

Biochemical Oxygen Demand

VELP Scientifica BOD Determination systems are based on the respirometric technique, a simple and easy way for monitoring the microorganisms' activity in water samples with extremely reliable results.

These microorganisms (bacteria) consume oxygen (O_2) and exhale carbon dioxide (CO_2), exactly as human beings.

When organic matter decomposes, the microorganisms feed upon this decaying material and eventually the matter becomes oxidized. The consumption of oxygen implies an alteration of the pressure in the bottle where the water is sampled and the BOD value is calculated by measuring this change of pressure in a closed atmosphere.

The carbon dioxide is absorbed by a strong alkali, positioned in the neck of the bottle.

The measurement principle consists of determining the oxygen concentration at the beginning and end of a measurement period, as specified by the index BOD_n .

The typical analysis lasts usually 5 days (BOD_5). Longer measurement times are also used, as BOD_7 , widely diffused in Scandinavian countries, and $BOD_{ultimate}$ for the complete oxidation obtained after a virtual period of 30 days.

Just few simple operations are required:

1. Add the stirring bar into the dark glass bottle; then fill it with enough sample, according to the following table:

Scale	Sample Volume
0 ÷ 1000 mg O_2 /l	100 ml
0 ÷ 600 mg O_2 /l	150 ml
0 ÷ 250 mg O_2 /l	250 ml
0 ÷ 90 mg O_2 /l	400 ml

Higher values can be measured by diluting the sample.

Position the CO_2 absorber, filled with specific reagent, e.g. soda lime (sodium calcium hydrate, 20% about carbon dioxide absorption capacity) or potassium hydroxide.

2. Incubate the sample at 20 °C for as many days as desired, including BOD_5 , BOD_7 and $BOD_{ultimate}$.

Plug the mains cable in the dedicated socket inside the incubator and in approx. 30-40 minutes the sample will reach the operating temperature.

3. Screw the BOD Sensor on.
4. Microorganisms start their activity: oxygen (O_2) is consumed and the carbon dioxide (CO_2) generated is collected by the dedicated absorber.
5. The sensor measures the internal pressure decrease and directly shows on the display the BOD value, in mg/l (or ppm), with no need for further calculation. Results are automatically stored in the BOD Sensor.

