Oxygen, Dissolved

DOC316.53.01098

Indigo Carmine Method **Method 8316**

6 to 800 µg/L O_2 (LR, spectrophotometers) **AccuVac® Ampuls**

10 to 1000 µg/L O_2 (LR, colorimeters)

Scope and application: For boiler feedwater

Test preparation

Instrument-specific table

The tables in this section show all of the instruments that have the program for this test. Table 2 shows sample cell and adapter requirements for AccuVac Ampul tests.

To use the table, select an instrument, then read across to find the corresponding information for this test.

Table 1 Instrument-specific information for AccuVac Ampuls

Instrument	Adapter	Sample cell
DR 6000 DR 5000 DR 900	—	2427606
DR 3900	LZV846 (A)	
DR 3800 DR 2800 DR 2700	LZV584 (C)	2122800

Before starting

Samples must be analyzed immediately after collection and cannot be preserved for later analysis.
Install the instrument cap on the DR 900 cell holder before ZERO or READ is pushed.
The dissolved oxygen reading is only stable for 30 seconds. After 30 seconds, the Ampul solution will absorb oxygen from the air.
Review the Safety Data Sheets (MSDS/SDS) for the chemicals that are used and use any recommended personal protective equipment.
Dispose of reacted solutions according to local, state and federal regulations. Use the Safety Data Sheets for disposal information for unused reagents. Consult the environmental, health and safety staff for your facility and/or local regulatory agencies for further disposal information.

Items to collect

Description	Quantity
Low Range Dissolved Oxygen AccuVac® Ampuls	1
Polypropylene beaker, 50-mL	1
Stoppers, for 18-mm tubes and AccuVac Ampuls	1
Sample cells (For information about sample cells, adapters or light shields, refer to Instrument-specific table on page 1.)	1

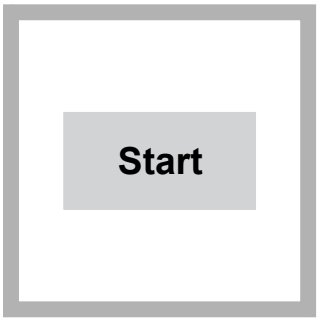
Refer to Consumables and replacement items on page 3 for reorder information.

Sample collection

The main consideration with sample collection is to prevent contamination of the sample with atmospheric oxygen.

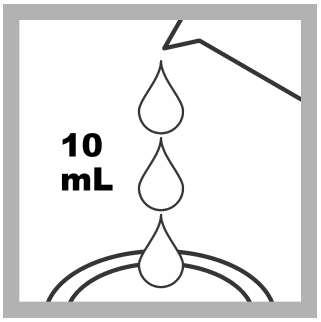
- Samples must be analyzed immediately after collection and cannot be preserved for later analysis.
- For best results, collect the sample from a stream of water that is hard-plumbed to the sample source.
- Use a funnel to maintain a continual flow of sample and yet collect enough sample to immerse the Ampul.
- Do not introduce air in place of the sample.
- Rubber tubing, if used, will introduce unacceptable amounts of oxygen into the sample unless the length of tubing is minimized and the flow rate is maximized.
- Flush the sampling system with sample for at least 5 minutes.

AccuVac® Ampul procedure

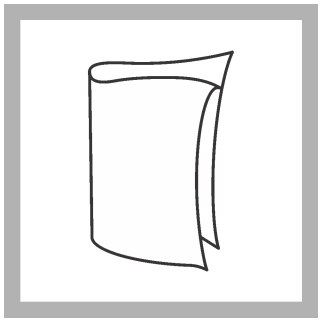


1. Start program **446 Oxygen, Dis LR AV**. For information about sample cells, adapters or light shields, refer to Instrument-specific table on page 1.

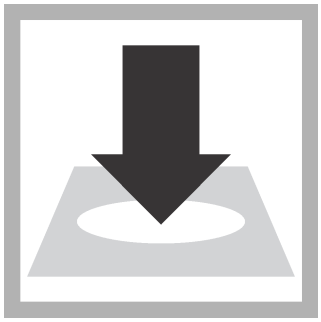
Note: *Although the program name may vary between instruments, the program number does not change.*



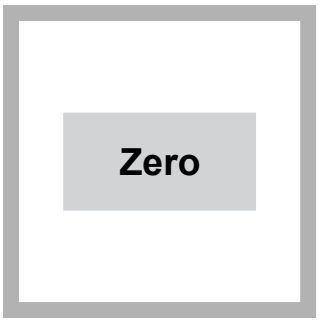
2. Prepare the blank: Fill the sample cell with 10 mL of sample.



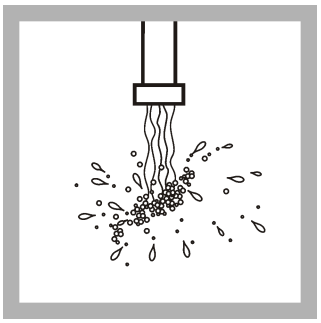
3. Clean the blank.



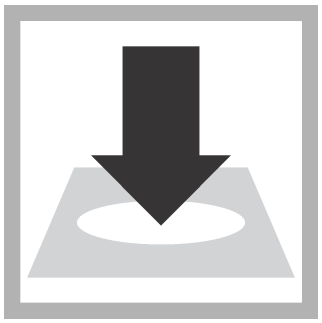
4. Insert the blank into the cell holder.



5. Push **ZERO**. The display shows 0 µg/L O_2.



6. Prepare the sample: Open the AccuVac Ampul. Fill the Ampul with sample. For best results, collect the sample from a stream of water that is hard-plumbed to the sample source. Refer to Sample collection on page 2.



7. Immediately clean and then insert the Ampul into the cell holder.

8. Push **READ**. Results show in µg/L O_2.

Interferences

Excess amounts of thioglycolate, ascorbate, ascorbate + sulfite, ascorbate + cupric sulfate, nitrite, sulfite, thiosulfate and hydroquinone will not reduce the oxidized form of the indicator and do not cause significant interference.

Interfering substance	Interference level
Hydrazine	100,000 fold excess will begin to reduce the oxidized form of the indicator solution.
Sodium hydrosulfite	Reduces the oxidized form of the indicator solution and will cause a significant interference.

Accuracy check

Reagent blank measurement

A reagent blank for this test can be measured as follows:

1. Fill a 50-mL beaker with sample.
2. Add one sodium hydrosulfite powder pillow and mix.
3. Fill a Low Range Dissolved Oxygen AccuVac Ampul with this sample.
4. Measure the dissolved oxygen concentration as shown in the test procedure. The result should be 0 ± 6 µg/L O_2.

Method performance

The method performance data that follows was derived from laboratory tests that were measured on a spectrophotometer during ideal test conditions. Users may get different results under different test conditions.

Program	Standard	Precision (95% Confidence Interval)	Sensitivity Concentration change per 0.010 Abs change
446	N/A	not determined	6 µg/L O_2

Summary of method

The Low Range Dissolved Oxygen AccuVac Ampul contains reagent vacuum-sealed in an Ampul. When the AccuVac Ampul is broken open in a sample containing dissolved oxygen, the yellow solution will turn blue. The blue color development is proportional to the concentration of dissolved oxygen. Test results are measured at 610 nm.

Consumables and replacement items

Required reagents

Description	Quantity/test	Unit	Item no.
Low Range Dissolved Oxygen AccuVac® Ampuls	1	25/pkg	2501025

Required apparatus

Description	Quantity/test	Unit	Item no.
Beaker, polypropylene, 50-mL, low form	1	each	108041

Recommended standards

Description	Unit	Item no.
Hydrosulfite Reagent Powder Pillows	100/pkg	2118869

Optional reagents and apparatus

Description	Unit	Item no.
AccuVac® Snapper	each	2405200
AccuVac® Sampler	each	2405100
AccuVac® vials for sample blanks	25/pkg	2677925
Stoppers for 18-mm tubes and AccuVac Ampuls	6/pkg	173106

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