

Company Introduction

No More Problems With Solutions.

If water analysis is your responsibility, your first analysis should start with CHEMetrics® self-filling reagent ampoules. These extraordinarily simple *snap-and-read* test kits actually have a lower cost per test than the labor-intensive versions you may be using now. Measured either instrumentally or by visual color comparison, you can have accurate, reliable, quantitative results for over 45 analytes in just two minutes or less.

No Mixing. No Measuring. No Mess.

Traditional methods often require sample and reagent preparation, multiple steps, and clean up. With the CHEMetrics systems, you simply immerse the ampoule in the sample, snap the tip, and quickly obtain dependable results.

Fewer Steps Means Fewer Errors.

Because test preparation is virtually eliminated, our products reduce potential operator error. That saves retesting time and money. And CHEMetrics vacuum-sealing helps you avoid inaccurate results from stale or unstable reagents.



Safer Testing.

Instead of handling chemicals and samples, you can reduce exposure significantly with CHEMetrics self-filling ampoules. Each contains a unit dose of pre-formulated reagent sealed in glass so that direct contact with chemicals is minimized.

Portable & Refillable.

Packaged with everything you need to run 30 tests, CHEMetrics products are compact and highly portable, making them ideal for fast, dependable analysis in the lab or in the field. And refill packs of 30 ampoules are always available with a single telephone call or online.

Our Reputation Is Your Greatest Assurance.

CHEMetrics is known for more than quality products. Our reputation is built on customer service. Expert, prompt, and courteous support is always available from our Technical Services and Sales Departments. Our rigorous Quality Assurance Program makes certain that our products perform as you expect them to. Our innovative Research and Development Group continuously develops exciting new products to meet emerging water analysis needs. And we stand 100% behind every aspect of every product and service we provide.

Better Water Testing Is A Snap

Dear Analyst,

For over thirty-eight years CHEMetrics has stood out from the pack because of one important characteristic: innovation. Our products have always provided faster, simpler, safer solutions to your water analysis needs, and we remain committed to continuing that tradition.

But providing test systems that save you time and make your work safer and easier is not our only forte; we are also known for the high level of quality and dependability of our products, the result of meticulous testing by our quality assurance staff. You can be sure of accurate, reliable results whether you are working in the laboratory or out in the field, testing a single sample or dozens.

Service, of course, is important to you, and it's extremely important to us, too. Our technical support staff is just a phone call or an email away, providing fast, helpful answers from knowledgeable, courteous people who are anxious to solve your testing problems. You will also find that they are able to work closely with you to develop a test system that is customized for your

particular application when one of our standard products is not well suited to your special requirements. Whatever your need, please ask—we'll do our best to be of service.

We realize that there are many firms to which you can turn for your water testing needs, but we are working hard to be your supplier of choice. If you are not already one of our many loyal customers, please give us the opportunity to demonstrate that we can provide the best combination of innovation, quality and service you can find anywhere. With CHEMetrics, it's not just about doing it well. It's about doing it better.



Sincerely,

Gordon A. Rampy, President
CHEMetrics, Inc.

Methods

References: USEPA Methods for Analysis of Water and Wastes, Method 410.4 (1983).

APHA Standard Methods, 20th ed., pp. 5-17, Method 5220 D (1998). A. M. Jirka and M. J.

Carter, "Micro Semi-Automated Analysis of Surface and Wastewaters for Chemical Oxygen Demand," *Analytical Chemistry*, Vol. 47, p.1397 (1975). J. A. Winter, "Method Research Study 3, Demand Analysis, An Evaluation of Analytical Methods for Water and Wastewater," USEPA, 1971. ASTM D 1252-00, Chemical Oxygen Demand (Dichromate Oxygen Demand) of Water, Test Method B.

The determination of Chemical Oxygen Demand (COD) is widely used in municipal and industrial laboratories to measure the overall level of organic contamination in wastewater. The contamination level is determined by measuring the equivalent amount of oxygen required to oxidize organic matter in the sample.

CHEMetrics offers two dichromate reactor digestion methods for fast, easy, safe determinations of low-, mid-, and high-range COD levels in wastewater: the USEPA-approved Method*, and a mercury-free method. The products using the USEPA-approved method contain mercuric sulfate in the reagent to eliminate chloride interferences. The more readily disposable mercury-free product line is applicable when chloride interference is not a concern and USEPA reporting is not required.

CHEMetrics' leakproof reagent vials contain pre-measured solutions of sulfuric acid and potassium dichromate. To perform the COD determination, the analyst simply removes the Teflon-lined screw cap from the vial, adds sample to the vial, and replaces the cap. The vial is then heated for two hours at 150°C in a standard digester block. Once digestion is completed, results are obtained using any photometer that accepts 16-mm diameter cells. CHEMetrics COD vials can be directly used in our V-2000 multi-analyte photometer, CHEMetrics' single analyte COD photometers, as well as in Hach¹ spectrophotometers. Built-in Hach COD methods and calibrations can be used without the need for a new calibration. A generic calibration table is included within the CHEMetrics kit for use with other spectrophotometers.

*Contains mercury. Dispose according to local, state or federal laws.

See Product Price List for COD Quantity Discount Schedule.

¹NOTE: No endorsement by Hach Company is implied or intended.

USEPA Approved



 Instrumental Kits

V-2000 Multi-Analyte Photometer

(See page 12 for instrumental features)

Range: 0-150 ppm

Method: Dichromate Reactor Digestion

COD (USEPA Approved) Vials Kit **Cat#**
***K-7350S**

Kit comes in a cardboard box and contains everything needed to perform up to 24 tests (except distilled water): 25 vials, instruction book with MSDS and calibration tables.

COD (USEPA Approved) Vials Kit ***K-7355**

Kit comes in a cardboard box and contains everything needed to perform up to 149 tests (except distilled water): 150 vials, instruction book with MSDS and calibration tables.

Range: 0-150 ppm

Method: Dichromate Reactor Digestion

COD (Mercury Free) Vials Kit **Cat#**
K-7351S

Kit comes in a cardboard box and contains everything needed to perform up to 24 tests (except distilled water): 25 vials, instruction book with MSDS and calibration tables.

COD (Mercury Free) Vials Kit **K-7356**

Kit comes in a cardboard box and contains everything needed to perform up to 149 tests (except distilled water): 150 vials, instruction book with MSDS and calibration tables.

Range: 0-1500 ppm

Method: Dichromate Reactor Digestion

COD (USEPA Approved) Vials Kit **Cat#**
***K-7360S**

Kit comes in a cardboard box and contains everything needed to perform up to 24 tests (except distilled water): 25 vials, instruction book with MSDS and calibration tables.

COD (USEPA Approved) Vials Kit ***K-7365**

Kit comes in a cardboard box and contains everything needed to perform up to 149 tests (except distilled water): 150 vials, instruction book with MSDS and calibration tables.

Range: 0-1500 ppm

Method: Dichromate Reactor Digestion

COD (Mercury Free) Vials Kit **Cat#**
K-7361S

Kit comes in a cardboard box and contains everything needed to perform up to 24 tests (except distilled water): 25 vials, instruction book with MSDS and calibration tables.

COD (Mercury Free) Vials Kit **K-7366**

Kit comes in a cardboard box and contains everything needed to perform up to 149 tests (except distilled water): 150 vials, instruction book with MSDS and calibration tables.

Range: 0-15,000 ppm

Method: Dichromate Reactor Digestion

COD (Not USEPA Approved) Vials Kit **Cat#**
***K-7370S**

Kit comes in a cardboard box and contains everything needed to perform up to 24 tests (except distilled water): 25 vials, instruction book with MSDS and calibration tables.

COD (Not USEPA Approved) Vials Kit ***K-7375**

Kit comes in a cardboard box and contains everything needed to perform up to 99 tests (except distilled water): 100 vials, instruction book with MSDS and calibration tables.

Range: 0-15,000 ppm

Method: Dichromate Reactor Digestion

COD (Mercury Free) Vials Kit **Cat#**
K-7371S

Kit comes in a cardboard box and contains everything needed to perform up to 24 tests (except distilled water): 25 vials, instruction book with MSDS and calibration tables.

COD (Mercury Free) Vials Kit **K-7376**

Kit comes in a cardboard box and contains everything needed to perform up to 99 tests (except distilled water): 100 vials, instruction book with MSDS and calibration tables.

All COD Kits require the use of a Digester Block and the V-2000 Photometer, a COD Photometer, or a spectrophotometer capable of accepting a 16 mm round cell. Instruments sold separately.

A fresh reagent ampoule blank must be prepared for each series of tests; therefore the number of samples that can be tested with each kit will vary.

Accessories

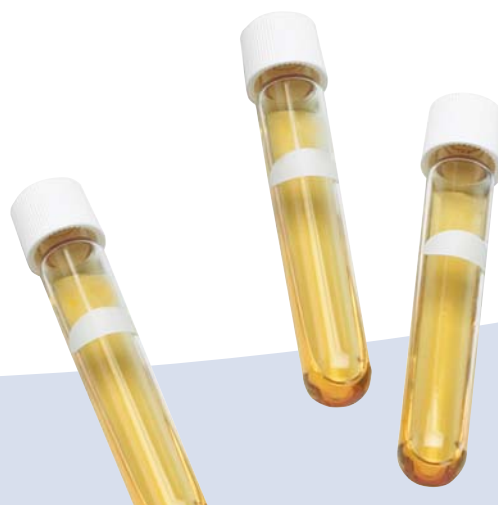
Description	Cat#
Vial Rack (holds 40 vials)	A-0107
Digester Block (115/230 Volt, 12 cells)	A-0111
Calibration Standard, 1000 ppm (200 mL), Shelf-life 8 months	A-7301 ¹
Calibration Standard, 10,000 ppm (200 mL), Shelf-life 8 months	A-7310 ¹
COD Photometer (20-150 ppm)	A-7320
COD Photometer (100-1500 & 1000-15,000 ppm)	A-7325

¹*This product must be refrigerated.*

Instructions are posted on our website.

If no shelf-life is listed for a product, then the shelf-life is at least 2 years.

*Contains mercury. Dispose according to local, state or federal laws.



Methods

The level of dissolved oxygen in natural waters is often a direct indication of quality, since aquatic plants produce oxygen, while microorganisms generally consume it as they feed on pollutants. At low temperatures the solubility of oxygen is increased; during summer, saturation levels can be as low as 4 ppm. Dissolved oxygen (D.O.) is essential for the support of fish and other aquatic life and aids in the natural decomposition of organic matter. Waste treatment plants that employ aerobic digestion must maintain a level of at least 2 ppm dissolved oxygen.

At elevated temperatures, oxygen is highly corrosive to metals, causing *pitting* in ferrous systems such as high-pressure boilers and deep well oil recovery equipment. To prevent costly corrosion damage, the liquids in contact with the metal surfaces must be treated, usually by a combination of physical and chemical means. Deaeration can reduce the dissolved oxygen concentration of boiler feedwater from several ppm to a few ppb. Chemical reducing agents such as hydrazine, DEHA, or sodium sulfite, may be used instead of or in conjunction with deaeration.

The Indigo Carmine Method

References: ASTM D 888-87, Colorimetric Indigo Carmine, Test Method A. Gilbert, T. W., Behymer, T. D., Castañeda, H. B., "Determination of Dissolved Oxygen in Natural and Wastewaters," *American Laboratory*, March 1982, pp. 119-134.

Test kits for environmental and drinking water applications (ppm range) employ the indigo carmine method. The reduced form of indigo carmine reacts with D.O. to form a blue product. The indigo carmine methodology is not subject to interferences from temperature, salinity, or dissolved gases such as sulfide, which plague users of D.O. meters. Results are expressed as ppm (mg/L) O₂.

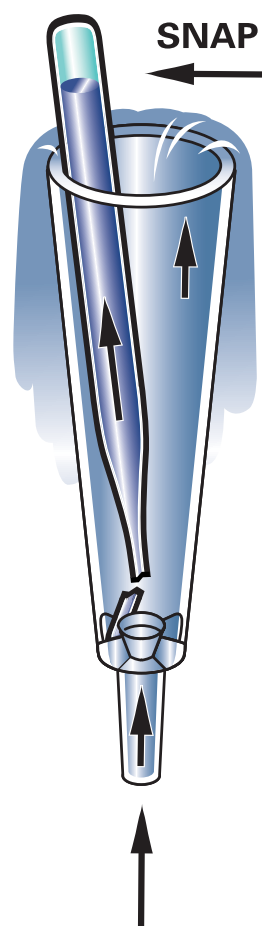
The Rhodazine D™ Method

References: Developed by CHEMetrics, Inc. ASTM Power Plant Manual, 1st ed. p. 169 (1984). ASTM D 5543-94 (2005), Low Level Dissolved Oxygen in Water, Test Method A.

Test kits for boiler waters and applications requiring trace levels of D.O. (ppb range) employ the Rhodazine D methodology. Developed by CHEMetrics, Inc., and

approved by ASTM as the reference method for ppb D.O. determination, the Rhodazine D compound in reduced form reacts with dissolved oxygen to form a bright pink reaction product. The method is not subject to salinity or dissolved gas interferences. Oxidizing agents, including benzoquinone, can cause high results. Reducing agents such as hydrazine and sulfite do not interfere. Results are expressed as ppm (mg/L) or ppb (µg/L) O₂.

Low-range dissolved oxygen test kits include a special *sampling tube* (diagram) for use with boiler feedwater. This device allows the user to break the tip of the ampoule in a flowing sample stream in order to preclude error from contamination by atmospheric oxygen.



 Visual Kits

Range: 0-20 ppb MDL: 1 ppb / Method: Rhodazine D	
ULR CHEMets Kit	Cat# K-7511
ULR CHEMets Refill, 30 ampoules	R-7511
Comparator, Shelf-life 2 years: 0, 2, 4, 6, 8, 12, 16, 20 ppb	C-7511
Kit comes in a plastic case and contains everything needed to perform 30 tests: Refill, Comparator, adhesive mounting clamp, permanent mounting clamp, sampling tube, instructions, and MSDS.	

Range: 5-180 ppb MDL: 5 ppb / Method: Rhodazine D	
CHEMets Kit	Cat# K-7518
CHEMets Refill, 30 ampoules	R-7518
Comparator, Shelf-life 2 years: 5, 20, 40, 60, 80, 110, 140, 180 ppb	C-7518
Kit comes in a plastic case and contains everything needed to perform 30 tests: Refill, Comparator, adhesive mounting clamp, permanent mounting clamp, sampling tube, instructions, and MSDS.	

Range: 0-40 ppb MDL: 2.5 ppb / Method: Rhodazine D	
CHEMets Kit	Cat# K-7540
CHEMets Refill, 30 ampoules	R-7540
Comparator, Shelf-life 2 years: 0, 5, 10, 15, 20, 25, 30, 40 ppb	C-7540
Kit comes in a plastic case and contains everything needed to perform 30 tests: Refill, Comparator, adhesive mounting clamp, permanent mounting clamp, sampling tube, instructions, and MSDS.	

Range: 0-1 ppm MDL: 0.025 ppm / Method: Rhodazine D	
CHEMets Kit	Cat# K-7501
CHEMets Refill, 30 ampoules	R-7501
Comparator, Shelf-life 2 years: 0, 0.05, 0.1, 0.2, 0.3, 0.4, 0.6, 0.8, 1.0 ppm	C-7501
Kit comes in a plastic case and contains everything needed to perform 30 tests: Refill, Comparator, adhesive mounting clamp, permanent mounting clamp, sampling tube, 25 mL sample cup, instructions, and MSDS.	

Range: 0-100 ppb MDL: 5 ppb / Method: Rhodazine D	
CHEMets Kit	Cat# K-7599
CHEMets Refill, 30 ampoules	R-7540
Comparator, Shelf-life 2 years: 0, 10, 20, 30, 40, 60, 80, 100 ppb	C-7599
Kit comes in a plastic case and contains everything needed to perform 30 tests: Refill, Comparator, adhesive mounting clamp, permanent mounting clamp, sampling tube, instructions, and MSDS.	

Range: 1-12 ppm MDL: 1 ppm / Method: Indigo Carmine	
CHEMets Kit	Cat# K-7512
CHEMets Refill, 30 ampoules	R-7512
Comparator, Shelf-life 2 years: 1, 2, 3, 4, 5, 6, 8, 10, 12 ppm	C-7512
Kit comes in a plastic case and contains everything needed to perform 30 tests: Refill, Comparator, 25 mL sample cup, instructions, and MSDS.	

If no shelf-life is listed for a product, then the shelf-life is at least 2 years.



 Instrumental Kits

V-2000 Multi-Analyte Photometer

(See page 12 for instrumental features)

Range: V-2000: 0.100-1.400 ppm / Spec: 100-800 ppb
Method: Rhodazine D

Vacu-vials Kit	Cat# K-7553
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Kit comes in a cardboard box and contains everything needed to perform 30 tests: thirty ampoules, sampling tube, adhesive mounting clamp, permanent mounting clamp, ampoule blank, instructions, calibration table, and MSDS.

Range: 0.20-2.00 ppm
Method: Indigo Carmine

Vacu-vials Kit	Cat# K-7503
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Kit comes in a cardboard box and contains everything needed to perform 30 tests: thirty ampoules, 25 mL sample cup, sampling tube, adhesive mounting clamp, permanent mounting clamp, ampoule blank, instructions, calibration table, and MSDS.

Range: 2.0-15.0 ppm
Method: Indigo Carmine

Vacu-vials Kit	Cat# K-7513
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Kit comes in a cardboard box and contains everything needed to perform 30 tests: thirty ampoules, 25 mL sample cup, ampoule blank, instructions, calibration table, and MSDS.

Vacu-vials Kits require the use of the V-2000 Photometer or a spectrophotometer capable of accepting a 13 mm diameter round cell. Instrument sold separately.

SAM Single-Analyte Photometers

(See page 15 for instrumental features)

Range: 2.0-15.0 ppm
Method: Indigo Carmine

SAM Kit	Cat# I-2002
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Vacu-vials Kit, 30 ampoules, 25 mL sample cup, ampoule blank, instructions, calibration table, and MSDS.

SAM Kit comes in a plastic case and contains everything needed to perform 30 tests: Vacu-vials Kit, SAM Photometer, 2 AA batteries, and instructions.

If no shelf-life is listed for a product, then the shelf-life is at least 2 years.

Kit Components common to Oxygen

Description	Cat#
Sample Cup Pack, 25 mL (6 ea)	A-0013
Sampling Tube Pack (3 ea)	A-0020
Mounting Clamp Pack, Adhesive (6 ea)	A-0022
Ampoule Blank Pack (5 ea)	A-0023
Mounting Clamp Pack, Permanent (6 ea)	A-0034

Instructions are posted on our website.

