



# DO Meters

## Oxygen Meters

### Dissolved Oxygen

Some oxygen is dissolved in practically every liquid. For example, at a temperature of 68 °F (20 °C) and an atmospheric pressure of 1013 mbar saturated water contains about 9 mg/l oxygen. Ethanol can contain up to 40 mg/l whereas glycerol only has about 2 mg/l.

Each liquid takes up oxygen until the partial pressure of oxygen in the liquid is in equilibrium with the air or gas phase in contact with it. The actual oxygen concentration depends on a number of factors, such as temperature, air pressure, oxygen consumption by microorganisms in a biodegradation process or oxygen production by algae, etc.

**The oxygen concentration is important for the:**

- Living conditions for fish and microorganisms in waters
- Degradation processes in wastewater treatment
- Corrosion processes in pipelines
- Shelf life of beverages, etc.

The determination of the oxygen concentration was formerly carried out by the WINKLER titration method. Today electrochemical measurement is a recognized method in numerous standard procedures.

In its simplest form an oxygen sensor contains a working electrode and a counter-electrode. Both electrodes are located in an electrolyte system which is separated from the sample by a gas-permeable membrane. The working electrode reduces the oxygen molecules to hydroxide ions. In this electrochemical reaction a current flows from the counterelectrode to the working electrode. The more oxygen present in the sample, the larger the current signal. The oxygen meter calculates the oxygen concentration in the sample from this signal.

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