H_2O_3 SOLUTIONS, INC.

DISTRIBUTOR TECHNOLOGY
AND
PRODUCT GUIDE

1215-C SHANA LANE
ASHEBORO, NORTH CAROLINA 27205
T. 336-626-4263
O. 336-626-0579
www.h203solutions.com

H2O3 SOLUTIONS, INC.

H2O3 Solutions, Inc. has a five-year history of purifying water and air with a patented process called **UltraPur**™ ***Ozone Purification System.*** We produce ozone or O3 with a corona cell, which is made of stainless steel and glass. Our system is effective in a wide variety of applications by accomplishing the same goal every time, completely disinfecting and oxidizing water.

Our competitive edge lies in our patented process, in which we put more ozone in solution by holding the solution under pressure, while using less ozone overall for disinfecting. We are able to put ozone in solution at any flow rate, even with no flow rate, and our process doesn't hinder water pressure.

Our top market line consists of drinking water systems in animal Agriculture. We have installed systems in 29 out of the 38 poultry companies in the US. However, our other market lines center around our ability to clean up the solution and then continue to add ozone in large amounts to create "highly" ozonated water. This highly ozonated water enables us to disinfect surfaces (food or equipment) without the use of chemicals. We also use this powerful ozonated solution to treat wastewater, converting effluent discharge into high quality water for re-use.

Increased political pressures are being placed on those who process and supply water around the world. Drinking water standards are becoming more stringent: the allowable maximum contaminant levels in drinking water are dropping as reflected in recent Clean Water Act standards. These laws will also allow less water to be taken out of the ground. There are many contaminants known to create health issues that do not get as much press attention, but actually create a much greater health risk related to the public.

Governments are aware they are unable to continue the existing water consumption rate. There is pressure to regulate water use and even require some technology for water re-use. Technologies that give the ability to re-use the water available are becoming necessary.

While the standards are becoming more restrictive, the social pressures for increased water consumption are rising dramatically. Because of the lack of water availability, society will not be able to continue at the current consumption rate. The political policy-makers are moving toward more effective water re-use measures in order to reduce demand on surface reservoirs as well as ground water supplies. There will eventually be a system in every home or manufacturing facility to finish (polish) the water to the desired quality level.

Drinking Water

- Stricter testing is required of protozoa counts in potable water. Ozone is the only approved technology that kills protozoa, recognized by EPA.
- Requirements of a lower level of THM (Chlorine by-products) in Municipalities.
- Growing concerns about biofilm in water lines.

Ground Water

- EPA mandatory disinfecting of ground water from hepatitis.
- Increasing mineral and metal contamination.

Waste Water

- EPA is dropping the maximum allowable level of contaminates that can be discharged in streams and rivers.
- Increased pressure to reuse water.

Dental Water and Food Processing

- FDA and ADA are pushing for reduction of bacteria counts in lines and equipment.
- Foods and Food Processing. USDA is reducing acceptable levels of bacteria on food.
- Pressure to reduce chemical use on food products.

THE SCIENCE

O_3

DISINFECTING WITHOUT THE USE OF CHEMICALS

Ozone is "active oxygen", a very powerful oxidizer that occurs in nature. Each ozone molecule is simply an oxygen molecule (O_2 - the oxygen that we breathe) with an extra oxygen atom attached, forming O_3. Unlike traditional chemicals, ozone leaves no harmful residues or by-products. When it has done its job, ozone simply becomes life-giving oxygen again. Our process leaves a high level of dissolved oxygen.

Ozone has repeatedly been proven to purify and sanitize water faster and more effectively than chemicals and traditional methods across all applications. In addition to destroying microorganisms in water, ozone also breaks down the metal and mineral precipitates in pipes, which can then be easily filtered and removed from the source water.

Ozone is 12 times more soluble than oxygen and destroys bacteria 3,000 times faster than chlorine. In addition, ozone protects equipment and pipes from harmful metal and mineral build-up, plus eliminates biofilm and the bacteria that accompany it.

USES OF OZONE

- **Disinfection:** Bacterial: Viral and Cyst Inactivation; Biofouling Control
- **Oxidation of Inorganics:** Iron, Manganese, Organically Bound Heavy Metals, Cyanides, Sulfides, Nitrites, Arsenic
- **Oxidation of Organics:** Color, Tastes & Odors, some Detergents & Pesticides, Phenols, Algae Control, Turbidity Control, Microflocculation (of soluble organics), Pretreatment of Organics for Biological Oxidation, Trihalomethane (THM) Precursor Control

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INABILITIES OF OZONE

- Incapable of oxidizing radon, methane, nitrate ions, calcium, magnesium, bicarbonate, or carbonate ions; consequently, ozone cannot oxidize hardness or alkalinity ions.
- Ozone cannot practically oxidize any of the trihalomethanes, except very slowly.
- Below pH 9, ozone is incapable of oxidizing ammonia at any practical rate.
- Ozone cannot oxidize chloride ion to produce free chlorine at any reasonable rate (but it can rapidly oxidize bromide ion to produce free bromine).

THE TECHNOLOGY

There are two methods to produce ozone. One is with a UV light, which yields a very low concentration of ozone and is not recommended for drinking water applications. The second method is with a corona charged ozone generator, which uses high voltage electricity to break the oxygen molecules and reform them as 0_3.

H_2O_3 uses the corona charged method and our patented process puts ozone in solution more effectively than any other technology on the market today. On each system, a contact tank mixes the ozone with the solution. We create two flows to accomplish complete contact time:

- A downward flow of the water through the contact vessel
- An upward flow of water that's already super ozonated.

We get great mixing from flow, so the ozone comes in contact with the organisms or the organics or any other contaminates in the water before it leaves our system. After the contaminates are pulled out of solution, we then filter with a seven layer multimedia filter. This method removes particles of less then 10 microns. These seven layers do not disintegrate with use. It is recommended to change these layers only once every 8 years.

Our system is tested and fully functional before it leaves our facility. When our customers receive it, the installer simply plumbs the unit in and out, then pours in the media filter (well water applications) and plugs it in. There is no assembly on site. It's easy to install, service and maintain.

3 PRIMARY TARGET APPLICATIONS

1. DRINKING WATER SYSTEMS

2. SURFACE DISINFECTING SYSTEMS

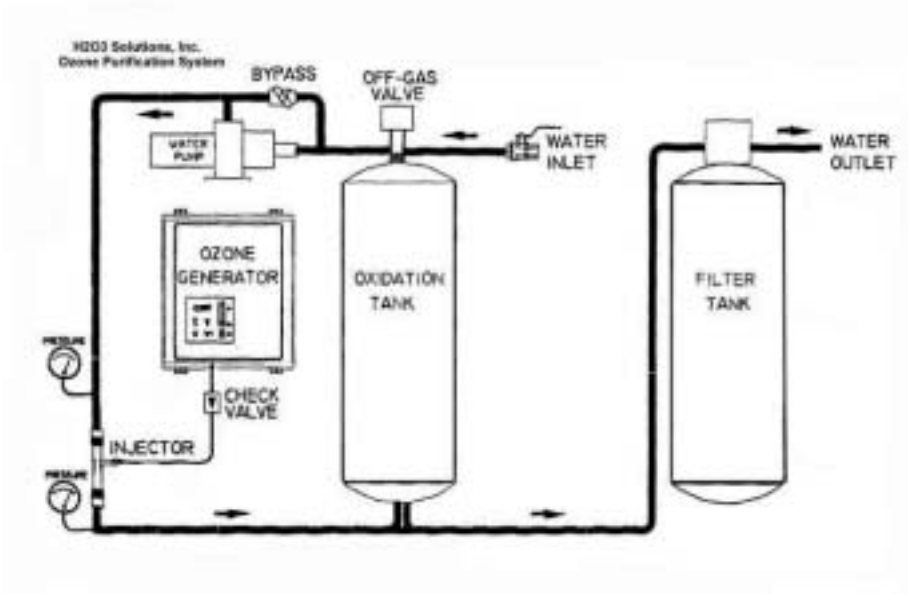
3. WASTEWATER/WATER RE-USE SYSTEMS

H2O3 Solutions uses a patented process system that oxidizes and disinfects water and/or air. Oxidizing and disinfecting is our objective with every application. Our total process is patented and we guarantee that we can purify water that meets FDA approval. We are the only non-operator-approved ozone drinking water system in North Carolina for transient non-community public water supplies.

All of our products operate from the same basic design, and then tailored to each specific application. The products described below are the same system every time, with the exception of:

1. ***Ozone generator size***
2. ***Filter size***
3. ***Pre-filtering and/or post-filtering***

Water Flow Chart for the UltraPur System



DRINKING WATER SYSTEMS

ULTRAPUR™:

This patented process produces high quality water for the entire farm, home, or commercial facility. This drinking water system is more efficient in cleaning up water than any other technology on the market today.

It does this without the use of chemicals and their accompanying health risks. This product is the basic system for the entire H2O3 product line.

Shown: **UPM-2: City Water System**

Shown: **UP- 2: Well Water System**

SURFACE DISINFECTING SYSTEMS

SDS SYSTEM **Surface Disinfecting Systems in Water**

H_2O_3 disinfects surfaces, whether it is equipment or food, chemical-free with highly ozonated water. In highly ozonated water the ozone is not converted back to oxygen.

This system is currently installed in commercial poultry hatcheries for the disinfecting of tray surfaces.

In addition, this product is used in food processing plants, where the disinfection of the equipment, belts and products is required. This system can be made either portable or stationary.

Shown: **Portable Ozone Cart**

EGGUARD™: **Surface Disinfecting Systems in Air and Water**

EGGuard™ is designed to disinfect hatching eggs while on the farm, in the complex or in transport vehicles. Strategically placed outlets disinfect the air without chemicals, killing all bacteria, molds and fungus.

EGGuard™ in solution is used for the disinfecting of table eggs, and yields the same benefits without chemicals but yields complete disinfection.

Both methods leave the cuticle of the egg in tack and allows it to do it's job to protect the inside.

COMMERCIAL AND INDUSTRIAL SYSTEMS

PURESTREAM™: **Waste-Water Treatment Systems (Water Re-Use)**

This product can treat the effluent discharge from a biological wastewater package plant. We can retrofit any wastewater system to produce quality water that can be reused for irrigation or discharged in lakes or streams.

Also, this system allows the customer to continually re-use their water instead of treating it with chemicals or discharging it. Our water re-use system is used in companies such as Coca-Cola and Garner Denver Corporation.

Shown:
200 gallons per minute

COOLING TOWER SYSTEM: **Chillers and Cooling Tower Treatment System**

We design systems to put ozone in chillers and cooling towers for effective water treatment in scale control and the elimination of biofilm.

There are many benefits to ozone in cooling towers. Chemicals are eliminated. Power and water consumption is lowered. Plus, heat exchange efficiency is maximized.

This system comes with remote monitoring via Internet or phone line along with built-in redundant components.

Louisiana Pacific, Charlotte Pipe, and Dillon Yarn Corporation are current customers for chiller and cooling tower applications.

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POOL UNITS

H2O3's pool units are designed to treat pools from 10,000 gallons to 100,000 gallons without the use of chemicals or additional equipment such as mineralizers or chlorinators.

Shown: This system is designed for pools that have self-cleaning bottom jets. Most ozone pool systems are sold without the contact tank as seen in this photo.

REMOTE DRINKING WATER STATIONS

In many parts of the world people are without pure, safe drinking water. With electricity in the form of a generator or AC power, this station will provide clean drinking water in the most remote areas of the world.

This station is equipped with the same UltraPur system used in any of H2O3's other drinking water applications.

The remote drinking water station will supply approximately 10,000 gallons of pure water a day, or an estimated 3500 people.

DISTRIBUTOR PACKAGES

Requirements:

- Non-Pressurized cart unit.
- Water test kit
- Spare parts lists
- Market survey for specific markets
- Annual budget for marketing efforts

Non-pressurized Bucket Test Unit Demo 2000

Pressurized Flow-through Test Unit Demo 4000

EXISTING TECHNOLOGIES

Technologies currently in the marketplace are listed below, along with the reasons why they are less efficient compared to H2O3 Solutions ozonation method of water treatment. The basic methods of water treatment are: Filtration, Aeration, Chemicals, Reverse Osmosis and Water Softeners.

FILTRATION: The trapping of undissolved solids.

- Does not disinfect or oxidize.
- Dissolved solids cannot be filtered.
- Particles have to be oxidized before they can be removed by filtration.
- Drop in water pressure.
- Does not remove biofilm.

AERATION: Bringing air into contact with water.

- The most oxidization you can get into solution is 4 ppm of oxygen.
- There are contact time restraints. You don't have the time to completely disinfect.
- You must always follow with filtration.
- Does not remove biofilm.

CHEMICALS: Injection of different Chemicals.

- Most common is chlorine (to oxidize) and polyphosphate (to prevent oxidation)
- Chlorine combined with organics produce 14,000 known by-products. Some are carcinogenic.
- pH is very important. There's only a window of opportunity for chemicals to be effective.
- Must follow with filtration.
- Dosage and contact time are very important to be effective.
- Government mandates are moving toward less chemical residual.
- Chlorine does not remove biofilm.

REVERSE OSMOSIS: High water pressure forced through a membrane.

- High initial & recurring costs.
- Does nothing to kill bacteria or viruses. It's simply collects contaminates and organisms at the membrane surface.
- Requires large retention tank.
- For each gallon of usable water, 4-5 gallons will be discarded.
- Recontamination of bacteria, viruses, etc. is very easy when changing membranes or if membrane growth occurs.
- Does nothing for biofilm.

WATER SOFTENERS: (Ion Exchange) The exchange of salt for certain minerals, commonly Calcium and Magnesium.

- Does not disinfect
- The higher the contaminate level, the more salt is left in the water.
- 51 Studies out of 9 countries have shown that Calcium and Magnesium have health benefits. Ion exchange removes these beneficial minerals out of solution.
- New regulations are being considered to reclassify the brine discharge.
- Does not remove biofilm.

UV LIGHT: High current of light to fracture and render contaminates unable to multiply.

- Does not destroy protozoa or organically bound bacteria.
- Incoming water must be high quality.
- Only a single point of disinfection.
- Very little light is able to penetrate if the water has color or organic particles.
- Does not remove biofilm.

OZONATION:

- Ozone is 3 molecules of oxygen.
- Best disinfectant available to kill bacteria, viruses, and protozoa.
- Best oxidizer available.
- Short residual left in the water.
- High dissolved oxygen levels (18+ ppm)
- Very effective at destroying biofilm.

BIOFILM: Organics such as bacteria, fungi, protozoa and inorganic surface deposits found on the inside of water supply lines.

OZONE is one of the few technologies that eliminate these deposits.

FACTORS INFLUENCING THE BUILD-UP OF BIOFILM:

- Incoming water quality
- Pipe size
- Water temperature
- Flow velocities
- Pressure changes

***Shown*:** **Pipes installed at the same time for 1 1/2 yrs. Inlet pipe is coated with Manganese. Outlet pipe is clean.**

Required Ozonation Specifications for Transient Non-Community Public Water Systems in North Carolina.

This approval was written using H_2O_3 Solutions' UltraPur Unit. 7/13/01

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1. Installation of the ozone unit must be in a protected enclosure not subject to extreme temperatures: ambient air temperature below 100 degrees F. and above 40 degrees F.

2. Ozone must be applied at a *minimum* dosage of 1.0 PPM with a minimum of two (2) minutes contact time, at the maximum gallons per minute (gpm) rating of the unit.

3. The materials of construction shall not impart toxic materials into the water either as a result of the presence of toxic constituents in materials of construction or as a result of physical or chemical changes resulting from exposure to Ozone.

4. The unit shall be designed to protect the owner/operator against electrical shock.

5. Unit must have surge protection to protect the electrical components.

6. Dryer housing must have HOT warning label.

7. Off-gas (ozone) must be vented outside of the building.

8. A flow control device must be installed to accurately restrict the water flow through the Ozone unit to the maximum design capacity of the unit.

9. A water sampling port for raw water and treated water must be installed.

10. The unit shall be designed and installed to allow the owner/operator access to clean, maintain and service when required.

11. The Ozone Gas Generator must be constructed of stainless steel and be glass lined.

12. A temperature sensitive probe is to be used to turn on the ozone unit. This probe must be sensitive enough to respond to any flow in the inlet line.

13. Ozone generator must have a sensor which shuts off the unit and the well pump when ozone production falls outside of design specifications.

14. Pressure differential across the venturi injector must have automatic shut off of the unit if the differential pressure decreases to 15 pounds per square inch (psi).

15. In the event that the ozonation unit fails during normal operation of a transient, non-community well water supply, utility water (such as toilet flush tanks) may be used. Precautionary measures must be taken such as the boiling of untreated water for potable use or the use of Bottled Water during this time.

16. Establishment must have ozone tester to monitor equipment performance.
    - The potable distribution system must be properly disinfected and sampled prior to potable use if at any time utility water was used without Ozonation.

17. Filtration is necessary if manufacturer recommends it, due to raw water quality.

18. Recommend annual inspection of ozone equipment by distributor, dealer or manufacturer.

Shown: **System used in H_2O_3's transient non-community public water system approval.**
Site test: **Bethany Methodist Church, Franklinville, North Carolina**

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