

Oxygen (Dissolved), Luminescence Measurement of Dissolved Oxygen, Hach Method 10360, Revision 1.2, October 2011

Initial Demonstration of Capability (DOC)

- Documentation (signed form) that analyst has read and understands all appropriate SOPs and Methods.
- Calibrate daily according to manufacturer's instructions
- Hach Method 10360 9.2.1 – Prepare and measure four samples of air-saturated water according to section 7.2.
 - 7.2.1 – Add approximately 1500 mL of organic-free water or BOD dilution water to a 2-L beaker or PET bottle
 - 7.2.2 – Allow the water to equilibrate to room temperature. Room temperature should be approximately $20 \pm 3^{\circ}\text{C}$.
 - 7.2.3 – With a steady gentle stream of filtered air ($\approx 10\text{-}40$ mL per minute), aerate the water for a minimum of 30 minutes. Alternatively, vigorously shake the reagent water or BOD dilution water for several minutes.
 - 7.2.4 – At the completion of aeration, let water re-equilibrate to room temperature ($20 \pm 3^{\circ}\text{C}$) for 30 minutes and note the barometric pressure of the laboratory during preparation. The barometric pressure reading is used in the calculation and determination of the theoretical DO concentration for the preparation of air-saturated water.
 - 7.2.5 – Transfer the aerated water to a BOD bottle until overflowing and stopper.
 - 7.2.6 – Calculate the theoretical dissolved oxygen concentration using a dissolved oxygen table such as Hitchman...
- **Real people language – prepare dilution water that is air-saturated and analyze four bottles and compare to the theoretical dissolved oxygen concentration.**
 - **Theoretical dissolved oxygen can be found at USGS's website at <http://water.usgs.gov/software/DOTABLES/> or by using a DO Saturation Table.**

Method Detection Limit (MDL)

- None

Initial Calibration Verification (ICV)

- 7.1.1 – Add approximately 1 inch (2.54 cm) of reagent water to a clean BOD bottle and stopper).
- 7.1.2 – Shake vigorously for ~ 10 seconds.
- 7.1.3 – Allow for the BOD bottle and its contents to equilibrate to room temperature. Room temperature should be approximately $20 \pm 3^{\circ}\text{C}$.
- 7.1.4 – The stopper may now be removed from the BOD bottle and the LBOD probe inserted for calibration purposes.
- **Real people language – calibrate daily by following manufacturer's instructions.**

Method Blank

- NONE

Laboratory Fortified Blank (LFB)

- NONE

Duplicate

- **Real people language – analyze 2 samples for DO, grab sample in a bucket and dip probe twice to get two readings**
 - **Target value is to get close to the first value and have a small RPD**

Laboratory Fortified Matrix (LFM)/Laboratory Fortified Matrix Duplicate (LFMD)

- NONE

Continuing Calibration Verification (CCV)

- 7.2.1 – Add approximately 1500 mL of organic-free water or BOD dilution water to a 2-L beaker or PET bottle
- 7.2.2 – Allow the water to equilibrate to room temperature. Room temperature should be approximately $20 \pm 3^{\circ}\text{C}$.
- 7.2.3 – With a steady gentle stream of filtered air ($\approx 10\text{-}40$ mL per minute), aerate the water for a minimum of 30 minutes. Alternatively, vigorously shake the reagent water or BOD dilution water for several minutes.
- 7.2.4 – At the completion of aeration, let water re-equilibrate to room temperature ($20 \pm 3^{\circ}\text{C}$) for 30 minutes and note the barometric pressure of the laboratory during preparation. The barometric pressure reading is used in the calculation and determination of the theoretical DO concentration for the preparation of air-saturated water.
- 7.2.5 – Transfer the aerated water to a BOD bottle until overflowing and stopper.
- 7.2.6 – Calculate the theoretical dissolved oxygen concentration using a dissolved oxygen table such as Hitchman...
- 9.3.1 – Upon air calibration, prepare a calibration verification standard with each analytical batch of 20 samples or less in an 8 hour period.
- 9.4.3 – Initially and at the end of each analytical batch of samples, analyze a dilution water sample that is air-saturated
- **Real people language – prepare dilution water that is air-saturated and analyze bottles and compare to the theoretical dissolved oxygen concentration.**
 - **Theoretical dissolved oxygen can be found at USGS's website at <http://water.usgs.gov/software/DOTABLES/> or by using a DO Saturation Table.**

Control Charts

- NONE

Corrective Action - 1020 B.5., B.8., & B.15.

Batch Size

- 9.3.1 – ... with each analytical batch of 20 samples or less in an 8 hour period.