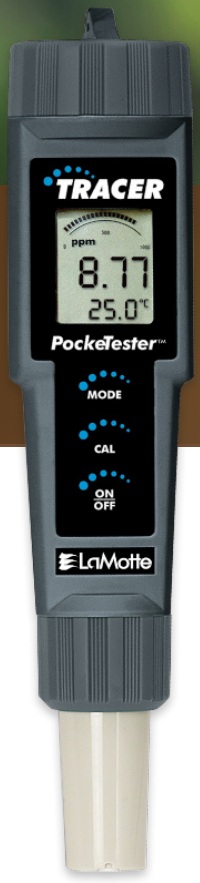
LaMotte®

Rural Water Testing Products



Measuring Turbidity and pH

Turbidity

Using portable, hand-held turbidimeters to check the clarity of field samples or the calibration of on-line turbidimeters requires meticulously designed optical systems and careful user technique. The instrument must be capable of stable, long-term calibrations with high accuracy and low detection limits. Measurement techniques as simple as sample tube alignment can be critical in obtaining precise low-level turbidity readings on any meter. Once the user understands how small the subject matter really is they gain significant respect for technique.

Turbidity analysis is an optical measurement of scattered light in a solution. When light is passed through a water sample, particles in the light path change the direction of the light, scattering it. If the turbidity is low, most of the light will continue in the original direction. Light scattered by the particles in its path allows the particles to be quantified in the water, just as sunlight illuminates dust particles in the air.

Measuring low level turbidity requires precisely quantifying the scattering of light in water using a turbidimeter, also known as a nephelometer. The terms nephelometer and turbidimeter are interchangeable, however, a nephelometer specifically measures light scattered at a 90° angle to the light source. Light scattered at other angles may also be measured, but the 90° angle defines a nephelometric measurement.

Instruments are designed to meet EPA (Environmental Protection Agency) and ISO (International Organization for Standardization) standards, respectively. The EPA method specifies a tungsten lamp, with a color temperature of 2,200 – 3,000 K. The units of measurement for the EPA method are recorded as nephelometric turbidity units (NTU). The ISO method specifies a light emitting diode (LED), with a wavelength of 860 nm and a spectral bandwidth less than or equal to 60 nm. The units of measurement for the ISO method are formazin nephelometric units (FNU). Where samples with color are being analyzed the ISO meter is the instrument of choice.

Turbidity measurements are more precise when the sample is viewed from more than one angle. This process compensates for variable particle densities, light source and color differences by computing a turbidity value using a ratio of the light received by several different detectors. This is known as a "ratiometric" method. A ratiometric turbidity instrument uses detectors at variable angles so floating debris is measured throughout the sample.

pH

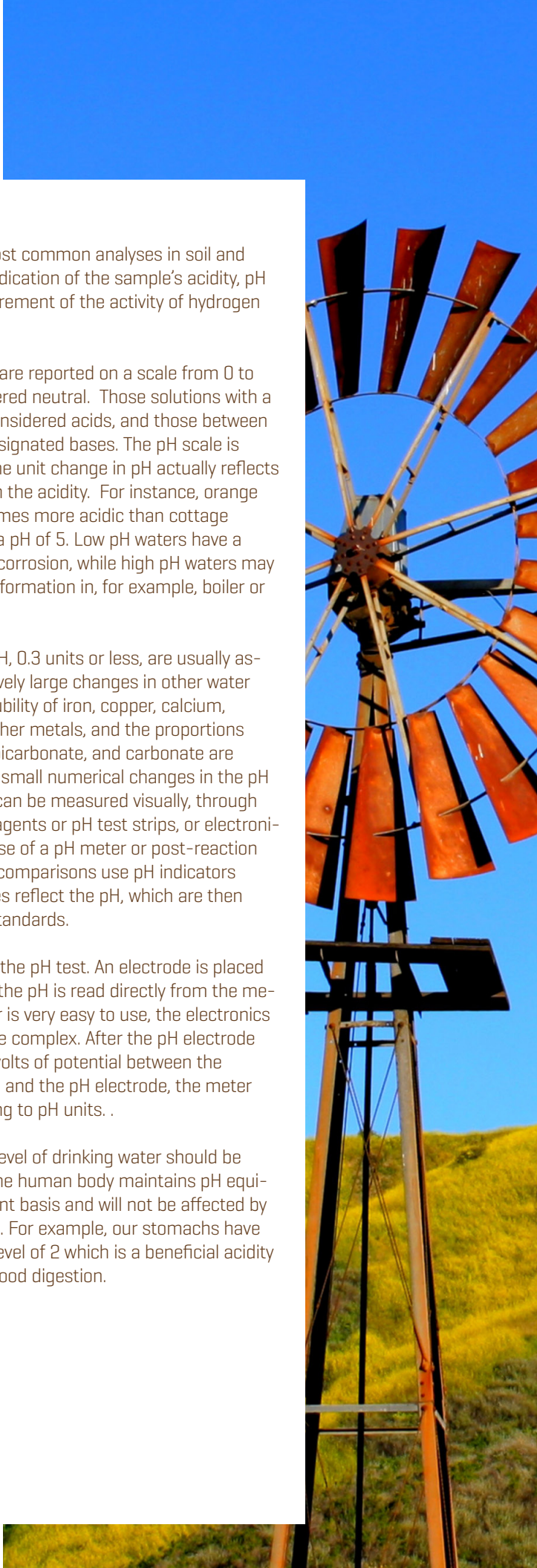
pH is one of the most common analyses in soil and water testing. An indication of the sample's acidity, pH is actually a measurement of the activity of hydrogen ions in the sample.

pH measurements are reported on a scale from 0 to 14, with 7.0 considered neutral. Those solutions with a pH below 7.0 are considered acids, and those between 7.0 and 14.0 are designated bases. The pH scale is logarithmic, so a one unit change in pH actually reflects a ten fold change in the acidity. For instance, orange juice, pH 4, is ten times more acidic than cottage cheese, which has a pH of 5. Low pH waters have a tendency to cause corrosion, while high pH waters may contribute to scale formation in, for example, boiler or cooling systems.

Small changes in pH, 0.3 units or less, are usually associated with relatively large changes in other water qualities — the solubility of iron, copper, calcium, manganese, and other metals, and the proportions of carbon dioxide, bicarbonate, and carbonate are greatly changed by small numerical changes in the pH measurement. pH can be measured visually, through the use of liquid reagents or pH test strips, or electronically, through the use of a pH meter or post-reaction colorimeter. Visual comparisons use pH indicators where color changes reflect the pH, which are then matched to color standards.

pH meters simplify the pH test. An electrode is placed in the sample, and the pH is read directly from the meter. While the meter is very easy to use, the electronics within the meter are complex. After the pH electrode measures the millivolts of potential between the reference electrode and the pH electrode, the meter converts this reading to pH units. .

While the ideal pH level of drinking water should be between 6 to 8.5, the human body maintains pH equilibrium on a constant basis and will not be affected by water consumption. For example, our stomachs have a naturally low pH level of 2 which is a beneficial acidity that helps us with food digestion.



ColorQ 2x Kits

ColorQ® 2x High Range Chlorine Colorimeter Kit

Order Code 2100

Aim High with the **LaMotte ColorQ 2x High Range Chlorine Meter Kit**. A perfect choice for analyzing your flushing and new main chlorine applications. Its simple operation allows swift measuring of **High Range Total Chlorine can be tested up to 750 ppm**, includes reagents for 100 tests. Go digital and waterproof without breaking the bank!

Order Code 2100

ColorQ® 2x Low Range Chlorine Colorimeter Kit

Order Code 2102

Go Low with a **LaMotte ColorQ 2x Low Range Chlorine Meter Kit!** This compact meter can detect **Low Chlorine Residuals down to 0.05 ppm and up to 4.00 ppm**, includes reagents for 100 tests. The double-wide tubes, precise optics, and DPD reagents make the ColorQ 2x ideal for compliance monitoring. This fast and easy to use, waterproof meter will help your budget go low, too!

EPA 330.5 | NPDWR NPDES | STD. METHOD 4500

Order Code 2102

2020t Portable Turbidity Meter

Order Code 1974-T

New RATIOMETRIC design in one of the most innovative, WATERPROOF, handheld meters available on the market!

The multi-detector optical configuration assures long-term stability and minimizes stray light and color interference. The new ratiometric design allows for easy and accurate testing. The nephelometric mode measures 0-40 NTU/FNU, ratiometric mode 40-1000 NTRU/FNRU and 1000-2000 AU. Now pinpoint the range of interest with better, more reliable results. Ideally suited for low-level drinking water applications, mid-range industrial applications, and high-range environmental applications.

- Easy menu driven operation and large LCD display
- 500 point data log; stored results can be viewed directly on instrument
- Seven user-selected languages: English, Spanish, French, Japanese, Chinese, Italian, and Portuguese
- Advanced calibration algorithms

Turbidity Specifications:

Mode	Ratiometric	Nephelometric	Attenuation
Unit of Measure	NTRU, NTU, ASBC, EBC	NTU, ASBC, EBC	AU, NTU, ASBC, EBC
Range	0-1,000 NTRU/FNRU, 0-17,500 ASBC 0-250 EBC	0-100 NTU/FNU, 0-1,750 ASBC 0-25 EBC	0-2,000 AU/FAU, 0-70,000 ASBC 0-1,000 EBC
Resolution	0–10.99 NTRU/FNRU: 0.01, 11.0–109.9 NTRU/FNRU: 0.1 110–1000 NTRU/FNRU: 1	0–10.99 NTU/FNU: 0.01 11.0–100.0 NTU/FNU: 0.1	0–2000 AU/FAU: 1
Accuracy	0-2.5 NTRU/FNRU: ±0.05, 2.5-100 NTRU/FNRU: ±2% 100-1000 NTRU/FNRU: ±3%	0-2.5 NTU/FNU: ±0.05 2.5-100 NTU/FNU: ±2%	0-2000 AU/FAU: ±10 AU/FAU or 6%, whichever is greater
Detection Limit	0.05 NTRU/FNRU	0.05 NTU/FNU	10 AU/FAU
Reproducibility	0.02 NTRU/FNRU or 1%	0.02 NTU/FNU or 1%	1%
Range Selection	Automatic		
Light Source	2020t: Tungsten lamp 2300 °K ±50 °K		
Detector	2020t: Photodiode, centered at 90° and 180°, maximum peak 400-600 nm		

Meter Features:

Signal Averaging	Power	Data Logging	Auto Shut-off	Languages	Response Time	Size	Weight	Display
Disabled, 2, 5, 10	USB computer cable, wall adapter or Lithium ion rechargeable battery, 3.7V, 2.5" x .75", 1.7 oz	500 points	Disabled, 5, 10, 30 seconds	English, French, Spanish, Japanese, Italian, Portuguese, Chinese	<2 Seconds	7.5 x 3.5 x 2.5 inches; 19.05x 8.84 x 6.35 cm	13 oz	6-line LCD with backlit display

Accessories

- 0 NTU Standard (EPA and ISO), 60 mL, Code 1440
- 1 NTU Standard (EPA), 60 mL, Code 1441
- 1 FNU Standard (ISO), 60 mL, Code 1446
- 10 NTU Standard (EPA), 60 mL, Code 1442
- 10 NTU Standard (ISO), 60 mL, Code 1447
- 100 NTU Standard (EPA), 60 mL, Code 1443
- 100 FNU Standard (ISO), 60 mL, Code 1448
- Formazin Standard Solution, 4000 NTU, 60 mL Code 6195-H
- USB Cable, Code 1720
- Wall Adapter, Code 1721
- Six-pack of vials, Code 0290-6
- Car Charger, Code 5-0132

Model 1500 · Single Test Colorimeter Lab

Order Code 3240 (tablet)

Waterproof USB Capable Rechargeable

- Large graphical liquid crystal display with simple, menu-driven operation
- Field & Lab Use: USB cable and wall adapter included; car charger optional
- Lithium ion rechargeable battery: No need to buy batteries again
- EPA Compliant: Uses proper wavelength and DPD test method to meet EPA design specifications for NPDWR and NPDES chlorine monitoring programs (EPA 330.5 and Standard Method 4500)
- European CE Mark
- Superior narrow band-width interference filters
- 0-4 ppm Chlorine: No need to select a low or high range. The DC1500 covers the entire critical chlorine range of 0-4 ppm with an MDL of 0.03 ppm.
- A Great Value: Complete, economical package! The DC1500 Chlorine Colorimeter Kit includes tablets for 100 tests or liquid reagents for 140 tests, six sample vials, and a sturdy carrying case.
- IP67 Waterproof Design: Designed with excessive exposure to moisture in mind, the DC1500 colorimeter delivers trouble-free performance

Options:

USB Cable (Order Code 1720)

Wall Plug (Order Code 1721)

Replacement Tubes (Order Code 0290-6)

Instrument Type:	Single wavelength, direct-reading colorimeter
Readout:	3½ digit LCD
Wavelength Accuracy:	±2%FS
Detector:	Silicon Photodiode with integrated interface filter
Sample Chamber:	Accepts 25mm diameter flat-bottom, screwcap tubes (6 included)
Light Source:	LED
Interface:	USB port
Power:	Lithium ion rechargeable battery
Size (LxWxH):	17 x 16 x 9 cm, 6.9 x 3.25 x 2.5 inches

Test Factor	Code	Range (ppm)	Detection Limit	Test Method (# of reagents)	# of Tests	Ship Code
Chlorine (Free & Total)	3240	0–4.0	0.05	DPD Tablets (2)	140	NH

ALSO AVAILABLE

Model 1500-UDV 568 nm Absorbance Colorimeter

For 10mm cuvettes

Order Code 3250

Chlorine Standards for Model 1500 & SMART3

For use with the 1500 series and SMART3 chlorine colorimeters. Secondary standards provide a fast way to check calibration without the burden of making primary standards. Based on Standard Methods for the Examination of Water and Wastewater, the operator can calibrate a colorimeter using a per-manganate primary standard or a chlorine primary standard. Once the meter is calibrated using the primary standard, the operator can insert secondary standards periodically to evaluate the calibration of the instrument.

- Secondary standard kit contains a blank and 3 standards for low, mid-range, and high chlorine calibrations.
- Packaged in a small plastic case with Certificate of Analysis stating range of each standard.

Ship Codes: (NH) Non-Hazardous Material - No Fees · (R1) Small Qty. Hazardous Material - No Fees · (LQ, R2, R3) Hazardous Material - Air Fees Only · (HF) Hazardous Material - Air & Ground Fees
*(NPDWR) EPA Accepted · †(NPDES) EPA Accepted · Direct Reading Titrators have a specific range, but may be refilled to test higher concentrations.

TRACER PockeTesters

A pocket-sized ISE meter for measuring total chlorine. Use it to test pH and ORP with interchangeable flat surface sensors.

Total Chlorine TRACER

Order Code 1740

- Read Total Chlorine from 0.00-10 ppm
- Readings are not affected by sample color or turbidity
- Automatic self calibration; extra bold display includes an analog bar graph feature; memory can store up to 15 readings
- Chlorine and pH modes also display sample temperature
- Unit identifies which probe is in use and retains calibrations
- Automatic shut-off and Low Battery indicator; uses four 3V CR-2032 batteries
- Includes 100 reagent tablets at almost half the price of similar Chlorine ISE reagents
- Follows EPA protocol for ISE methods

1740-KIT-01

TRACER KIT with pH, Total Chlorine and ORP probes

Order Code 1740-KIT-01

Includes Tracer meter with pH, Total Chlorine and ORP probes, 100 Chlorine tablets, 50 pH 7.0 buffer tablets, tablet crusher and convenient carrying case.

1740

Fluoride TRACER

Order Code 1756

- The first Fluoride meter with built-in Automatic Temperature Compensation and fastest response (<1 min)
- Small sample/TISAB volume required for testing
- Complies with EPA Method 340.2 (Potentiometric Ion Selective Electrode)
- Automatic electronic 1 or 2 point calibration with offset adjustment
- Memory stores 25 labeled readings and water resistant to IP54
- Complete with electrode, 20 TISAB reagent tablets, sensor cap, four 3V button batteries, and 48" (1.2m) neckstrap

Options:

TISAB Reagent, 100 Tablets, Order Code 7024-J

Fluoride Replacement Electrode*, Order Code 1757

Fluoride Standard, 1 ppm, 1000 mL, Order Code 2798-M

Fluoride Standard, 1,000 ppm, 60 mL, Order Code 4154-H

Fluoride Standard, 1,000 ppm, 500 mL, Order Code 4154-L

Fluoride:	0.1 to 10 ppm, max. resolution: 0.1 ppm, accuracy: ±3% rdg
Temperature	32°F to 140°F (0 to 60°C), max. resolution: 0.1 °F, accuracy: ±1.8°F/1°C
Accuracy:	EC, TDS, Salt: ± 2% FS; Temperature: ± 1°C (1.8°F)

pH/TDS/SALT/CONDUCTIVITY/TEMP TRACER

Order Code 1766

- Measures five parameters including Conductivity, TDS, Salinity, pH, and Temperature using one electrode
- Units of measure: pH, µS, mS, ppm, ppt, mg/L, g/L, °C, °F
- Memory stores up to 25 labeled readings; auto power off and low battery indicator
- Adjustable Conductivity to TDS ratio

Options:

pH/EC/TDS/SAL Replacement Electrode*, Order Code 1755

Sample Cups w/cap, Order Code 1745-1

Conductivity Standard, 84 µS, 30 mL, Order Code 6312-G

Conductivity Standard, 1413 µS, 30 mL, Order Code 6354-G

Conductivity Standard, 12,880 µS, 30 mL, Order Code 6317-G

	Range	Resolution	Accuracy
Conductivity	0 to 199.9 µS, 200 to 1999 µS, 2.00 to 19.99 mS	0.1 µS	±1%
TDS/Salinity	0 to 99.9 ppm (mg/L), 100 to 999 ppm (mg/L), 1.00 to 9.99 ppt	0.1 ppm (mg/L)	±2%
pH	0.00 to 14.00 pH	0.01 pH	±0.01 pH
Temperature	32° to 149°F (0 to 65°C)	0.1°F/°C	±1.8°F/°C

*Not interchangeable with Cl/pH/ORP TRACER

TRACER PockeTesters and Test Strips

Dissolved Oxygen Tracer

Order Code 1761

- Oxygen level displayed as % Saturation from 0 to 200.0% or Concentration from 0 to 20.00 ppm (mg/L)
- Adjustable Altitude Compensation (0-20,000 ft in 1,000 ft increments)
- Adjustable Salinity Compensation from 0 to 50 ppt
- Memory stores up to 25 data sets with DO and Temperature reading
- Self-calibration on power up; Data, Hold, Auto power off, Low battery indicator
- Optional 3 ft (1m) or 16 ft (5m) extension cable; complete with DO electrode, protective sensor cap, spare membrane cap, electrolyte, four 1.5V CR-2032 batteries, and 48" (1.2m) neckstrap

	Range	Resolution	Accuracy
DO (sat. mode)	0 to 200.0%	0.1%	±2% FS
DO (conc. mode)	0 to 20.00 ppm (mg/L)	0.01 ppm (mg/L)	0.4 ppm (mg/L)
Temp.	32 to 122°F (0 to 50°C)	0.1°F/°C	±1.8°F (1°C)
Dimensions	1.4x6.9x1.6" (36x176x41mm)		
Weight	3.8 oz (110g)		

Test Strips

LaMotte offers a convenient, economical way to perform spot checks for several water quality factors. LaMotte test strips are a great way to monitor water without having to use reagents or field kits. Strips are available for the factors below...and we're working on more!

Single Factor Test Strips

Test Factor	Ammonia	Chlorine, Free, Low Range	Chlorine, Total, Low Range	Chlorine, Total, Low Range	Chlorine, Free & Total	Chlorine, High Range	Nitrate	pH, Wide Range
Code	3023-G	2964-G	2963LR-G	2979	3027-G	3031	3012-G	2974
Range (ppm)	0-6	0-10	0-10	0-5	0-10	0-800	0-200	4-10 (pH)
Water Testing Application	Food/ Beverage/ Drinking	Drinking, Food/ Beverage, Medical	Drinking, Food/ Beverage, Medical	Drinking, Food/ Beverage	Drinking, Food/ Beverage, Medical	Food/Beverage, Medical	Pool	Drinking, Food/ Beverage
# of Tests Per Factor/Per Value	25	25	25	50	25	50	25	50
Values (ppm)	0, 0.5, 1.0, 3.0, 6.0	0, 0.5, 1, 3, 5, 10	0, 0.25, 0.5, 1, 3, 10	0, 0.5, 1, 3, 5	0, 0.5, 1, 3, 5, 10	0, 0.5, 1, 3, 5, 10	0, 10, 30, 60, 120, 200	4, 5, 6, 7, 8, 9, 10

Multi-Factor Test Strips

Test Factor	Code	Range	Water Testing Application*	# of Tests Per Factor/Per Vial	Values (ppm)
6-Way Drinking Water	2933-G	0-10 FCl 0-10 TCl 0-400 Total Hardness (0-23 gpg Total Hardness) 4-10 pH 0-10 Nitrite 0-10 Nitrate	Drinking	25	0, 0.5, 1, 3, 5, 10 0, 0.5, 1, 3, 5, 10 0, 50, 100, 200, 400 (gpg: 0, 3, 5.8, 11.7, 23), 4, 5, 6, 7, 8, 9, 10, 0, 0.5, 1, 5, 10, 0, 5, 10, 25, 50
Nitrate & Nitrite	2996	0-50 (Nitrate) 0-10 (Nitrite)	Drinking	50 50	0, 5, 10, 25, 50 (NO_3-N), 0, 0.5, 1, 5, 10 (NO_2-N)

To see our complete list of products, go to www.lamotte.com

Individual Test Kits

Order Code	Test System	Range/Sensitivity	# of Tests (# Reagents)	Reagent Refill Order Code	Shipping Code (Weight/Lbs)
CHLORINE Free, Combined and Total Chlorine may be determined using DPD with either colorimetric or titrimetric methods. These determinations are generally limited to concentrations of 0–10 ppm, although the FAS titration can test higher concentrations by dilution or with the addition of more DPD indicator. Higher concentrations require the iodometric titration, whereby the sample is acidified and iodide is added, which is oxidized by chlorine to iodine and is titrated with a standard thiosulfate solution. Iodometric determinations will only test total chlorine.					
FREE & TOTAL					
3308-01*	DPD Tablet Octa-Slide 2 Comparator	0.2, 0.4, 0.6, 0.8, 1.0, 1.5, 2.0, 3.0 ppm Cl	50 (2)	R-3308-01	NH (1)
3312-01*	DPD Tablet Octa-Slide 2 Comparator	0.1, 0.2, 0.3, 0.4, 0.5, 0.6, 0.8, 1.0 ppm Cl	50 (2)	R-3312-01	NH (1)
DPD FREE, MONO & DICHLORAMINES, TOTAL CHLORINE, pH					
6980-01	DPD Tablet/ Phenol Red Tablet Octa-Slide 2 Comparator	Low: 0.1–1.0 ppm Cl High: 1.0–6.0 ppm Cl pH: 6.8–8.2	200 (5)	R-6980	NH (7)
DPD-FAS TITRATION FOR FREE AND TOTAL CHLORINE					
3176-02*†	Direct Reading Titrator	0–10 ppm/0.2 ppm Cl	50 at 10 ppm (4)	R-3176-02	R1 (2)
7514-01	FAS Dropper Bottle Titration	1 drop = 0.2 or 0.5 ppm Cl	50 (3)	R-7514-01	NH (1)

3716-02

7514-01

IRON Bipyridyl is a ferrous iron indicator that tests total iron after any ferric iron is reduced to ferrous in the sample. Ferrous and ferric may be tested separately by eliminating the reduction step. A similar ferrous indicator, 1,10 phenanthroline, is used in the DC1500 kit.					
7787-01	Total Iron LRC Comparator	0.05, 0.10, 0.20, 0.30, 0.40, 0.60, 0.80, 1.0 ppm Fe	30 (2)	R-7787-01	R1 (1)
4447-01	Total Iron Octa-Slide	0.5, 1.0, 2.0, 3.0, 4.0, 6.0, 8.0, 10.0 ppm Fe	90 (2)	R-3318	R1 (1)

7787-01

4447-01

HARDNESS EDTA titration is used for all hardness determinations, with a red to blue endpoint. Both total and calcium hardness buffers include inhibitors to eliminate metal interferences. All results are as $CaCO_3$; some kits also express results as gpg. The 3609, which is recommended for salt water analysis, includes a conversion factor for Ca++. The -LI suffix indicates an all liquid kit; -LT indicates a liquid buffer and tablet indicator.					
4482-DR-LI-01	Total Hardness Direct Reading Titrator	0–200 ppm/4 ppm CaCO3 Liquid indicator	50 at 200 ppm (3)	R-4482-DR-LI-01	R1 (1)

*(NPDWR) EPA Accepted · †(NPDES) EPA Accepted · Direct Reading Titrators have a specific range, but may be refilled to test higher concentrations.

LaMotte® Water Testing Leader Since 1919!

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