



RADICAL WATERS

Natural Hygiene Solutions



Product Catalogue

SANERA
CANADA



CLEANING SOLUTIONS



European Biocidal Products Regulation: Article 95 Listed Company



Table of Content

About Radical Waters	3
What is ECA Technology	4
How do the Radical Waters ECA Generators work?	6
Applications	7
Brewing and beverage industry	8
Cooling towers and ponds	8
Wastewater treatment	8
Food and dairy industry	8
Meat industry	8
Fruit and vegetable washing	9
Horticulture	9
Drinking water	9
Swimming pools	9
Hotels and public facilities	9
Medical facilities	10
Fishing and Fish processing	10
Livestock industries	10
Veterinary	10
Oil and gas industries	10
Why use dangerous chemicals when there are safer more environmentally friendly alternatives?	11
Our Certificates and Approvals	14
ECA Hygiene Generators	16
High Salt Single Stream N.O.W Generators	16
Low Salt Single Stream N.O.W Generators	17
Differences between Radical Waters Low Salt and High Salt ECA Generators	18
Low Salt Dual Stream N.O.W Generators	19
Catholyte only N.O.W Generators	20
Alkaline Water N.O.W Generators	21
Custom Radical Waters N.O.W. Generatros	22
Contact Details	23



About Radical Waters

The Radical Waters ECA N.O.W (Electrochemical Activation of Water) Hygiene Generators are made using state of the art European Technology. Our ECA Generators ensure the consistent production of quality ECA solutions litre after litre.

The Generators are easy to operate and require basic inputs; food grade salt, soft water and electricity, offering an environment-friendly hygiene solution that addresses various industries, and their applications. By using the Radical Waters N.O.W ECA Generators, our Customers can generate tailor-made cost effective, antimicrobial solutions on-site and as they need them.

Radical Waters is the global leader in Electrochemically Activated Water (ECA) technology.

Radical Waters (Pty) Ltd has spent decades focused on developing and commercialising “Green” ECA technology. Radical Waters has installed ECA Generators on 6 continents and in 23 countries, primarily for blue chip companies.

Our ECA products are used in a wide range of markets formerly dependent on chemicals, for controlling contamination and microbial infection.

Radical Waters customers operate in beverage production, meat and seafood, sauce manufacture, milling, hospitality, animal husbandry, wound therapy, agriculture, aquaculture and water treatment industries among others.

Under the chairmanship of Dion Friedland, the Group restructured to meet growing demand and provide improved service to its worldwide customer base of blue chip international companies.

The holding company, Radical Waters International, Ltd, owns three subsidiary companies: Radical Waters International (UK) LLP, headquartered in London, which administers global distribution

relationships in all countries outside of the Rand Monetary Area; Radical Waters (Pty) Ltd, located in South Africa which source generators from our OEM manufacturer and provides marketing, sales Installation and technical support to our customers and distributors. Finally, Radical Waters Intellectual Property (Pty) Ltd, maintains and is expanding a considerable patent portfolio. Twenty-three patents have been granted covering meat processing, animal husbandry, agricultural yield enhancement, dentistry, medicine, borehole rehabilitation and microbial resistance management. Significant patents are pending in the general beverage field and dental market, as well as unique applications in the starch and grain industries.

Radical Waters ECA N.O.W technology has proven highly effective in combating the spread of infectious disease, including major public health threats of *M. tuberculosis*, MRSA, *E.coli*, Norovirus, Avian Influenza, HIV, SARS-CoV-2, Polio Virus, *Helicobacter pylori* and Legionella.

What is ECA Technology

The Radical Waters, Electrolyzed Water (EW, EOW or EO, also known as electrolyzed oxidizing water or ionized water solution) technology, is the process of passing a diluted saline solution through a specially designed electrolytic cell in order to modify its functional properties.



Depending on the Generator Family (Single Stream Low Salt, Single Stream High Salt or Dual Stream Low Salt), the Radical Waters ECA Generators produce two basic types of solutions:

1. **Anolyte** solutions are strong oxidizing solutions with a pH range of 6-7 and an Oxidation-Reduction Potential (ORP) of 850 – 950 mV. Anolyte can be used as a broad spectrum antimicrobial agent to kill all types of microorganisms including viruses, fungi, bacteria, mould and spores. The major constituent of Anolyte is Hypochlorous acid (HOCl) a highly effective anti-microbial solution that is harmless to humans, animals and plants.
2. **Catholyte** solutions are antioxidantizing, mild alkaline solutions with a pH range of 10.5 to 12.5 and an ORP of –600 to –900mV. Catholyte solutions can be used as degreasers or detergents. The major constituent of Catholyte is Sodium Hydroxide (NaOH) a well known detergent.

What does ECA Technology do?

Anolyte produced from the ECA N.O.W Generators has demonstrated the ability to purify water, remove pesticides and herbicides and destroy microorganisms, including:

- *Enterococcus hirae*
- *Escherichia coli*
- *Pseudomonas aeruginosa*
- *Staphylococcus aureus*
- *Aspergillus brasiliensis*
- *Rhizopus stolonifer*
- *Candida albicans*
- Bacteriophage P001
- Bacteriophage P008
- *Serratia marcescens* (highly resistant strain)
- Feline coronavirus (allow claim for coronavirus)
- Poliovirus (allow claims effective against all viruses)
- Adenovirus (allow claims effective against all viruses)
- Murine norovirus (allow claims effective against all viruses)

...As a hard-surface disinfectant Anolyte application on a daily basis for more than a decade has demonstrated that microorganisms do not develop immunity to Anolyte over time...

Based on extensive research, the Radical Waters ECA solutions are:

- environmentally friendly
- non-toxic to both humans, animals and plants
- requires no special handling
- powerful biocide (anolyte)
- can be safely disposed of in sewage systems
- is fast-acting
- can be used at all stages of disinfection and cleaning
- at recommended concentrations, does not bleach surfaces or materials
- can be applied in liquid, ice or aerosol (fog) form
- is hypoallergenic
- yields no toxic by-products,
- leaves no synthetic chemical residues
- is generated on-site:
 - o eliminating handling and storage of dangerous chemicals
 - o produced fresh, in required quantities and required concentrations

Anolyte contains, Hypochlorous Acid (HOCl) that is a highly potent bactericide. Microorganisms such as *Escherichia coli* when exposed to Hypochlorous Acid lose viability within seconds. *Escherichia coli* is a major cause of food and water-borne infections in humans.

In addition to killing bacteria Anolyte is effective in breaking down Biofilms which protect the bacteria from the action of the Hypochlorous acid.

As a hard-surface disinfectant Anolyte application on a daily basis for more than a decade has demonstrated that microorganisms do not develop immunity to Anolyte over time. This makes it possible to apply anolyte generated by Radical Waters ECA Generators in a number of areas directly related to personal health and safety.



How does the Radical Waters ECA Generators work?

The Radical Waters family of ECA Generators, utilize patented cells from our OEM to effectively deliver electrolyzed water solutions (Anolyte and Catholyte) using a 0.15 -0.4 % brine solution as precursor.

The patented cells are used in all Radical Waters ECA N.O.W Generators, with differences only found in the hydraulic layout. These differences allow Radical Waters to offer 3 distinct categories of ECA N.O.W Generators:

1. High Salt single stream ECA Generators.
2. Low Salt single stream Generators.
3. Low Salt Dual stream Generators.

Apart from the three main categories of ECA Generators, Radical Waters also offer the following sub-categories:

Catholyte only generators; High Salt Generators with modified hydraulics to produce catholyte only.

Alkaline Water Generators; specifically designed to produce ionized alkaline water for human consumption.

Custom Generators; Generators that produce low output as measured in litres per hour, but with a very high FAC (free available Chlorine) concentration.

The ECA N.O.W Generator cells are manufactured in different sizes with output capacity ranging from 20LPH to 1200LPH of Anolyte per cell. Using a combination of cells and hydraulic arrangements allows for the manufacture of ECA Generators with an output up to 6000LPH for both the High Salt and Low Salt families. Low Salt Dual Stream Generators are available up to 300 LPH of Anolyte and 300 LPH of Catholyte.



Applications

Depending on the application, Anolyte or Catholyte from the Generators can either be dosed directly into your application or alternatively diverted into a buffer tank for later use. Integrating the ECA Generator with your application can be done using an Electrical conductivity or FAC sensor, a controller & dosing pump.

The ECA N.O.W Generators are controlled by a PLC with an easy to operate HMI (Human Machine Interface) allowing the end user to easily produce Anolyte in the case of Single Stream Generators or anolyte and catholyte in the case of Dual Stream Generators.

Average cost for generating 1000 litres of Anolyte in a number of European and North American Countries is 1 Euro, making Anolyte a very cost-effective alternative to many presently used chemicals.

Radical Waters has identified the following industries for sales and marketing focus:

- clean in place ("CIP") for food and beverage processing
- meat, fish and poultry processing
- drinking water disinfection and waste water treatment
- cooling towers and cooling system water treatment
- dairy production and processing
- agricultural grow-out and processing
- livestock industries and livestock breeding
- ballast water treatment
- aquaculture
- medical and health care
- oil & gas industry

Radical Waters focuses on these markets because we either have industry leading experience or patents that gives us a competitive advantage.



Brewing and beverage industry

Radical Waters pioneered the use of ECA in the beverage industry for CIP applications and holds the patent for this application in many countries. Radical Waters currently serve the major global soft drink and beer producers and we continually add more customers. Other than the CIP applications, Radical Waters ECA N.O.W Generators can also be used for disinfecting water supplies, tunnel pasteurizers, bottle washing and cleaning of conveyor and transport systems.

The use of Radical Waters ECA N.O.W Generators result in significant savings as it allows processes to be run at lower temperatures or even cold and the water to be reclaimed and recycled.

Cooling towers and ponds

Anolyte produced by Radical Waters ECA N.O.W Generators effectively controls Legionella and other bacteria maintaining a safe and healthy environment. The powerful disinfecting solution Anolyte, also destroys biofilm yet is no more corrosive than tap water.



Wastewater treatment

The addition of Anolyte to waste water can reduce bacterial counts to safe levels without contaminating the environment.



Meat industry

Bacterial contamination of meat is an ever present problem. ECA is ideally suited to surface cleaning of preparation areas, packing cases and transport systems yet without the problems associated with traditional chlorine based chemicals.



Fruit and vegetable washing

Anolyte is a highly effective disinfection agent for washing of Fruit and Vegetables both whole and pre-cut, increasing the shelf life and providing a safer product for consumers.



Horticulture

Misting or spraying with ECA Anolyte offers effective bacterial, fungus & algae control. Disinfecting irrigation water improves growth of plants & vegetables and increase crop yield without additional use of fertilizers.

Special single stream low salt ECA Generators are available that use potassium Chloride (KCl) as the precursor instead of Sodium Chloride (NaCl). The residual Potassium in the anolyte acts as a foliar feed, increasing yield even further.

Drinking water

Radical Waters ECA Anolyte is approved for use as a disinfecting agent for drinking water making it safe for consumption without the unpleasant smell and taste associated with conventional chlorine based water treatment and without the risk of generating unwanted by products normally associated with Chlorine based disinfection.



Swimming pools

Radical Waters on-site Anolyte ECA N.O.W Generators ensure a safe swimming environment without the unpleasant smell or eye stinging effects of traditional chlorine based treatments. Anolyte is safer for staff as they do not have to handle potentially dangerous alkaline or acidic chemicals.

Hotels and public facilities

Legionella is a major health problem in facilities having large water systems where areas of the water system are not always in use such as hotel rooms in low season.

The unused areas can result in the build-up of Legionella or other health endangering bacteria within the water system. The addition of Radical Waters Anolyte to hot & cold water systems can



prevent the need for costly cold & high temperature flushing.



Medical facilities

Due to its non-toxicity & non-corrosive nature Radical Waters ECA Anolyte is ideal for surface sterilization or ambient air disinfection through misting of medical facilities to help prevent bacterial infection, viruses & pathogens. Cold sterilization of medical instruments, or surface cleaning of walls, furniture and floors, eliminates/reduces other chemical usage. Suitable for use in laundries to provide linen disinfection.

Fishing and Fish processing

Radical Waters ECA N.O.W Generators are suitable for onboard ship sterilization of drinking and ballast water. Anolyte can also be added to water used in ice making machines for the fishing industry to ensure a safer product as it is processed and packed on-board.

Anolyte has been shown to be highly effective in destroying bacteria such as *Vibrio Cholerae* and *E. coli* making a safer product for consumers.



Livestock industries and livestock breeding

Radical Waters ECA Anolyte provides general disinfection of surfaces and equipment. It can be used as a disinfecting or misting medium for aerobic and anaerobic bacterial control. As a drinking water additive it reduces mortality, promotes fodder assimilation and improves the general health of the animal.



Veterinary

Anolyte increases vitality and resistance, and improves fertility. It provides a residue free treatment of mastitis, and assists with diarrhoea and other infections. Better feed stuff utilization. Effectively controls major microorganisms that lead to disease.



Oil and gas industries

ECA Anolyte and Catholyte solutions have been used to stimulate and enhance oil and gas production and to improve performance of drilling solutions. Anolyte is a highly effective alternative to bactericides that are non-biodegradable or bio-accumulative. As a bactericide, Anolyte is selective, targeting bacteria responsible for microbial-induced corrosion and slime while being safe to humans.

Why use dangerous chemicals when there are safer more environmentally friendly alternatives?

Every year people get hurt or even killed in chlorine gas-related accidents. Incidents are due to delivery system issues or the manual mixing of incorrect cleaning and disinfection chemicals.

Chlorine & its chemical compounds are extremely effective as disinfecting agents. A balance to maintain the safety of the food and water supply chain whilst protecting the health & lives of those working in these areas, is required.

Using Radical Waters N.O.W Generators, it is possible to generate Hypochlorous acid, a potent disinfectant, we call Anolyte, safely on site by using a process that combines salt, water & electricity. Hypochlorous Acid, or Anolyte is known as the most powerful part of all chlorine based disinfection agents.

At concentrations significantly lower than traditional chlorination with an ORP of +850 to +950mV and pH of 6.5, it can achieve a log8 reduction of *Escherichia coli* within 10 seconds.

As an added bonus, our disinfection solutions are classed as non-toxic and biodegradable under EU guidelines, which helps protect both people & the environment. All these benefits are coupled with the possibility of making substantial cost savings in many applications, as on site production is substantially cheaper than using traditional chlorine based chemicals.

The ECA N.O.W Generators can reduce energy and water usage, as the solutions allow some processes to be carried out at ambient temperatures, enabling water to be reclaimed and recycled.

The benefits of Radical Waters on site ECA Hygiene Generators

- The low active chlorine concentration of Anolyte diluted in water does not result in any toxicity effects or the production of any toxic by-products.
- The Electrochemical Activation process breaks the hydrogen bonds in water resulting in "micro water" which allows Anolyte to penetrate microscopic pores, fissures and cracks in pipelines, tanks and surfaces, thereby reaching and eliminating previously unreachable microorganisms, ensuring complete disinfection of the target surface.
- Anolyte effectively eliminates biofilm and algae from water distribution systems.
- Anolyte is "free rinsing" i.e. any surface, tank or pipeline can be used immediately after the application of Anolyte without the need for a final rinse.
- Anolyte doesn't harm the original, natural properties of the water.
- Anolyte can be stored for later use.
- Dosing of Anolyte does not require any special equipment.
- High level of safety: Both the ingredients (water and salt) and final product (Anolyte) are non-toxic or hazardous.



Why Radical Waters hygiene technology is better than traditional chemicals:

- Although seemingly analogous to chlorine, Anolyte is unique and clearly superior to sodium hypochlorite in the destruction of spores, bacteria, viruses and other pathogen organisms on an equal residual base. Sodium hypochlorite in concentration of 5% is effective only in disinfection, but not sterilization. Sodium hypochlorite is not effective against cysts (Guardia, Cryptosporidium). Sodium Hypochlorite at an equivalent pH does not produce “micro water” and is not effective in the removal of Biofilm.
- Most of the pathogens, particularly waterborne, develop resistance to Sodium hypochlorite over time. Anolyte application, as a water disinfectant on a daily basis for more than ten years, has demonstrated that microorganisms did not developed resistance to Anolyte.
- The required contact time for Anolyte is lower for a similar result than other Sodium Hypochlorite.
- Sodium Hypochlorite loses its activity during long-term storage & poses a potential danger of gaseous chlorine emissions during storage.
- Anolyte is totally soluble.
- Microbial efficiency is between pH 4 to 9, although Radical Waters promotes the use of pH neutral Anolyte.
- Anolyte is minimally corrosive, primarily due it’s low concentrations.
- The reaction of Anolyte and organic materials in water produces much lower quantities of trihalomethanes and other disinfecting byproducts of chlorine based products.
- Anolyte eliminates existing scale & biofilm build-up plus any harboured pathogens, within scale or the dissolved solids. It also stops new scale forming within fresh water supplies. The use of Anolyte for Chlorination within a building does not require the water services to be closed off during treatment .

Typical layout of the Radical Waters System

Every Radical Waters N.O.W hygiene management system consists of:

- 1 x Radical Waters ECA N.O.W Generator (could be more)
- 1 x Anolyte storage tank for single stream High or Low Salt Generators
- 2 x Storage tanks for Anolyte and Catholyte Low Salt dual stream generators.
- 1 x Brine preparation tank
- 1 x Water softener (if soft water is not available)
- 2 x Sediment filters
- 2 x Shut off hand valves

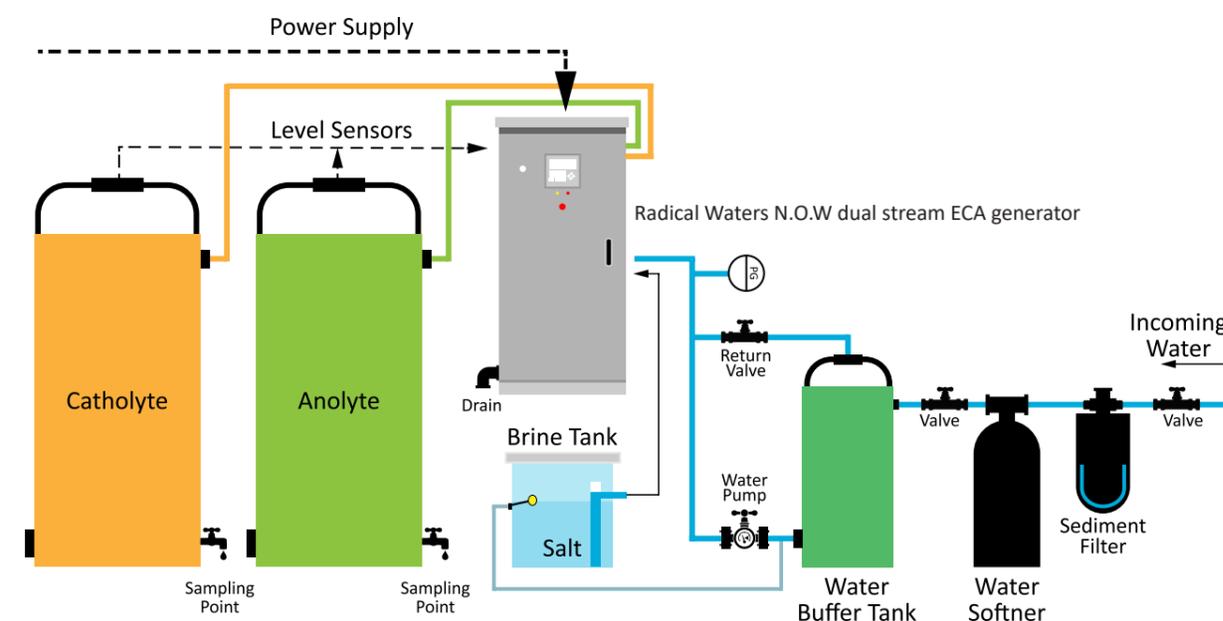
Optionally the installation may require:

- Constant pressure water supply system and control electronics
- Water buffer tank

Our Natural Hygiene Solutions, generically known as Anolyte and Catholyte, are produced through a process known as electrochemical activation of water, or ECA.

Ref. www.radicalwaters.com

Anolyte and/or Catholyte produced by the **Radical Waters ECA N.O.W Generator** is collected in a suitable sized Storage tank/s. Depending on the application, the Anolyte and/or Catholyte is then dosed into the customer application system, much the same way as with current chemicals



Installation diagram for a Radical Waters N.O.W Low Salt dual stream ECA generator



Our Certificates and Approvals

Below are the accreditations and/or approvals and test reports Radical Waters and their distributors have received throughout the years:

South Africa:

- South African Department of Health – “Analyte solution does not present a food safety hazard and therefore we have no objection to its use”.
 - NRCS Registration for ActSol®* LS+ (NRCS/8054/295520/88).
 - SGS South Africa (Pty) Ltd – Complies with the requirements of a safe organic disinfectant with no harmful residues.
 - Kosher approval for ActSol® LS+ where Kosher foods meet the requirements of Jewish law.
 - Halaal approval ActSol® LS+ where Halaal means permitted, allowed, lawful or legal. In relation to food or drink it means that the food or drink is lawful, permitted or allowed for Muslims.
 - BIOCON safety test reports:
 - o Acute Oral toxicity, median lethal dose (LD50) of Analyte, Catholyte and the combination of both
 - o Acute skin irritation potential of Analyte, Catholyte and the combination of both
 - o Acute eye irritation potential of Analyte, Catholyte and the combination of both
- * ActSol LS+ is the registered trademark of Low Salt anolyte produced by our ECA Generators

European Union:

- Regulation (EU) No 528/2012 (Biocide Products Regulation):
 - o Radical Waters (Pty) Ltd is listed in the Article 95 of Regulation (EU) No 528/2012 of the

- o European Parliament and of the Council of 22 May 2012 concerning the making available on the market and use of biocidal products.
- o The entry is “Active chlorine generated from sodium chloride by electrolysis (Redefined from Active Chlorine: manufactured by the reaction of hypochlorous acid and sodium hypochlorite produced in situ) and Active chlorine released from hypochlorous acid (Redefined from Active Chlorine: manufactured by the reaction of hypochlorous acid and sodium hypochlorite produced in situ)” allowed for Product Types PT1, PT2, PT3, PT4, PT5 and PT11.
- Organic status of Analyte as electrolyzed water in the EU:
 - o Abstract from EGTOP (Expert Group for Technical Advice on Organic Production) Final Report on Cleaning and Disinfection (https://ec.europa.eu/info/sites/default/files/food-farming-fisheries/farming/documents/final_report_egtop_on_cleaning_disinfectant_en.pdf):
 - o The substances listed in Annex VII(1) have been authorized for organic production in EU. In the Group’s (Expert Group for Technical Advice on Organic Production) opinion, there is a broad consensus that these substances (listed in Annex VII(1) are in line with the objectives and principles of organic production.
 - o In the Group’s opinion, the use of electrolysed water is similar to the use of sodium hypochlorite (listed in Annex VII(1)).

It may therefore be used for all purposes for which sodium hypochlorite is authorized, but not for any other purposes. For the time being the Group sees no need to mention electrolyzed water explicitly.

United States:

- FDA (US Food and Drug Administration):
 - o FDA 1997 – No Objection to the use of ECA technology for food processing applications.
 - o FDA 2010 – Letter to Radical Waters – Aqueous chlorine solutions are permitted for use as antimicrobials. No further approvals are needed from FDA
- USDA FSIS (United States Department of Agriculture Food Safety and Inspection Service)
 - o FSIS 1998 – No objection to the use of ECA in meat, poultry or egg products.
 - o FSIS 7120.1 – Approved as safe and suitable ingredient used in the production of meat, poultry and egg products.
- CFR (Code of Federal Regulations):
 - o 40 CFR 180.940 - active and inert ingredients for use in antimicrobial formulations (Food-contact surface sanitizing solutions): Hypochlorous acid up to 200ppm.
 - o 7 CFR 205.605 - Non-agricultural (nonorganic) substances allowed as ingredients in or on processed products labelled as “organic” or “made with organic (specified ingredients or food group(s))”: Hypochlorous acid - generated from electrolyzed water.
 - o 7 CFR 205.601 - Synthetic substances allowed for use in organic crop production: Hypochlorous acid - generated from electrolyzed water.
 - o 7 CFR 205.603 - Synthetic substances allowed for use in organic livestock production: Hypochlorous acid - generated from electrolyzed water.
- EPA (Environmental Protection Agency):
 - o Our ECA device OEM has got an EPA establishment number – 96504-EST-1
 - o Hypochlorous acid is listed in List N of EPA of USA: Products with Emerging Viral Pathogens AND Human Coronavirus claims for use against SARS-CoV-2

- U.S. Department of Health and Human Services:
 - o Pasteurized Milk Ordinance (PMO):
 - On-site generation of ECA generated Hypochlorous acid that is produced onsite and used as a sanitizer for the sanitization of multi-use containers, utensils and equipment.
 - ECA included in PMO and criteria for use published.

Rest of the World:

Canada:

- Health Canada – Letter of No objection for the use of active chlorine solution (<=200ppm) for sanitation procedure of food contact equipment and surfaces in food processing establishments.
- Health Canada – Analyte registered as a “Hand Wash/Cleaner” as a cosmetic.

Ireland:

- Approval from the Irish Department of Agriculture, Food and Marine to market Analyte as a biocide under Product Types PT1, PT2 and PT4.

Zimbabwe:

- Zimbabwe ministry of Health and Food Safety approved the Analyte product called “Ano-Care Watershield” for water disinfection.
- Standards Association of Zimbabwe (SAZ) approved Analyte as a general disinfectant.
- Medical Control Authority of Zimbabwe (MCAZ) approved “Ano-Care” products for various uses in the agricultural sector.

Other Registrations:

ECA Generators:

- CE Mark (conforms with European Union manufacturing standards)
- ISO 9001.2008 for the OEM manufacturing facility
- NSF/ANSI Standard 61 Drinking water system components – Health effects – all components used in the generators comply with this standard.

ECA Hygiene Generators

High Salt Single Stream N.O.W Generators

Radical Waters High Salt single stream ECA N.O.W Generators were developed for use where corrosion is not an issue, and are ideally suited for use in animal husbandry, agriculture, aquaculture, surface cleaning and disinfection or any other application where the anolyte will not come into contact with metal.



The Radical Waters N.O.W single stream High salt ECA Generators use a single cell (or multiple cells in series and parallel for larger generator configurations). Brine flows through both the anodic and cathodic chambers. The Anolyte pH is controlled by adding Catholyte to the anolyte. Excess Catholyte is directed to drain but can be collected and used as a detergent. This configuration uses 0.4 – 0.5% brine solution as the precursor.

All High Salt ECA N.O.W Generators produce solutions with the following specifications:

Anolyte:

- Hypochlorous acid concentration measured as FAC: > 500 ppm
- pH: 6.5 (can be adjusted from ~ 3 to 8)
- ORP (Oxidation reduction potential): > 850 mV
- Electrical Conductivity: ~ 4.5mS (depends on the salt input)
- Residual Chloride: ~0.25%

Catholyte:

Normally directed to drain, but if collected for use as a detergent:

- NaOH concentration: ~ 0.16%
- pH: > 12

Low Salt Single Stream N.O.W Generators

The Radical Waters Low Salt single stream N.O.W Generators are the most efficient generators and are especially suited for applications on or around metal surfaces, including high quality stainless steel such as those found in beverage plants and food processing facilities.



These generators use a special hydraulic configuration to produce Anolyte using less salt and energy. Brine flows through the anodic chamber and a small amount of water through the cathodic chamber. This configuration use a 0.15% brine concentration as the precursor. The pH of the Anolyte is similar to the pH of the soft water used in the production of anolyte but can be regulated as low as ~ 5.5 by including additional components during the generator build.

The water flowing through the cathodic chamber absorbs the sodium from the reaction and is sent to drain. The water can be collected but the output volume is not commercially viable as it is normally about 0.5% of the generator capacity.

All low salt N.O.W Generators produce solutions with the following specification:

- Anolyte:**
- hypochlorous acid concentration measured as FAC: > 500 ppm
 - pH: 7.5 (can be adjusted to as low as 5.5 by including additional components during the build)
 - ORP (Oxidation reduction potential): > 850 mV
 - Electrical Conductivity: ~ 3mS (depends on the salt input)
 - Residual Chloride: ~0.04%

[LINK to Product Specifications:](#)

[High Salt Single Stream N.O.W. Generators](#)



[LINK to Product Specifications:](#)

[Low Salt Single Stream N.O.W. Generators](#)





Differences between Radical Waters Low Salt and High Salt ECA Generators

- HS Generators – higher salt consumption to produce Anolyte compared to LS Generators – HS ~5g of salt per litre of Anolyte produced vs ~1.5g of salt per litre of Anolyte for the LS Generators.
 - From a practical point of view this means much more salt will be required on-site for HS Generators and the brine tank will need to be refilled with salt more often than LS Generators.
- HS Generators have higher power requirements than the LS Generators. For example, the Compact 200.0 HS power consumption is ~2.2KWH vs the Compact 200.0 LS which is ~1.1KWH
- HS Generators have much higher residual chlorides in the concentrated Anolyte solution. HS Anolyte at 500ppm FAC have residual chlorides of ~2500ppm. LS Generators have substantially lower residual chlorides in the concentrated Anolyte solution of ~400ppm, therefore the risk of corrosion with solutions produced from the LS units are much lower in comparison to HS units. At a 10% dilution of a LS Anolyte solution, you will have ~50ppm of FAC with ~40ppm of residual chlorides plus the chlorides in the dilution water. This is lower than the recommended chloride level for well-known OEM suppliers of filling equipment for carbonated soft drinks.
- HS Generators have a different reactor cell design in comparison with the LS reactor cell design. For the HS Anolyte reactor cell, pH is controlled by a control valve for re-introduction of Catholyte into the Anolyte. LS Anolyte pH is largely dependent on incoming water pH.
- In terms of the activation mechanism and reactor cell design, for HS devices, the brine is introduced into the Anodal and Cathodal chambers, some of the Catholyte is reintroduced into the Anolyte chamber for pH correction and the rest is directed to waste for a single stream Anolyte generator.
- For the LS Generators, brine is introduced into the Anodal chamber only at a low flow rate, where activation takes place, whereafter this concentrated Anolyte is re-introduced into a water stream that flows through the centre of the reactor. A small water stream is introduced into the Cathodal Chamber and then directed to waste.
- Waste production for the HS devices is dependent on the pH of the Anolyte, whereas the waste for the LS devices is ~0.5% of the total flow of the Generator.
- Expected cell lifetime is similar for both HS and LS Generators.
- LS Generators reactors are slightly more expensive than the HS generator reactors due to the difference in reactor design.

Low Salt Dual Stream N.O.W Generators

The Radical Waters N.O.W dual stream ECA Generators were developed in tandem with our OEM partner for application in the food processing and beverage markets and is available in a low salt configuration only.

These ECA Generators are ideally suited to Cleaning in Place (CIP) applications or hospitality sectors (hotels, schools, government facilities, military bases, prisons, cruise ships, janitorial services, etc.).

These Generators are easy to install, operate and maintain, they are an ideal solution when safety and cost are of concern.

The dual stream Generators are a significant step forward in Anolyte and Catholyte production technology and are characterized by:

- Minimal maintenance.
- State of the art reactor cell technology, with a prolonged operational life improving the generator performance dramatically.
 - reduced total cost of ownership
- On demand Anolyte and Catholyte solutions
- Highly effective eco-friendly ECA solutions
 - Anolyte 500ppm FAC with pH 6,5
 - Catholyte ~1000ppm NaOH with pH >12

- Individual Anolyte and Catholyte reactor cell technology
 - less complicated
 - extremely low waste generation, less than 0,5% of Anolyte waste production and ~10% of catholyte production
- Easy ECA; Generators are factory set to customer specification
 - simplified installation and operation
- Low salt/chloride technology to protect any customer's corrosion concerns
 - 28–34ppm of chlorides within the final CIP solutions plus chlorides of CIP makeup water.
 - easy to use interface, ensuring that the solutions are always within their specified parameters and are producing consistent quality Anolyte and Catholyte.
 - Equipped with remote monitoring for peace of mind (GSM or Ethernet).

Although dual stream Generators were designed with the beverage market in mind, they can be used in any situation where both Anolyte and Catholyte solutions are required for effective cleaning and sanitizing operations.

LINK to Product Specifications:

[Dual Stream N.O.W. Generators](#)



Catholyte only N.O.W Generators

The Radical Waters Catholyte only ECA Generators are designed to produce Catholyte on site and on demand from NaCl brine with an NaOH concentration of 0.1% and a pH ~11.5-13.5. The very high pH makes it an ideal NaCl solution for cleaning operations, bio-stimulation procedures, precipitation of heavy metals and organic matter during water purification or for the extraction of essential oils.

Production of Catholyte is a cost effective & an efficient and environmentally friendly alternative to other chemical detergents, it is suitable for a multitude of applications particularly in CIP, food processing, horticulture, green houses and within hospitality businesses. In-situ generation eliminates the hazards associated with transportation, handling and storage of dangerous caustic chemicals.

During generation of Catholyte a small volume, i.e. 0.4% of total flow, of acidic Anolyte is produced as a by-product for which safety disposal measures should be considered.

Our Catholyte only generators are custom build to your requirement and can be configured to produce from 1000 ppm up to 6000 ppm of NaOH concentrations with output from 20 LPH up to 4000 LPH. Please send us your inquiry and we will gladly configure a Catholyte only device according to your specifications.

Alkaline Water N.O.W Generators

The Radical Waters Alkaline Water Generators was specially designed to fulfil the growing trend for ionized alkaline water. These Generators use a cell similar to the rest of the Radical Waters range but with specific modifications to the coatings used on the anode and cathode as well as a special membrane. The combination of coating and membrane ensure the highest quality and purity of the produced ionized alkaline water.

As a precursor these generators can use pure water with a moderate to low natural mineralization with a TDS (Total Dissolved) in the range of 450 ppm. Alternatively, the customer can use ultra-pure RO (reverse osmosis) water and then dose the required minerals into the RO water. The pH and taste of the water will depend on the minerals used and the final TDS of the precursor. Typical pH range for water produced is from 8 to 9.

The ionized alkaline water produced with the Radical Water Alkaline water Generators possesses excellent absorption and hydrating potential, having smaller cluster sizes and a greater concentration of soluble minerals. It reduces over-acidic conditions and increases stabilized oxygen within the human body, contributing to better digestion. Radical Waters ionized alkaline water is slightly alkaline, has

a low ORP and is rich in electrons, which makes it an antioxidant.

Research of effects of ionized Alkaline water has been carried out since 1950s and has shown that ionized alkaline water is good for arthritis, chronic constipation, chronic diarrhoea, diabetes, heartburn, chronic fatigue, indigestion, high blood pressure, leg cramps, poor circulation, migraines, nausea, obesity, osteoporosis, psoriasis, stress*.

Our Alkaline only generators are custom build to your requirement with output from 120 LPH up to 12000LPH. Please send us your inquiry and we will gladly configure a Alkaline water generator according to your specifications.

* - Ionized Alkaline water does not replace regular medical treatment, and the above listed uses are not medical advice. No result is guaranteed or predicted.



Custom Radical Waters N.O.W Generators

Radical Waters recognizes that not all our customers will be satisfied with our standard ECA N.O.W Generators and can offer special units for special requirements. Our custom Generators build on our standard low salt single stream and dual stream generators. The custom Generators trade lower solution output for higher solution concentration. With FAC and NaOH concentrations up to 3000 ppm and higher possible, allowing our customers to address even the most difficult cleaning and disinfection challenges across many industries.

- Single stream (anolyte only) custom generators are particularly useful in large water treatment facilities.
- Custom dual stream Generators are ideally suited when the customers first need to clean and/or degrease heavily soiled surfaces, premises, equipment or tools and then disinfect.

As with all our ECA generators, these Generators are easy to install, operate and maintain and are the ideal solution when safety and cost implications are a concern.

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