



*Healthy **Water**. Healthy **Earth**. Healthy **You**!*

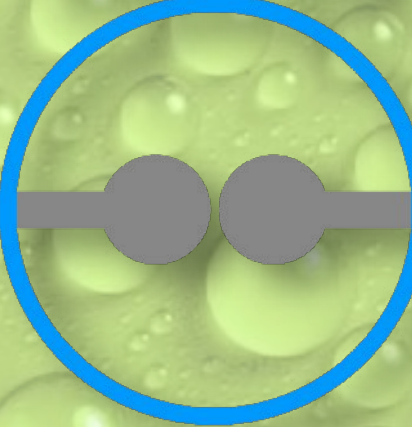
OXYGEN



COPPER



SILVER



ULTRAVIOLET



# **E - Clear Organic Sanitizers Vs Conventional Sanitizing Methods**



# RATING COMPARISON BETWEEN VARIOUS POOL SANITIZERS

10- best  
5- mediocre  
1- worst

\* see additional info, pages 2-10

Swimming Pool	E-CLEAR	Ozonation	Chlorine	Salt Chlorination	Bromine	Ultraviolet	Ionizers
All in one Solution	10	4	8	8	6	4	5
Ease of use & testing	10 /8	3	9	6	7	9	8
INITIAL COST	5	2	8	3	9	2	4
Monthly Chemicals	10	5	1	6	1	4	5
Electricity Usage/cost	8	4	10	4	9	3	5
Consumables	3	3	10	2	10	4	3
Maintenance Costs	9/7	5	8	6	8	7	6
Customer Satisfaction/ HEALTH/ Water QUALITY	10+++	6	1	1	1	10	9
Pool Downtime Due to unbalanced Water	9	7	8	9	8	10	9
Environmentally Friendly/ GREEN TECHNOLOGY	10+++	6	1 - -	1 - - -	1 - -	10	8
Staff hazards	10	7	1	1 - -	1	8	10
Water Conservation	10	8	1 - - -	1 - - -	3	10	9
TOTAL	8.6	5	5.5	3.5	5.3	6.8	6.8

\*notes

All in one solution:

ONLY E-Clear offers an all in one, Chemical free solution to sanitizing and cleaning your swimming pool! Non of the other sanitization options offer that.

Ease of use and testing:

Ease of use is a 10 if subscribed to the air connect service or an 8 if not subscribed

Initial cost:

EcClear is on par with ozonators, chlorinators and chlorine/bromine dosing systems

Maintenance costs:

7 if subscribed to the air connect service. 9 if not subscribed. Due to monthly fees.

Consumables:

Can be in very busy pools but still far less expensive than chlorine/bromine chemicals and on par with the cost of consumables for chlorinators and ozonators.

Ozonation is not a stand alone shouting it requires secondary sanitizers

Chlorine requires proper dosers and a lot of testing equipment and training to test

The advantages and disadvantages of ozone, salt chlorination, chlorine, bromine, ultraviolet, and ionization as pool sanitization method.

Advantages of ECLEAR:

Crystal clear clean soft drinkable pool water

at neutral pH.

Environmentally friendly!

The most healthy sanitizer- it's organic- the way nature cleans water

No dangerous by products

A truly green solution.

No carcinogenic dangerous chemicals in contact with the human body or in the air.

**NO COMPETITION!!**

Advantages of Ozone:

1. **Effective Disinfection:** Ozone is a powerful oxidizing agent that effectively eliminates bacteria, viruses, and contaminants in pool water. It is a strong disinfectant, even more potent than chlorine, and can provide a high level of sanitization.

2. **Reduced Chemical Usage:** Ozone reduces the reliance on traditional chemical sanitizers like chlorine. By using ozone as the primary disinfectant, the need for chlorine or other chemicals can be significantly reduced, leading to lower chemical usage in the pool. This can be beneficial for individuals with chlorine sensitivities or those who prefer a chemical-free swimming experience.

3. **Minimal Byproduct Formation:** Ozone does not leave behind harmful byproducts or residues in the water. Unlike chlorine, which can react with organic matter to form disinfection byproducts (DBPs), ozone breaks down into oxygen molecules after disinfection, leaving no residual chemicals or harmful compounds.

4. **Reduced Skin and Eye Irritation:** Ozone is known to reduce skin and eye irritation commonly associated with chlorine use. Swimmers often report a more comfortable and pleasant swimming experience in ozonated pools, as ozone does not cause the same levels of dryness or irritation to the skin and eyes.

5. **Water Clarity and Quality:** Ozone helps improve water clarity by oxidizing and breaking down organic compounds, reducing turbidity and removing contaminants. It enhances the overall quality of the pool water, making it clearer and more visually appealing.

#### Disadvantages of Ozone:

1. **Additional Equipment and Costs:** Ozone systems require the installation of additional equipment, such as ozone generators and contact tanks. These components can be expensive, increasing the upfront costs of implementing an ozone system in a swimming pool.

2. **Ozone Dissipation:** Ozone is unstable and dissipates quickly. Continuous ozone generation is necessary to maintain effective disinfection, which requires consistent operation of the ozone system. Without proper control and monitoring, ozone levels can drop below the desired disinfection threshold.

3. **Limited Residual Protection:** Unlike chlorine, ozone does not provide long-lasting residual sanitization. Ozone's effectiveness diminishes quickly once it is generated, meaning that additional sanitizers may still be required to maintain continuous disinfection.

4. **Maintenance Requirements:** Ozone systems may require more frequent maintenance and replacement of components compared to other sanitization methods. Ozone generators and other equipment need regular inspection, cleaning, and potential replacement, which can incur additional maintenance costs.

5. **Higher Upfront Costs:** Ozone systems may have higher upfront costs compared to other pool sanitization methods. The initial investment required for the installation of ozone equipment and infrastructure can be a deterrent for pool owners with limited budgets.

#### Advantages of Salt Chlorination:

1. **Convenient Chlorine Generation:** Salt chlorination systems convert salt into chlorine through a process known as electrolysis. This eliminates the need for handling and storing chlorine directly, providing a convenient and automated way to generate chlorine for pool sanitation.

2. **Steady Release of Chlorine:** Salt chlorination systems maintain a consistent and steady release of chlorine into the pool water. This helps to ensure a continuous and adequate level of sanitization without the need for frequent manual adjustments.

3. **Reduced Skin and Eye Irritation:** Saltwater pools are often reported to be less irritating to the skin and eyes compared to traditional chlorine pools. The lower chlorine levels and absence of chloramines in saltwater can result in reduced instances of dryness, itching, and redness after swimming.

4. **Lower Chemical Odor:** Saltwater pools generally have a milder and more pleasant odor compared to traditional chlorine pools. The absence of chloramines, which are responsible for the distinct "chlorine smell," contributes to a more enjoyable and odor-free swimming experience.

5. **Compatibility and Retrofitting:** Salt chlorination systems can be compatible with existing pool systems by retrofitting salt chlorinators. This allows pool owners to upgrade their pools to saltwater without requiring extensive modifications or replacement of the entire pool system.

#### Disadvantages of Salt Chlorination:

1. **Higher Initial Costs:** Salt chlorination systems can be more expensive to install initially compared to traditional chlorine systems. The cost of purchasing and installing the salt chlorinator, along with the necessary plumbing modifications, can be a significant investment.

2. **Corrosion Potential:** The high salt levels in saltwater pools can contribute to increased corrosion of certain pool equipment, surfaces, and fixtures if not properly managed. Regular maintenance and proactive measures are necessary to minimize the potential corrosive effects.

3. **Salt and Chlorine Level Monitoring:** Salt chlorination systems require regular monitoring and adjustment of salt and chlorine levels to maintain optimal sanitization. The need for testing kits and periodic adjustments can add to the overall maintenance and operating costs of a salt chlorinated pool.

4. **Saltwater Sensation:** Saltwater pools may have a different feel compared to traditional freshwater pools. Some swimmers may find the saltwater sensation unusual or unfamiliar, which can be a subjective disadvantage for certain individuals.

5. **Compatibility Limitations:** Salt chlorination may not be suitable for pools with specific water chemistry or certain pool surface materials. High levels of calcium hardness, total dissolved solids (TDS), or specific types of pool finishes may not be compatible with saltwater systems, requiring alternative sanitization methods.

#### Advantages of Chlorine:

1. **Widely Available and Affordable:** Chlorine is readily available and affordable, making it a commonly used and accessible pool sanitizer. It can be purchased in various forms such as liquid, tablets, or granules from pool supply stores or retailers.

2. **Effective Disinfection:** Chlorine is highly effective at killing bacteria, viruses, and algae in the pool water. It provides reliable sanitization and helps maintain water quality by eliminating harmful microorganisms and controlling the growth of algae.

3. **Residual Protection:** Chlorine provides residual protection by remaining active in the water, continuously sanitizing and disinfecting the pool. This helps to maintain water quality over time, even in the presence of organic matter or increased bather load.

4. **Versatility and Flexibility:** Chlorine can be used in various forms to suit different pool types and user preferences. Liquid chlorine, chlorine tablets, or granular chlorine can be selected based on the pool size, ease of use, or specific application requirements.

5. **Combination with Other Sanitizers:** Chlorine can be used in combination with other sanitization methods for enhanced effectiveness. This allows pool owners to employ a multi-layered approach to pool sanitization, providing an added layer of protection against contaminants.

#### Disadvantages of Chlorine:

1. **Skin and Eye Irritation:** Chlorine can cause skin and eye irritation, especially at higher concentrations or when improperly balanced. Swimmers may experience redness, dryness, itching, or discomfort after swimming in chlorinated pools, particularly individuals with sensitive skin or pre-existing conditions.

2. **Disinfection Byproduct Formation:** When chlorine reacts with organic matter such as sweat, urine, or leaves, it can form disinfection byproducts (DBPs). Some DBPs, such as chloramines and trihalomethanes, are known to have adverse health effects and can be potentially harmful.

3. **Distinct Odor and Taste:** Chlorine can impart a distinct odor and taste to the pool water, which some individuals find unpleasant. The "chlorine smell" often associated with chlorinated pools can be off-putting to certain swimmers.

4. **Maintenance and Monitoring:** Chlorine levels in the pool water need to be regularly monitored and adjusted to maintain optimal sanitization. This requires the use of testing kits and the addition of chlorine products as needed, which can add to the maintenance responsibilities and costs.

5. **Potential Fading or Discoloration:** Chlorine can cause fading or discoloration of certain pool materials and surfaces over time. Prolonged exposure to high chlorine levels or improper maintenance can result in damage to pool liners, decking, or equipment.

#### Advantages of Bromine:

1. **Effective Disinfection:** Bromine is a powerful sanitizer that effectively kills bacteria, viruses, and algae in pool water. It provides reliable sanitization and helps maintain water clarity and quality.

2. **Stability in High Temperatures:** Unlike chlorine, bromine remains stable and effective in high-temperature environments. This makes it suitable for hot tubs, spas, or pools with elevated water temperatures.



3. **Reduced Chloramine Formation:** Bromine has a lower tendency to form chloramines compared to chlorine. Chloramines, responsible for the “chlorine smell” and associated irritations, are less likely to occur in bromine-treated pools.

4. **Longer-Lasting Residual Sanitization:** Bromine provides longer-lasting residual protection in the water compared to chlorine. This helps maintain water quality between treatments and can be advantageous for pools with irregular usage patterns.

5. **Less pH Sensitivity:** Bromine is less sensitive to pH changes compared to chlorine. It remains effective in a wider pH range, reducing the need for frequent pH adjustments and providing greater stability in water chemistry.

#### Disadvantages of Bromine:

1. **Higher Cost:** Bromine can be more expensive than chlorine, increasing the overall cost of pool maintenance. The higher cost of bromine tablets or products, especially for larger pools, can be a financial disadvantage.

2. **Skin and Eye Irritation:** Bromine can still cause skin and eye irritation, although generally to a lesser extent than chlorine. Some individuals may still experience dryness, redness, or itching after swimming in brominated pools.

3. **Odor and Taste:** Some bromine compounds can produce unpleasant odors or tastes in the pool water. While typically milder than chlorine, these odors can still be noticeable and disliked by certain swimmers.

4. **Slower Disinfection:** Bromine requires more time to effectively disinfect the pool water compared to chlorine. This may result in longer treatment times or the need for higher bromine concentrations for proper sanitization.

5. **Limited Algae Control:** Bromine may be less effective in controlling certain types of algae compared to chlorine. Some specific strains of algae may require additional treatments or supplemental products to maintain adequate control.

#### Advantages of Ultraviolet (UV) Treatment:

1. **Chemical-Free Disinfection:** UV treatment provides chemical-free disinfection, eliminating the need for traditional sanitizers such as chlorine or bromine. This can be advantageous for individuals with chemical sensitivities or those seeking a more eco-friendly pool system.

2. **Effective Against a Broad Range of Microorganisms:** UV treatment effectively inactivates a wide range of microorganisms, including bacteria, viruses, and algae. It provides reliable sanitization and helps maintain water quality.

3. **No Disinfection Byproducts:** UV treatment does not produce disinfection byproducts (DBPs) like chlorine or bromine. This eliminates the potential health risks associated with DBPs and ensures a cleaner and healthier swimming environment.

4. **Reduced Chemical Usage:** UV treatment reduces the reliance on chemical sanitizers. While supplemental sanitizers may still be required, the reduced chemical usage can lead to cost savings and a milder swimming experience.

5. **Minimal Maintenance:** UV systems typically require minimal maintenance compared to other sanitization methods. The UV lamps or bulbs may need periodic replacement, but there are no ongoing chemical adjustments or monitoring requirements.

#### Disadvantages of Ultraviolet (UV) Treatment:

1. **Lack of Residual Protection:** UV treatment does not provide residual protection in the water. Once the water passes through the UV system, it is no longer actively sanitized. This means that additional sanitizers or chemicals may be required to maintain continuous disinfection.

2. **Limited Contact Time:** UV treatment effectiveness relies on sufficient contact time between the UV light and the water. Factors such as flow rate, water clarity, and UV lamp condition can influence the contact time, requiring careful system design and monitoring.

3. **Ineffectiveness Against Particulate Matter:** UV treatment is primarily effective against microorganisms but does not remove particulate matter, such as dirt or debris, from the pool water. Filtration or other treatment methods may be necessary to address these non-living contaminants.

4. Potential Maintenance and Replacement: UV lamps or bulbs have a limited lifespan and need periodic replacement, typically every 1-2 years. The cost of replacement lamps should be considered as part of the overall maintenance expenses.

5. Effectiveness Against Specific Organisms: While UV treatment is effective against a broad range of microorganisms, its efficacy against certain types of algae or resistant microorganisms may be limited. Additional treatments or supplemental sanitizers may be required to address specific challenges.

#### Advantages of Ionization:

1. Reduced Chemical Usage: Ionization reduces the reliance on traditional chemical sanitizers such as chlorine or bromine. It provides an alternative method of sanitization, leading to lower chemical usage and potentially fewer chemical-related irritations.

2. Effective Against Microorganisms: Ionization systems can effectively control bacteria, viruses, and algae in pool water. The release of copper or silver ions creates an environment that inhibits the growth of these microorganisms.

3. Extended Residual Protection: Ions released by ionization systems can provide extended residual protection in the water, reducing the need for frequent manual adjustments or constant monitoring.

4. Potential Algae Prevention: Ionization can help prevent algae growth in the pool. Copper ions, in particular, have algicidal properties and can inhibit the growth and development of various types of algae.

5. Minimal Odor and Taste: Ionized pools typically have minimal or no odor, and the water can have a more pleasant taste compared to chlorine or bromine-treated pools. This can enhance the overall swimming experience for many individuals.

#### Disadvantages of Ionization:

1. Maintenance and Monitoring: Ionization systems require regular maintenance and monitoring to ensure proper ion levels. Electrodes may need cleaning or replacement, and ion levels should be periodically checked and adjusted, adding to the maintenance responsibilities.

2. Potential Staining: Improperly balanced ionization systems or high ion levels can cause staining on pool surfaces, including the liner, walls, or equipment. Regular monitoring and proper water balance are necessary to prevent such staining issues.

3. Compatibility Concerns: Ionization may not be suitable for pools with specific water chemistry or high levels of hardness or minerals. Water balancing products or additional treatments may be required to achieve the ideal water conditions for ionization.

4. Effectiveness Against Certain Organisms: While ionization systems are effective against many microorganisms, they may not be as effective in controlling certain types of algae or resistant microorganisms. Additional treatments or supplemental sanitizers may be necessary to address specific challenges.

5. Initial Investment: The upfront cost of installing an ionization system can be higher compared to traditional chlorine or bromine systems. The cost of the ionizer unit, electrodes, and necessary equipment should be considered as part of the initial investment.

In conclusion, each pool sanitization method—ozone, salt chlorination, chlorine, bromine, ultraviolet (UV), and ionization—comes with its own set of advantages and disadvantages. Ozone offers effective disinfection and reduced chemical usage but requires additional equipment and maintenance. Salt chlorination provides convenient chlorine generation and reduced skin irritation but can be more expensive initially and potentially cause corrosion. Chlorine offers affordability and versatility but can lead to skin and eye irritation and the formation of disinfection byproducts. Bromine provides stable disinfection and longer-lasting residual protection but can be more costly and still cause some skin and eye irritation. UV treatment offers chemical-free disinfection and minimal maintenance but lacks residual protection and requires careful monitoring of contact time. Ionization reduces chemical usage and offers extended residual protection but requires maintenance and may cause staining issues.

Here are ten disadvantages for each of the pool systems.

#### Ozonation:

1. Requires additional equipment and installation costs.
2. Ozone is unstable and dissipates quickly, requiring continuous ozone generation.
3. Ozone is not a long-lasting residual sanitizer, so additional sanitizers may still be required.
4. Ozone systems may require more frequent maintenance and replacement of components.
5. Ozone systems may have higher upfront costs compared to other pool sanitization methods.
6. Ozone can be corrosive to certain pool equipment and materials if not properly managed.
7. Ozone systems may require professional installation and expertise.
8. Ozone generators can produce ozone gas, which can be harmful if inhaled in high concentrations.
9. Ozone effectiveness can be influenced by factors such as pH, temperature, and water flow rate.
10. Ozone may not effectively combat certain types of algae or resistant microorganisms.

#### Chlorine:

1. Chlorine can cause skin and eye irritation, especially at high concentrations.
2. Chlorine use requires regular monitoring and adjustment to maintain appropriate levels.
3. Chlorine can produce disinfection byproducts (DBPs) when reacting with organic matter, which can be harmful.
4. Chlorine may have a distinct smell and taste, which some people find unpleasant.
5. Chlorine levels may need to be adjusted during heavy pool usage or weather changes.
6. Chlorine can fade or discolor certain pool materials and surfaces over time.
7. Some individuals may have allergic reactions or sensitivities to chlorine.
8. Chlorine can be harmful if ingested in large amounts.
9. Storing and handling chlorine can be hazardous if proper precautions are not taken.
10. Chlorine effectiveness can be reduced by sunlight and UV exposure, requiring additional stabilizers.

#### Salt Chlorination:

1. Salt chlorination systems can be more expensive to install initially compared to traditional chlorine systems.
2. The saltwater can corrode certain pool equipment and surfaces if not properly maintained.
3. Requires regular monitoring and adjustment of salt and chlorine levels.
4. Salt chlorination systems may require additional maintenance and replacement of the salt cell.
5. Salt chlorination may not be suitable for pools with specific water chemistry or certain pool surface materials.
6. Salt chlorination systems can be affected by power outages, requiring reprogramming or recalibration.
7. High salt levels can be corrosive to metal fixtures and equipment in the pool area.
8. Salt chlorinators may require periodic cleaning and descaling of the cell.
9. Saltwater pools may have a different feel compared to traditional freshwater pools.
10. Salt chlorination systems may not effectively combat certain types of algae or resistant microorganisms.

#### Bromine:

1. Bromine can be more expensive than chlorine, increasing the cost of pool maintenance.



2. Bromine levels may need regular monitoring and adjustment to maintain proper sanitization.
3. Bromine can cause skin and eye irritation, although generally less compared to chlorine.
4. Some bromine compounds can produce unpleasant odors or tastes in the pool water.
5. Bromine effectiveness can be influenced by pH levels and water temperature.
6. Bromine tablets can dissolve slowly, requiring proper distribution in the pool water.
7. Bromine can fade or discolor certain pool materials and surfaces over time.
8. Bromine can be less effective in outdoor pools exposed to direct sunlight.
9. Bromine may require special handling and storage precautions to avoid contamination.
10. Bromine may not effectively combat certain types of algae or resistant microorganisms.

#### Ultraviolet:

1. UV systems require electricity to operate, resulting in ongoing energy costs.
2. UV systems do not provide residual protection, requiring additional sanitizers for continuous disinfection.
3. Proper flow rate and contact time with UV light are essential for effective disinfection.
4. UV lamps require periodic replacement, typically every 1-2 years, for optimal performance.
5. UV systems may not be effective against certain types of algae or resistant microorganisms.
6. UV systems may not remove other non-living contaminants, such as dirt or debris, from the pool water.
7. UV systems may have specific installation requirements and restrictions.
8. UV effectiveness can be influenced by factors such as water clarity and turbidity.
9. UV lamps can become less efficient over time, requiring regular monitoring and maintenance.
10. UV systems may not be suitable for pools with high levels of suspended particles or organic matter.

#### Ionizers:

1. Ionizers require regular maintenance, including electrode cleaning and replacement.
2. Ionizers may have a higher upfront cost compared to some other pool sanitization methods.
3. Ionizers may not be suitable for pools with specific water chemistry or high levels of hardness or minerals.
4. Ionizers may not provide residual sanitization, requiring the use of additional sanitizers.
5. The effectiveness of ionizers may be influenced by factors such as pH, temperature, and water flow rate.
6. Ionizers can cause staining on pool surfaces if not properly balanced and maintained.
7. Ionizer electrodes may require periodic replacement or cleaning to maintain performance.
8. Ionizers may not effectively combat certain types of algae or resistant microorganisms.
9. Ionizers may require specific water balance adjustments to optimize performance.
10. Ionizers may not be as effective in pools with heavy bather loads or high organic debris.

#### ECLEAR disadvantages

1. Water filtration and movement in the pool must be very good
2. PH must be strictly maintained between 6.8-7.2



3. Very high swimload pools, consumables can get expensive
4. You may need to run the pumps and filters a little longer since there are no aggressive chemicals being produced by the ECLEAR system, so the water may need longer to remain clear and clean.
5. Monthly service fee, if chosen, is extra

financial disadvantages related to running a swimming pool using different sanitization methods:

#### Ozonation:

1. Ozonation systems require additional equipment and installation costs, which can be expensive.
2. Continuous ozone generation and maintenance may lead to higher electricity costs.
3. Ozone systems may require more frequent maintenance and replacement of components, incurring additional expenses.
4. Ozone systems may have higher upfront costs compared to other pool sanitization methods.
5. Ozone systems may require professional installation and expertise, which can increase costs.
6. Ozone generators can be expensive to repair or replace if they malfunction.
7. Ozone systems may require the use of additional sanitizers, adding to the overall chemical cost.
8. Ozone effectiveness can be influenced by factors such as pH, temperature, and water flow rate, requiring adjustments and monitoring.
9. Ozone systems may require periodic testing and verification of ozone levels, which can incur additional costs.
10. Ozone may not effectively combat certain types of algae or resistant microorganisms, leading to the need for additional treatments or products.

#### Chlorine:

1. Chlorine costs can add up over time, especially for larger pools or pools with high usage.
2. Regular monitoring and adjustment of chlorine levels require testing kits or meters, which can be an ongoing expense.
3. Chlorine can produce disinfection byproducts (DBPs) when reacting with organic matter, potentially leading to additional treatment requirements or costs.
4. Unstable chlorine levels due to environmental factors or heavy usage can result in more frequent chemical adjustments and purchases.
5. Storing and handling chlorine properly requires the use of appropriate containers and safety measures, incurring additional costs.
6. Chlorine can cause fading or discoloration of certain pool materials, leading to potential repair or replacement costs.
7. Maintaining chlorine stabilizer levels to prevent degradation from sunlight exposure may require additional stabilizer products.
8. Treatment of chlorine-related skin and eye irritation can result in the purchase of additional pool care products or remedies.
9. Shock treatments and superchlorination, occasionally necessary for water quality maintenance, can increase chlorine costs.
10. Periodic replacement of chlorine feeders, dispensers, or equipment can add to the overall expenses of running a chlorine-based pool.

#### Salt Chlorination:

1. The initial installation cost of a salt chlorination system can be higher compared to traditional chlorine systems.
2. Salt chlorination systems require the periodic purchase of salt, which contributes to ongoing expenses.



3. Saltwater pools may require more frequent maintenance and replacement of certain pool equipment due to corrosion, resulting in added costs.
4. Monitoring and adjusting salt and chlorine levels require testing kits or meters, which can be an ongoing expense.
5. High salt levels can be corrosive to metal fixtures and equipment in the pool area, potentially leading to repair or replacement costs.
6. Salt chlorination systems may require periodic cleaning and descaling of the salt cell, which can involve additional products or professional services.
7. The compatibility of salt chlorinators with existing pool systems or equipment may necessitate modifications or upgrades, increasing costs.
8. Saltwater pools may have different water chemistry requirements, leading to the need for additional pool chemicals or balancing products.
9. The need for periodic salt cell replacement adds to the overall maintenance expenses of a salt chlorinated pool.
10. Specialized maintenance or troubleshooting for salt chlorination systems may require professional services, resulting in additional costs.

#### Bromine:

1. Bromine can be more expensive than chlorine, increasing the overall cost of pool maintenance.
2. Regular monitoring and adjustment of bromine levels require testing kits or meters, which can be an ongoing expense.
3. Bromine tablets or products for continuous sanitation need to be purchased regularly, contributing to overall costs.
4. Some bromine compounds can produce unpleasant odors or tastes in the pool water, potentially requiring additional water treatment products.
5. Bromine can cause fading or discoloration of certain pool materials, which may lead to repair or replacement costs.
6. Bromine effectiveness can be influenced by pH levels and water temperature, requiring additional monitoring and potential adjustments.
7. The need for periodic shock treatments or oxidation of bromine-treated water can add to chemical expenses.
8. Maintaining proper water balance for bromine sanitation may require additional chemical products.
9. Bromine-resistant algae or microorganisms may require specialized treatments or products, increasing costs.
10. The use of bromine tablets may result in more frequent replenishment and disposal, contributing to ongoing expenses.

#### Ultraviolet:

1. UV systems require electricity to operate, leading to ongoing energy costs.
2. UV lamps or bulbs have a limited lifespan and need to be replaced periodically, incurring replacement expenses.
3. UV systems do not provide residual protection, necessitating additional sanitizers or chemicals, increasing overall costs.
4. Proper flow rate and contact time with UV light are essential for effective disinfection, potentially requiring adjustments or additional equipment.
5. UV systems may not be effective against certain types of algae or resistant microorganisms, requiring supplementary treatments or products.
6. UV lamps can become less efficient over time, reducing their effectiveness and requiring monitoring and potential replacement.
7. UV systems may require professional installation or maintenance services, resulting in added expenses.
8. Water clarity and turbidity can affect the efficiency of UV systems, potentially requiring additional water treatment or clarification products.
9. UV systems may have specific installation requirements or restrictions, leading to modifications or upgrades, increasing costs.



10. UV systems may have higher upfront costs compared to some other pool sanitization methods, impacting the initial investment.

#### Ionizers:

1. Ionizers may have a higher upfront cost compared to some other pool sanitization methods.
2. Regular maintenance and cleaning of ionizer electrodes can involve additional products or professional services, incurring ongoing expenses.
3. Ionizers may require the use of additional sanitizers or chemicals, contributing to overall chemical costs.
4. Ionizers may not be suitable for pools with specific water chemistry or high levels of hardness or minerals, potentially requiring water treatment or conditioning products.
5. The effectiveness of ionizers may be influenced by factors such as pH, temperature, and water flow rate, necessitating adjustments and potential additional expenses.
6. Ionizers may not provide residual sanitization, requiring the use of supplementary sanitizers, adding to chemical costs.
7. Ionizers may require periodic replacement or maintenance of electrodes, incurring additional expenses.
8. Ionizers may not effectively combat certain types of algae or resistant microorganisms, necessitating additional treatments or products.
9. The need for specialized water balance adjustments for ionizer systems may require additional chemical products.
10. Ionizers may not be as effective in pools with heavy bather loads or high organic debris, potentially requiring additional maintenance or treatment products.

health based disadvantages for each of the pool systems.

#### Ozonation:

1. Ozone exposure can cause respiratory irritation, coughing, and difficulty breathing, especially in high concentrations.
2. Improperly maintained ozone systems can lead to the production of harmful byproducts, such as nitrogen oxides or ozone-depleting substances.
3. Ozone can exacerbate symptoms in individuals with pre-existing respiratory conditions, such as asthma or allergies.
4. Ozone exposure may increase the risk of lung-related illnesses and respiratory infections.
5. Ozone is not a long-lasting residual sanitizer, potentially leaving the water susceptible to microbial growth.
6. Ozone does not effectively control certain types of parasites, such as *Cryptosporidium*, which can cause waterborne illnesses.
7. Ozone can react with organic matter, such as sweat or urine, to form disinfection byproducts (DBPs), which can be harmful to health.
8. Ozone is a powerful oxidant and can cause irritation or damage to the eyes, skin, and mucous membranes.
9. Ozone exposure during swimming or water activities can lead to the formation of reactive compounds on the water surface, potentially irritating the respiratory system.
10. Ozone systems require proper installation, maintenance, and monitoring to ensure safe and effective operation.

#### Chlorine:

1. Chlorine can cause skin and eye irritation, leading to redness, itching, and discomfort.
2. Prolonged exposure to chlorine fumes or vapor can irritate the respiratory system, causing coughing, wheezing, or shortness of breath.
3. Chlorine use can lead to the formation of disinfection byproducts (DBPs), such as chloramines and trihalomethanes, which have been associated with respiratory issues and certain types of cancer.



4. Chlorine can exacerbate symptoms in individuals with asthma, allergies, or chemical sensitivities.
5. Chlorine absorption through the skin or inhalation can disrupt the balance of beneficial bacteria on the skin and in the respiratory tract.
6. Chlorine exposure can cause dryness and irritation of the skin, leading to rashes or eczema flare-ups.
7. Chlorine can interact with sweat, urine, or other organic matter to form chloramines, which can cause eye and respiratory irritation.
8. Chlorine can react with hair and skin oils to form chloroform and other volatile compounds, which can be inhaled or absorbed through the skin.
9. High chlorine levels in indoor pools can contribute to poor indoor air quality, leading to respiratory symptoms and discomfort.
10. Overexposure to chlorine or accidental ingestion can lead to nausea, vomiting, abdominal pain, and other gastrointestinal symptoms.

#### Salt Chlorination:

1. Salt chlorination systems can generate chlorine, which can still cause skin and eye irritation similar to traditional chlorine use.
2. High salt levels in the pool water can dry out the skin and contribute to skin irritation or eczema flare-ups.
3. Saltwater pools can disrupt the natural balance of oils on the skin and hair, leading to dryness or damage.
4. Saltwater exposure can cause eye discomfort, redness, and temporary vision disturbances.
5. The production of chlorine in salt chlorination systems can still result in the formation of disinfection byproducts (DBPs), which can have adverse health effects.
6. Saltwater pools may not effectively control certain types of parasites, such as *Cryptosporidium*, which can cause waterborne illnesses.
7. Ingesting saltwater from the pool can upset the electrolyte balance in the body and lead to dehydration or other health issues.
8. Saltwater pools can contribute to increased corrosion of dental work or metal jewelry worn by swimmers.
9. Saltwater pools may not be suitable for individuals with salt-sensitive conditions, such as hypertension or certain kidney disorders.
10. Salt chlorination systems require proper maintenance and monitoring to ensure appropriate salt and chlorine levels for safe and effective operation.

#### Bromine:

1. Bromine can cause skin and eye irritation, similar to chlorine, leading to redness, itching, and discomfort.
2. Prolonged exposure to bromine fumes or vapor can irritate the respiratory system, causing coughing, wheezing, or shortness of breath.
3. Bromine absorption through the skin or inhalation can disrupt the balance of beneficial bacteria on the skin and in the respiratory tract.
4. Bromine use can lead to the formation of disinfection byproducts (DBPs), which have been associated with respiratory issues and certain types of cancer.
5. Bromine can exacerbate symptoms in individuals with asthma, allergies, or chemical sensitivities.
6. Bromine exposure can cause dryness and irritation of the skin, leading to rashes or eczema flare-ups.
7. Bromine can react with sweat, urine, or other organic matter to form bromamines, which can cause eye and respiratory irritation.
8. Bromine can react with hair and skin oils to form volatile compounds, which can be inhaled or absorbed through the skin.
9. High bromine levels in indoor pools can contribute to poor indoor air quality, leading to respiratory symptoms and discomfort.
10. Overexposure to bromine or accidental ingestion can lead to nausea, vomiting, abdominal pain, and other gastrointestinal symptoms.

#### Ultraviolet:

1. UV systems are not a standalone sanitizer and may require additional chemical disinfection methods to maintain proper water quality.
2. UV systems do not provide residual protection, leaving the water susceptible to microbial regrowth.
3. UV systems may not effectively control certain types of parasites, such as Cryptosporidium, which can cause waterborne illnesses.
4. UV systems require proper maintenance and periodic replacement of UV lamps to ensure optimal disinfection performance.
5. Direct exposure to UV light can be harmful to the eyes and skin, requiring appropriate safety precautions during maintenance or repair.
6. Inadequate UV dosage or improper installation can lead to insufficient disinfection, posing health risks to swimmers.
7. UV systems may require regular monitoring and adjustment of flow rates and contact time to ensure effective disinfection.
8. UV systems can be sensitive to water clarity and turbidity, requiring additional treatment or filtration to optimize UV effectiveness.
9. UV systems may not effectively combat certain types of algae or resistant microorganisms, necessitating additional treatments or products.
10. UV systems require regular monitoring and maintenance to prevent malfunctions or failures that can compromise water safety.

#### Ionizers:

1. Ionizers may not provide adequate disinfection on their own and may require additional sanitizers or chemicals to maintain water quality.
2. Ionizers may not effectively control certain types of parasites, such as Cryptosporidium, which can cause waterborne illnesses.
3. Ionizers may not provide residual sanitization, leaving the water vulnerable to microbial regrowth.
4. Ionizers require proper maintenance and cleaning of electrodes to ensure effective operation, avoiding the risk of bacterial or algae growth.
5. Ionizer effectiveness can be influenced by factors such as pH, temperature, and water flow rate, requiring adjustments and monitoring.
6. Ionizers may not effectively combat certain types of algae or resistant microorganisms, necessitating additional treatments or products.
7. Ionizers may not be as effective in pools with heavy bather loads or high organic debris, potentially leading to water quality issues.
8. Ionizers may require the use of additional chemicals to adjust water balance or address specific water chemistry concerns.



# The Benefits of E-Clear vs chemicals in Pools

The benefits can be divided into 5 Categories:

- 1. Environmentally friendly:** E-clear systems use advanced oxidation processes to eliminate contaminants, reducing or eliminating the need for harmful chemicals. This makes it a greener option that is safer for the environment.
- 2. Health benefits:** Chemicals used in traditional pool cleaning can cause skin and eye irritation, respiratory issues, and allergies for some individuals. E-clear systems help minimize these health risks by reducing or eliminating the need for chemicals.
- 3. Water quality:** E-clear systems maintain superior water quality by effectively oxidizing and removing organic and inorganic compounds, including bacteria, viruses, algae, and other contaminants. This results in cleaner, clearer, and healthier water for swimmers.
- 4. Cost-effective:** Although the initial investment for an E-clear system may be higher, it can lead to long-term cost savings. By reducing the need for chemicals, maintenance costs and chemical purchases can be significantly reduced over time.
- 5. Easy maintenance:** E-clear systems are generally easy to maintain, requiring minimal effort compared to traditional pool cleaning methods. This can save pool owners time and hassle.

## The Dangers and Risks of using Conventional Chemicals in Pools

- 1. Health hazards:** Traditional pool chemicals, such as chlorine and bromine, can cause skin and eye irritation, respiratory problems, and allergic reactions in some individuals. They may also release toxic fumes, especially when improperly handled or mixed. E-clear systems reduce the need for these chemicals, minimizing health risks.
- 2. Chemical imbalances:** Improper use or overuse of traditional chemicals can lead to imbalances in pool water chemistry. This can result in discomfort for swimmers and potential damage to pool surfaces and equipment. E-clear systems help maintain balanced water chemistry, reducing the risk of imbalances.
- 3. Environmental impact:** Chemicals used in conventional pool cleaning can have a negative impact on the environment. They can contaminate water sources, harm aquatic life, and contribute to overall water pollution. E-clear systems minimize chemical usage, making them more environmentally friendly.
- 4. Handling and storage hazards:** Chemicals require careful handling, storage, and disposal to prevent accidents and environmental contamination. They can be hazardous if not managed properly. E-clear systems eliminate or significantly reduce the need for chemical storage and handling, reducing potential risks.
- 5. Odor and taste:** Traditional chemicals can give off strong odors and impart an unpleasant taste to pool water. E-clear systems provide a more pleasant swimming experience with reduced chemical odors and improved water taste.



# The Financial Benefits of E-Clear vs chemicals in Pools

- 1. Reduced chemical purchases:** E-clear systems minimize or eliminate the need for traditional pool chemicals like chlorine, bromine, and algaecides. This can lead to substantial cost savings over time since you won't have to regularly purchase these chemicals.
- 2. Lower maintenance costs:** Traditional chemical-based pool maintenance requires regular testing, balancing, and adjusting of chemical levels. This often involves purchasing testing kits and additional chemicals to maintain proper water chemistry. With an E-clear system, the need for frequent chemical adjustments is reduced, resulting in lower maintenance costs.
- 3. Extended equipment lifespan:** Harsh chemicals used in conventional pool maintenance can accelerate wear and tear on pool equipment, such as pumps, filters, and heaters. E-clear systems, by reducing chemical usage, help extend the lifespan of these equipment components, reducing the frequency of repairs or replacements.
- 4. Water conservation:** E-clear systems can contribute to water conservation efforts by allowing for longer water usage before the need for draining and refilling. This can be particularly beneficial in regions where water is scarce or costly, leading to financial savings.
- 5. Energy efficiency:** Some E-clear systems are designed to operate efficiently, consuming less energy compared to traditional pool equipment. This can result in lower energy bills and long-term cost savings.

While the initial investment for an E-clear system may be higher than purchasing traditional pool chemicals, the long-term financial benefits, including reduced chemical purchases, maintenance costs, and equipment longevity, can make it a cost-effective choice for pool owners.

## The Environmental Benefits of E-Clear vs Chemicals in Pools

- 1. Reduced chemical usage:** E-clear systems minimize or eliminate the need for chlorine, bromine, and other chemical additives typically used in pool maintenance. This reduction in chemical usage significantly reduces the release of potentially harmful substances into the environment.
- 2. Water conservation:** With an E-clear system, the need for frequent draining and refilling of pool water is reduced. This helps conserve water resources, especially in regions where water scarcity is a concern. Additionally, fewer chemicals in the water mean that it can be safely reused for other purposes, such as irrigation.
- 3. Protection of aquatic ecosystems:** Traditional pool chemicals can find their way into water sources through backwashing or accidental spills, potentially harming aquatic ecosystems. By minimizing chemical usage, E-clear systems help protect local waterways, aquatic life, and the overall ecological balance.
- 4. Reduced air pollution:** Chemicals used in conventional pool maintenance can release harmful fumes, especially when improperly handled or mixed. These fumes contribute to air pollution and can be detrimental to human health. E-clear systems, with their reduced reliance on chemicals, help mitigate air pollution and create a healthier environment for both pool users and surrounding areas.
- 5. Minimized chemical runoff:** Chemicals added to pools can wash off during rainfall or splash out during pool use, eventually reaching storm drains and natural water bodies. E-clear systems, by reducing the overall chemical load in pool water, help minimize the potential for chemical runoff and the associated water pollution.

By opting for the E-clear system, pool owners can make a positive environmental impact by reducing chemical usage, conserving water, protecting aquatic ecosystems, minimizing air pollution, and preventing chemical runoff.



# **The Dangers of using CHLORINE**

**1. Health risks to people:** Chlorine can cause skin and eye irritation, especially in individuals with sensitive skin. Prolonged exposure to high chlorine levels can lead to respiratory problems, exacerbate asthma symptoms, and cause allergic reactions in some people. Chlorine disinfection byproducts, such as chloramines, can also be harmful when inhaled or ingested.

**2. Environmental impact:** Chlorine and its byproducts can have detrimental effects on the environment. When chlorinated pool water is discharged into natural water bodies, it can harm aquatic life, disrupt ecosystems, and contribute to water pollution. Additionally, the manufacture and transport of chlorine involve energy consumption and the release of greenhouse gases.

**3. Pool equipment and infrastructure damage:** High chlorine levels can corrode pool equipment, such as pumps, filters, and heaters, leading to frequent repairs or replacements. Chlorine can also cause discoloration or degradation of pool surfaces and materials over time.

**4. Disinfection byproduct formation:** When chlorine reacts with organic matter, such as sweat, urine, and body oils, disinfection byproducts can form. These byproducts, including chloramines and trihalomethanes, have been associated with potential health risks, including respiratory and eye irritation, and have been linked to certain health concerns in long-term exposure.

# **The Dangers of Using BROMINE**

Bromine, like chlorine, is commonly used as a disinfectant in swimming pools. While it shares similarities with chlorine, the use of bromine in swimming pools can also pose risks to people, the environment, and the pool itself:

**1. Health risks to people:** Bromine, when present in high levels, can cause skin and eye irritation similar to chlorine. Some individuals may be more sensitive to bromine than others, leading to allergic reactions or respiratory issues. Additionally, bromine disinfection byproducts, such as bromamines, can be harmful when inhaled or ingested.

**2. Environmental impact:** Bromine and its byproducts can have adverse effects on the environment. Discharging brominated pool water into natural water bodies can harm aquatic life and ecosystems. Bromine production and transport also involve energy consumption and potential environmental impacts.

**3. Pool equipment and infrastructure damage:** Similar to chlorine, high bromine levels can corrode pool equipment and surfaces, leading to damage and the need for repairs or replacements.

**4. Disinfection byproduct formation:** When bromine reacts with organic matter, it can form disinfection byproducts, including bromamines. These byproducts can contribute to eye and respiratory irritation and may have long-term health implications in cases of prolonged exposure.



# The Dangers of using OZONE

Ozone is sometimes used as a disinfectant in swimming pools, but it's important to be aware of potential risks associated with its use:

- 1. Health risks to people:** Ozone, when present in high concentrations, can cause respiratory irritation and discomfort, particularly in individuals with respiratory conditions such as asthma. Ozone can also react with other chemicals in the pool water to form disinfection byproducts that may pose health risks.
- 2. Environmental impact:** Ozone, when released into the environment, can contribute to air pollution. Ozone gas can react with pollutants in the air and form smog, which can be harmful to human health and ecosystems. Additionally, the process of ozone generation requires energy consumption, which may contribute to greenhouse gas emissions.
- 3. Pool equipment and infrastructure damage:** Ozone can be corrosive to certain materials and components of pool equipment, such as rubber seals, gaskets, and certain types of plumbing. This can lead to premature deterioration and the need for repairs or replacements.
- 4. Lack of residual disinfection:** Unlike chlorine or bromine, ozone does not provide a long-lasting residual disinfectant in the pool water. It is effective at the point of application but does not provide continuous disinfection as the water circulates throughout the pool. Therefore, an additional disinfectant may be required to maintain consistent water sanitation.

# The Dangers of Using SALT CHLORINATION

Salt chlorination, also known as saltwater pools, offers a different approach to pool disinfection. It's important to be aware of potential risks associated with salt chlorination:

- 1. Health risks to people:** Saltwater pools convert salt into chlorine through the process of electrolysis. While the chlorine produced is generally less harsh than traditional chlorine, it can still cause skin and eye irritation, especially in individuals with sensitive skin. Additionally, high levels of chlorine can pose respiratory risks and exacerbate asthma symptoms.
- 2. Environmental impact:** Saltwater pool systems discharge salt-laden water into the environment. In coastal areas or regions with poor drainage, the high salt content can harm plants, soil quality, and nearby water bodies. It's important to properly manage the discharge of saltwater pool water to prevent ecological damage.
- 3. Corrosion and maintenance concerns:** Saltwater can be corrosive to certain pool surfaces, metal fixtures, and equipment if not properly maintained. This can lead to accelerated wear and tear, increased maintenance costs, and the need for repairs or replacements.
- 4. Salt system maintenance:** Salt chlorinators require regular maintenance, including monitoring salt levels, cleaning the salt cell, and ensuring proper system operation. Neglecting maintenance can lead to inadequate chlorine production, imbalanced water chemistry, or reduced system lifespan.
- 5. Water balance challenges:** Saltwater pools can be more prone to water balance challenges, including pH fluctuations and high calcium hardness levels. Proper monitoring and maintenance of water chemistry are essential to prevent scaling, cloudy water, and other water quality issues.



## 4 SEPERATE, ORGANIC, NATURAL, CHEMICAL FREE PROCESSES TO SANITIZE AND PURIFY WATER

**EACH SEPARATE PROCESS INDIVIDUALLY RECOGNISED BY REGULATORY AUTHORITIES AS A WIDELY ACCEPTED METHOD OF WATER PURIFICATION**



Using an advanced electrolysis process the e-clear oxygenator technology generates powerful natural oxidizers, hydroxyl (OH), atomic oxygen (O1), hydrogen peroxide (H2O2) and oxygen (O2) from the water molecule itself.

Dissolved oxygen in the pool is combined with copper ionization to provide a long lasting healthy and natural sanitizing residual in the water.

Since e-clear oxidizers are more powerful than chlorine or ozone and since e-clear produces a sanitizing residual in the water e-clear pools do not require chlorine or other sanitizing chemicals.

The unique feature of e-clear is that swimmers are only exposed to the healthy sanitizing residuals – dissolved O2 and the copper ionization, since OH, O1 and H2O2 are produced within a sealed chamber away from the swimmer.

The powerful oxidizers, OH, O1 and H2O2, combined with O2 and copper, effectively inactivates algae, viruses, bacteria, yeast, fungi, protozoa and pathogens

EQUIPMENT

REACTION

PRODUCT

CLEANSING ACTION

RESULT

### OXYGEN



**E-CLEAR PATENTED: 2003/2934**



Smaller amounts of **HYDROGEN PEROXIDE** is produced. Readily converting back into H2O Leaving little residual effect. Can also be added as a Liquid to boost the E-Clear System



**MOLECULAR OXYGEN** is a powerful stable Oxidiser producing a high ORP in water. A high Oxygen Residual is maintained in the water, disinfecting and super-oxygenating The water.



The **HYDROXYL ION** is a very powerful yet shortlived oxidiser. Far more powerful than chlorine or ozone it quickly converts back into H2O, leaving no residual effect



**ATOMIC OXYGEN** an oxidant more powerful than chlorine or ozone. Quickly converts back into H2O leaving no residual effect A byproduct of the AOP PROCESS

### COPPER



Developed by NASA for the Apollo missions Copper Ionization is the most effective means in destroying algae, fungi, viruses, bacteria and protozoa in water .

A low 0.5ppm residual is maintained, well below the 2.0ppm maximum level stipulated by the EC98/83 Directive for human consumption.

Since a residual of copper is maintained constantly in the water, microorganisms DNA is disrupted making them Unable to reproduce and thus are quickly eliminated

Copper is a widely accepted method of safely controlling microorganisms, without the addition of dangerous chemicals, in many industries.

### SILVER



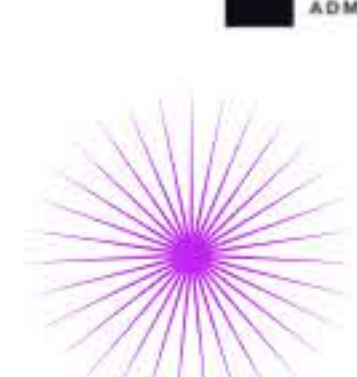
A low 50ppb residual is maintained in the water.

Silver is world's most powerful anti-bacterial agent.

An immune booster, treats psoriasis, excema, heals wounds quickly and safely. Anti-virus, anti- inflammatory, treats and prevents sinus infection and allergies. The system produces colloidal silver which can be safely drunk to promote general well being and good health.

Silver Ionization is widely accepted around the world in almost all industries and in all countries, as a safe, chemical free method of saltization.

Silver effectively disables the DNA of Microorganisms



Approved by numerous agencies worldwide, including the US FDA As a primary means of purifying water.

Chemical free disinfection. Quick, reliable , cost effective.

Ultraviolet energy affects the genetic core of microorganisms rendering them unable to function.

More effective than chlorine in destroying microorganisms.

Helps break down oils and fats in the water.

Effectively destroys chloramine gas and prevents its production.

Kills 99.99% of algae, bacteria, viruses and protozoa suspended in the water column.

**ORGANIC, SUPER-SOFT, NATURAL, SPARKLING, CLEAN OXYGEN-RICH WATER**



**WATER FREE OF MICROORGANISMS**



**WATER THAT HEALS THE BODY**



**WATER THAT'S SAFE TO DRINK**



# How AIR CONNECT Works



Connect to Local  
Wi-Fi network



**E - C L E A R O N**  
T E C H N O L O G I E S OXYGEN  
**C L O U D**



**E - C L E A R O N**  
T E C H N O L O G I E S



**CUSTOMER AND/OR SERVICE COMPANY**  
Download the NEW E-CLEAR  
Air Connect App

CUSTOMER CHOOSES IN APP  
WHICH SERVICE TO USE

**Register E-Clear  
For WARRANTY Purposes  
(Free APP Download)**

**OR**

**Monitor E-CLEAR ONLY  
(Monthly app fee)**

**OR**

**Monitor and Control E-CLEAR  
(Monthly APP fee)**

**E - C L E A R O N**  
T E C H N O L O G I E S OXYGEN  
**SERVICE TECHNICIAN**