tr" result of 85 equals a Chlorine Dioxide value of 0.46 ppm).

eXact™ Strip Micro DPD-1, Part No. 486637 - for 3.3mL Samples, USE MICRO VIAL

tr	9	8	7	6	5	4	3	2	1	0
90	0.01	0.03	0.06	0.09	0.12	0.15	0.18	0.21	0.23	0.27
80	0.31	0.35	0.38	0.42	0.46	0.49	0.53	0.57	0.60	0.64
70	0.68	0.72	0.75	0.79	0.83	0.86	0.90	0.94	0.97	1.01
60	1.05	1.09	1.12	1.16	1.20	1.23	1.27	1.31	1.34	1.38
50	1.42	1.46	1.49	1.53	1.57	1.60	1.64	1.71	1.71	1.75
40	179	1.83	1.86	1.90	1.94	1.97	2.05	2.13	2.21	2.30
30	2.38	2.47	2.56	2.66	2.75	2.85	2.94	3.04	3.15	3.25
20	3.36	3.47	3.58	3.74	3.85	3.96	4.07	4.19	4.30	4.42
10	4.55	4.67	4.80	4.92	5.05	5.19	5.32	546	5.59	5.73
0	5.87	6.02	6.16	6.31	6.46	6.61	6.77	6.92	7.15	----

Rev. 022106 ClO<sub>2</sub>

## eXact™ Xtra MICRO Calcium Hardness (Ca<sup>+2</sup>) Table (3.3mL)

Calcium Hardness results require the table below. Follow eXact™ Xtra MICRO Test Procedure (page 4) using eXact™ Strip MICRO Ca, Part No. 486629



Find the "tr" result in the table below to determine the Calcium Hardness concentration in ppm (parts per million) and record your result. (Example: "tr" result of 85 equals a Calcium Hardness value of 13 ppm).

eXact™ Strip Micro Ca, Part No. 486629 - for 3.3mL Samples, USE MICRO VIAL

tr	9	8	7	6	5	4	3	2	1	0
90	<1	1	2	4	5	6	7	8	10	11
80	12	12	12	12	13	13	13	13	13	13
70	13	13	14	14	14	14	14	14	14	14
60	15	15	15	15	15	15	15	15	16	16
50	16	16	16	16	16	16	17	23	23	25
40	26	27	28	29	31	32	33	34	36	37
30	38	39	40	42	43	44	45	47	48	49
20	50	52	53	54	55	56	58	59	60	61
10	63	64	65	66	67	69	70	71	72	74
0	75	76	92	>100	>100	>100	>100	>100	>100	----

To report result as CaCO<sub>3</sub>, multiply Calcium (Ca<sup>+2</sup>) result by 2.5

Rev. 022206 Ca

## How to Use the Table

After completing the test procedure in "tr" mode, use the two (2) digits displayed as follows:

- Take the first digit and add a zero (0) to the end. For example, if the display reads 85, take the 8 and add a zero to make it read 80. Find the corresponding number in the left column.

eXact™ Strip Table										
9	8	7	6	5	4	3	2	1	0	
90	0	1	2	3	4	5	6	7	8	9
80	14	16	18	20	22	24	26	28	30	32
70	31	32	33	34	35	36	37	38	39	40
60	47	49	51	53	54	56	58	60	62	64
50	64	65	66	67	68	69	70	71	72	73
40	80	82	84	86	87	88	89	90	91	92
30	97	99	101	103	104	105	106	107	108	109
20	114	116	118	120	122	124	126	128	130	132
10	152	154	156	158	160	162	164	166	168	170
0	225	226	227	228	229	230	231	232	233	234

- Next, take the second digit on the display and find the corresponding number on the top row. For example, if the display reads 85, take the 5 and find the corresponding number in the top row.

eXact™ Strip Table										
9	8	7	6	5	4	3	2	1	0	
90	0	1	2	3	4	5	6	7	8	9
80	0	1	2	3	4	5	6	7	8	9
70	31	32	33	34	35	36	37	38	39	40
60	47	49	51	53	54	56	58	60	62	64
50	64	65	66	67	68	69	70	71	72	73
40	80	82	84	86	87	88	89	90	91	92
30	97	99	101	103	104	105	106	107	108	109
20	114	116	118	120	122	124	126	128	130	132
10	152	154	156	158	160	162	164	166	168	170
0	225	226	227	228	229	230	231	232	233	234

- Draw a line from the left column to your right and from the top row down. Where the two lines intersect is your final concentration value.

tr	9	8	7	6	5	4	3
90	0	1	2	3	4	5	6
80	0	1	2	3	4	5	6
70	31	32	33	34	35	36	37
60	47	49	51	53	54	56	58
50	64	65	66	67	68	69	70
40	80	82	84	86	87	88	89
30	97	99	101	103	104	105	106
20	114	116	118	120	122	124	126
10	152	154	156	158	160	162	164
0	225	226	227	228	229	230	231

## eXact™ Xtra MICRO Iodine (I) Table (3.3mL)

Iodine results require the table below. Follow eXact™ Xtra MICRO Test Procedure (page 4) using eXact™ Strip MICRO DPD-1, Part No. 486637



Find the "tr" result in the table below to determine the Iodine concentration in ppm (parts per million) and record your result. (Example: "tr" result of 85 equals a Iodine value of 0.70 ppm).

tr	9	8	7	6	5	4	3	2	1	0
90	0.02	0.07	0.12	0.17	0.22	0.27	0.31	0.36	0.41	0.46
80	0.51	0.56	0.61	0.65	0.70	0.75	0.80	0.85	0.98	1.03
70	1.09	1.15	1.20	1.26	1.31	1.37	1.43	1.48	1.54	1.60
60	1.65	1.71	1.76	1.82	1.88	1.93	1.99	2.05	2.10	2.16
50	2.22	2.27	2.33	2.38	2.44	2.50	2.55	2.67	2.67	2.68
40	2.75	2.83	2.90	2.99	3.07	3.16	3.25	3.34	3.44	3.54
30	3.65	3.76	3.87	3.99	4.11	4.24	4.37	4.51	4.65	4.80
20	4.95	5.11	5.27	5.44	5.62	5.80	5.98	6.18	6.37	6.58
10	6.79	7.01	7.23	7.46	7.70	7.95	8.20	8.46	8.72	9.00
0	9.28	9.57	9.87	10.17	10.49	10.81	11.14	11.47	11.82	----

Rev. 021706 I

## eXact™ Xtra MICRO Bromine (Total) Table (3.3mL)

Bromine results require the table below. Follow eXact™ Xtra MICRO Test Procedure (page 4) using eXact™ Strip MICRO DPD-1, Part No. 486637



Find the "tr" result in the table below to determine the Bromine concentration in ppm (parts per million) and record your result. (Example: "tr" result of 85 equals a Bromine value of 0.65 ppm).

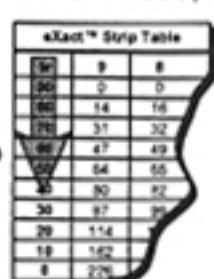
tr	9	8	7	6	5	4	3	2	1	0
90	0.02	0.07	0.11	0.15	0.20	0.24	0.29	0.33	0.38	0.42
80	0.47	0.51	0.56	0.60	0.65	0.69	0.74	0.78	0.83	0.87
70	0.92	0.96	1.01	1.05	1.10	1.14	1.19	1.23	1.28	1.32
60	1.37	1.41	1.46	1.50	1.55	1.59	1.56	1.62	1.69	1.75
50	1.82	1.88	1.95	2.02	2.09	2.16	2.23	2.37	2.37	2.44
40	2.51	2.58	2.65	2.73	2.80	2.88	295	3.03	3.11	3.18
30	3.26	3.34	3.42	3.50	3.58	3.66	3.72	3.88	4.04	4.22
20	4.40	4.59	4.80	5.01	5.24	5.47	5.72	5.98	6.26	6.54
10	6.84	7.16	7.49	7.83	8.19	8.56	8.95	9.36	9.79	10.23
0	10.69	11.16	11.66	12.18	12.71	13.27	13.84	14.44	15.05	----

Rev. 021706 TBr

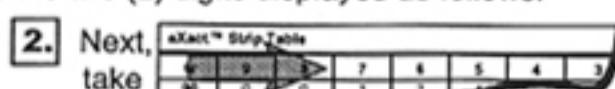
## How to Use the Table

After completing the test procedure in "tr" mode, use the two (2) digits displayed as follows:

- Take the first digit and add a zero (0) to the end. For example, if the display reads 85, take the 8 and add a zero to make it read 80. Find the corresponding number in the left column.



- Next, take the second digit on the display and find the corresponding number on the top row. For example, if the display reads 85, take the 5 and find the corresponding number in the top row.



- Draw a line from the left column to your right and from the top row down. Where the two lines intersect is your final concentration value.



## eXact™ Xtra MICRO Peroxide Table (3.3mL)

Peroxide results require the table below. Follow eXact™ Xtra MICRO Test Procedure (page 4) using eXact™ Strip MICRO PX, Part No. 486616



Find the "tr" result in the table below to determine the Peroxide concentration in ppm (parts per million) and record your result. (Example: "tr" result of 85 equals a Peroxide value of 4 ppm).

**NOTE:** To ensure accurate results, wait 40 seconds after completing Step 6 of the eXact™ Xtra MICRO Test Procedure before pressing the "R" button.

eXact™ Strip Micro PX, Part No. 486614 - for 3.3mL Samples, USE MICRO VIAL

tr	9	8	7	6	5	4	3	2	1	0
90	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
80	<0.02	0.02	0.04	0.06	0.08	0.10	0.12	0.14	0.16	0.19
70	0.21	0.23	0.26	0.28	0.30	0.32	0.35	0.37	0.39	0.41
60	0.43	0.45	0.48	0.50	0.52	0.54	0.56	0.58	0.60	0.62
50	0.64	0.66	0.68	0.70	0.72	0.74	0.76	0.80	0.80	0.82
40	0.84	0.85	0.87	0.89	0.91	0.93	0.95	0.96	0.98	1.00
30	1.02	1.05	1.12	1.18	1.25	1.32	1.39	1.47	1.55	1.63
20	1.71	1.80	1.88	1.97	2.06	2.16	2.26	2.36	2.46	2.56
10	2.67	2.78	2.89	3.00	3.12	3.24	3.36	3.48	3.61	3.73
0	3.86	4.00	>4.00	>4.00	>4.00	>4.00	>4.00	>4.00	>4.00	----

This test reports results as Hydrogen Peroxide ( $H_2O_2$ )

Rev. 040406 PXsec

## eXact™ Xtra MICRO High Range Ammonia Table (3.3mL)

Ammonia results require the table below. Follow eXact™ Xtra MICRO Test Procedure (page 4) using eXact™ Strip MICRO HRNH<sub>3</sub>, Part No. 486618



Find the "tr" result in the table below to determine the Ammonia concentration in ppm (parts per million) and record your result. (Example: "tr" result of 85 equals an Ammonia value of 4 ppm).

**NOTE:** To ensure accurate results, wait 4 ½ minutes after completing Step 6 of the eXact™ Xtra MICRO Test Procedure before pressing the "R" button.

eXact™ Strip Micro HRNH<sub>3</sub>, Part No. 486618 - for 3.3mL Samples, USE MICRO VIAL

tr	9	8	7	6	5	4	3	2	1	0
90										
80										
70										
60										
50										
40										
30										
20										
10										
0										

This test is recommended for raw water or waste water samples.

Rev. 040406 NH3sec

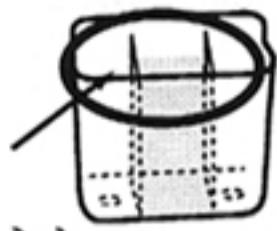
**CHART UNDER DEVELOPMENT**

## eXact™ Xtra MICRO (3.3mL) Cyanuric Acid Test Procedure

Cyanuric Acid results require the table on Page 11. Be sure to read this test procedure before beginning the test.



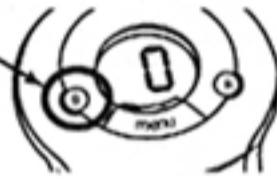
1.....Rinse supplied **MICRO VIAL** 2 or 3 times and fill capacity with water sample (3.3ml). **DO NOT OVERFILL!** Dry outside of vial with a soft paper or cloth towel.



2.....Lift the chamber lid and insert **MICRO VIAL** into test chamber. Close chamber lid.



3.....Press the "Menu" pad until the "tr" symbol appears.

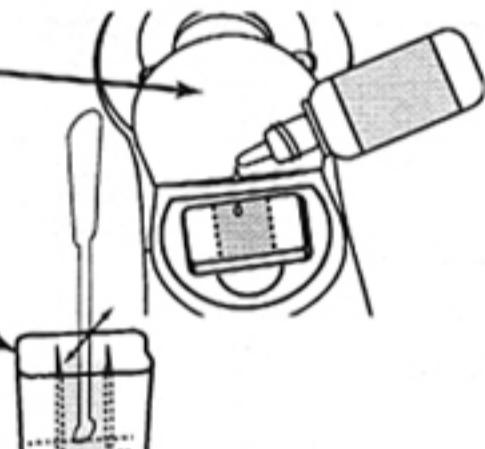


4.....Press the "B" button to blank the meter to 0 (zero).

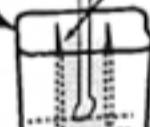
5.....Shake the bottle of eXact™ Reagent CY to mix the chemical in the bottle.



6.....Leaving the **MICRO VIAL** in the test chamber, open the chamber lid and add **3 drops** of eXact™ Reagent CY to the water sample.



7.....Using the supplied blue stirrer, stir the sample for **20 seconds**. Remove the blue stirrer.



8.....Wait **10 seconds**, close the chamber lid, and press the "R" button to read the "tr" result.

9.....Find the "tr" result in the table on Page 11 to determine the Cyanuric Acid concentration in ppm (parts per million) (Example: a "tr" result of 85 equals a Cyanuric Acid value of 4 ppm)

10.....Record your results.

**IMPORTANT:** If you run the Cyanuric Acid test frequently, a film / residue will form on the inside of the standard vial. This film may eventually interfere with the ability of the meter to be blanked to 0. To avoid this from occurring, clean the inside of the standard vial by carefully wiping with a cloth or paper towel to remove the film / residue. Washing with soap and water after each test is also acceptable for cleaning the standard vial.

## eXact™ Xtra MICRO Sulfate Table (3.3mL)

Sulfate results require the table below. Follow eXact™ Xtra MICRO Test Procedure (page 4) using eXact™ Strip MICRO SO<sub>4</sub>, Part No. 486608



Find the "tr" result in the table below to determine the Sulfate concentration in ppm (parts per million) and record your result. (Example: "tr" result of 85 equals a Sulfate value of 17 ppm).

eXact™ Strip Micro SO<sub>4</sub>, Part No. 486608 - for 3.3mL Samples, USE MICRO VIAL

tr	9	8	7	6	5	4	3	2	1	0
90	0	0	0	1	2	4	5	7	8	10
80	11	13	14	15	17	18	20	21	22	24
70	25	27	28	29	31	32	33	34	36	37
60	38	40	41	42	43	44	46	47	48	49
50	50	52	53	54	55	56	57	59	59	61
40	62	63	64	65	66	67	68	69	70	71
30	72	73	74	75	76	77	78	78	79	80
20	81	82	83	85	88	92	96	100	105	111
10	117	123	130	138	146	155	164	174	184	195
0	>200	>200	>200	>200	>200	>200	>200	>200	>200	---

Rev. 052506 SO4sec

# eXact™ Xtra MICRO Total Alkalinity Table (3.3mL)

Total Alkalinity results require the table below. Follow eXact™ Xtra MICRO Test Procedure (page 4) using eXact™ Strip MICRO AL, Part No. 486635



Find the "tr" result in the table below to determine the Total Alkalinity concentration in ppm (parts per million) and record your result. (Example: "tr" result of 85 equals a Total Alkalinity value of 38 ppm).

eXact™ Strip Micro Total Alkalinity, Part No. 486635 - for 3.3mL Samples, USE MICRO VIAL

tr	9	8	7	6	5	4	3	2	1	0
90	<2	2	4	6	8	10	12	14	16	18
80	20	2	24	26	27	29	31	33	35	37
70	39	41	43	45	47	49	51	53	55	57
60	59	61	63	64	66	68	70	72	74	76
50	78	80	87	93	100	106	112	124	124	130
40	136	142	148	153	159	164	170	175	180	185
30	190	195	200	205	210	214	19	223	227	232
20	236	240	254	268	282	294	307	318	330	340
10	350	360	369	378	39	393	400	>400	>400	>400
0	>400	>400	>400	>400	>400	>400	>400	>400	>400	----

Rev. 033006 sec

## eXact™ Xtra MICRO Cyanuric Acid Table (3.3mL)

Cyanuric Acid results require the table below. Follow eXact™ Xtra MICRO Cyanuric Acid Test Procedure (page 10) using eXact™ Reagent CY, Part No. 481652



Find the "tr" result in the table below to determine the Cyanuric Acid concentration in ppm (parts per million) and record your result. (Example: "tr" result of 85 equals a Cyanuric Acid value of 4 ppm).

eXact™ Reagent CY, Part No. 481652 - for 3.3mL Samples, USE MICRO VIAL

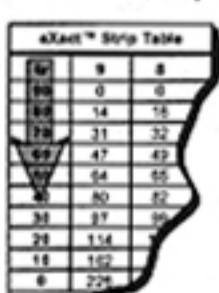
tr	9	8	7	6	5	4	3	2	1	0
90	<2	<2	<2	<2	<2	<2	2	2	2	3
80	3	3	3	4	4	4	5	5	5	6
70	6	6	7	7	7	8	8	9	9	9
60	10	11	11	12	12	13	14	14	15	16
50	17	17	18	19	20	20	21	23	23	24
40	25	25	26	27	28	29	30	31	32	33
30	34	3	37	38	39	40	41	43	44	46
20	47	48	50	54	55	57	59	61	63	65
10	67	70	72	75	78	81	84	88	92	6
0	100	>100	>100	>100	>100	>100	>100	>100	>100	----

Rev. 022306 CY

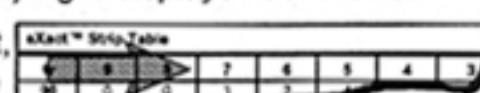
## How to Use the Table

After completing the test procedure in "tr" mode, use the two (2) digits displayed as follows:

- Take the first digit and add a zero (0) to the end. For example, if the display reads 85, take the 8 and add a zero to make it read 80. Find the corresponding number in the left column.



- Next, take the second digit on the display and find the corresponding number on the top row. For example, if the display reads 85, take the 5 and find the corresponding number in the top row.



- Draw a line from the left column to your right and from the top row down. Where the two lines intersect is your final concentration value.



## eXact™ Xtra MICRO Chloride (as Cl<sup>-</sup>) Table (3.3mL)

Chloride results require the table below. Follow eXact™ Xtra MICRO Test Procedure (page 4) using eXact™ Strip MICRO NaCl, Part No. 486628



Find the "tr" result in the table below to determine the Chloride concentration in ppm (parts per million) and record your result. (Example: "tr" result of 85 equals a Chloride value of 33 ppm).

eXact™ Strip Micro NaCl, Part No. 486628 - for 3.3mL Samples, USE MICRO VIAL

tr	9	8	7	6	5	4	3	2	1	0
90	<4	<4	<4	4	8	12	14	17	19	22
80	24	26	29	31	33	36	38	40	43	45
70	47	49	52	54	56	58	61	6	65	67
60	70	72	74	76	78	80	83	85	87	89
50	91	93	95	97	100	102	104	106	106	108
40	110	112	114	116	118	120	122	124	126	128
30	130	132	134	136	137	139	141	143	145	147
20	149	151	153	155	157	158	160	162	64	166
10	168	170	172	174	176	179	181	182	184	186
0	187	189	191	192	194	196	197	199	201	----

NOTE: To report results as Sodium Chloride (NaCl) multiply Cl<sup>-</sup> result by 1.65 Example: a reading of 120ppm Cl<sup>-</sup> multiplied by 1.65 = 198ppm NaCl.

Rev. 040406 NaCl

## eXact™ Xtra MICRO LR Total Hardness (CaCO<sub>3</sub>) Table (3.3mL)

Total Hardness results require the table below. Follow eXact™ Xtra MICRO Test Procedure (page 4) using eXact™ Strip MICRO LRT, Part No. 486630



Find the "tr" result in the table below to determine the Total Hardness concentration in ppm (parts per million) and record your result. (Example: "tr" result of 45 equals a Total Hardness value of 8.1 ppm).

eXact™ Strip Micro LRT, Part No. 486634 - for 3.3mL Samples, USE MICRO VIAL

tr	9	8	7	6	5	4	3	2	1	0
90	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
80	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
70	<0.4	0.4	0.6	0.8	1.1	1.3	1.5	1.8	2.0	2.2
60	2.5	2.7	2.9	3.2	3.4	3.6	3.9	4.1	4.4	4.6
50	4.8	5.1	5.3	5.5	5.8	6.0	6.2	6.7	6.7	6.9
40	7.2	7.4	7.6	7.9	8.1	8.4	8.6	8.8	9.1	9.3
30	9.5	9.8	10.0	10.1	10.2	10.3	10.5	10.8	11.0	11.3
20	11.5	11.7	12.0	15.2	15.7	16.2	16.6	17.1	17.6	18.2
10	18.7	19.2	19.7	20.3	20.8	21.4	21.9	22.5	23.1	23.6
0	24.2	24.8	25.4	26.0	26.7	27.3	27.9	28.5	29.2	----

(to report results as Calcium (Ca<sup>2+</sup>), multiply CaCO<sub>3</sub> result by 0.4) - This test detects Ca<sup>2+</sup> AND Mg<sup>2+</sup> ions.

Rev. 022406 CaCO<sub>3</sub>

## How to Use the Table

After completing the test procedure in "tr" mode, use the two (2) digits displayed as follows:

- Take the first digit and add a zero (0) to the end. For example, if the display reads 85, take the 8 and add a zero to make it read 80. Find the corresponding number in the left column.

eXact™ Strip Table										
tr	9	8	7	6	5	4	3	2	1	0
90	0	0	0	0	0	0	0	0	0	0
80	0	0	0	0	0	0	0	0	0	0
70	0	0	0	0	0	0	0	0	0	0
60	0	0	0	0	0	0	0	0	0	0
50	0	0	0	0	0	0	0	0	0	0
40	0	0	0	0	0	0	0	0	0	0
30	0	0	0	0	0	0	0	0	0	0
20	0	0	0	0	0	0	0	0	0	0
10	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0

- Next, take the second digit on the display and find the corresponding number on the top row. For example, if the display reads 85, take the 5 and find the corresponding number in the top row.

- Draw a line from the left column to your right and from the top row down. Where the two lines intersect is your final concentration value.

tr	9	8	7	6	5	4	3
90	0	0	0	0	0	0	0
80	0	0	0	0	0	0	0
70	0	0	0	0	0	0	0
60	0	0	0	0	0	0	0
50	0	0	0	0	0	0	0
40	0	0	0	0	0	0	0
30	0	0	0	0	0	0	0
20	0	0	0	0	0	0	0
10	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0

## eXact™ Xtra MICRO Iron (Fe<sup>+2</sup> / Fe<sup>+3</sup>) Table (3.3mL)

Iron results require the table below. Follow eXact™ Xtra MICRO Test Procedure (page 4) using eXact™ Strip MICRO Fe, Part No. 486631



Find the "tr" result in the table below to determine the Iron concentration in ppm (parts per million) and record your result. (Example: "tr" result of 85 equals an Iron value of 0.2 ppm).

NOTE: To ensure accurate results, wait 1 ½ Minutes after completing Step 6 of the eXact™ Xtra MICRO Test Procedure before pressing the "R" button.

**eXact™ Strip Micro Fe, Part No. 486631 - for 3.3mL Samples, USE MICRO VIAL**

tr	9	8	7	6	5	4	3	2	1	0
90	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.04	0.06	0.07
80	0.09	0.11	0.12	0.14	0.16	0.18	0.19	0.21	0.23	0.24
70	0.26	0.28	0.29	0.31	0.33	0.35	0.36	0.38	0.40	0.42
60	0.43	0.45	0.47	0.49	0.51	0.53	0.55	0.57	0.59	0.60
50	0.62	0.64	0.66	0.68	0.70	0.72	0.74	0.79	0.79	0.81
40	0.83	0.85	0.87	0.89	0.91	0.93	0.96	0.98	1.00	1.02
30	1.04	1.07	1.09	1.11	1.13	1.15	1.16	1.18	1.20	1.22
20	1.24	1.27	1.30	1.33	1.37	1.41	1.45	1.49	1.53	1.58
10	>1.60	>1.60	>1.60	>1.60	>1.60	>1.60	>1.60	>1.60	>1.60	>1.60
0	>1.60	>1.60	>1.60	>1.60	>1.60	>1.60	>1.60	>1.60	>1.60	----

Rev. 041806 Fe

## eXact™ Xtra MICRO Copper (Cu<sup>+1</sup> / Cu<sup>+2</sup>) Table (3.3mL)

Copper results require the table below. Follow eXact™ Xtra MICRO Test Procedure (page 4) using eXact™ Strip MICRO Cu, Part No. 486632



Find the "tr" result in the table below to determine the Copper concentration in ppm (parts per million) and record your result. (Example: "tr" result of 85 equals a Copper value of 0.50 ppm).

**eXact™ Strip Micro Cu, Part No. 486632 - for 3.3mL Samples, USE MICRO VIAL**

tr	9	8	7	6	5	4	3	2	1	0
90	<0.04	<0.04	0.04	0.08	0.12	0.15	0.19	0.23	0.27	0.31
80	0.34	0.38	0.42	0.46	0.50	0.54	0.57	0.61	0.65	0.69
70	0.73	0.76	0.80	0.84	0.88	0.92	0.95	0.99	1.03	1.07
60	1.11	1.14	1.18	1.22	1.26	1.30	1.34	1.37	1.41	1.45
50	1.49	1.53	1.56	.60	1.64	1.68	1.72	1.92	1.92	1.98
40	2.04	2.10	2.16	2.23	2.29	2.35	2.42	2.49	2.55	2.62
30	2.69	2.76	2.83	2.91	2.98	3.05	3.13	3.20	3.28	3.36
20	3.44	3.52	3.60	3.68	3.77	3.85	3.94	4.02	4.11	4.20
10	4.29	4.38	4.47	4.56	4.66	4.75	4.85	4.94	5.00	>5.00
0	>5.00	>5.00	>5.00	>5.00	>5.00	>5.00	>5.00	>5.00	>5.00	----

Rev. 022206 Cu

## How to Use the Table

After completing the test procedure in "tr" mode, use the two (2) digits displayed as follows:

- Take the first digit and add a zero (0) to the end. For example, if the display reads 85, take the 8 and add a zero to make it read 80. Find the corresponding number in the left column.

eXact™ Strip Table	
9	8
0	0
14	16
31	32
47	49
64	65
80	82
97	99
114	116
131	132
147	150

- Next, take the second digit on the display and find the corresponding number on the top row. For example, if the display reads 85, take the 5 and find the corresponding number in the top row.

tr	9	8	7	6	5	4	3
90	0	0	1	2	3	4	5
80	14	16	17	18	19	20	21
70	31	32	34	35	36	37	38
60	47	49	51	52	53	54	55

- Draw a line from the left column to your right and from the top row down. Where the two lines intersect is your final concentration value.

9	8	7	6	5	4	3
0	0	1	2	3	4	5
14	16	17	18	19	20	21
31	32	34	35	36	37	38
47	49	51	52	53	54	55

## eXact™ Xtra MICRO Sulfide Table (3.3mL)

Sulfide results require the table below. Follow eXact™ Xtra MICRO Test Procedure (page 4) using eXact™ Strip MICRO S, Part No. 486622

Find the "tr" result in the table below to determine the Sulfide concentration in ppm (parts per million) and record your result. (Example: "tr" result of 85 equals a Sulfide value of 4 ppm).



eXact™ Strip Micro S, Part No. 486622 - for 3.3mL Samples, USE MICRO VIAL

tr	9	8	7	6	5	4	3	2	1	0
90	<0.1	<0.1	0.1	0.2	0.2	0.3	0.3	0.4	0.4	0.5
80	0.6	0.6	0.7	0.7	0.8	0.9	0.9	1.0	1.0	1.1
70	1.1	1.2	1.3	1.3	1.4	1.4	1.5	1.5	1.6	1.7
60	1.9	2.0	2.0	2.0	2.1	2.1	2.1	2.1	2.2	2.2
50	2.2	2.2	2.2	2.3	2.3	2.4	2.5	2.9	2.9	3.0
40	3.2	3.4	3.5	3.7	3.8	4.0	4.1	4.2	.4	4.5
30	4.6	4.8	4.9	5.0	5.1	5.2	5.3	5.4	5.5	5.6
20	5.7	5.8	5.9	>6.0	>6.0	>6.0	>6.0	>6.0	>6.0	>6.0
10	>6.0	>6.0	>6.0	>6.0	>6.0	>6.0	>6.0	>6.0	>6.0	>6.0
0	>6.0	>6.0	>6.0	>6.0	>6.0	>6.0	>6.0	>6.0	>6.0	----

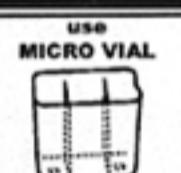
This test reports results as Sulfide (S<sup>-</sup>)

NOTE: Sulfide-containing water usually can be detected by a the typical odor / smell of "rotten eggs". Some users may be able to detect this typical smell as low as 0.01 mg/L; lower than this meter can detect.

Rev. 040406 Ssec

## eXact™ Xtra MICRO Chromium Hexavalent (as CrO<sub>4</sub><sup>2-</sup>) Table (3.3mL)

Chromium Hexavalent (as CrO<sub>4</sub><sup>2-</sup>) results require the table below. Follow eXact™ Xtra MICRO Test Procedure (page 4) using eXact™ Strip MICRO Cr, Part No. 486614



Find the "tr" result in the table below to determine the Chromate concentration in ppm (parts per million) and record your result. (Example: "tr" result of 85 equals a Chromate value of 4 ppm).

NOTE: To ensure accurate results, wait 40 seconds after completing Step 6 of the eXact™ Xtra MICRO Test Procedure before pressing the "R" button.

eXact™ Strip Micro Cr, Part No. 486614 - for 3.3mL Samples, USE MICRO VIAL

tr	9	8	7	6	5	4	3	2	1	0
90	0.00	0.00	0.00	0.02	0.03	0.04	0.06	0.07	0.08	0.09
80	0.11	0.12	0.13	0.15	0.16	0.17	0.19	0.20	0.21	0.22
70	0.24	0.25	0.26	0.27	0.29	0.31	0.32	0.34	0.36	0.37
60	0.39	0.41	0.42	0.44	0.46	0.48	0.49	0.51	0.53	0.54
50	0.56	0.58	0.59	0.61	0.63	0.64	0.66	0.70	0.70	0.71
40	0.73	0.75	0.76	0.78	0.80	0.81	0.83	0.85	0.86	0.88
30	0.90	0.91	0.93	0.95	0.99	1.03	1.08	1.13	1.18	1.23
20	1.28	1.34	1.39	1.45	1.51	1.57	1.64	1.70	1.77	1.84
10	1.91	1.98	2.06	2.14	2.21	2.29	2.38	2.46	2.55	2.63
0	2.72	2.81	2.91	3.00	>3.00	>3.00	>3.00	>3.00	>3.00	----

This test is designed to detect Chromate (CrO<sub>4</sub><sup>2-</sup>) but values are given as Chromium Cr<sup>6+</sup>. If Chromium is present as Cr<sup>3+</sup>, it has to be first converted to Chromate for detection. See conversion procedure below.

Rev. 040406 Crsec

Note: To report results as Hexavalent Chromium (Cr<sup>6+</sup>) multiply the CrO<sub>4</sub><sup>2-</sup> result by 0.45 Example: A reading of 1.59ppm CrO<sub>4</sub><sup>2-</sup> multiplied by 0.45 = 0.72ppm Cr<sup>6+</sup>

## Cr<sup>3+</sup> to CrO<sub>4</sub><sup>2-</sup> Conversion Procedure

For the rapid determination of Cr<sup>3+</sup> with our chromate test, follow this simple procedure that converts Cr<sup>3+</sup> to CrO<sub>4</sub><sup>2-</sup> which allows the use of ITS chromate test to detect Cr<sup>3+</sup> and CrO<sub>4</sub><sup>2-</sup> (or Total Chromate). For this procedure you will need three chemicals:

1. 10% Sodium Hydroxide Solution
2. 3% Hydrogen Peroxide Solution
3. 10% Nitric Acid Solution

1. Add 10 ml of the water sample that you want to test into a small beaker.
2. Add 2ml of 10% Sodium Hydroxide Solution to the beaker and mix/swirl gently.
3. Add 1 ml of 3% Hydrogen Peroxide Solution to the beaker and mix/swirl gently.
4. Let mix sit undisturbed for a minimum of one (1) minute.
5. Follow the eXact™ Xtra MICRO Test Procedure on page 4 using this prepared solution for your sample.

For best precision multiply the result by 1.3 (example: if level found is 10 PPM then 10 X 1.3 =13 PPM). This will accommodate the dilution of the sample by the reagents that were added.

## eXact™ Xtra MICRO Acid pH Table (3.3mL)

Acid pH results require the table below. Follow eXact™ Xtra MICRO Test Procedure (page 4) using eXact™ Strip MICRO Acid pH, Part No. 486624



Find the "tr" result in the table below to determine the Acid pH concentration in pH units and record your result. (Example: "tr" result of 85 equals an Acid pH value of 3.59).

eXact™ Strip Micro Acid pH, Part No. 486624 - for 3.3mL Samples, USE MICRO VIAL

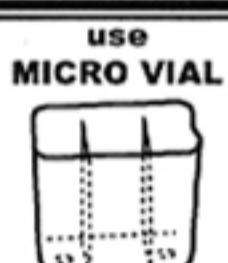
tr	9	8	7	6	5	4	3	2	1	0
90	<3.00	<3.00	<3.00	<3.00	<3.00	3.00	3.09	3.15	3.22	3.28
80	3.34	3.41	3.47	3.53	3.59	3.65	3.71	3.77	3.83	3.88
70	3.94	4.00	4.05	4.11	4.16	4.22	4.27	4.32	4.38	4.43
60	4.48	4.53	4.58	4.63	4.68	4.73	4.77	4.82	4.87	4.91
50	4.96	5.00	5.05	5.09	5.13	5.17	5.22	5.30	5.30	5.34
40	5.38	5.41	5.45	5.49	5.53	5.56	5.60	5.63	5.67	5.70
30	5.73	5.77	5.80	5.83	5.86	5.89	5.92	5.95	5.98	6.00
20	6.03	6.06	6.08	6.11	6.13	6.16	6.18	6.20	>6.20	>6.20
10	>6.20	>6.20	>6.20	>6.20	>6.20	>6.20	>6.20	>6.20	>6.20	>6.20
0	>6.20	>6.20	>6.20	>6.20	>6.20	>6.20	>6.20	>6.20	>6.20	----

NOTE: Environmental water with a pH level below 4.6 is typically referred to as "Acid" or "Acid Rain"

Rev. 032906 ApHsec

## eXact™ Xtra MICRO Alkali pH Table (3.3mL)

Alkali pH results require the table below. Follow eXact™ Xtra MICRO Test Procedure (page 4) using eXact™ Strip MICRO Alkali pH, Part No. 486609



Find the "tr" result in the table below to determine the Alkali pH concentration in pH units and record your result. (Example: "tr" result of 55 equals an Alakli pH value of 7.70).

eXact™ Strip Micro Alkali pH, Part No. 486609 - for 3.3mL Samples, USE MICRO VIAL

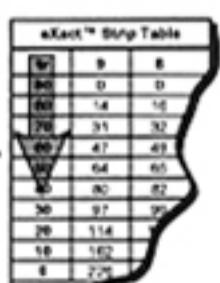
tr	9	8	7	6	5	4	3	2	1	0
90	<7.00	<7.00	<7.00	<7.00	<7.00	<7.00	<7.00	<7.00	<7.00	<7.00
80	<7.00	<7.00	<7.00	<7.00	<7.00	<7.00	<7.00	<7.00	<7.00	<7.00
70	7.01	7.04	7.07	7.10	7.13	7.16	7.19	7.22	7.25	7.28
60	7.31	7.34	7.36	7.39	7.42	7.45	7.48	7.51	7.54	7.56
50	7.59	7.62	7.65	7.68	7.70	7.73	7.76	7.81	7.81	7.84
40	7.87	7.90	7.92	7.95	7.98	8.00	8.03	8.06	8.09	8.11
30	8.14	8.16	8.19	8.22	8.24	8.27	8.30	8.32	8.35	8.37
20	8.40	8.43	8.45	8.48	8.50	8.53	8.55	8.58	8.60	8.63
10	8.65	8.68	8.70	8.73	8.75	8.78	8.80	8.83	8.85	8.87
0	8.90	8.92	8.95	8.97	8.99	>9.00	>9.00	>9.00	>9.00	----

Rev. 041806 APKPHSEC

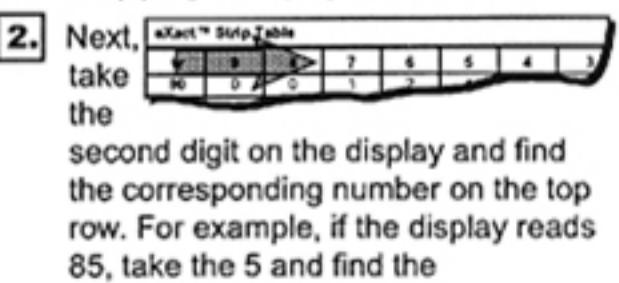
## How to Use the Table

After completing the test procedure in "tr" mode, use the two (2) digits displayed as follows:

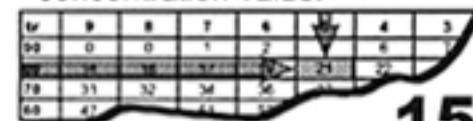
- Take the first digit and add a zero (0) to the end. For example, if the display reads 85, take the 8 and add a zero to make it read 80. Find the corresponding number in the left column.



- Next, take the second digit on the display and find the corresponding number on the top row. For example, if the display reads 85, take the 5 and find the corresponding number in the top row.

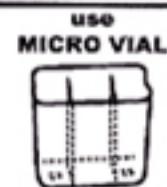


- Draw a line from the left column to your right and from the top row down. Where the two lines intersect is your final concentration value.



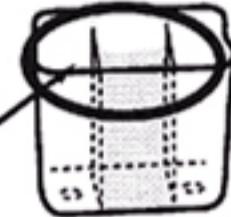
# eXact™ Xtra MICRO (3.3mL) Turbidity Test Procedure

Turbidity results require the table below. Follow eXact™ Xtra (3.3mL) Turbidity Test Procedure (below). Note: ideal for unfiltered, non-potable water ONLY. Can also be used in microbiology for determining relative microbe concentration in growth media.



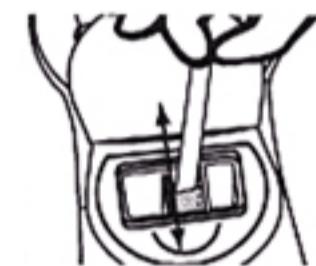
- Fill and empty the **MICRO VIAL** 2 or 3 times with DISTILLED or DEIONIZED water.

(Rinsing minimizes potential cross contamination from previous test)

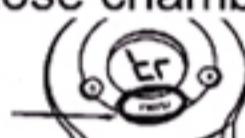


- Fill with DISTILLED or DEIONIZED water to capacity (3.3ml)

- Dry outside of **MICRO VIAL** with paper towel or soft absorbent cloth. Lift the chamber lid and insert the **micro VIAL** into test chamber. Close chamber lid.



- Press the "Menu" pad until the "tr" symbol appears.



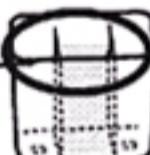
- Press the "B" button to blank the meter to 0 (zero).

- Open the chamber lid and remove the **MICRO VIAL**. Discard the water used in Step 2.

Please note back & front orientation of the vial (e.g., which side faced front).



- Rinse the **MICRO VIAL** 2 or 3 times then fill center section to capacity (3.3ml) with water to be tested.

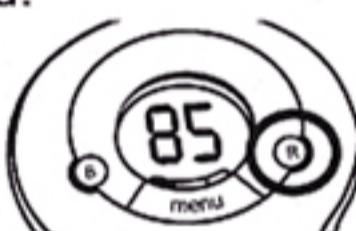


- Insert the **MICRO VIAL** into the test chamber.

Note: For best results, insert the vial in the same orientation as when blanked.



- Close the chamber lid, and press the "R" button. Read the result on the display.



- Find the "tr" result in the table below to determine the Turbidity concentration in NTU (Nephelometric Turbidity Units)

(Example: a "tr" result of 85 equals a Turbidity value of 36 NTU)

- Record your results.

## eXact™ Xtra MICRO Turbidity Table (3.3mL)

Turbidity results require the table below. Follow eXact™ Xtra MICRO (3.3mL) Turbidity Test Procedure (above).



eXact™ Xtra Turbidity - for 3.3mL Samples, USE MICRO VIAL

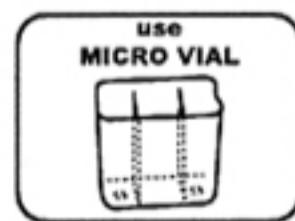
tr	9	8	7	6	5	4	3	2	1	0
90	<5	5	7	9	11	14	16	18	21	23
80	25	28	31	33	36	38	41	44	47	49
70	52	55	58	61	64	67	70	73	76	80
60	83	86	89	93	96	99	103	106	110	113
50	16	117	121	126	130	135	140	150	150	155
40	161	167	172	178	185	191	198	205	212	219
30	227	234	243	251	259	268	277	287	296	306
20	317	327	338	349	361	373	385	397	410	425
10	445	460	473	484	495	508	523	543	569	602
0	644	696	760	837	>900	>900	>900	>900	>900	----

This table was calibrated using stabilized Formazin Turbidity Standards.

Rev. 021706 NTU

## eXact™ Xtra MICRO Magnesium Hardness (3.3mL)

Magnesium Hardness results require the table below. Follow eXact™ Xtra MICRO Test Procedure (page 4) using eXact™ Strip MICRO Mg, Part No. 486610



Find the "tr" result in the table below to determine the Magnesium Hardness concentration in ppm (parts per million) and record your result. (Example: "tr" result of 85 equals a Magnesium Hardness value of 22 ppm).

NOTE: To determine results, follow Steps 1 - 6 of the eXact™ Xtra MICRO Test Procedure, then at 2 minutes (1 minute and 40 seconds after removing the strip), press the "R" key and record the result.

### eXact™ Strip Micro Mg, Part No. 486610 - for 3.3mL Samples, USE MICRO VIAL

tr	9	8	7	6	5	4	3	2	1	0
90	<10	<10	<10	<10	<10	<20	<20	<20	20	20
80	21	21	21	22	22	23	23	23	24	24
70	24	25	25	26	26	26	27	27	27	28
60	28	29	29	29	30	30	31	31	31	32
50	32	32	33	33	34	34	34	35	35	35
40	36	36	37	37	37	38	38	38	39	39
30	40	42	42	43	43	44	45	45	46	47
20	49	50	51	53	55	57	61	61	64	66
10	69	72	75	79	82	86	94	94	99	>100
0	>100	>100	>100	>100	>100	>100	>100	>100	>100	----

Rev. 051606micro sec

## eXact™ Xtra MICRO (3.3mL) Dilution Procedure

This procedure applies to all parameters that may require a dilution to be performed. Use this procedure if the meter displays "HI" or if tr reading is below 10. This procedure does not apply to pH readings.



### How to Dilute Sample:

1. To a clean **50ml Graduated Cylinder** (*not supplied, order no. F28692-0000, \$6.99*), add the water sample to be tested to the 10mL line.
2. Using distilled or deionized water to dilute sample, add 10mL of water to the same graduated cylinder from step 1 (making the total volume 20mL). Mix gently by swirling. This is the diluted water sample.
3. Run the diluted water sample according to the **eXact™ Xtra MICRO Test Procedure** (page 4). Find the "tr" result in the appropriate chart and multiply ppm result by the dilution factor used (see table below). If further dilution is needed, reference the chart below.

Dilution	Water Sample	Calcium Hardness Free Water	Total Volume (diluted sample)	Dilution Factor
1:2	10ml	10ml	20ml	2
1:3	10ml	20ml	30ml	3
1:4	10ml	30ml	40ml	4
1:5	10ml	40ml	50ml	5
1:10	5mL	45ml	50ml	10

## eXact™ Xtra Meter Maintenance

The battery life indicator is at the top of the display screen and appears when the unit is on. When the indicator shows empty, replace the 9-volt battery.

**To change the battery:** Unclasp the bottom cover on the instrument. Carefully pull out the battery and disconnect the 9 volt battery connector. Snap on the new battery, place it back in the unit, and attach the bottom cover.

Through normal usage of your eXact™ meter, water may accumulate in the test chamber and underneath in the bottom cover. The accumulation of water may cause your meter to malfunction (dimmed display, unable to blank, does not power on, error code displayed). To correct these malfunctions if they occur, open the bottom cover and empty all excess water. Pat the area dry with a paper towel and let electronics dry completely (this may require up to 24 hours). Routine emptying and drying of the bottom cover area, as described, is recommended to prevent these issues.

To ensure optimal performance, store your eXact™ kit in a cool, dry place away from excess heat (below 100°F / 38°C), moisture, and oxidizers such as Chlorine and Bromine.



## eXact™ Xtra Meter Error Messages

If the test procedures are not accurately followed, you may experience an error message. The following are the most common messages that may be displayed. If an error message other than E2, E3, E4 is displayed, please contact technical support.

E2: tester did not blank or testing chamber lid is open.

E3: Meter was not blanked properly before sample was run.

E4: Internal error, allow meter to switch off and then turn back on. Possible cause is that the internal section of the meter contains excess moisture. See Maintenance for remedy.

## eXact™ Xtra Meter Limited Warranty

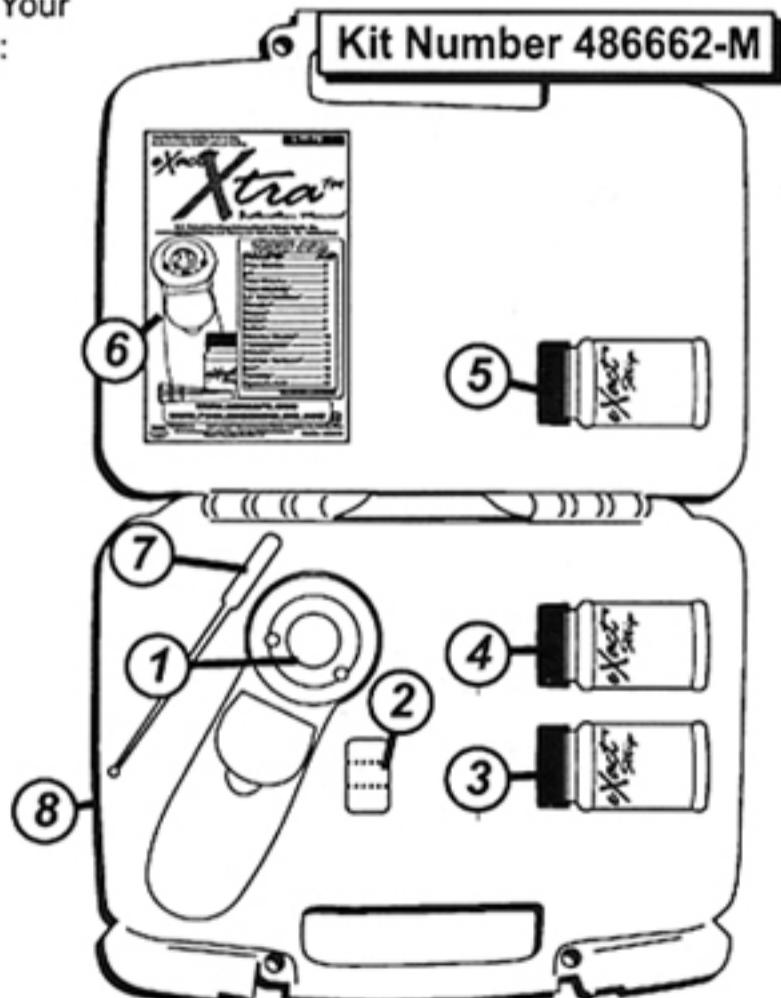
ITS warrants this product to be free from defects in materials and workmanship, and to conform to its published product specifications, under normal use and service, for a period of 24 months commencing from the date of purchase. This limited warranty is extended only to the first purchaser and applies only to product failures due to defective materials and/or workmanship. Without limiting the generality of the foregoing, the foregoing warranty will not apply if, upon inspection, it is found that the product was: misused or abused; used for a purpose for which it is not designed; mishandled; placed in an improper environment; repaired by unauthorized personnel; or improperly adjusted. The sole and exclusive remedy in the event of any breach of the foregoing warranty shall be for the original purchaser to return the product to ITS, freight and insurance prepaid, for repair or replacement, at ITS' option. Any product repair or replacement under the foregoing warranty shall be shipped back to the customer freight and insurance prepaid. In no event shall ITS be liable for any loss, inconvenience, or damages, including without limitation, direct, indirect, special, incidental or consequential damages, resulting from or relating to the use of inability to use a product whether resulting from breach of warranty or any other legal theory, even if ITS has been advised of the possibility of such inconvenience, damage, or loss.

## eXact™ Xtra Meter & Kit Specifications

Thank you for purchasing the eXact™ Xtra Photometric System. Your new eXact™ Xtra System contains the following components:

ITEM	COMPONENT	QTY
1	eXact™ Xtra	1
2	eXact™ MICRO Vials	2
3	eXact™ Strip MICRO DPD-1	1 Bottle, 100 Tests
4	eXact™ Strip MICRO DPD-3	1 Bottle, 100 Tests
5	eXact™ Strip MICRO PH	1 Bottle, 100 Tests
6	eXact™ Instructions	1
7	Blue Stirrer	1
8	eXact™ Case	1
In Meter	9-Volt Battery	1

Specifications	
Power	9 Volt Battery
Weight	160 grams (6 oz)
Wavelength	562 nm
Window	20 nm
Scan Width	15 mm (Inside)
Size	7" x 2" x 1.5" (LxWxH) or 17cm x 6cm x 4cm (LxWxH)



# eXact™ Xtra - For Best Accuracy

1.	Become familiar with the meter and the different tests by reading the instructions carefully. Use the appropriate STANDARD TEST PROCEDURE (10ml or 3.3ml) where instructed.
2.	Observe the dip timing (20 seconds) accurately for best results.
3.	Test immediately after filling the STANDARD / MICRO VIAL with water sample.
4.	Be sure the VIAL is filled to capacity (10ml / 3.3ml). Run test with chamber lid closed. Sample that may splash out of VIAL during movement of eXact™ strip will not affect accuracy.
5.	Rinse the VIAL with clean water immediately after running test. (Some test reagents can stain vial)
6.	Just before testing, rinse the VIAL with sample water several times to avoid contamination from previous tests. (Use deionized or distilled water for rinsing if you have limited amount of sample).
7.	Store meter and all test materials out of direct sunlight and away from chemical storage areas. Minimize exposure to heat above 100°F (38°C).
8.	Dry the meter and VIAL when testing is complete.
9.	Record results for future reference. The eXact™ Xtra meter is programmed to run all of the test parameters in both the 10ml and 3.3ml VIALS. Use the appropriate eXact™ Strip and VIAL for each test.
10.	Each bottle of eXact™ Strips contains the quantity of strips notated on the bottle label in addition to 1 or 2 strips that are noticeably smaller or larger in width - this is normal. Using these strips will compromise results. Please remove and discard.
11.	Each conversion table supplied has a unique revision number located in the bottom right corner of the chart. If revisions to a given chart become necessary, a new chart will be supplied upon reordering the eXact™ Strip.

All tests were calibrated at 75°F (24°C).

## eXact™ Strip MICRO (3.3ml) Reorder Information

eXact™ Strip MICRO has been designed to offer the user a more cost-effective alternative to testing. Instead of using a full 10ml sample, eXact™ Strip MICRO uses a 3.3ml sample size. Be sure you use the correct strip when performing tests using the MICRO VIAL.

Product	Part Number	Description	Retail Price
eXact™ Xtra Kit	486662-M	eXact™ Xtra meter with (2) 3.3ml MICRO Vials, 50 tests for FCI (DPD-1), TCI (DPD-3), & pH	
eXact™ Strip MICRO DPD-1*	486637	eXact™ Strip MICRO for Free Chlorine (DPD-1), Bottle of 100	
eXact™ Strip MICRO DPD-3*	486638	eXact™ Strip MICRO for Total Chlorine (DPD-3), Bottle of 100 (for use with DPD-1)	
eXact™ Strip MICRO DPD-4*	486670	eXact™ Strip MICRO for Total Chlorine (DPD-4), Bottle of 100	
eXact™ Strip MICRO pH	486639	eXact™ Strip MICRO for pH (with Chlorine Protection), Bottle of 100	
eXact™ Reagent CY*	481652	eXact™ Reagent for Cyanuric Acid, 20ml bottle (apx. 250 tests)	
eXact™ Strip MICRO AL*	486635	eXact™ Strip MICRO for Total Alkalinity, Bottle of 100	
eXact™ Strip MICRO DPD-1*	486637	eXact™ Strip MICRO for Total Bromine (Bromine + Bromamines, DPD-1), Bottle of 100	
eXact™ Strip MICRO DPD-4*	486670	eXact™ Strip MICRO for Ozone (DPD-4), Bottle of 100	
eXact™ Strip MICRO Ca*	486629	eXact™ Strip MICRO for Calcium Hardness (Ca <sup>2+</sup> ), Bottle of 100	
eXact™ Strip MICRO LRTH*	486630	eXact™ Strip MICRO for Low Range Total Hardness (Ca <sup>2+</sup> / Mg <sup>2+</sup> ), Bottle of 100	
eXact™ Strip MICRO Cu*	486632	eXact™ Strip MICRO for Copper (Cu <sup>1+</sup> / Cu <sup>2+</sup> ), Bottle of 100	
eXact™ Strip MICRO Fe*	486631	eXact™ Strip MICRO for Iron (Fe <sup>-2</sup> / Fe <sup>-3</sup> ), Bottle of 50	
eXact™ Strip MICRO DPD-1*	486637	eXact™ Strip MICRO for Iodine (DPD-1), Bottle of 100	
eXact™ Strip MICRO NaCl*	486628	eXact™ Strip MICRO for Chloride (NaCl), Bottle of 50	
eXact™ Strip MICRO DPD-1*	486637	eXact™ Strip MICRO for Chlorine Dioxide (DPD-1), Bottle of 100	
eXact™ Strip MICRO DPD-1*	486637	eXact™ Strip MICRO for Permanganate (DPD-1), Bottle of 100	
eXact™ Strip MICRO Nitrite*	486623	eXact™ Strip MICRO for Nitrite (NO <sub>2</sub> ), Bottle of 50	
eXact™ Strip MICRO Nitrate*	486617	eXact™ Strip MICRO for Nitrate (NO <sub>3</sub> ), Bottle of 50	
eXact™ Strip MICRO Sulfate*	486608	eXact™ Strip MICRO for Sulfate (SO <sub>4</sub> <sup>2-</sup> ), Bottle of 50	
eXact™ Strip MICRO Fluoride*	486611	eXact™ Strip MICRO for Fluoride (F <sup>-</sup> ), Bottle of 25	
eXact™ Strip MICRO Potassium*	486621	eXact™ Strip MICRO for Potassium (K), Bottle of 50	
eXact™ Strip MICRO Magnesium Hardness*	486610	eXact™ Strip MICRO for Magnesium Hardness (Mg <sup>2+</sup> ), Bottle of 50	
eXact™ Strip MICRO Acid pH*	486624	eXact™ Strip MICRO for Acid pH, Bottle of 50	
eXact™ Strip MICRO Alkali pH*	486609	eXact™ Strip MICRO for Alkali pH, Bottle of 50	
eXact™ Strip MICRO Sulfide	486622	eXact™ Strip MICRO for Sulfide (S <sup>2-</sup> ), Bottle of 50	
eXact™ Strip MICRO Peroxide*	486616	eXact™ Strip MICRO for Peroxide (H <sub>2</sub> O <sub>2</sub> ), Bottle of 50	
eXact™ Strip MICRO Protein*	486620	eXact™ Strip MICRO for Protein, Bottle of 50	
eXact™ Strip MICRO Ammonia*	486618	eXact™ Strip MICRO for Ammonia (NH <sub>3</sub> / NH <sub>4</sub> ), Bottle of 50	
eXact™ Strip MICRO Zinc*	486615	eXact™ Strip MICRO for Zinc (Zn), Bottle of 50	
eXact™ Strip MICRO Chromium*	486614	eXact™ Strip MICRO for Chromium Hexavalent, Bottle of 50	
eXact™ Strip MICRO Aluminum*	486613	eXact™ Strip MICRO for Aluminum (Al), Bottle of 50	
eXact™ Strip MICRO Beryllium*	486612	eXact™ Strip MICRO for Beryllium (Be), Bottle of 50	
eXact™ Xtra MICRO VIAL	486663	Plastic MICRO VIALS for use with Xtra 3.3mL Micro samples, Pack of 5	

\* requires conversion table; included with kit.

All products sold in case quantities (12 bottles per case).

PRICE SUBJECT TO CHANGE WITHOUT NOTICE

# How to Order Replacement Parts

## eXact™ Xtra MICRO Detection Specifications

### eXact™ Xtra MICRO (3.3ml) Detection Specifications

PARAMETER	DETECTION RANGE	RESOLUTION	ACCURACY	MENU	CHEMISTRY
Free Chlorine (DPD-1)*	0.1 - 7.0 ppm	0.1 ppm	+/- 0.2	CL	DPD
Total Chlorine (DPD-3)	0.1 - 7.0 ppm	0.1 ppm	+/- 0.2	CL	KI (for use with DPD-1)
Total Chlorine (DPD-4)	0.1 - 7.0 ppm	0.1 ppm	+/- 0.2	CL	DPD + KI
pH	6.6 - 8.6***	0.1	+/- 0.3	PH	Phenol Red
Total Alkalinity**	1 - 360 ppm***	2 ppm	+/- 20	tr	Phenol Red + Citrate
Bromine (DPD-1)**	0.1 - 11.5 ppm	0.05 ppm	+/- 0.2	tr	DPD
Copper (Cu <sup>2+</sup> )**	0.1 - 5.0 ppm	0.1 ppm	+/- 0.2	tr	Biquinoline
Calcium Hardness**	2 - 200 ppm	2 ppm	+/- 5	tr	Oxalic Acid (ppt)
Cyanuric Acid**	2 - 125 ppm	1 ppm	+/- 5	tr	Melamine (ppt)
Iron (Fe <sup>2+</sup> /Fe <sup>3+</sup> )**	0 - 2.0 ppm	0.05 ppm	+/- 0.1	tr	TPTZ
LR Total Hardness**	0 - 98 ppm	2 ppm	+/- 3	tr	Phthalein Purple
Chloride (as Cl <sup>-</sup> )**	3 - 200 ppm	3 ppm	+/- 20	tr	Silver (ppt)
Ozone (DPD-4)**	0.01 - 2.0 ppm	0.02 ppm	+/- 0.05	tr	DPD + KI
Iodine (DPD-1)**	0.01 - 10 ppm	0.02 ppm	+/- 0.1	tr	DPD
Chlorine Dioxide (DPD-1)**	0.03 - 4.0 ppm	0.03 ppm	+/- 0.2	tr	DPD
Permanganate (DPD-1)**	0.01 - 4.5 ppm	0.01 ppm	+/- 0.03	tr	DPD
Acid pH**	3.0 - 6.2	0.1	+/- 0.3	tr	Alizaine Red S
Turbidity**	5 - 200 NTU	5 NTU	+/- 10 NTU	tr	Nephelometric Turbidity Units
Sulfide (as S <sup>-</sup> )**	0.1 - 10 ppm	0.1 ppm	+/- 0.3	tr	Silver (ppt)
Peroxide (as H <sub>2</sub> O <sub>2</sub> )**	0.01 - 4 ppm	0.1 ppm	+/- 0.2	tr	DPD + Molybdate + KI
High Range Ammonia (as NH <sub>3</sub> )**	0.3 - 60 ppm	0.2 ppm	+/- 1	tr	Silver + Tannin
Hexavalent Chromium (as CrO <sub>4</sub> )**	0.05 - 5 ppm	0.05 ppm	+/- 0.1	tr	Diphenylcarbohydrazide

SPECIFICATIONS SUBJECT TO CHANGE WITHOUT NOTICE.

\* For Free Chlorine levels above 3.0 ppm, two (2) eXact DPD-1 Strips should be used.

\*\* Results utilize the tr (transmission) meter function and require the use of a table.



See respective test procedures for more information and tables.

\*\*\*For pH and Total Alkalinity: If the water sample is below 70°F (21°C), readings may be low.

NOTE: Accuracy is +/- 5% or the value given above, whichever is higher.