

SANITATION TESTING PRODUCTS

# TEST METHODS

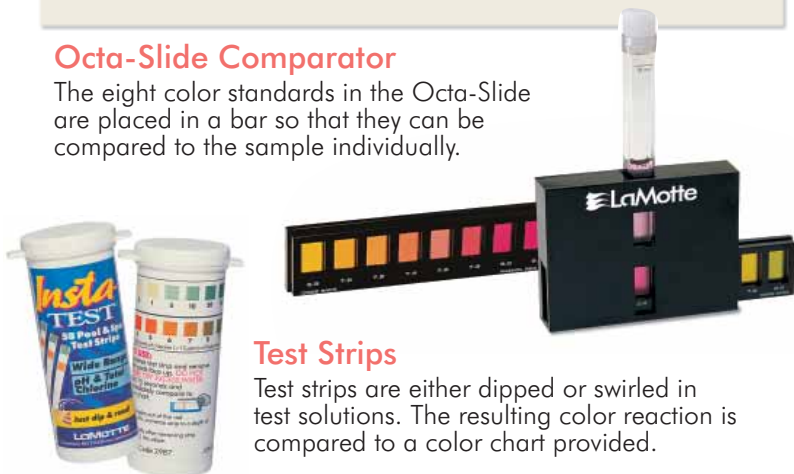
## COLORIMETRIC

There are two basic types of colorimetric tests:

1. Tests which determine the concentration of a substance are based on Beer's Law. Simply stated, this says that the higher the concentration of a substance, the darker the color developed in the test, so more light is absorbed by the sample.
2. pH tests use an indicator which changes color with changes in the concentration of hydrogen ions, or the acidity of the solution.

### Octa-Slide Comparator

The eight color standards in the Octa-Slide are placed in a bar so that they can be compared to the sample individually.



### Test Strips

Test strips are either dipped or swirled in test solutions. The resulting color reaction is compared to a color chart provided.

### Octet Comparator

The Octet Comparator contains eight color standards. The color standards are arranged so that the sample can be compared to four standards at once. There are two accessories which may be used with an Octet Comparator. The Bi-Color Reader (Code 2150) neutralizes sample color and/or turbidity to give more accurate readings. The Axial Reader (Code 2070) uses a mirror to extend the viewpath and intensify faint colors of low concentrations for easy distinction. Both accessories attach directly to the comparator and come with complete instructions for use.



### Color Chart Comparator

Color charts are laminated color standards. The reacted sample is held against the panel and compared to the color standards.

## ELECTRONIC METHODS

Electronic colorimeters measure the amount of light which travels through the reacted sample, and convert the measurement to a reading as ppm, absorbance or %T. In addition to colorimeters, LaMotte offers instruments to test pH, TDS/conductivity, dissolved oxygen, and turbidity.



## TITRIMETRIC

Titrimetric tests can be used to determine the concentration of a substance in a sample solution. After the sample is treated with an indicator, a standard titrant is added until a color change indicates a completed reaction. LaMotte offers four separate types of titration methods, allowing a choice of precision and convenience.

### Direct Reading Titrator

The Direct Reading Titrator is a 1.0 mL microburet calibrated to allow direct reading of the test result. Each Titrator has a specific range, but may be refilled to test higher concentrations.



### Automatic Buret

The self-zeroing automatic buret is calibrated from 0 to 10 mL in 0.1 mL increments. It is available with a squeeze valve (pinchcock), glass stopcock, or Teflon® stopcock.



### Dropper Pipet

The drop count test uses a pipet to provide fast, reliable measurements in the field. The number of drops used to obtain a color change is multiplied by a given factor to produce the test result.



### Dropper Bottle

The dropper bottle test uses bottle tips which deliver a consistent standard drop size to add titrant to the sample. As with the drop count test, the number of drops used to complete the reaction is multiplied by a given equivalence factor to determine the concentration. Many dropper bottle tests use different sample sizes for different equivalences.



# 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.



## SINGLE FACTOR TEST STRIPS

TEST FACTOR	CODE	RANGE (ppm)	# OF TESTS PER FACTOR/PER VIAL	VALUES (ppm)
CHLORINE DIOXIDE	2999LR	0-10	50	0, 0.25, 0.5, 1, 3, 10
CHLORINE DIOXIDE	3002	0-500	50	0, 10, 25, 50, 100, 250, 500
CHLORINE, FREE, LOW RANGE	2964-G	0-10	25	0, 0.25, 0.5, 1, 3, 5, 10
CHLORINE, TOTAL, LOW RANGE	2963LR-G	0-10	25	0, 0.1, 0.25, 0.5, 1, 3, 10
CHLORINE, FREE, HIGH RANGE*	3031	0-800	50	0, 50, 100, 250, 500, 800
CHLORINE, TOTAL	2979	0-5	50	0, 0.5, 1, 3, 5
HARDNESS, LOW RANGE	2981	0-180	50	0, 30, 60, 120, 180
pH, WIDE RANGE	2974	4-10 (pH)	50	4, 5, 6, 7, 8, 9, 10
PERACETIC ACID, LOW RANGE	3000LR	0-50	50	0, 5, 10, 20, 30, 50
PERACETIC ACID	3000	0-160	50	0, 10, 20, 40, 60, 85, 160
PERACETIC ACID, HIGH RANGE	3000HR			Available August 2007
HYDROGEN PEROXIDE	2984LR	0-50	25	0, 1, 3, 10, 30, 50
HYDROGEN PEROXIDE HR	2984	0-90	25	0, 15, 30, 50, 90

\*See also chlorine test papers below.

## MULTI-FACTOR TEST STRIPS

TEST FACTOR	CODE	RANGE (ppm)	# OF TESTS PER FACTOR/PER VIAL	VALUES (ppm)
IRON & COPPER	2994	0-5 (Iron)	25	0, 0.3, 0.5, 1, 3, 5
		0-3 (Copper)	25	0, 0.3, 0.6, 1, 3
WIDE RANGE (pH & TOTAL CHLORINE)	2987	4-10 (pH)	25, 50	4, 5, 6, 7, 8, 9, 10
		0-50 (TCl)	25, 50	0, 1, 5, 10, 20, 50
NITRATE & NITRITE	2996	0-50 (Nitrate)	50	0, 5, 10, 25, 50 (NO <sub>3</sub> -N)
		0-10 (Nitrite)	50	0, 0.5, 1, 5, 10 (NO <sub>2</sub> -N)

## SANITIZER TEST PAPERS

Strips and color chart are packaged in a waterproof plastic vial. 2951 is specifically formulated to read all types of QAC.

TEST FACTOR	CODE	RANGE (ppm)	# OF TESTS PER FACTOR/PER VIAL	VALUES (ppm)
CHLORINE	4250-BJ	10-200 ppm	200	10, 50, 100, 200 ppm
IODINE	2948-BJ	12-100 ppm	200	12, 25, 50, 100 ppm
QAC	2951	50-400 ppm	100	50, 100, 200, 400 ppm
QAC, HIGH RANGE	2951HR	200-1500 ppm	50	200, 400, 600, 1000, 1500 ppm



# INDIVIDUAL TEST KITS



ORDER CODE MODEL	TEST SYSTEM	RANGE/SENSITIVITY	# OF TESTS (# REAGENTS)	SHIPPING CODE (WEIGHT/LBS)
<b>ACIDITY</b> Some cleaning processes require acidic products. To determine the strength of the acid, titrate the sample with a standard alkali.				
7182	HCl, H <sub>2</sub> SO <sub>4</sub> , H <sub>3</sub> PO <sub>4</sub> Dropper Bottle	1 drop = 0.1 or 1.0% (as the particular acid)	50 at 10% (2)	R1 (1)
8205	H <sub>2</sub> SO <sub>4</sub> dropper pipet	1 drop = 0.05 oz/gal.	50 at 1 oz/gal.	R2 (1)
<b>ALKALINITY</b> Alkalinity plays an important part in process waters used in foods and beverages. The three primary forms are hydroxyl, carbonate and bicarbonate. Titration with a standard acid to the phenolphthalein (P) endpoint determines all of the hydroxyl and 1/2 of the carbonate alkalinity. Titration to the total (T) alkalinity endpoint determines the other half of the carbonate and all of the bicarbonate. P alkalinity is sometimes called active alkalinity. Inactive alkalinity is calculated by the difference in the P and T determinations. The 7515 kit contains barium to eliminate carbonate and allow direct titration of OH alkalinity.				
7240-01	P & T Alkalinity Dropper Bottle	1 drop = 10, 25, or 50 ppm as CaCO <sub>3</sub>	100 at 500 ppm (3)	R1 (2)
4491-DR WAT-DR	Total Alkalinity Direct Reading Titrator	0–200 ppm/4ppm as CaCO <sub>3</sub>	50 at 200 ppm (2)	NH (1)
4533-DR WAT-MP-DR	P & T Alkalinity Direct Reading Titrator	0–200 ppm/4 ppm as CaCO <sub>3</sub>	50 at 200 ppm (3)	NH (1)
7515 WAT-MPH-DC	P, T, & OH Alkalinity Dropper Pipet	1 drop = 10 ppm as CaCO <sub>3</sub>	50 at 200 ppm (4)	R1 (1)
<b>ARSENIC</b> The procedure requires about 15 minutes and employs a test strip. Inorganic As <sup>+3</sup> and As <sup>+5</sup> are converted to arsine gas. This reacts with the test strip in a closed container and produces yellow to brown colors on the strip. The strip color is compared to a color chart to determine concentration in ppb.				
4053	Test Strip	<4, 4, 5, 6, 7, 8, 9, 10, 15, 40, 50, 80, 100, 150, 200, 500, >500 ppm	50	R1 (8)
<b>CAUSTIC</b> Caustic soda, NaOH, is used for cleaning equipment in the food, beverage and other process areas. In some cases caustic is reported as Na <sub>2</sub> O. Percent caustic concentrations are determined by titration with a standard acid. The 8225 kit uses a single reagent that combines the indicator and titrant. The 8226 is for chlorinated cleaners.				
7516-DR-01 DCA-DR	Direct Reading Titrator	0–10%/0.2% NaOH	50 at 10% (4)	R1 (1)
8225	Dropper Pipet	1 drop = 0.25% NaOH, 1 drop = 0.01% Na <sub>2</sub> O	50 (1)	R2 (2)
7181	Dropper Bottle	1 drop = 0.1 or 1% NaOH	50 at 10% (3)	R1 (1)
8226	Dropper Pipet	1 drop = 0.01% NaOH	50 (3)	R2 (2)
<b>CHLORIDE</b> High chloride concentrations may affect the taste of foods and beverages and can increase corrosion of metal parts. An argentometric titration using silver nitrate is used to determine concentrations.				
7247	Dropper Bottle	1 drop = 2, 5, or 10 ppm Cl <sup>-</sup>	120 at 10 ppm (5)	R1 (1)
7172-01	Dropper Bottle	1 drop = 10, 25, or 50 ppm Cl <sup>-</sup>	120 at 100 ppm (5)	R1 (2)
7459-01 POL-H	Salinity Direct Reading Titrator	0-20 ppt/0.4 ppt Salinity	50 at 20 ppt (2)	NH (1)
<b>CHLORINE</b> Chlorine is a sanitizer for many applications. Several different methods are available to determine chlorine, depending on the concentration. DPD is usually used for concentrations from 0-10 ppm; the FAS-DPD test can titrate higher concentrations by adding more DPD and refilling the titrator. Test strips or papers can read as high as 800 ppm. The iodometric titration is used for higher ppm and % concentrations (see also the 1200 Colorimeter and Tracer, pp. 7 and 11).				
<b>DPD KITS</b>				
3308* SL-26	DPD Tablet Octa-Slide	0.2, 0.4, 0.6, 0.8, 1.0, 1.5, 2.0, 3.0 ppm Cl	50 (2)	NH (1)
3308-LI	DPD Liquid Octa-Slide	0.2, 0.4, 0.6, 0.8, 1.0, 1.5, 2.0, 3.0 ppm Cl	144 (3)	R1 (1)

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# INDIVIDUAL TEST KITS

ORDER CODE MODEL	TEST SYSTEM	RANGE/SENSITIVITY	# OF TESTS (# REAGENTS)	SHIPPING CODE (WEIGHT/LBS)
<b>CHLORINE (cont.)</b>				
<b>DPD KITS (cont.)</b>				
3328 SL-60	DPD Tablet Octa-Slide	1.0, 2.0, 3.0, 4.0, 5.0, 6.0, 8.0, 10.0 ppm Cl	50 (2)	NH (1)
3624 CL-BR	Chlorine or Bromine Direct Reading Titrator	0–10 ppm/0.2 ppm Cl or Br 0–100 ppm/2 ppm Cl or Br	50 at 10 ppm (3)	NH (1)
7514 CC-25	FAS-DPD Dropper Bottle Titration	1 drop = 0.2 or 0.5 ppm Cl	50 (3)	NH (1)
<b>IODOMETRIC KITS</b>				
4497 PCT-DC	Dropper Pipet	1 drop = 10 ppm Cl	50 at 200 ppm (3)	R2 (1)
4497-DR PCT-DR	Direct Reading Titrator	0–200 ppm/4 ppm Cl	50 at 200 ppm (3)	R2 (1)
4501	Dropper Pipet	1 drop = 1 ppm Cl	50 (3)	R2 (1)
7105-02	Direct Reading Titrator	0–10%/0.2% Cl	50 at 10% (3)	R1 (2)
7894 LB	Dropper Pipet	1 drop = 0.005%, 0.05%, or 0.5% Cl	50 at 0.1, 1.0, or 10% (3)	R1 (1)
<b>CHLORINE DIOXIDE</b> Chlorine dioxide is used in sanitizing food and beverage equipment and in some drinking water applications. There are 2 ranges of test strips available. Chlorite up to 1,000 ppm and chlorine up to 2 ppm will not interfere with the strip determinations. The field kit and meter use the DPD method. Glycine is added in this method to eliminate chlorine interference. (see also the 1200 colorimeter, p. 7 and test strips, p. 3)				
3622	Octa-Slide	0.0, 0.2, 0.6, 0.8, 1.0, 2.0, 3.0, 5.0 ppm ClO <sub>2</sub> (0–10 by dilution)	50 (2)	NH (1)
2999LR	Test Strip	0, 0.25, 0.50, 1.0, 3.0, 10 ppm	50	NH (1)
3002	Test Strip	0, 10, 25, 50, 100, 250, 500 ppm	50	NH (1)
<b>DETERGENTS</b> Detergents are surfactants that are used in cleaners to break up dirt and grease. Anionic detergents (ABS) are tested using a modification of the methylene blue method.				
4507-01 DS-1-DC	Dropper Pipet	1 drop = 1.0 ppm Detergent	60 at 5.0 ppm (3)	R1 (2)
4515	Dropper Pipet	1 drop = 0.1 ppm Detergent	30 (4)	HF (2)
<b>HARDNESS</b> Calcium and magnesium are the primary components of hardness. They interfere with soap/suds formation and can leave undesirable deposits on surfaces. EDTA titration of hardness is the commonly used method.				
7171-01	Total Hardness Dropper Bottle	1 drop = 10, 25, or 50 ppm CaCO <sub>3</sub>	100 (3)	R1 (1)
7246-01	Total Hardness Dropper Bottle	1 drop = 2, 5, or 10 ppm CaCO <sub>3</sub>	100 (3)	R1 (1)
4824-LT-01 PHT-CMD-LT	Calcium, Magnesium, Total Hardness Dropper Bottle	1 drop = 10 ppm or 1 gpg CaCO <sub>3</sub> Tablet indicator	50 at 200 ppm or 20 gpg (5)	R1 (1)
<b>HYDROGEN PEROXIDE</b> Various concentrations of hydrogen peroxide are used as oxidizers and bleaching agents in water systems. Iodometric titration is used for ppm and % determinations.				
7138-DB	Iodometric Dropper Bottle	1 drop = 5 ppm H <sub>2</sub> O <sub>2</sub>	50 (4)	HF (2)
7150	Iodometric Dropper Bottle	1 drop = 0.5% H <sub>2</sub> O <sub>2</sub>	50 (4)	HF (2)
2984	Test Strips	0, 15, 30, 50, 90 ppm	25 (1)	NH (1)
2984LR-H	Test Strips	0, 1, 3, 10, 30, 50 ppm	50 (1)	NH (1)
<b>IODINE</b> Iodine is a sanitizer used in food/beverage and warewash processes. Health Departments usually require a concentration of 12.5–25 ppm for warewash. As with many other oxidizers, iodine may be titrated with a standard thiosulfate solution.				
2948-BJ	Test Papers	12, 25, 50, 100 ppm I <sub>2</sub>	200	NH (1)
7253-DR PIT-DR	Direct Reading Titrator	0–50 ppm/1 ppm I <sub>2</sub>	50 at 50 ppm (3)	R1 (1)
7253 PIT-DC	Dropper Pipet	1 drop = 2.5 ppm I <sub>2</sub>	100 at 25 ppm (3)	R1 (1)

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# INDIVIDUAL TEST KITS

ORDER CODE MODEL	TEST SYSTEM	RANGE/SENSITIVITY	# OF TESTS (# REAGENTS)	SHIPPING CODE (WEIGHT/LBS)
<b>IRON</b> Iron is present in many natural waters and can impart a foul taste in beverages. The bipyridal method is used for analysis of total iron. A modification of this test can distinguish ferrous and ferric iron. (See p. 7 for the colorimeter version.)				
<b>3318 SL-P61</b>	Total Iron Octa-Slide	0.5, 1.0, 2.0, 3.0, 4.0, 6.0, 8.0, 10.0 ppm Fe	90 (2)	R1 (1)
<b>3347 SL-P-63</b>	Ferrous/Ferric Iron Octa-Slide	0.5, 1.0, 2.0, 3.0, 4.0, 6.0, 8.0, 10.0 ppm Fe	100 (2)	R1 (1)
<b>NITRATE</b> Nitrate can be present in natural waters. The EPA limit on nitrate is 10 ppm as -N, 44 ppm as -NO <sub>3</sub> . The method employs zinc to reduce the nitrate to nitrite, which is then reacted to form a pink color.				
<b>3354</b>	Zinc Reduction Octa-Slide	0, 1, 2, 4, 6, 8, 10, 15 ppm NO <sub>3</sub> <sup>-</sup> -N	50 (2)	NH (2)
<b>2996</b>	Test Strips	0, 5, 10, 25, 50 ppm NO <sub>3</sub> <sup>-</sup> 0, 0.5, 1, 5, 10 ppm NO <sub>2</sub> <sup>-</sup> -N	50 (1)	NH (1)
<b>OZONE</b> Ozone is a strong oxidizer used in some food/beverage operations. DPD can be used to test solutions that contain only ozone. However, if chlorine is also present, the indigo trisulfonate colorimeter must be used.				
<b>3526 LP-62</b>	DPD Tablet Octet Comparator with Axial Reader	0.01, 0.03, 0.07, 0.11, 0.2, 0.4, 0.7, 1.0 ppm O <sub>3</sub>	50 (2)	NH (1)
<b>3678-01 DC1200-OZ</b>	Indigo Trisulfonate Colorimeter	0-0.4 ppm/0.04 ppm O <sub>3</sub>	100 (3)	NH (7)
<b>PERACETIC ACID/HYDROGEN PEROXIDE</b> This chemical combination is used to sanitize where the use of other sanitizers is not appropriate. The titration kit uses a ceric titration of the peroxide followed by an iodometric titration of the peracetic acid. One may also test the peracetic acid only. The kit allows the use of 2 samples sizes to give a 1 drop = 15 or 300 ppm peracetic acid equivalence. There are also 2 test strips available.				
<b>7191-01</b>	Dropper Bottle	1 drop = 50 ppm Peroxide 1 drop = 15 or 300 ppm Peracetic Acid	50 (5)	R1 (2)
<b>3000</b>	Test Strips	0, 10, 20, 40, 60, 85, 160 ppm	50	NH (1)
<b>3000LR</b>	Test Strips	0, 5, 10, 20, 30, 50 ppm	50	NH (1)
<b>pH</b> One of the most common analyses, pH must be controlled and monitored because it plays an essential role in almost all chemical and biological processes. Field kits using pH indicators and pH test strips are below. See pp. 11-12 for pH meters.				
<b>2108/P-CPR</b>	Chlorophenol Red	5.4-6.8 pH		NH (1)
<b>2109/P-BTB</b>	Bromthymol Blue	6.0-7.4 pH		NH (1)
<b>2110/P-PR</b>	Phenol Red	6.8-8.2 pH		NH (1)
<b>2111/P-CR</b>	Cresol Red	7.2-8.6 pH		NH (1)
<b>2112/P-TB</b>	Thymol Blue	8.0-9.4 pH		NH (1)
<b>5858</b>	Precision Wide Range	3.0-6.5 pH, 7.0-10.5 pH		R1 (1)
<b>2124/P-8512</b>	Alkaline Wide Range	8.5-12.0 pH		R1 (1)
<b>pH TEST PAPERS</b>				
<b>2912</b>	Test Papers	3.0-10.0 pH/1 pH	200 Strips	NH (1)
<b>2953</b>	Test Papers	4.5-7.5 pH/0.5 pH	1 Roll	NH (1)
<b>2954</b>	Test Papers	0-13 pH/1 pH	1 Roll	NH (1)
<b>2956</b>	Test Papers	1-11 pH/1 pH	1 Roll	NH (1)
<b>3-2950</b>	pH Indicator Sticks	0-14/1 pH	100 Strips	NH (1)
<b>2974</b>	pH Wide Range	4-10 pH/1 pH	50 Strips	NH (1)
<b>POLYQUAT</b> Polyquats are used as biocides to clean contact surfaces. A polyelectrolytic titration is used to determine the concentration.				
<b>7056</b>	Dropper Bottle	1 drop = 1 ppm Polyquat	100+ (5)	R1 (1)
<b>QUATERNARY AMMONIUM COMPOUNDS</b> These biocides are also referred to as Quats or QAC. They are used to clean food processing implements and contact surfaces. Test papers or a tetraphenylboron titration may be used for high concentrations. A variable equivalence titration may be used for all concentrations.				
<b>7057</b>	Polyelectrolytic Dropper Bottle	1 drop = 2, 5, or 10 ppm Alkyl dimethyl benzyl ammonium chloride	100+ (5)	R1 (2)
<b>3043-DR QT-DR</b>	BPB Direct Reading Titrator	0-500 ppm/10 ppm Alkyl dimethyl benzyl ammonium chloride	50 at 500 ppm (2)	NH (1)
<b>3042</b>	BPB Direct Reading Titrator	0-1,000 ppm/20 ppm 0-5,000 ppm/100 ppm with dilution	50 at 1,000 ppm (2)	NH (1)
<b>2951</b>	Test Papers	50, 100, 200, 400 ppm	100	NH (1)
<b>2951HR</b>	Test Papers	200, 400, 600, 1000, 1500 ppm	50	NH (1)

# INSTRUMENTATION



## MODEL 1200 SERIES

The 1200 Series of single test, direct reading colorimeters incorporates design advances that enhance reliability, improve accuracy, and simplify the calibration process, all in a portable, hand-held package.

Meters are available for ammonia nitrogen, bromine, chlorine, chlorine dioxide, copper, fluoride, iron, manganese, molybdenum, nitrate nitrogen, ozone, phosphate and sulfate.

## SINGLE TEST COLORIMETER KITS

TEST FACTOR	ORDER CODE	MODEL	RANGE (PPM)	DETECTION LIMIT	TEST METHOD (# OF REAGENTS)	SHIP CODES
Ammonia Nitrogen	3680-01	DC1200-NH	0–5.0	0.05	Nessler (2)	R1
Chlorine (Free & Total)	3670-01	DC1200-CL	0–4.0	0.05	DPD Tablets (2)	NH
Chlorine (Free & Total)	3670-01-LI	DC1200-CL-LI	0–4.0	0.05	DPD Liquid (3)	R1
Chlorine Dioxide	3671-01	DC1200-CLO	0–7.0	0.05	DPD with Glycine Solution (2)	NH
Copper	3673-01	DC1200-CO	0–6.0	0.03	Diethyldithiocarbamate (1)	NH
Iron	3681-01	DC1200-FE	0–4.0	0.25	1,10 Phenanthroline (2)	R1
Nitrate Nitrogen	3677-01	DC1200-NA	0–3.0	0.05	Cadmium Reduction (2)	R1
Ozone	3678-01	DC1200-OZ	0–0.4	0.04	Indigo Blue (3)	NH
Phosphate	3679-01	DC1200-PLR	0–3.0	0.07	Ascorbic Acid (2)	R2

## LIQUID CHLORINE DPD REAGENTS

30 mL (1 oz.)	CODE	SHIP CODES	60 mL (2 oz.)	CODE	SHIP CODES
DPD 1A	P-6740-G	NH	DPD 1A	P-6740-H	NH
DPD 1B	P-6741-G	R1	DPD 1B	P-6741-H	R2
DPD 3	P-6743-G	NH	DPD 3	P-6743-H	NH



Easier push-thru packaging!



## TABLET CHLORINE DPD REAGENTS

TABLET	QUANTITY/ ORDER CODE			SHIP CODE
	50	100	1000	
Chlorine DPD #1 Rapid	6999A-H	6999A-J	6999A-M	NH
Chlorine DPD #1 Instrument	6903A-H	6903A-J	6903A-M	NH
Chlorine DPD #3 Rapid	6905A-H	6905A-J	6905A-M	NH
Chlorine DPD #3 Instrument	6197A-H	6197A-J	6197A-M	NH
Chlorine DPD #4 Rapid	6899A-H	6899A-J	6899A-M	NH
Chlorine DPD #4 Instrument	6906A-H	6906A-J	6906A-M	NH



# INSTRUMENTATION

LaMotte offers a number of instruments to test process water, wastewater and sanitizers. A brief summary of these is below. For more information on these and other instruments, please visit [www.lamotte.com](http://www.lamotte.com).



## SMART SPECTRO SPECTROPHOTOMETER

The SMART Spectro is a portable spectrophotometer that is easier to use and more accurate than anything in its price range. With automatic wavelength selection, pre-programmed tests, and superior performance, this is the best spectrophotometer for the money! Over **80 pre-programmed tests** are included, and 25 user calibrations can be entered into the memory. The user can also customize sequences for frequently run tests.

### Advanced Features:

- A wider wavelength range
- Menu-driven display
- Pre-programmed tests with 25 user tests
- Automatic wavelength selection
- Unique optical design system using a 1200 lines/mm grating
- Greater accuracy, higher resolution
- The SMART Spectro is supplied with 6 sample tubes (25mm round), 2 sample cell holders (25mm round and COD, 10 mm cuvettes), AC adapter, battery charger, instruction manual including test procedures, and quick start guides.

## SMART 2 COLORIMETER

The user-friendly SMART2 Colorimeter is the direct reading colorimeter for complete on-site water analyses. All of the **80 pre-programmed tests** can be run on this compact instrument and each test features automatic wavelength selection. The entire multi-LED optical system is embedded in the light chamber and optimized for LaMotte test reagent systems. This enables the analyst to simply select the test and put in the sample with reagent. The microprocessor, which selects the wavelength, also allows the user to load up to 10 tests for analyzing custom reagent systems.

### Advanced Features:

- Menu-driven display
- Over 80 pre-programmed tests with 10 user tests
- Automatic wavelength selection
- The SMART 2 Colorimeter is supplied with 4 sample tubes, AC adapter, and instruction manual including test procedures.



## 2020 PORTABLE TURBIDITY METERS

The multi-detector optical configuration assures long term stability and minimizes stray light and color interferences. All readings are determined by the process of signal averaging over a 5 second period. This minimizes fluctuations in readings attributed to large particles and results in rapid, highly repeatable measurements. Ideally suited for both low-level drinking water applications as well as monitoring high turbidity in the field.

- 0-4000 NTU
- Patent pending optical design features focusing optics for low level precision and accuracy.
- Six user selected languages – English, Spanish, French, Japanese, Italian, and Portuguese.
- MSP430 Microcontroller used is the most advanced controller on the market for hand held applications.
- Advanced calibration algorithms.
- Tube positioning ring limits vial variability.
- Easy menu driven operation and large LCD display.
- 4000 point data log, stored results can be viewed directly on instrument or downloaded to a computer via RS232 cable.
- Units of measure- NTU, FNU, FAU, ASBC, EBC units.



**2020e** version meets **USEPA** design criteria as specified by USEPA method 180.1.  
**2020i** version meets design criteria for quantitative methods of turbidity using optical turbidimeters as specified by **ISO 7027**.  
Kits are supplied with 0, 1, and 10 NTU standard, sample bottle, four sample tubes, and an extra battery. AC power adapter is optional.



# INSTRUMENTATION



## DIGESTION TUBES FOR TOTAL NITROGEN AND TOTAL PHOSPHORUS

LaMotte offers low and high Total Phosphorus and a Total Nitrogen test that are reacted in a heater block and are then tested using a colorimeter or spectrophotometer. All kits ship as R1. (Small Qty. Hazardous Material- No Fee)

CODE	DESCRIPTION	RANGE	# of TESTS
4024	Low Total Phosphorus	0-3.5 mg/L	25
4025	High Total Phosphorus	0-100 mg/L	25
4026	Total Nitrogen	0-25 mg/L	25

## COD MULTI-RANGE REAGENT SYSTEMS

LaMotte-manufactured Chemical Oxygen Demand reagent systems used with our COD PLUS Colorimeter, SMART 2 Colorimeter or SMART Spectro Spectrophotometer are an easy and precise way to measure critical COD levels. Measure low, medium or high levels of COD using your choice of mercury (USEPA approved method) or non-mercury reagent systems. Each package contains 25 ready to use vials. All kits ship as R1. (Small Qty. Hazardous Material- No Fee)

MERCURY-FREE SYSTEMS	
CODE	RANGE
0072-SC	0-150 ppm
0073-SC	0-1500 ppm
0074-SC	0-15,000 ppm
MERCURY BASED SYSTEMS	
CODE	RANGE
0075-SC	0-150 ppm (EPA approved)
0076-SC	0-1500 ppm (EPA approved)
0077-SC	0-15,000 ppm



## COD HEATER BLOCK

**COD Heater Block, 120V and 230V, 12-tube capacity**  
**Code 5-0102 (120V)**  
**Code 5-0102-EX2 (230V)**

This COD heater block features digital microprocessor control, programmable time and temperature settings, and a dual LED display to monitor both temperature and timer. Perfect for COD, Total Phosphorus, and Total Nitrogen testing PLUS other tests requiring digestion.

FEATURE	
Temperature:	30-200°C
Timer:	0-999 minutes
Vial Capacity:	12 (16 mm tubes)
Stability:	±0.1°C @ 100°C
Weight:	3.6 kg
Dimensions	310 x 250 x 80 mm (LxWxH)
CE Mark:	Yes
Oven Temp Cutoff:	212°C

## COD PLUS METER

**Code 1922**

The user-friendly COD PLUS Colorimeter is direct reading for on-site water analyses. It features pre-programmed tests, automatic wavelength selection, menu-driven operation, and large display screens. In addition to COD, it also tests for ammonia-nitrogen, boron, cobalt, copper, fluoride, ozone, phosphate, potassium, silica, sulfate, sulfide, tannin, and zinc.



# INSTRUMENTATION

## ColorQ PRO-4

MODEL PRO-4 • Code 2055  
(Ship Code R1; 2 lbs.)

The unique, multi-test ColorQ pool and spa hand-held photometer reads up to SEVEN test factors directly on a digital display. Featuring an innovative dual-optic design, the ColorQ eliminates the need to visually determine slight color variations or use look-up tables.

TEST FACTOR	RANGE	RESOLUTION	# of TESTS
Free Chlorine	0-10.0 ppm	.01 ppm	144
Total Chlorine	0-10.0 ppm	.01 ppm	144
Bromine	0-20.0 ppm	.10 ppm	144
pH	6.8-8.2 pH	.10 pH	144

Upgrades easily to measure Alkalinity, Hardness, and Cyanuric Acid.



# TEMPERATURE

## "MIN-MAX" MEMORY THERMOMETER

Code 5-0095

- Range: 14 – 392°F or -10 – 200°C
- °F or °C selectable scale
- Recalls minimum and maximum temperature



FEATURE	SPECIFICATIONS FOR SPECIALTY POCKETESTERS
Code:	5-0095
Range:	-10 to 200°F, 14 to 392°C
Resolution:	0.1°F to 199.9°, 1°C above 200°
Accuracy:	±1.8°F / ±1.0°C
Calibration:	Factory calibrated; fine adjustment through keypad
Operating Temperature:	32 to 122°F; 0 to 50°C
Special Functions:	On/Off or Auto-Off after 8.5 min.; HOLD; °F or °C scale selectable; factory calibration maintained when batteries are replaced
Power & Battery Life:	LR-44 button cell; 2 yr life
Dimensions:	4.3 x 0.14 x 1.8 inches (109 x 4 x 46 mm)
Weight:	3 oz

## TEMPTESTR® IR METER

Code 5-0056

Optional Carrying Case Code 5-0062

The convenience of non-contact temperature measurements, now with a spot-laser sighting!

### Food Safety Applications

Fast and convenient screening tool for both cold and hot foods for Food Safety and HACCP. No contamination or damage to the product. Easily take temperature of products moving on conveyors or hard-to-reach places. Verify equipment performance, sanitation and process temperature conditions. Scan cooling systems, refrigerated display cases, trucks and storage areas before loading and stacking.



FEATURE	
Range:	-18 to 260°C/0 to 500°F
Resolution:	1°C/1°F
Accuracy:	25 to 260°C (77 to 500°F): ±2% or ±2°C (±3°F) whichever is greater -1 to 25°C (30 to 77°F): ±3°C (±5°F) -18 to -1°C (0 to 30°F): ±4°C (±7°F)
Repeatability:	±2% of reading, or ±2°C (±3°F)
Operating Temperature:	0 to 50°C (32 to 120°F) 10 to 95% RH noncondensing, at up to 30°C (86°F)
Storage Temperature:	-20 to 65°C (-4 to 150°F) without battery
Response Time:	500mSec, 95% response
Spectral Response:	7 to 18 mm
Emissivity:	pre-set at 0.95
Distance-to-Spot Size:	6:1
Power:	One 9V alkaline or NiCd battery
Battery Life (alkaline):	12 hours
Dimensions:	7.25 x 1.75 x 1.5 inches (185 x 45 x 38 mm)
Weight:	0.5 lbs. (227g)

# POCKETESTERS

The world's first pocket-sized ISE meter for measuring Total Chlorine. Ideal for use in colored or turbid solutions. Use it to test pH and ORP with interchangeable flat surface sensors (optional)

## TOTAL CHLORINE TRACER

### 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 mode also displays 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

EPA  
Approved  
(NPDES Monitoring)

## pH TRACER

### Code 1741

- Provided with 4, 7, and 10 pH buffer tablets
- Rugged flat surface electrode is ideal for food analysis and will alert user when it is time to "RENEW"
- A "CAL" indicator shows when to recalibrate and user can select a 1, 2, or 3 point calibration
- Includes Automatic Temperature Compensation and displays temperature while showing pH result

FEATURE	
Range:	0.00 to 14.00 pH
Temp:	23° to 194°F (-5° to 90°C)
Resolution:	0.01 pH
Accuracy:	±0.01 pH

## ORP TRACER

### Code 1742

- High resolution to 1 mV
- Automatic self calibration

FEATURE	
Range:	-999 to 999 mV
Resolution:	1 mV
Accuracy:	±4 mV



## OPTIONS

### Additional Probes

- 1733 pH Sensor 0-14.00/±0.01 pH  
 1734 ORP Sensor -999 to 999mV/±4mV  
 1732 Cl<sub>2</sub> Sensor 0-10.00/±10% of reading

### Chlorine Test Tablets

#### Code 7044A-J

Specially formulated just for the TRACER, these deliver a precise amount of iodide for a 20 mL sample. Available in packages of 100.

### Weighted Stand

#### Code 1746

Ideal for precise and stable Total Chlorine readings. Prevents unit from tipping over during analysis. Stand comes with five 20 mL sample cups. Weight 165 grams.



# POCKETESTERS



## pH POCKETESTER 10

Code 5-0103  
(Replacement Electrode,  
Code 5-0097)

- ±0.1 pH accuracy

## pH POCKETESTER 20

Code 5-0104  
(Replacement Electrode,  
Code 5-0097)

- ±0.01 pH accuracy

Both meters feature automatic temperature compensation, and buffer recognition for three point calibration based on US (pH 4.01, 7.00, 10.01) or NIST (pH 4.01, 6.86, 9.18) systems. The sensor is a double junction Ag/AgCl system with polymer gel. The IP67 rated housing features a 1.0625" (26.99 mm) display, which also displays diagnostic messages. Auto-off after 8.5 minutes to conserve battery life.

SPECIFICATIONS FOR PH POCKETESTERS		
Model:	<b>pH Pocketester 10</b>	<b>pH Pocketester 20</b>
Code:	5-0103	5-0104
Range:	-1.0 to 15.0 pH; extended range	
Resolution:	0.1 pH	0.01 pH
Accuracy:	±0.1 pH	±0.01 pH
Calibration:	Select up to 3 points	
Operating Temperature:	32 to 122°F; 0 to 50°C	32 to 122°F; 0 to 50°C
Temperature Compensation:	Automatic (ATC) 0 to 50°C	
Special Functions:	On/Off or Auto-Off after 8.5 min.; HOLD; CALibrate; CONFirm	
Power & Battery Life:	Four 1.5V alkaline button cell batteries (supplied), 500 hour use	
Dimensions:	8.5 x 2.4 x 2.5 inches, 216 x 61 x 64 mm (boxed); 6.5 x 1.5 inches, 165 x 38 mm (unit only)	
Weight:	4.5 oz/125 gms (boxed); 3.25 oz./90 gms (unit only)	



## BUFFER TABLETS

Add one tablet to 20 mL of Deionized Water to produce buffers. Available in 50, 100, and 1000 tablet packs. In foil strips of 10 tablets each.

pH VALUE	CODE
4.00	3983-H
7.00	3984-H
10.00	3985-H



## STANDARDIZED pH BUFFER SOLUTIONS

For use in calibration of pH meters.  
Ordering information for all buffers is listed.

pH VALUE	SIZE	CODE	pH VALUE	SIZE	CODE
4.0	120 mL	2866-J	7.00	120 mL	2881-J
	500 mL	2866-L		500 mL	2881-L
4.01	120 mL	2807-J	9.18	120 mL	2809-J
	500 mL	2807-L		500 mL	2809-L
6.86	120 mL	2808-J	10.00	120 mL	2896-J
	500 mL	2808-L		500 mL	2896-L



## COLOR-CODED pH BUFFER SOLUTIONS

Minute amount of color permits immediate visual distinction of different buffer values.

pH VALUE	COLOR	SIZE	CODE
4.01	Red	500 mL	3771-L
7.00	Yellow	500 mL	3772-L
10.00	Blue	500 mL	3773-L



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