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# **BOD test with Control Test Tablets**

## **Biochemical Oxygen Demand according to Respirometric Method**

Reference: **Standard Method 5210 D** and **UNI EN ISO 5815-1:2019**

Tested with **RESPIROMETRIC Sensor System 6 – BOD** (Code SA10200146) and **FOC 200E Connect Cooled Incubator** (Code F10300542)



### Introduction

BOD (Biochemical Oxygen Demand) is an analytical procedure for determining the amount of dissolved oxygen consumed by aerobic biological microorganisms in water. The analysis occurs in a given water sample at a certain temperature over a specific period. It is most commonly expressed in milligrams of oxygen consumed per liter of sample at the constant temperature of 20 °C during 5 days of incubation (BOD<sub>5</sub>) or monitoring the complete oxidation value after a maximum period of 30 days (BOD<sub>ultimate</sub>). BOD determination is widely used as an indication of the organic quality of water and the degree of organic pollution of water.

### BOD Test using Control Test Tablets

In order to check the complete RESPIROMETRIC Sensor System, it is possible to use the Control Test Tablets (Code A00000136), performing an oxygen demand experiment analogous to the BOD method.

Introducing a tablet, a certain amount of oxygen in the test is chemically absorbed. Thus, inside the bottles a reproducible negative pressure increases which can be used for a system check. Thanks to the software RespiroSoft™ it's possible to read the test value after 24-48 hours and this value should remain constant for 5 days. In this way, the whole BOD System can be tested, including the stirring system, the incubator, the correct sealing and calibration of the complete pressure measurement system sensor.

### Control Test Tablets

Expected value: 293 ± 30 mg/l

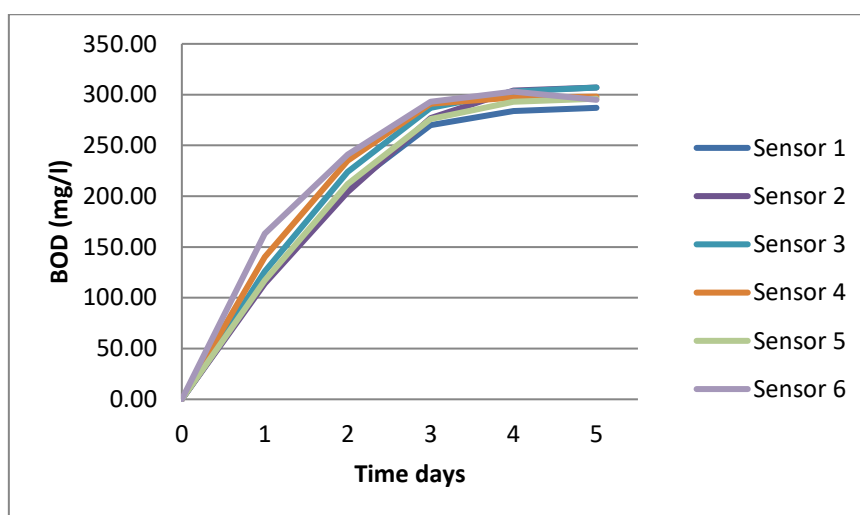
### Analysis Procedure

1. Set the temperature of the refrigerated thermostat at 20.0 ± 0.5 °C;
2. Verify the cleaning of bottles and stirring rods;
3. Pour 157 ml of distilled water measured with a graduated cylinder in each BOD bottle and add the stirring rod;
4. Place the 6 bottles in the stirring equipment "RESPIROMETRIC Sensor System 6" and introduce it into the refrigerated thermostat;
5. Connect the power cable of the equipment to the internal socket;
6. The equipment's thermal equilibrium at 20.0 °C is normally reached in 30-40 minutes;
7. In the software RespiroSoft™ set the following parameters:
  - Sample name: Tablet
  - Volume (ml): 157
  - Type: Standard 2
  - Sensor N°: from 1 to 6
  - Scale (mg/l): 600
  - Duration analysis (d): 5
  - Sampling time (h): 8
8. Connect the wireless receiver to the PC and from the software select [Menu], [Service], [Connect receiver].
9. After pre-tempering, without taking the bottles out of the refrigerated thermostat, put one tablet inside each bottle: open tablet strip by tearing the foil sideways in that way, that one could be released completely and directly into a bottle without touching it;
10. Fit the empty alkali holder into the bottleneck without introducing CO<sub>2</sub> absorber (different from usual BOD analysis), to prevent deviation from the check value;
11. Screw RESPIROMETRIC Sensor tightly on each bottle;
12. Press two times the key [START] on each RESPIROMETRIC Sensor to start the test.

### Results with BOD Control Test Tablets

Sample Name	Type	Sensor N°	Scale (mg/l)	Last value (mg/l)
Tablet	Standard 2	1	600	307
Tablet	Standard 2	2	600	298
Tablet	Standard 2	3	600	307
Tablet	Standard 2	4	600	296
Tablet	Standard 2	5	600	287
Tablet	Standard 2	6	600	303

Expected value: 293± 30 mg/l



### Conclusions

The VELP RESPIROMETRIC Sensor System is the perfect solution for BOD analysis providing accurate and precise results together with ease-of-use. All the obtained results are in accordance with the expected value.

VELP RESPIROMETRIC Sensor Systems come ready to use including all the necessary accessories and parts to be operational including: Stirring station, 500 ml amber bottles, KOH containers, stirring bars, DataBox™ and RESPIROSoft™ software.

With the optional Control Test Tablet verify through 5 days the correct tightening and functioning of the instrument.

### Respirometric Sensor Connectivity

- The RESPIROMETRIC Sensor transmits data directly to the PC enabling real-time monitoring of the analysis.
- Constant monitoring of multiple analysis thanks to the intuitive proprietary software, RESPIROSoft™.
- Wireless transmission of the measurements to the DataBox™ that is able to store data of up to 48 sensor, 8 Systems.
- The Wireless DataBox™ sends the data to the [VELP Ermes cloud platform](https://www.velp.com) ensuring a revolutionary lab experience.