

## ORP (REDOX) ELECTRODE CALIBRATION PROCEDURE

The performance of an ORP electrode can be determined by use of the ORP Calibration Kit and the procedures given below. The Calibration Kit can be used for 30 calibrations and consists of the following items:

- |                                |                       |
|--------------------------------|-----------------------|
| (1) pint pH 4 buffer           | (1) pint pH 7 buffer  |
| (3) 4oz beakers                | (75) wood applicators |
| (1) 20 gram bottle quinhydrone | (1) instruction sheet |

Proceed as follows:

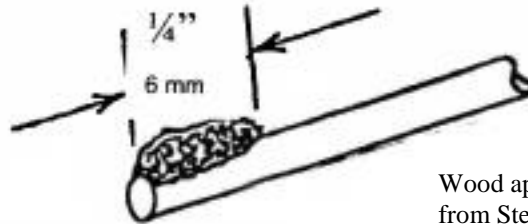
1. Fill a beaker with de-ionized or distilled water to use for rinsing the electrode.
2. Fill a second beaker to the ½ oz. mark with pH 7 buffer.
  - a. To this buffer, add the amount of quinhydrone that stays on about ¼” (6 mm) of the wood applicator (see the sketch below).
  - b. Use the wood applicator to stir the quinhydrone into the buffer.
  - c. A small amount of quinhydrone MUST remain undissolved. If all the quinhydrone dissolves, add a small amount and stir. Repeat as necessary until a small amount of quinhydrone remains undissolved.
3. Fill a third beaker to the ½ oz. mark with pH 4 buffer.
  - a. To this buffer, add the amount of quinhydrone that stays on about ¼” (6 mm) of the wood applicator (see the sketch below).
  - b. Use the wood applicator to stir the quinhydrone into the buffer.
  - c. A small amount of quinhydrone MUST remain undissolved. If all the quinhydrone dissolves, add a small amount and stir. Repeat as necessary until a small amount of quinhydrone remains undissolved.
4. Rinse the ORP electrode and pat it dry with a soft tissue.
  - a. Put it in the beaker filled with 7- buffer/quinhydrone mixture. Stir the electrode gently and let it rest against the side of the beaker.
  - b. Allow the reading to stabilize 30 to 60 seconds typically. Note the reading.
  - c. The reading should be within ±15 MV from the following values:

Readings in pH 7 Buffer/Quinhydrone Mixture

Temperature:	20°C (68°F)	25°C (77°F)	30°C (86°F)
Reading:	+96 mV	+90mV	+83mV

5. Rinse the ORP electrode and pat it dry with a soft tissue.
  - a. Put it in the beaker filled with 4- buffer/quinhydrone mixture. Stir the electrode gently and let it rest against the side of the beaker.
  - b. Allow the reading to stabilize 30 to 60 seconds typically. Note the reading.
  - c. The reading should be between +170 mV and +185 mV above the reading in the 7 buffer mixture (step 4). For example, if the reading from step 4 is +90mV, then the reading from this step should be between +260mV (90 + 170) and +275mV (90 + 185).

- d. With time and/or use, the value in the 7 buffer (step 4) may change. However, the +170 to +185mV span between readings in 7 and 4 buffers (steps 4 and 5) should remain the same. Obtaining this reading means that the electrode has good span and should be able to be calibrated along with the meter to reflect the proper residual chlorine concentration or ORP (REDOX) potential.
6. If short span is found, (less than a +170 mV range between the 7 and 4 buffers (steps 4 and 5) the platinum measuring surface may be coated. Remove the coating by one of the following means:
  - a. Wipe the surface clean with the soft cloth or tissue.
  - b. Soak the electrode in a chemical known to dissolve the suspected coating material.
  - c. As a last resort, very gently polish the surface with 600 grade wet silicone carbide paper.
  - d. After cleaning the electrode, soak in one of the calibrating solutions for about 5 minutes before re-calibrating.
7. The buffer/quinhydrone mixtures should be freshly made each time the ORP electrodes are calibrated. Do not store the mixtures or use after 2 hours as their values change with time.



Wood applicator With Quinhydrone  
from Steps 2 and 3