



# Technical Data Sheet

## Chlorine (free & total)

### DDPD Method

**Applications and Industries:** Drinking water, wastewater, surface and ground water, industrial process water; Pool and Spa industry, Food and Beverage industry

**References:** The DDPD methodology was developed by CHEMetrics, Inc.

**Chemistry:** Free chlorine oxidizes DDPD, a methyl substituted form of DPD (N,N-diethyl-p-phenylenediamine), to form a purple colored species in direct proportion to the chlorine concentration. Total chlorine, the sum of free chlorine and combined chlorine (chloramines), is determined by adding potassium iodide (A-2500 solution) to the sample. Chlorine oxidizes the iodide to iodine, and the iodine then oxidizes DDPD to the purple colored species. Results are expressed in ppm (mg/L) Cl<sub>2</sub>. The chloramine concentration of a sample can be determined by difference between the total and free results.

**Sampling Information:** Chlorine is not stable in aqueous solution. Exposure of samples to excessive light or agitation should be minimized, and chlorine analysis should be performed immediately after sample collection.

#### Interference Information:

Various oxidizing agents, including other halogens (bromine, iodine), ozone and peracetic acid, and various halogenating agents will react with the chemistry to cause false high test results.

Chlorine itself and other halogens at concentrations significantly above the test kit range may prevent proper color development, causing a false low result.

Chloramines present at concentrations within the test range do not interfere significantly during free chlorine analysis. Nitrite interferes positively, particularly during total chlorine analysis.

Oxidized manganese (permanganate, Mn<sup>7+</sup>) interferes positively; however, it is not appropriate to use permanganate standards to validate this test method.

Cupric copper may interfere positively.

Chromate at levels up to 15 ppm should not interfere.

Ferric iron and hydrogen peroxide at concentrations comparable to the test range do not interfere with this chemistry. Sample pHs between 2 and 8 can be tolerated. Samples with extreme pHs should be adjusted to pHs of approximately 6-7 prior to analysis.

The DDPD chemistry is UV-light sensitive. When performing the test outdoors, care must be taken to prevent exposure of the ampoules to sunlight, both before use and after the ampoules have filled with sample.

**Safety Information:** Safety Data Sheets (SDS) are available upon request and at [www.chemetrics.com](http://www.chemetrics.com). Read SDS before using these products. Breaking the tip of an ampoule in air rather than water may cause the glass ampoule to shatter. Wear safety glasses and protective gloves.

**Available Analysis Systems:** Visual colorimetric: CHEMets®, ULR CHEMets®, VACUettes®

**Storage Requirements:** Products should be stored in the dark and at room temperature.

**Shelf Life:** *When stored in the dark and at room temperature*: The CHEMets, ULR CHEMets, and VACUettes refills have shelf lives of 4 years. Color comparators have 12-month shelf lives. The accessory solution has a shelf life of 2 years.

**Accuracy:** CHEMets, ULR CHEMets, and VACUettes kits: ± 1 color standard increment

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