

DPD Test Strips

FAC Free Available CHLORINE Test

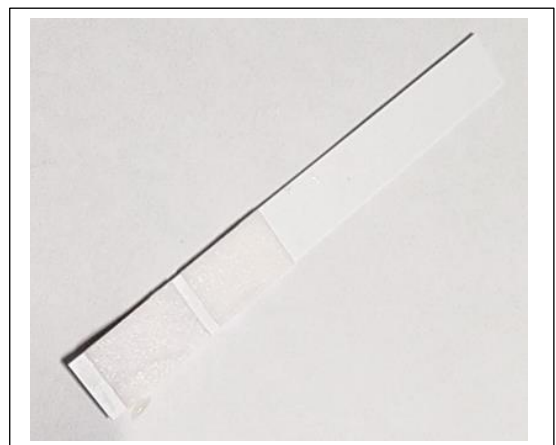
0-5.0ppm

A fast, safe, convenient & accurate system for your DPD testing with 10ml Sample size.

With our DPD-1 Free Chlorine Test Strip from Sensafe, there are no more tablets to crush, powders to spill, or dispensers that release irritating dust.

All reagents, as identified in the AWWA Handbook (4500-Cl G.), are delivered from the pads of the DPD Strip and can be used with most 10 ml DPD Free Chlorine photometer systems, incl HACH

Order as: TS 1400 DPD No.1 FAC Chlorine Test Strips, Box 100 Strips, Individually wrapped



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APPROVED METER AND DPD TESTS

Over the last few years the use of portable colorimetric meters for water quality testing has grown rapidly. This is easy to understand, given the current attention of providing the safest water possible to consumers. What is difficult to understand is why colorimetric meters have remained relatively unchanged and unimproved for so long. The more sophisticated photometers/colorimeters have only become larger and more expensive, and their focus has been on a large menu of tests.

Nothing new has happened with portable colorimeters until now. N,N-diethyl-p-phenylenediamine (DPD) is universally accepted as the indicator of choice for routine colorimetric free and total chlorine testing.

A variety of DPD reagent delivery methods are commercially available. Each delivery method has benefits and drawbacks. DPD liquid reagents have a short shelf life and can be inconvenient since pipettes are required to deliver the liquid reagents. DPD reagent powder pillows have a longer shelf life, but technicians complain of irritating dust and spillage of powder when delivering the reagent powder to the test vial. Incomplete delivery can also cause questionable results. DPD tablets avoid both of these issues but come with the inconvenience of having to crush the tablet and they dissolve slowly when the sample is cold.

The latest free chlorine DPD delivery method became available in 2005. Industrial Test Systems, Inc. introduced eXact® Strip DPD-1 (for 10 ml) and eXact® Strip Micro (4 ml) for use with EPA, ISO, or DIN-compliant meters that are acceptable for compliance reporting.

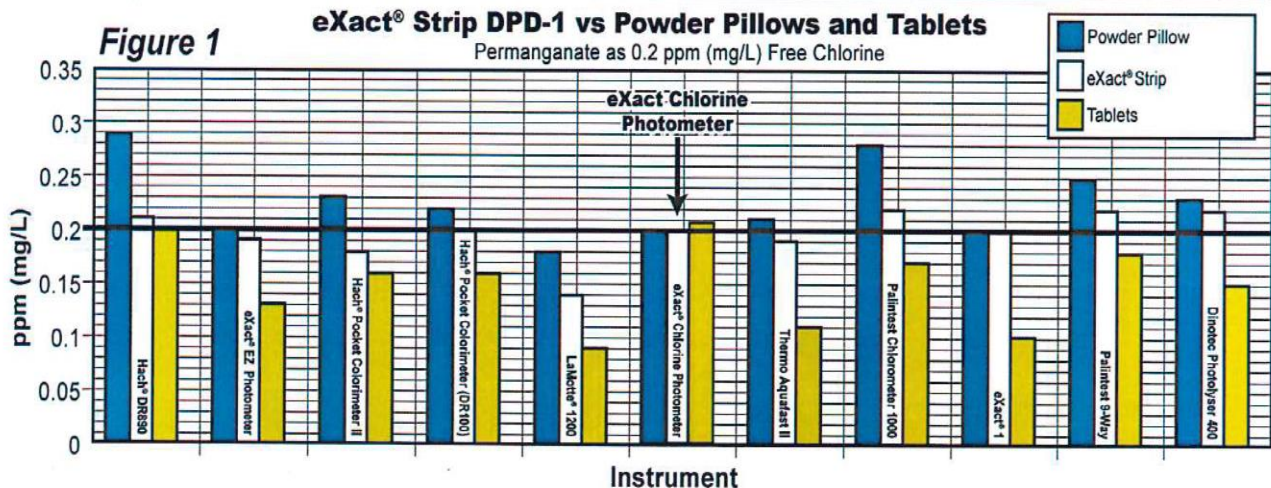
The DPD-1 strips deliver the exact chemicals in the specified proportions for Free Chlorine and Total Chlorine DPD Colorimetric determination as required in Standard Methods for the Examination of Water and Wastewater Method 4500-Cl G (published by APHA, AWWA, and WEF): Monobasic Phosphate, Dibasic Phosphate, EDTA Sodium salt, and DPD Sulfate. Potassium Iodide is used for Total Chlorine testing.

The eXact® Chlorine Photometer system was especially designed for use with the eXact® Strip technology without the need for vials or cells; streamlining the testing process. It is environmentally friendly, using 60% less reagents than 10mL sample tests.

The eXact® Strip DPD-1 was functional in all EPA Compliant 10mL test volume portable colorimeters tested. Similar results are found using the eXact® Chlorine Photometer. The following study was performed to demonstrate this compatibility. Twelve different meters manufactured by nine different companies were evaluated using two standards. The data reported below (Table 1, Figure 1) shows how the meters perform against one another with identical test standards. The study compares two standard levels across the instruments using powder pillows, tablets, and the eXact® Strip DPD-1. Because of its stability, Permanganate standards as 0.2 and 0.8 ppm (mg/L) Free Chlorine were used on each instrument below using powder pillows (Hach® Company), eXact® Strip DPD1, eXact® Strip Micro DPD1, and tablets (Palintest, Ltd.); according to the DPD reagent manufacturer's instructions.

Table 1

| DPD Delivery Method Compatibility | 0.2 ppm (mg/L) Permanganate Standard | | | 0.8 ppm (mg/L) Permanganate Standard | | |
|-----------------------------------|--------------------------------------|--------------------|---------|--------------------------------------|--------------------|---------|
| | Powder Pillow | eXact® Strip DPD-1 | Tablets | Powder Pillow | eXact® Strip DPD-1 | Tablets |
| Hach® DR890 | 0.20 | 0.21 | 0.18 | 0.81 | 0.89 | 0.92 |
| eXact® Chlorine Photometer | 0.20 | 0.20 | 0.21 | 0.77 | 0.89 | 0.88 |
| eXact® EZ Photometer | 0.20 | 0.19 | 0.13 | 0.73 | 0.76 | 0.68 |
| Hach® Pocket Colorimeter II | 0.23 | 0.18 | 0.16 | 0.79 | 0.81 | 0.73 |
| Hach® Pocket Colorimeter (DR100) | 0.22 | 0.20 | 0.16 | 0.83 | 0.86 | 0.76 |
| LaMotte® 1200 | 0.18 | 0.14 | 0.09 | 0.68 | 0.73 | 0.63 |
| Hanna 95711 | 0.15 | 0.11 | 0.06 | 0.74 | 0.74 | 0.66 |
| Thermo Aquafast II | 0.21 | 0.19 | 0.11 | 0.78 | 0.77 | 0.73 |
| Palintest Chlorometer 1000 | 0.28 | 0.22 | 0.17 | 0.90 | 0.92 | 0.83 |
| eXact® 1 | 0.2 | 0.2 | 0.1 | 0.8 | 0.8 | 0.7 |
| Palintest 9-Way | 0.25 | 0.22 | 0.18 | 0.93 | 0.99 | 0.88 |
| Dinotec Photolyser 400 | 0.23 | 0.22 | 0.15 | 0.84 | 0.92 | 0.77 |
| Mean | 0.22 | 0.19 | 0.14 | 0.80 | 0.835 | 0.74 |
| % difference from expected | 6.25 | 5.00 | 29.17 | 0.00 | 5.00 | 4.48 |



In this study the tablets gave a lower value for the 0.2ppm Permanganate data set compared to the powder pillows and the eXact® Strip DPD-1. On the whole, the results for all three delivery methods are comparable.

Compliance Verification for Free and Total Chlorine Testing

This DPD test system is USEPA accepted for Free and Total Chlorine testing requirements. The eXact® Strip Micro CL (DPD-1) uses the same reagents and proportions, and the resulting solution pH is maintained between 6.2 and 6.5 as specified by AWWA (American Water Works Association) method 4500-CL-G. A colorimeter wavelength between 490 and 530nm is required for compliance; the Micro Chlorine Photometer uses a wavelength of 525nm. Likewise, AWWA proportions are followed as required for Total Chlorine measurements using Potassium Iodide. It should be understood that the USEPA does not "approve" commercial DPD delivery systems such as reagent powder pillows, tablets, dispensers, or eXact® Strip DPD-1 delivery devices.

The eXact® Strip Micro CL (DPD-1) for Free Chlorine, and the eXact® Strip Micro CL (DPD-3) or the eXact® Strip Micro CL (DPD-4) for Total Chlorine meet your reportable testing requirements because the eXact® Strip Micro CL delivers the approved chemicals in identical proportions (see table below); therefore, when used with approved procedures, the system is accepted for compliance testing.

| Component (Free Chlorine) | AWWA 4500 - Cl G | eXact® Strip DPD-1 |
|------------------------------------------------------------|------------------|--------------------|
| Anhydrous DPD sulfate | 1.5% | 1.5% |
| Anhydrous Na ₂ HPO ₄ | 33.4% | 33.4% |
| Anhydrous KH ₂ HPO ₄ Na ₂ | 64.0% | 64.0% |
| EDTA | 1.1% | 1.1% |