

# Oxygen, Dissolved

★Method 8166  
AccuVac® Ampuls

HRDO Method  
HR (0.3 to 15.0 mg/L O<sub>2</sub>)

Scope and Application: For water and wastewater



## Test Preparation

### Before starting the test:

Analyze samples on-site. Do not store for later analysis

### Collect the following items:

Quantity

High Range Dissolved Oxygen AccuVac® Ampuls with reusable Ampul caps

1

Polypropylene Beaker, 50-mL

1

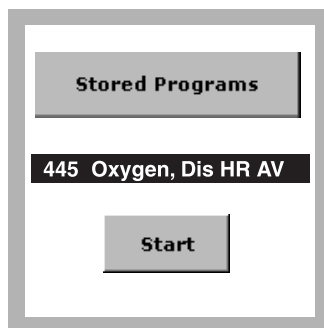
Sample Cell, 10-mL

1

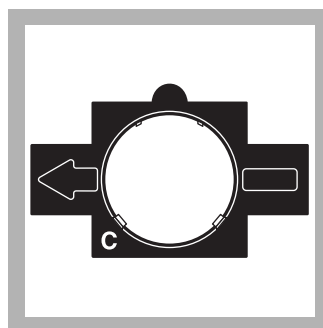
**Note:** Reorder information for consumables and replacement items is on page 4.

AccuVac Ampul®

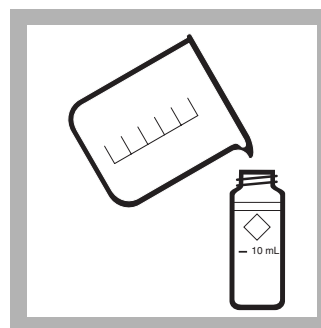
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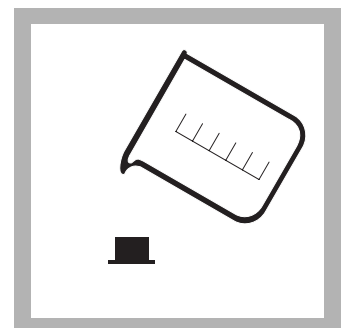
1. Select the test.



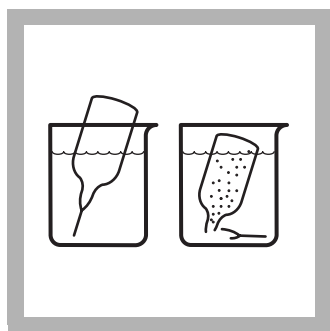
2. Insert Adapter C.



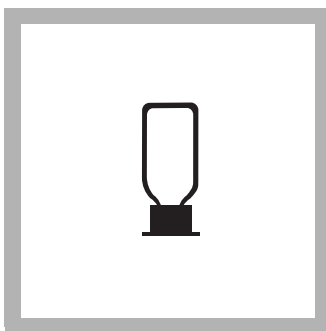
3. **Blank Preparation:**  
Fill a round sample cell with 10 mL of sample.



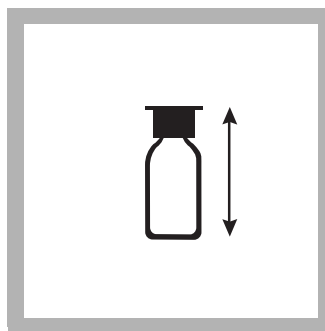
4. Fill a blue Ampul cap with sample.



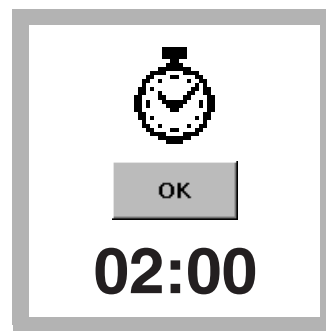
**5. Prepared Sample:** Fill a High Range Dissolved Oxygen AccuVac Ampul with sample. Keep the tip immersed while the Ampul fills completely.



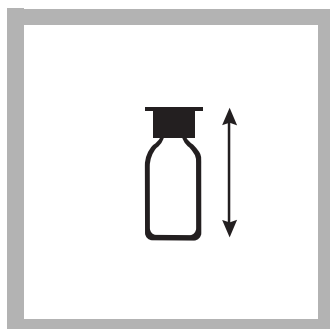
**6.** Hold the Ampul with the tip pointing down and immediately insert the Ampul into the Ampul cap. The cap prevents contamination from atmospheric oxygen.



**7.** Shake the Ampul for 30 seconds. A small amount of undissolved reagent will not affect results.

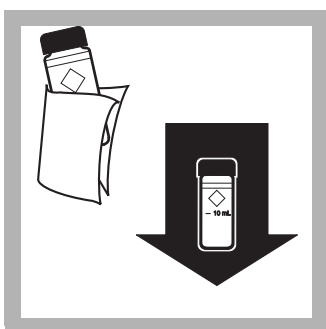


**8.** Press **TIMER>OK**. A two-minute reaction period will begin. This enables the oxygen that was degassed during aspiration to redissolve and react.

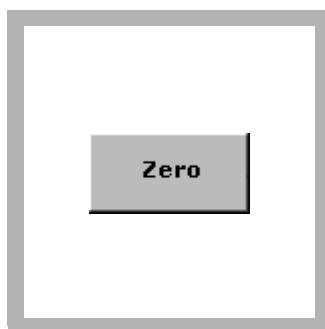


**9.** When the timer expires, shake the Ampul for 30 seconds.

Allow any bubbles to dissipate before proceeding.



**10.** Insert the blank in the cell holder.



**11.** Press **ZERO**. The display will show: 0.0 mg/L O<sub>2</sub>



**12.** Insert the prepared sample into the cell holder. Press **READ**. Results will appear in mg/L O<sub>2</sub>.

## Interferences

Table 1 Interfering Substances and Levels

Interfering Substance	Interference Levels and Treatments
Cr <sup>3+</sup>	Greater than 10 mg/L
Cu <sup>2+</sup>	Greater than 10 mg/L
Fe <sup>2+</sup>	Greater than 10 mg/L
Mg <sup>2+</sup>	Magnesium is commonly present in seawater and causes a negative interference. If the sample contains more than 50% seawater, the oxygen concentration obtained by this method will be 25% less than the true oxygen concentration. If the sample contains less than 50% seawater, the interference will be less than 5%.
Mn <sup>2+</sup>	Greater than 10 mg/L
Ni <sup>2+</sup>	Greater than 10 mg/L
NO <sup>2-</sup>	Greater than 10 mg/L

## Sample Collection, Preservation, and Storage

The main consideration in sampling with the High Range Dissolved Oxygen Ampul is to prevent the sample from becoming contaminated with atmospheric oxygen between breaking open the Ampul and reading the absorbance. This is accomplished by capping the Ampul with an Ampul cap. If the Ampul is securely capped, the Ampul should be safe from contamination for several hours. The absorbance will decrease by approximately 3% during the first hour and will not change significantly afterwards.

Sampling and sample handling are important considerations in obtaining meaningful results. The dissolved oxygen content of the water being tested may change with depth, turbulence, temperature, sludge deposits, light, microbial action, mixing, travel time, and other factors. A single dissolved oxygen test rarely reflects the accurate overall condition of a body of water. Several samples taken at different times, locations, and depths are recommended for most reliable results. Samples must be tested immediately upon collection, although only a small error results if the absorbance reading is taken several hours later.

## Accuracy Check

The results of this procedure may be compared with the results of a titrimetric procedure (request Lit. Code 8042), or by using any of the following dissolved oxygen meters: sens*ion*<sup>TM</sup>6 Dissolved Oxygen Meter\*, HQ10 Portable LDO Dissolved Oxygen Meter\*, or HQ20 Portable LDO Dissolved Oxygen/pH Meter\*.

## Summary of Method

The High Range Dissolved Oxygen AccuVac Ampul contains reagent vacuum-sealed in a 14-mL Ampul. When the AccuVac Ampul is opened in a sample containing dissolved oxygen, it forms a yellow color which turns purple. The purple color development is proportional to the concentration of dissolved oxygen. Test results are measured at 535 nm.

\* See [Optional Reagents and Apparatus on page 4](#).

## Consumables and Replacement Items

### Required Reagents

Description	Quantity/Test	Unit	Cat. No.
High Range Dissolved Oxygen AccuVac® Ampuls with 2 reusable Ampul caps	1	25/pkg	25150-25

### Required Apparatus

Description	Quantity/Test	Unit	Cat. No.
Adapter, 1-inch round, for AccuVac Ampuls	1	each	LZV584
Polypropylene Beaker, 50-mL	1	each	1080-41
Sample Cell, 10-mL, with cap	1	each	21228-00

### Optional Reagents and Apparatus

Description	Cat. No.
HQ10 Portable LDO Dissolved Oxygen Meter	51815-00
HQ20 Portable LDO Dissolved Oxygen/pH Meter	51825-00
sens <i>ion</i> ™6 Dissolved Oxygen Meter	51850-01



FOR TECHNICAL ASSISTANCE, PRICE INFORMATION AND ORDERING:  
In the U.S.A. – Call toll-free 800-227-4224  
Outside the U.S.A. – Contact the HACH office or distributor serving you.  
On the Worldwide Web – [www.hach.com](http://www.hach.com); E-mail – [techhelp@hach.com](mailto:techhelp@hach.com)

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