

**Keep Your Process Water
Free of Fruit & Human Pathogens**



**Advanced Water Sanitation Technology
Outstanding Full-Service Program**

pH/ORP
Automated Water Sanitation System



pH/ORP

Automated Water Sanitation System

Complete Automation of Water Sanitation



Accurate monitoring and recording of disinfection procedures is an important component of a sound postharvest quality and safety program.

Oxidation-Reduction Potential (ORP), measured in millivolts (mV), is an innovative approach for fruit packers and shippers to disinfect wash water during harvest and post-harvest handling processes.

The pH/ORP Automated Water Disinfection System decreases the level of contamination by

plant and fruit pathogens and microbes during harvest and post harvest handling and cooling, packing and processing activities that involve the use of water.

Operationally, combined with the digital thermometer or pH probe, ORP sensors allow for easy monitoring, tracking, and automated maintenance of critical disinfectant levels in water systems.

The system provides complete automation of the water disinfection and chemical treatment process that allows for "Hands-Free" operation of water treatment.

Features

- Sensors monitor pH and ORP levels
- Automatically injects chemical only on demand or as needed
- Always maintains a tight chemical concentration range
- Self maintains and adjusts to organic load
- Data logger maintains a continuous record of levels
- Operates only when the process is ON
- Smart Logic allows "Hands Free" operation
- Special sensors require low maintenance

Benefits

- Provides a continuous digital readout
- Maintains continuous chemical control
- Insures continuous recording of data
- Provides efficient chemical use and minimizes waste
- Increases product shelf life and safety
- Built-In safety alarms and chemical shut-off
- Saves money, time and labor
- Strengthen HACCP
- Provide efficacy to the water disinfection process
- Satisfies Food Safety Guidelines (WGA, IFPA)



Operator Interface - display panel for quick and easy monitoring.

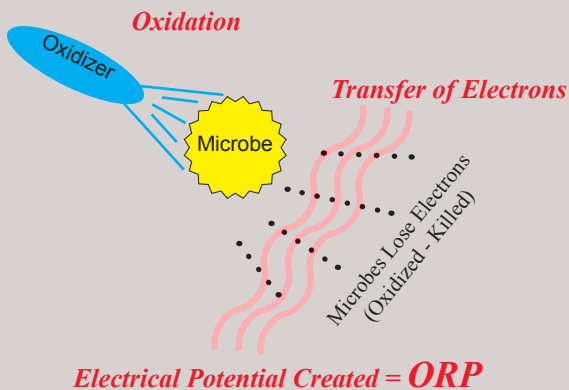


Pace International Quality Service

Pace's pH/ORP system is not only the most advanced water sanitation technology available in the market, but also receives the highest quality service possible by Pace's Technical Services Team.

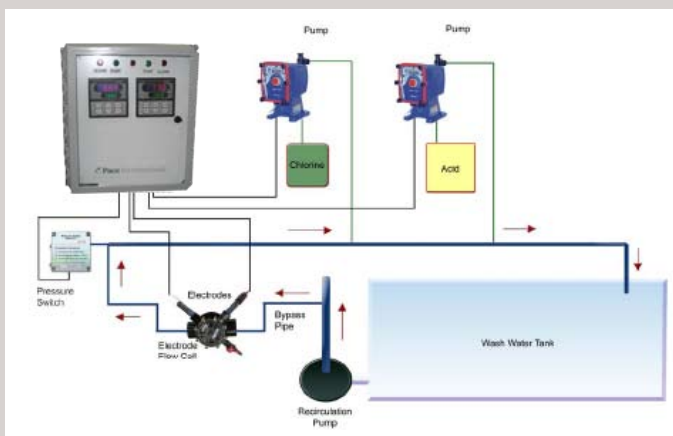
ORP = Oxidation Reduction Potential

The Oxidation Process



- Chlorine, Ozone, Peroxyacetic Acid, etc. are Oxidizers
- Oxidation is the Transfer of Electrons
- Microbes lose electrons and are Oxidized (killed)
- The transfer of Electrons creates an Electrical Potential, which is ORP
- ORP is measured in millivolts and the stronger the ORP, the faster the microbe is killed
- ORP measures disinfection, NOT ppm of Chlorine

pH/ORP System Layout



Example of System 3 layout

Chlorine + electrons - KILLS MICROBES

Table 1: E. Coli Kill Time

ORP (mV)	KILL TIME - E. Coli
450	Infinite
500	1 hour
550	100 seconds
600	10 seconds
650	0 seconds

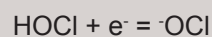
Tougher organisms require slightly higher ORP. Ex. Listeria, Salmonella, Yeast, Mold require ≥ 750 mV.

Typical ORP in produce wash water is at 650 mV.

Chlorine Chemistry

Table 2: Percentage of Oxidation

pH	HOCl	OCl ⁻
6.5	95%	5%
7.0	80%	20%
7.5	50%	50%
8.0	20%	80%



HOCl = Fast Oxidizer (Sanitizer)

OCl⁻ = Slow Oxidizer (No Sanitation)

Maximum Efficiency of Chlorine is at pH 6.5 and ORP at 650 mV (not ppm).

**Pace International
Brings Innovative Technologies to
Increase Efficiencies in Application Processes
with Unsurpassed Service Quality**



The Leading Postharvest Specialist

Innovative Technologies
High Quality Products
Efficient Application Systems
Professional Services & Support
Global Experience & Research



For more information about the pH ORP, please contact your Pace Representative or Pace International, LLC
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