



# Technical Data Sheet

## Chlorine (free & total)

### DPD Method

*CHEMetrics' chlorine Vacu-vials® are EPA approved for the analysis of drinking water and wastewater.*

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

**References:** APHA Standard Methods, 22<sup>nd</sup> ed., Method 4500-Cl G - 2000; USEPA Methods for Chemical Analysis of Water and Wastes, Method 330.5 (1983)

**Chemistry:** Free chlorine oxidizes DPD (N,N-diethyl-p-phenylenediamine) to form a pink colored species in direct proportion to the chlorine concentration. Total chlorine, the sum of free chlorine and chloramines (combined chlorine), is determined by adding potassium iodide to the sample. Chlorine oxidizes the iodide to iodine, and the iodine then oxidizes DPD to the pink colored species. Results are expressed as 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 range may prevent proper color development, causing a false low result.

Chromate may interfere.

Permanganate, Mn<sup>+7</sup>, interferes positively.

Manganese (II), Mn<sup>+2</sup>, does not interfere at up to at least 4 ppm.

Cupric copper may interfere positively.

Nitrite at concentrations up to at least 5 ppm does not interfere.

Ferric iron and hydrogen peroxide at concentrations comparable to the test range do not interfere with this chemistry.

Chloramines present at concentrations within the test range do not interfere significantly during free chlorine analysis.

Samples with extreme pHs or that are highly buffered should be adjusted to pHs of approximately 6 - 7 prior to analysis.

**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®. Instrumental colorimetric: Vacu-vials®.

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

**Shelf Life:** *When stored in the dark and at room temperature:* Visual colorimetric: The CHEMets refills have shelf lives of 4 years. The color comparators and accessory solution have 2-year shelf lives. Instrumental colorimetric: The free chlorine Vacu-vials test kit, K-2523, has a shelf life of 4 years. The free & total chlorine Vacu-vials test kit, K-2513, has a 2-year shelf life.

**Accuracy:** CHEMets kits: ± 1 color standard increment; Vacu-vials kits: ± 10% error at 75% of full range, ± 20% error at 25% of full range, ± 30% error at CHEMetrics' Practical Detection Limit (PDL).

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