

COMPANY OVERVIEW

D&Z Worldwide

Advanced treatment technology for the 21st century — mineral oxychloride chemistry that generates a high concentration of reactive oxygen species (ROS) to disinfect water, protect food and control biofilm where chlorine and ozone fall short.



Smarter. Safer. Sustainable. — ozone-class oxidation delivered as a ready-to-use liquid.

2.8–2.9 v

OXIDATION POTENTIAL — ABOVE
OZONE (2.07 V) & CHLORINE (1.36 V)

100%

WATER-SOLUBLE, READY-TO-USE
LIQUID — NO GAS TO DISSOLVE

6×

SHELF LIFE — SIX MONTHS VS. 30
DAYS FOR SODIUM HYPOCHLORITE

— Who We Are

D&Z Worldwide was formed in 2010 to market a new generation of water-treatment chemistry. Our mission is captured in three words—**Smarter, Safer, Sustainable**—and delivered through advanced oxidation technology built on mineral oxychloride chemistry.

Our flagship oxidant, **DZ 9450**, is a powerful oxidizer based on mineral oxychloride chemistry first explored in the early 1900s. Only in the late 20th century did the instruments needed to measure and control this chemistry become commercially available. D&Z Worldwide brought DZ 9450 to market in 2013—first for proof-of-concept studies, plant trials and laboratory work, and today as a commercial product in active use across the water-treatment industry.

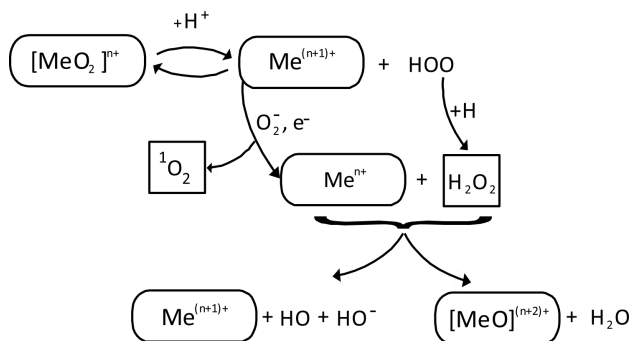
— The Technology: Mineral Oxychloride & ROS

DZ 9450 is a new oxidative technology for generating **reactive oxygen species (ROS)**—hydroxyl radical ions and singlet oxygen—that simulate an advanced oxidation process (AOP). A proprietary catalyst reacts with sodium hypochlorite to release a cascade of highly reactive, short-lived oxidants:



The strength of an oxidant is measured by its electrochemical potential (Ev)—the energy it makes available for disinfection. DZ 9450 reaches **2.8–2.9 V**, well above ozone (2.07 V), chlorine dioxide (1.57 V), chlorine gas (1.36 V) and sodium hypochlorite (0.94 V). It is a low-cost producer of hydroxyl radical ions with a high concentration of oxidative energy—a larger *electronic* footprint (Ev) rather than the larger *chemical* footprint of conventional oxidants.

OXIDATION POTENTIAL OF COMMON OXIDANTS		
REAGENT	FORMULA	VOLTS
Fluorine	F ₂	3.06
Mineral Oxychloride	M _x O ₉ Cl _l	2.8–2.9
Hydroxyl Radical	OH•	2.80
Oxygen Ion	O ⁻	2.42
Ozone	O ₃	2.07
Hydrogen Peroxide	H ₂ O ₂	1.78
Perhydroxyl Radical	HO ₂	1.70
Chlorine Dioxide	ClO ₂	1.57
Hypochlorous Acid	HOCl	1.49
Chlorine Gas	Cl ₂	1.36
Oxygen (Molecule)	O ₂	1.23
Hypochlorite Ion	OCl ⁻	0.94
Sodium Hypochlorite	NaOCl	0.94
Hydroperoxide Anion	HO ₂ ⁻	-0.88
Superoxide Radical	O ₂ ⁻	-2.40



Mineral oxychloride cycle: the metal-oxo catalyst regenerates while releasing singlet oxygen, hydrogen peroxide and hydroxyl radicals—the reactive oxygen species that drive disinfection.

— Why ORP Matters to Disinfection

Treatment is controlled with oxidation-reduction potential (ORP), measured in millivolts. ORP indicates the **energy available for disinfection**, the **contact time required**, and lets operators **optimize dosing to system demand** in real time. The World Health Organization considers water safe at an ORP greater than **+750 mV**. Emerging regulations increasingly pair ORP (mV) with the Langelier Index to monitor corrosion and water quality, and current EPA guidance is being discussed to include both as a matrix for water-quality control.

— The Products: DZ 9450 & DZ 9966

DZ 9450

STRONG OXIDANT & DISINFECTANT

The core mineral oxychloride oxidant for water and wastewater treatment—generating ROS to disinfect, control biofilm, and oxidize taste, odor, iron and manganese while earning contact-time (CT) credit as a primary disinfectant.

NSF/ANSI 60 Certified

DZ 9966

REGISTERED ALGAECIDE & BIOCIDES

The same mineral oxychloride chemistry registered for the broadest range of uses—from cooling towers and food safety to post-harvest agriculture—delivering ozone-class oxidation as a safe, ready-to-use liquid.

EPA FIFRA Registered

USDA Organic

— Simple to Install & Operate

Installation takes **less than 30 minutes** and requires no additional equipment—typically a metering pump and drum at the injection site with standard containment. The technology is simple to use and monitor, needs a low capital investment, and serves many applications across a single treatment facility.

In neat form the liquid is corrosive and will freeze, so handling calls for rubber gloves, a face shield and long sleeves. Once diluted it is safe to use—and it holds a **six-month shelf life** versus roughly 30 days for sodium hypochlorite.

INJECTION SKID



Metering pump and drum at the injection site with standard containment.

— Markets Served

Water & Wastewater

Potable water, wastewater, water recycling, desalination and well-water treatment.

Agriculture

Post-harvest produce treatment and irrigation-water quality.

Food Safety

Food preparation, food safety and food & beverage processing.

Cooling Towers

Biofilm and algae control for HVAC and industrial cooling water.

Oil & Gas

Produced-water and process-water treatment.

Specialty & Emerging

Zebra-mussel control, iron & manganese removal, healthcare and hospitality.

— Advantages Over Ozone & Chlorine

DZ 9450/9966 delivers ozone-class oxidation without dissolving a hazardous gas, and it succeeds where chlorine alone falls short—chlorine takes too long to kill pathogens, needs more product for less result, and is an explosive, corrosive gas.

ATTRIBUTE	OZONE	DZ 9450 / 9966
Form & handling	Gas — hard to dissolve	Liquid — ready to use
Oxidation potential (V)	2.07	2.70–2.90
Solubility in water	5% max	100%
Active species	O ₃	ROS (hydroxyl radical ion)
Handling safety	Very dangerous, explosive	Safe diluted; corrosive neat (high pH)
Potential by-products	Bromate, HAA5s	None
Residual protection	No	Yes, monitored by ORP (mV)
Capital cost	Very high (\$\$\$\$\$)	Very low (\$)
Air pretreatment	Extensive	None

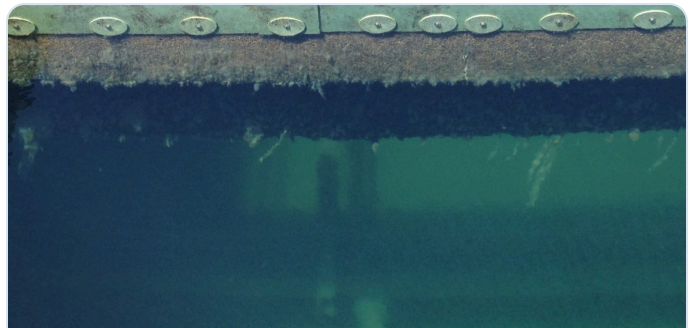
Both oxidants remove taste, odor and waterborne pathogens; DZ 9450/9966 does so at higher oxidative energy, lower cost and with no bromate or HAA5 by-products.

— Proven in the Field: Biofilm Control

In a clarifier fouled with biofilm, DZ 9450/9966 eliminated the algae, restored clean weirs and improved system efficiency.



BEFORE — algae overgrown on the clarifier weirs.



AFTER — biofilm controlled and algae eliminated.

NSF/ANSI 60 Certified

EPA FIFRA Registered

USDA Organic

Made in the USA

LET'S GET STARTED

D&Z Worldwide — deepak@dz-worldwide.com • www.dz-worldwide.com
Smarter. Safer. Sustainable.