



Oxidation Reduction Potential (ORP)

Oxidation Reduction Potential (ORP), expressed in millivolts (mV), measures the tendency of aqueous solutions or chemical species to accept or donate electrons. It serves as an indicator of oxidizing or reducing activity in water quality processes.

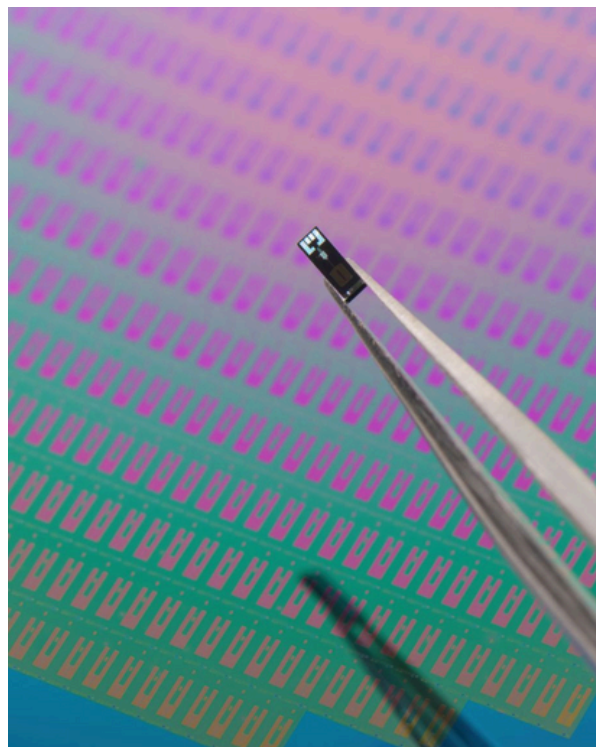
- **Higher (more positive) ORP values** indicate stronger oxidizing conditions. These solutions tend to accept electrons, meaning they can oxidize other species.
- **Lower (more negative) ORP values** indicate stronger reducing conditions. These solutions tend to donate electrons, meaning they can reduce other species.

How to Measure ORP

Millar / Sentron ORP sensors use a noble-metal measuring electrode (typically platinum or gold) paired with a reference electrode to detect changes in REDOX potential. The result is a stable, linear measurement ideal for continuous monitoring or integration into smart sensing systems. Unlike pH sensors, ORP sensors do not require calibration, reducing maintenance and simplifying long-term deployment.

Why Measure ORP?

- Oxidizers (positive ORP) accept electrons and are used for disinfection (chlorine, ozone, bromine).
- Reducers (negative ORP) donate electrons and are used in processes involving chemical reduction.
- ORP does not directly measure disinfectant concentration – but in systems with one dominant oxidizer (e.g., chlorine in pool water), ORP strongly correlates with sanitizing effectiveness.



Example Equations

Aluminum ($3\text{Al} \rightarrow \text{Al}^{3+} + 3\text{e}^-$; ORP $\approx -1.66\text{ V}$)

Al metal: strong reducing agent

Al^{3+} ion: weak oxidizing agent

Chlorine ($\text{Cl}_2 + 2\text{e}^- \rightarrow 2\text{Cl}^-$; ORP $\approx +1.36\text{ V}$)

Cl^- ion: weak reducing agent

Cl_2 molecule: strong oxidizing agent

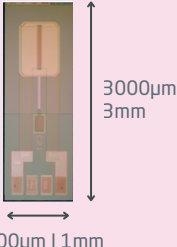
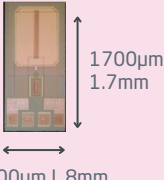
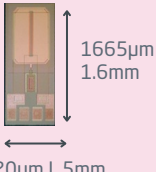
For inquiries, quotes, and orders, contact:

T: +1 832-667-7000

<https://millar.com/contact/quote-request>

ORP Levels by Application

0-150 mV	Low oxidation environment
150-250 mV	Aquaculture
250-350 mV	Cooling Towers
400-475 mV	Swimming Pools
450-600 mV	Hot Tubs
600 mV	Water Disinfection
800+ mV	Water Sterilization

pH Sensors	ISFET1000	ISFET800	ISFET520
			

Test our Technology

Wireless Parameter Probe



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