

SP-600 Free/Total Chlorine Testing

DPD Chlorine Methods, Reagents & Secondary Verification

DPD Test Method Description

The Pyxis SP-600 offers both Free & Total Chlorine (10mL) methods based on the USEPA-accepted N,N-diethyl-p-phenylenediamine (DPD) chemistry. Well known for its use, the DPD method for Free and Total Chlorine measurement is highly regarded as the “go-to” method for industrial and domestic/drinking water guidelines. The SP-600 may use either Pyxis Lab DPD or HACH/Conventional DPD Free & Total Chlorine Powder Pillows, both in 10mL test format. The SP-600 offers a unique colorimetric method timer for both CL-F (DPD Free Chlorine) and CL-T (DPD Total Chlorine) which can be rapidly selected by the user. Once selected, the user can conduct a ZERO calibration with unreacted sample in the sample cell of the SP-600, then separately prepare a 10mL reacted sample with the DPD powder pillow. Then simply “pre-rinse” and “pour” the reacted sample into SP-600 sample cell for real-time read out of reaction as it occurs and final value as ppm DPD free or total chlorine. This unique measurement feature of SP-600 allows it to offer the market an all-in-one Multi-Meter with DPD Chlorine Colorimeter in one convenient and easy to use device.

DPD Chlorine Secondary Standard Verification Kit

Per EPA guidelines for drinking water applications, the SP-600 device requires DPD Chlorine secondary standard verification prior to each recorded/reported test. To ensure the accuracy of your SP-600 DPD Chlorine method, Pyxis has developed unique liquid 1.0ppm & 2.0ppm DPD Chlorine secondary standards. These liquid standards are provided in a 125mL bottle including COA and can be used as a secondary reference standard for DPD Chlorine calibration verification. Stable for up to 6 months, these liquid standards are easy to use and have been specially designed at a low pH (4.0) to be used to pre-cleaning agent of the sample cell prior to its use as a secondary standard. If the SP-600 unit requires calibration users may follow the operational manual instructions for field calibration using known Free Chlorine Standard or reset their unit to default to factory calibration settings. If desired, the SP-600 unit may also be sent to the Pyxis Lab Inc. facility for certified factory calibration by contacting service@pyxis-lab.com



DPD Free & Total Chlorine Powder Pillows



DPD Chlorine Secondary Standards

Features of Pyxis SP-600 DPD Chlorine Testing Capability

- SP-600 Offers both colorimetric Free & Total DPD Chlorine Methods (0.00 – 10.00 ppm)
- SP-600 May use 10mL Free & Total DPD Chlorine Powder Pillows from Pyxis or HACH (other)
- SP-600 Firmware Programmed to offer two separate methods CL-F & CL-T
- Users May Field Calibrate SP-600 with known Free Chlorine Standard or Reset Factory Calibration
- Users May Send SP-600 to Pyxis Lab for Certified DPD Chlorine Calibration
- Pyxis 1.0ppm & 2.0ppm DPD Chlorine Secondary Standard Verification Solution Available
- Secondary Standard Solution Kits are formulated at pH 4.0 to enable sample cup pre-cleaning
- Secondary Standard Solution Kit also includes Pipe Cleaner Brush for Pre-cleaning of sample cup

DPD Chlorine Secondary Standard Solution Kit Specifications

Items	Parameter
1.0 ppm DPD Secondary Standard Solution	1.0ppm as DPD Chlorine +/- 0.03ppm
2.0 ppm DPD Secondary Standard Solution	2.0ppm as DPD Chlorine +/- 0.06ppm
Form	Liquid – Deep Pink in Color
Storage Temperature	4-40°C (40-104°F)
Shelf Life	6 Months
Container	125mL Amber Narrow Mouth Bottle

Ordering Information

	P/N
SP-600 Multi-Meter (<i>pH/ORP/Conductivity/TDS/Resistivity/Temp/DPD-F&T Cl₂</i>)	50353
Replacement Bluetooth pH/ORP Module	50315
Pyxis Free DPD Chlorine Powder Pillow (<i>x100 Pack</i>)	31002
Pyxis Total DPD Chlorine Powder Pillow (<i>x100 Pack</i>)	31014
Pyxis 1ppm DPD Chlorine Secondary Standard Sol. (<i>125mL</i>)	21039
Pyxis 2ppm DPD Chlorine Secondary Standard Sol. (<i>125mL</i>)	21040

Related Products

	P/N
pH 4-7-10 Combination Calibration Std Kit (<i>500mL each</i>)	57007
Conductivity Calibration Std 1,000uS/cm (<i>500mL</i>)	57008
ORP Calibration Std 200mV (<i>500mL</i>)	57020
Pyxis Handheld Device Sample Well Cleaner (<i>500mL</i>)	SER-02

DPD Free & Total Chlorine Measure Procedure for SP-600

The Pyxis SP-600 free and total chlorine methods are based on the USEPA-accepted N, N-diethyl-p-phenylenediamine (DPD) chemistry. The Free Chlorine (CL-F) powder pillow reagent and Total Chlorine (CL-T) powder pillow reagent dissolve and react with free chlorine and total chlorine in the water sample to form a pink solution. The SP-600 measures the absorbance value of the resulted pink solution to determine the free chlorine and total chlorine concentration as DPD.

****NOTE* Both Pyxis Lab DPD or HACH DPD 10mL free and total chlorine reagent powder pillows may be used for this test method.***



Follow the steps below to measure DPD Free and Total Chlorine:

1. Press **Cond** (the < key) to switch to conductivity measurement mode.
2. Press **Cond** (the < key) to launch the measurement selection menu (Figure 8). Press **Cond** (the < key) as needed to highlight **Chlorine** in the selection. Press **OK** to select the Total (CL-T) or Free chlorine (CL-F) for testing and measurement of DPD Chlorine. (Figure 1)
3. Rinse the Conductivity/Chlorine sample cell with the sample to be tested. Fill the sample cell with the sample.
4. Click **Zero** (the < key). ZERO will be displayed on the upper left corner of the screen. (Figure 2)
5. Separately, prepare one sample to be tested to the 10mL sample vial provided. Add one free chlorine or total chlorine powder pillow to the 10 mL sample vial then cap the vial. (Figure 3) Invert the vial several times allowing the reagent to fully dissolve. This is the developed sample. The color will be pink if either species of chlorine is present in the sample.
6. Click **Timer** (the > key), the SP-600 will begin a 1-minute count down timer for free chlorine or 3-minute count down time, dependent on which species test method was selected (CL-F or CL-T)
7. Use a portion of the developed sample to rinse the SP-600 sample cell once. Pour the remaining sample in the vial to the cell. (Figure 4)
8. The SP-600 will continuously display the free or total chlorine concentration as the timer counts down. Record the final value after timer stops.



Figure 1. Colorimetric screen for DPD Free or Total chlorine measurement



Figure 2. Zero sample before reagent addition



Figure 3. Add DPD powder to the 10 ml sample vial



Figure 4. Transfer the developed sample to sample cell

Calibration Check using the Pyxis DPD Chlorine Secondary Standard

Pyxis provides both 1.0ppm and 2.0ppm Secondary DPD Chlorine Standard solutions. To check if the SP-600 chlorine measurement is in need of calibration, please run a measurement using the Secondary DPD Standard as the developed sample following the steps below. If the measured DPD chlorine value is outside the standard value range marketed certificate provided with the Secondary DPD Chlorine Standard Kit, follow the procedure to calibrate the SP-600 or contact service@pyxis-lab.com for pricing on factory calibration services.

Pyxis DPD Chlorine Secondary Standard Liquid 1.0ppm



1. Fill the sample cell with the Secondary DPD Standard Solution and allow to soak for 15 minutes. This solution not only serves as a secondary calibration standard, but also as a sample cell cleaner having a pH of 4.0.
2. After 15 minutes of soaking, use the pipe-cleaner brush or Q-Tip provided with the Secondary DPD Standard kit to gently clean the internal walls of the sample cell.
3. Triple Rinse the sample cell with deionized water after initiating the cleaning steps above.
4. Fill the sample cell with deionized water.
5. Press Zero (the < key).
6. Rinse the sample cell with the Pyxis secondary DPD standard solution three times. Fill the cell with the standard.
7. Click Read and record value.
8. If the measured chlorine value is outside the standard value range marketed certificate provided with the Secondary DPD Standard Kit, follow the procedure to calibrate Chlorine Slope (Section 6.2) of the SP-600 or contact service@pyxis-lab.com for pricing on factory calibration services.

Restore SP-600 to Default Chlorine Calibration Parameters

Pressing the Default (the **OK** key) will copy the default calibration intercept and slope to the working intercept and slope, respectively (Figure 36). This button action is to restore the working calibration parameters to the original factory loaded calibration parameters.