

## APPLICATION NOTE • FOOD SAFETY &amp; POST-HARVEST

# Mineral Oxychloride Improves Food Safety

Mineral oxychloride technology uses various forms of oxygen to reduce or eliminate the microorganisms behind both food spoilage and foodborne illness — without impacting taste.

## 6-log

MICROBIAL REDUCTION IN <10 SECONDS

## +700 mV

SUSTAINED ORP THRESHOLD

## 12-day

SHELF-LIFE STUDY (RASPBERRIES)

Food scientists have long recognized two categories of concern: food-spoilage microorganisms and pathogenic microorganisms. Their research has pointed to using a strong disinfectant (oxidizer) that provides a measurable residual while not impacting taste. Research using ROS (reactive oxygen species) has demonstrated a **6-log reduction in less than 10 seconds** at an ORP (oxidation-reduction potential) consistently above +700 mV.

The mineral oxychloride solution quickly destroyed microorganisms and delayed mold formation. It also provided oxidative energy to the fruit, slowing spoilage. The chemistry generates a high concentration of hydroxyl radical ions and singlet oxygen ions, enabling quicker disinfection — killing microorganisms as quickly as ozone.

DZ 9966 (sodium oxychloride) works like liquid ozone. It is USEPA-registered as a disinfectant for post-harvest applications, USDA Organic-certified for organic applications, and NSF/ANSI 60 certified for use in potable water systems.

EPA FIFRA Registered

USDA Organic Certified

NSF/ANSI 60 Certified



Figure 1 — 12-day study: raspberries washed with DZ 9450 (~+750 mV) vs. a rinse-water control

### OXIDATION POTENTIAL OF COMMON OXIDANTS

| REAGENT             | FORMULA                                       | VOLTS   |
|---------------------|-----------------------------------------------|---------|
| Fluorine            | F <sub>2</sub>                                | 3.06    |
| Mineral Oxychloride | M <sub>x</sub> O <sub>9</sub> Cl <sub>4</sub> | 2.8–2.9 |
| Hydroxyl Radical    | OH•                                           | 2.80    |
| Oxygen Ion          | O <sup>-</sup>                                | 2.42    |
| Ozone               | O <sub>3</sub>                                | 2.07    |
| Hydrogen Peroxide   | H <sub>2</sub> O <sub>2</sub>                 | 1.78    |
| Perhydroxyl Radical | HO <sub>2</sub>                               | 1.70    |
| Chlorine Dioxide    | ClO <sub>2</sub>                              | 1.57    |
| Hypochlorous Acid   | HOCl                                          | 1.49    |
| Chlorine Gas        | Cl <sub>2</sub>                               | 1.36    |
| Oxygen (Molecule)   | O <sub>2</sub>                                | 1.23    |
| Hypochlorite Ion    | OCl <sup>-</sup>                              | 0.94    |
| Sodium Hypochlorite | NaOCl                                         | 0.94    |
| Hydroperoxide Anion | HO <sub>2</sub> <sup>-</sup>                  | -0.88   |
| Superoxide Radical  | O <sub>2</sub> <sup>-</sup>                   | -2.40   |