

SYSTEMS PRODUCT GUIDE

2024 - 2025





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ABOUT CENTREGO

01

Centrego Ltd has been producing disinfectant and cleaning solution generators and solutions for over 15 years and is an industry leader in ECA technology and systems. Centrego produces innovative environmentally responsible systems that reduce carbon emissions and environmental impacts for commercial and consumer markets.

Centrego is growing quickly due to demand for enhanced facilities hygiene, and many companies desire to adopt environmentally responsible products that reduce their carbon footprints, reduce plastic use and wastage, reduce transport miles, and reduce dependency on synthetic chemicals. Centrego continually evolves to meet the changing needs of their clients, distributors, industry and legislation.



ABOUT ECA SOLUTION

02

To make ECA (Electro Chemical Activation) solution, you mix salt and water. The Centrego machine then uses an electrolysis process that produces the eco-friendly disinfectant and cleaning solution which will clean surfaces and fabrics and kills up to 99.999% of microorganisms.

The strength of the eca solution can be adjusted depending on the client's needs. Once produced, the solution can be used on almost any surface to clean and eliminate microorganisms to enhance hygiene and protect assets, staff and customers.

ECA solution can be used for cleaning almost any surface that you require. Walls, floors, furniture, fabric, glass, metal, wood, plastic, etc.

Centrego has found the solution highly effective, not only in the office and the house. But also in vehicles, with pets, on broken skin and to clean windows. It really can be used almost anywhere!

Upon contact, ECA solution will kill 99.99% of bacteria and viruses. Spray it onto almost any material that you wish to disinfect. A microfibre cloth is the best tool to apply the solution for the most effective results. It is also recommended that the surface is wiped until dry.

ECA SCIENCE

03

ECA solution kills SARS-CoV-2 (COVID-19)

It has become more important than ever to ensure our surroundings are clean and free from infection and viruses during and after the global pandemic.

Centrego's ECA solutions have been tested against both the surrogate SARS-CoV-2 virus and against the SARS-CoV-2 virus itself in a Government research laboratory. This is a very unusual test and is unavailable in commercial laboratories due to the extreme hazard risk. However, it evidences that ECA solutions will destroy the SARS-CoV-2 virus, which causes severe acute respiratory syndrome - Covid-19.

EFFICACY

04

The Environment – “The environment” refers to all the things that surround us. This includes living things like plants and animals as well the air we breathe, the ground we step on, and nearby bodies of water.

Environmental Impact – Environmental impact is the effect we have on the environment by our actions.

Climate Change – Climate change refers to changes in weather patterns all around the world.

Greenhouse gases – Greenhouse gases trap heat in the atmosphere and are a major cause of global warming.

Carbon dioxide CO₂ – one of the most common greenhouse gases. Human activities that lead to carbon dioxide emissions come primarily from energy production, including burning coal, oil, or natural gas, and from burning timber, scrub and grassland.

Methane CH₄ – over 20 times more potent than CO₂ as a greenhouse gas, methane emission sources include landfills, oil and natural gas systems, agricultural activities, coal mining and certain industrial processes.

Sustainability – human practices that do not result in the permanent damage, alteration or depletion of the environment, ecosystems, species or natural resources.



THE PERFECT DISINFECTANT

05

If you were setting out to design the 'perfect disinfectant', you would have these performance factors down on your wish list:

- High efficacy – kills to a high Log reduction, i.e. Log 4 (99.99%) and above
- Almost immediate contact time – i.e. kills virtually on contact
- Kills across the whole micro-organism spectrum – bacteria, viruses, fungi, spores, moulds
- Virtually no regrowth – i.e. kills comprehensively
- No mutations due to kill levels and zero regrowth
- Totally safe to use – non-hazardous, non-toxic, hypoallergenic
- No PPE requirements for staff
- No COSHH requirements as classified non-hazardous
- No environmental pollution – relaxes back to slightly salty water
- Very low carbon emission footprint
- Can be generated on-site from water, salt and small electrical load (and even solar power)
- Easy to apply – spray and wipe, mop, mist, and dose into water supplies
- Multiple applications across multiple sectors – general cleaning and disinfection, water treatment, food processing and preparation, brewing, pharmaceuticals
- Naturally synthesized compound – all macro-organisms generate HOCl as part of their defence against infection
- Inputs of natural and naturally sustainable compounds – water and salt
- Will clean and disinfect in one pass
- No repeat ordering, transportation, inventory, shrinkage, packaging disposal
- No plastic containers for transport and disposal
- No sticky residues or smearing
- Ultra-low-cost of production – water, salt plus small electrical current
- Eliminate exposure to future price increases of synthetic chemicals

If you combined all the above into a single cleaning and disinfection agent – this would be your perfect solution. No synthetic chemical cleaner or disinfectant has all or even most of these performance properties. ECA solutions have all of them.

COMPLIANCE

06

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Sustainability – human practices that do not result in the permanent damage, alteration or depletion of the environment, ecosystems, species or natural resources.

Single Use – Single-use items are products and materials that can only be used once before being discarded. The most common single use material is plastic.

Green energy – “Green energy” includes wind and solar energy, geothermal energy, and energy harnessed from the sea – natural sources of energy that don't harm the environment and are continuously replenished.

Carbon Emissions – the amount of CO₂ emitted by a process of building, using and disposing of goods

Carbon Footprint – a carbon footprint is the amount of carbon that's emitted as a result of our actions – a measure of the effect that our actions have on the environment.

Carbon neutral – Carbon neutrality is a state of net-zero carbon dioxide emissions. This can be achieved by balancing emissions of carbon dioxide with its removal or by eliminating emissions from society.

Carbon Zero – Carbon neutral refers to a policy of not increasing carbon emissions and of achieving carbon reduction through offsets. Net zero carbon means making changes to reduce carbon emissions to the lowest amount – with offsetting as a last resort.

Carbon Offset – A carbon offset is a reduction or removal of emissions of carbon dioxide or other greenhouse gases made in order to compensate for emissions made elsewhere – for example, planting trees to offset CO₂ used for other purposes.

Carbon Credit – a carbon credit is an instrument that represents ownership of one metric tonne of carbon dioxide equivalent (using CO₂ as a unit to measure different greenhouse gases) that can be traded, sold or retired.

Greenwashing – A form of corporate misrepresentation where a company will present a green public image and publicise green initiatives that are false or misleading.

ECA Solution Generators Introduction

07

CENTREGO ECA SYSTEMS

Centrego design, develop and manufacture ElectroChemical Activation (ECA) systems in the UK that generate disinfection and cleaning solutions from ordinary potable water and small amounts of salt. The systems, designed for in-situ use, have the benefits of ultra-low carbon emission footprints when compared with purchased synthetic chemicals, low operational costs, and improved health and safety for users and environments.

Solutions generated by Centrego's ECA systems include

- > Hypochlorous acid (HOCl) – a powerful but safe pH-neutral biocide with very rapid contact times and high efficacy
- > Mixed oxidant solution (MOS) – active substances of sodium hypochlorite (NaOCl) and hypochlorous acid a combined biocide and cleaning agent at pH8.2 – pH8.5
- > Sodium hydroxide (NaOH) – a cleaning agent and surfactant at pH13 – pH14

DECIDING WHICH SYSTEM IS OPTIMUM FOR YOUR BUSINESS

The first steps in choosing the optimum device for your organisation is establishing what applications are required, what solutions would deliver the efficacy and cleaning performance required, and deciding how much solution is needed on a daily, weekly, monthly basis.

Decisions should also take into account corporate initiatives to reduce carbon emission footprints and environmental impacts, Return on Investment and payback periods, and considerations of the health and safety of users, staff and the public.

Centrego and its partners are experts in assisting businesses to identify the best ECA system for the requirements, specifying the solution delivery mechanisms, providing installation, training and aftersales support, and quantifying the environmental and cost benefits of adopting the systems.

Centrego manufactures a comprehensive range ECA systems which meet the demands of multiple public and commercial sectors. In addition, we develop bespoke systems for specific applications and invest heavily in R&D to continue to expand the use of ECA technology.

CERTIFICATION AND APPROVALS

Centrego systems carry the appropriate biocides and safety regulatory listings and certifications in multiple countries. The solutions generated are tested by independent accredited laboratories to EN standards for efficacy performance on multiple microorganisms.

SYSTEM CATEGORISATION AND APPLICATION

SMALL DEVICES

e-Spray

- > Domestic
- > Home

Centrego Renew

- > Small offices
- > Small pubs and bars
- > Retail outlet
- > Studio
- > Bakeries
- > Coffee shops
- > Local shops
- > Dance yoga studios
- > Art galleries
- > Small schools and nurseries
- > Florists
- > Vehicles
- > Pet services

FLOW SYSTEMS

Flow-40, Flow-40 Plus, Flow-120

- > Larger office facilities
- > Cruise ships
- > Warehouses, sorting and fulfilment centres
- > Research centres
- > Schools and universities
- > Multiple-use facilities
- > Food processing
- > Supermarkets

Flow-200, Flow-400, Flow-600

- > Large multi-site, multi-use facilities
- > Schools and universities
- > Cruise ships
- > Food processing
- > Cleaning-in-place (CIP)
- > Laundry
- > Agriculture
- > Aquaculture
- > Horticulture
- > Water treatment
- > offshore platforms facilities

Flow-1000, Flow 1,200

- > Industrial process water
- > Cruise ships
- > Food processing
- > Cleaning-in-place (CIP)
- > Agriculture
- > Aquaculture
- > Horticulture
- > Water treatment

MEDIUM SYSTEMS

Toucan Active, Active Plus & Active Plus Auto

- > Medium-sized offices
- > Medium-sized retail spaces
- > Restaurants
- > Large pubs and bars
- > Small to medium-sized factories
- > Workplaces
- > Merchant ships
- > Small food processing and preparation facilities
- > Schools and nurseries

5K SYSTEMS

5K20, 5K40, 5K120, 5K200

- > Industrial process water
- > Water treatment
- > Cruise ships – water treatment and laundry
- > Merchant ships – hold cleaning for 'black cargo', agricultural products and fertiliser
- > Wastewater treatment
- > Fisheries – fishing and shell-fishing trawlers Fish and shell-fish processing
- > Aquaculture – hatcheries and growing farms
- > Agriculture – dairy, pig, poultry
- > Cleaning-in-place (CIP) – food processing, beverage production, yeast production
- > Offshore platforms facilities

CATHOLYTE SYSTEMS

NaOH-20, NaOH-155, NaOH-1000

- > Cleaning-in-place (CIP) – food processing, beverage production, yeast production
- > Aquaculture – pH balancing in fish-tank water
- > Water treatment – pH balancing

SMALL SYSTEMS

TOUCAN ECO E-SPRAY

Capacity: 350ml
 Active substances: mixed oxidant solution of hypochlorous acid (HOCl) and sodium hypochlorite (NaOCl)
 Concentration: 125-250ppm pH7.5-pH8.5
 Activation cycle: 5 minutes
 Salt consumption: 4g/l
 Power rating: 10W 5V 2A via USB port
 Stand-alone/desk-top
 Dimensions: H280mm x W90mm x D90mm
 Suitable for domestic use for general cleaning and disinfection applications



CENTREGO RENEW

Capacity: 2ls mixed oxidant solution
 Active substances: hypochlorous acid (HOCl) and sodium hypochlorite (NaOCl)
 Concentration: 125-250ppm pH7.5-pH8.5
 Activation cycle: 4 or 8 minutes
 Salt consumption: 4g/l
 Power rating: 33W
 Stand-alone/desk-top
 Dimensions: H320mm x W200mm x D230mm
 Suitable for small to medium-sized commercial facilities for general cleaning and disinfection applications



TOUCAN ECO BIO CARRY

Active substances: hypochlorous acid (HOCl) and sodium hypochlorite (NaOCl) Up to 10ls capacity
 Capacity up to 10ls
 Concentration: up to 250ppm
 Salt consumption: 1-2gm/l
 Power ratings: 240V mains or 12V solar-powered battery
 Dimensions: H350mm x W450mm x D120mm
 Portable Field unit for remote locations or emergency response and disaster relief generation of mixed oxidant solutions



MEDIUM SYSTEMS

TOUCAN ECO ACTIVE

Capacity: 10ls mixed oxidant solution
 Active substances: hypochlorous acid (HOCl) and sodium hypochlorite (NaOCl)
 Concentration: 100-200ppm
 pH7.5 – pH8.5
 Activation cycle: 20 minutes
 Salt consumption: 1-2g/l
 Power rating: 100W
 Dispensing via discharge tap
 Dimensions: H550mm x W550mm x D160mm
 Suitable for medium-sized commercial applications



TOUCAN ECO ACTIVE PLUS

Capacity: 5ls mixed oxidant solution
 Active substances: hypochlorous acid (HOCl) and sodium hypochlorite (NaOCl)
 Concentration: 350-600ppm
 pH7.5 – pH8.5
 Activation cycle: 40 minutes
 Salt consumption: 2-4g/l
 Power rating: 100W
 Dispensing via spray bottle and bucket/container fillers
 Point-of-use solution dispensing: 17ls @120ppm, 34ls @60ppm
 Dimensions: H550mm x W600mm x D160mm



TOUCAN ECO ACTIVE PLUS AUTO

Capacity: 5ls mixed oxidant solution
 Active substances: hypochlorous acid (HOCl) and sodium hypochlorite (NaOCl)
 Concentration: 350-600ppm
 pH7.5-pH8.5
 Activation cycle: up to 40 minutes
 Salt consumption: 2-4g/l
 Power rating: 600W
 Dispensing via spray bottle and bucket/container nozzle
 Point-of-use solution dispensing: 17ls @120ppm, 34ls @60ppm
 Dimensions: H650mm x W480mm x 250mmD



FLOW SYSTEMS

CENTREGO FLOW 40 - 120, 200, 400, 600, 1000 AND 1,200

Membrane cell system

Active substances: Hypochlorous acid (HOCl) from the anode and sodium hydroxide (NaOH) from the cathode

Outputs options: 40ls/hr, 120ls/hr, 200ls/hr, 400ls/hr, 600ls/hr, 1000ls/hr and 1,200ls/hr

Concentrations: 500ppm HOCl pH 7.2, NaOH pH10.5

Power ratings: 1.1kW-8kW

Salt consumption: 2gm/l

Full telemetry is available for remote monitoring, recording and control

Range of ancillary equipment for solution storage, dispensing and dosing

Dimensions: (Flow-40 and 120) H740mm x W550 x D330mm

Dimensions for Flow 200 upwards on request, dependant on specification

Suitable for large facilities, cruise ships and industrial process water



CENTREGO FLOW SERIES - WITH ANCILLARY EQUIPMENT

Membrane cell system

Active substances: hypochlorous acid (HOCl) from the anode and sodium hydroxide (NaOH) from the cathode

Outputs options: 40ls/hr

Concentrations: 500ppm HOCl pH 7.2, NaOH pH10.5

Power ratings: 1.1kW

Salt consumption: 2gm/l

Full telemetry is available for remote monitoring, recording and control.

Suitable for large facilities, cruise ships and industrial processes.

Range of ancillary equipment for water softening, solution storage, dispensing and dosing

Dimensions for Flow series dependant on specification



CENTREGO FLOW 40 AND FLOW 120 PLUS

Membrane cell system

Fully integrated system with water softener, holding tanks and dispensers mounted on 316-grade stainless steel frame.

Active substances: hypochlorous acid (HOCl) from the anode and sodium hydroxide (NaOH) from the cathode

Outputs options: Flow-40 Plus @ 40ls/hr, Flow-120 Plus @ 120ls/hr

Concentrations: 500ppm HOCl

pH 6.5-7.2

Power rating: 1.1kW-1.8kW

Salt consumption: 2gm/l

Full telemetry is available for remote monitoring, recording and control

Suitable for large facilities, cruise ships and industrial processes

Range of ancillary equipment for solution storage, dispensing and dosing

All-in-one integrated solution for ECA production

Dimensions : H1840mm x W660 x D490mm



5K SYSTEMS

CENTREGO 5K20 5K40 & 5K120

Non-membrane cell system with inputs of either water + brine, sea water, or a combination
 Fully integrated system with water softener, holding tanks and dispensers, mounted on a 316-grade stainless steel frame
 Mixed oxidant solution
 Active substances: hypochlorous acid (HOCl) and sodium hypochlorite
 Outputs: 5K20 20ls/hr, 5K40 40ls/hr and 5K120 120ls/hr
 Concentrations: 5000ppm mixed oxidants
 pH8.2-pH8.5
 Power rating: 1.5kW-6kW
 Salt consumption: 20gm/l
 Full telemetry is available for remote monitoring, recording and control
 Dimensions : H1740mm x W860 x 530mmD
 Suitable for industrial process water, water treatment and CIP



CENTREGO 5K200 & 5K400

Non-membrane cell system with inputs of either water + brine, seawater, or a combination
 Fully integrated system with water softener, mounted on a 316-grade stainless steel frame
 Mixed oxidant solution
 Active substances: hypochlorous acid (HOCl) and sodium hypochlorite
 Outputs: 5K200 200ls/hr, 5K400 400ls/hr
 Concentrations: 5000ppm (adjustable) mixed oxidants pH8.2-pH8.5
 Power rating: 8kW-16kW
 Salt consumption: 20gm/l
 Full telemetry is available for remote monitoring, recording and control
 Dimensions : 800mmH x W1000 x D780mm
 Suitable for industrial process water, water treatment and CIP
 Suitable for marine applications using seawater



CATHOLYTE SYSTEMS

CENTREGO NAOH FLOW-20 GENERATOR

Membrane cell system with inputs of water + brine
 Active substance: sodium hydroxide and hypochlorous acid
 Outputs: Flow-20 20ls/hr NaOH, 0.1ls/hr HOCl
 Concentration: 3000ppm catholyte (NaOH) at pH13.0-pH13.5
 Concentration: 3000ppm HOCl at pH2.5-pH3.0
 Power rating: 1.8kW
 Salt consumption: 4gms salt per 1g NaOH
 Full telemetry is available for remote monitoring, recording and control
 Dimensions : H740mm x W550 x D330mm
 Suitable for industrial process wash-water, water pH balancing and CIP



CENTREGO NAOH FLOW-20 PLUS GENERATOR

Fully integrated system with water softener, holding tanks and dispensers mounted on a 316-grade stainless steel frame.
 Membrane cell system with inputs of water + brine
 Active substance: sodium hydroxide and hypochlorous acid
 Outputs: Flow-20 20ls/hr NaOH, 1ls/hr HOCl
 Concentration: 3000ppm catholyte (NaOH) at pH13.0-pH13.5
 Concentration: 3000ppm HOCl at pH2.5-pH3.0
 Power rating: 11.8kW
 Salt consumption: 4g salt per 1g NaOH
 Full telemetry is available for remote monitoring, recording and control
 Dimensions : H1840mm x W660 x D490mm
 Suitable for industrial process wash-water, water pH balancing and CIP



CATHOLYTE SYSTEMS

CENTREGO NAOH FLOW-155 GENERATOR

Membrane cell system with inputs of water + brine
 Active substance: sodium hydroxide and hypochlorous acid
 Outputs: Flow-155 155ls/hr NaOH, 1ls/hr HOCl
 Concentrations: 3000ppm catholyte (NaOH) at pH13.0-pH13.5
 Concentration: 3000ppm HOCl at pH2.5-pH3.0
 Power rating: 7kW
 Salt consumption: 4g salt per 1g NaOH
 Full telemetry is available for remote monitoring, recording and control
 Suitable for industrial process wash-water, water pH balancing and CIP
 Dimensions : H2000mm x W665 x D400mm



CENTREGO NAOH FLOW-1000 GENERATOR

Membrane cell system with inputs of water + brine
 Active substance: sodium hydroxide and hypochlorous acid
 Outputs: 1000ls/hr NaOH, 5ls/hr HOCl
 Concentrations: 3000ppm catholyte (NaOH) at pH13.0-pH13.5
 Concentration: 3000ppm HOCl at pH2.5-pH3.0
 Power rating: 380 VAC/3-Phase.
 Total power usage: 12V, 3600A. 43kW
 Salt consumption: 4g salt per 1g NaOH
 Full telemetry is available for remote monitoring, recording and control
 Dimensions : H2000mm x W2250mm x D400mm
 Suitable for industrial process wash-water, water pH balancing and CIP

NaOH flow 1000 generators are available in modular form adding 155 or 310 ls/hr capacity for each additional module.

Dimensions and overall design may vary dependant on applications.



ENVIRONMENTAL BENEFITS

08

CARBON FOOTPRINT SCREENING OF TOUCAN ACTIVE PLUS

Many companies use phrases such as eco-friendly, green, environmentally sustainable to describe their products, without specifying or quantifying what exactly these expressions mean. Some call this greenwashing, others simply misleading, or making false or exaggerated claims.

Centrego in the UK and its partner Food Diagnostics in Denmark wanted to quantify the environmental credentials of some of its products so that our clients could analyse the environmental impact and benefits of adopting our cleaning and disinfection generating systems and then compare these with other products on the market. The best way to measure the environmental impact of a product is to calculate the carbon emissions footprint of the product throughout its expected lifespan.

We therefore commissioned the international environmental consultancy Force Technology in Denmark to undertake an audit of the carbon footprint of our Toucan Active Plus product, as an example of the environmental impact of using one of our ECA systems. Centrego's ECA systems generate cleaning and disinfection solutions on-site. There are therefore two elements to calculating the carbon emissions footprint of the system: i) the amount of CO₂ emitted from the manufacturer of the systems, and ii) the amount of CO₂ emitted from the production of 1 litre of the activated solution. Calculating the carbon emissions footprint of a product is a very detailed exercise. Every component in the product has to be identified – the electronics, plastics, steel, wiring, plumbing etc – every component's own individual carbon footprint calculated, the transport miles to the product manufacturing site identified, the energy used in assembly, and the transport to the site of use calculated. This calculation quantifies the amount of global warming potential generated to actually make the product and get it installed on the Client's site, in units of carbon dioxide equivalent (CO₂-eq). The calculation for generating 1 litre of solution is easier – it is the energy used to produce and transport 1.2 grams of salt, 1 litre of water and the power used to achieve the activation.

The table demonstrates that the CO₂ emissions to manufacture the ECA system and get it installed on the user site is 263 kg CO₂ equivalent. The CO₂ emissions to generate 1l of diluted, point-of-use activated solution is 3.07 g CO₂ equivalent. Over the lifetime of the system, the aggregated CO₂ emissions – that is the CO₂ emissions of the system averaged over the expected total amount of ECA generated – is 10.5 g CO₂-eq, and for point-of-use solution diluted 2:1, it is 3.50 g CO₂-eq.

The CO₂ emissions to generate 1 L of diluted, point-of-use activated solution when not counting the emissions from production of the system, are 3.07g CO₂-eq. To put this into context, running a laptop PC for 1 hour would produce the same CO₂ emissions as generating 8.8 L of ECA ready-to-use solution, or boiling a kettle would produce the same CO₂ emissions as generating 5 L of ECA ready-to-use solution.

The aggregated CO₂ emissions to generate 4.3 L of diluted, ready-to-use activated solution would equate to boiling a kettle once. With these figures quantified, it is then possible to compare the environmental impact of using Centrego's ECA systems to alternative solutions for cleaning and disinfection. The most widely used cleaning and disinfection solutions are manufactured synthetic chemicals. The infographic on Page 2 shows the process of manufacturing synthetic chemicals, transporting and distributing them to the point-of-use, and disposing of the packaging and waste plastics. This is CO₂ emission-heavy process, and is repeated for every delivery of the chemicals to site, and the collection of waste products. It is not the role or responsibility of

Centrego and Food Diagnostics to calculate the CO₂ footprint or environmental impact of using individual synthetic chemical products for cleaning and disinfection, however by quantifying our own product's environmental impacts, it can provide a benchmark against which other alternatives can be assessed. The calculations to quantify the CO₂ emissions from adopting and using Centrego ECA systems are detailed and complex. However a more simplistic approach can be adopted. Certainly the components and manufacturing of the systems uses energy and so produces CO₂ as evidenced in the Table above. However, once on site, the inputs are natural, naturally sustainable – water and salt – and emit very low CO₂ levels. Only very small electric power input is used to activate the solutions. Other than the transport of the ECA system itself to site, there is no on-going transport carbon emissions, no packaging disposal, no ongoing plastic containerisation and plastic disposal.

Centrego ECA systems are not carbon zero. However the carbon emissions and environmental impact of adopting and using the systems to generate cleaning and disinfection solutions are extremely small if compared to the production and distribution of synthetic chemicals, and the disposal of the plastic containers and packaging.



Environmental impact: Synthetic Chemicals versus ECA



CORPORATE GOVERNANCE

09

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Environmental Benefits

Reducing carbon, plastic, water and synthetic chemical footprints. Centrego ECA devices generate environmentally responsible solutions from natural and naturally sustainable compounds – water and salt. The disinfection and cleaning solutions are generated on-site, eliminating the need for the manufacture, transport, distribution, and storage of chemicals and the use and disposal of plastic containers and packaging. The use of ECA solution increases the well-being of staff and the public by reducing plastics and hazardous, toxic synthetic chemicals in their working environments and facilities.

Corporate Benefits and Environmental Corporate Social Responsibility (ECSR)

All major companies have Environmental Corporate Social Responsibility (ECSR) policies and strategies in place which are published in their Annual Reports. ECSR statements are designed to inform their shareholders, staff, customers, and the public how the company contributes to sustainable development by delivering environmental, economic, and social benefits for all stakeholders. All corporates now make environmental responsibility a key plank of their ECSR policies. Adopting Toucan Eco ECA systems contribute to corporate’s environmental policies and demonstrate commitment to Protecting People and Protecting the Environment

Safety Benefits

Toucan Eco solutions are non-hazardous, non-toxic, and non allergenic. Generated from just water and salt, the solutions are entirely safe to use without the need for protective measures or equipment. The solutions are certified ‘food safe’ and can be used for food processing and preparation. Toucan Eco ECA solutions are safe to use around babies, children, the elderly, and immune-compromised patients

Cost Benefits

The productions of cleaning and disinfection solutions using Centrego’s ECA devices is far more cost effective than the continual purchase of synthetic chemicals.

Solution production costs consist of water, salt and small amounts of electricity, and can be measured in points of cents or pence per litre. In addition, there are no procurement costs, inventory



WATER TREATMENT



XXXXXXXXXXXXXXXXXXXXXXXXXXXX
XXXXXXXXXXXXXXXXXXXX

GRSFSAGSG

CONTAINERISM



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XXXXXXXXXXXXXXXXXXXX

GRSFSAGSG

CENTREGO MARINE

12

SERVING THE MARINE SECTOR

Centrego Marine was established in 2021 by Runi Nielsen, Robin Turner and Tonny Nielsen with the aim to help the Marine sector worldwide with solutions for controlling microbiology through in-situ production of a sustainable, green, safe, natural and effective disinfection agent called ECA. The company is established in the fishing harbour of Grenaa in Denmark, where it shares offices, laboratories and test facilities, with the company Food Diagnostics. Here we have the perfect environment for testing solutions with the most novel laboratory methods like real-time pcr etc. and also access to academic researchers.

ECA Technology is the term used for Electrical Chemical Activation processes that produce powerful but entirely safe disinfectants and cleaning solutions using only the simple inputs of ordinary water and salt passed across a patented electrochemical cell. The solutions generated are non-toxic, non-allergenic and totally harmless to macro-organisms, including humans. This makes it safe to use across a wide variety of environments and applications. Solutions can be either generated in small 'batch generators' or for large volumes at high concentrations, through 'flow-through' generators. Control systems regulate the quality and properties of the solutions to make on-site production easy and highly cost effective.

ECA Technology represents the most environmentally sensitive biocide technology available which is totally effective in eliminating all forms of micro-organisms in water supplies, on work surfaces and fabrics and materials. The inputs of water and salt are naturally occurring and sustainable products while the output biocide is pH neutral, non-toxic and non-hazardous to all macro-organisms while being totally effective against all bacteria, viruses, cysts, protozoa, algae and spores with no mutation or resistance. The technology allows for the biocides to be produced easily, cheaply and efficiently on-site, which combined with the sustainable properties of the inputs gives it a very small environmental footprint.

ECA Technology today is being applied across a growing number of sectors for multiple applications as individuals and companies realise that they don't have to use toxic, environmentally damaging and expensive synthetic chemicals to clean and disinfect. Using simply water, salt and a very small power input, these tasks can now be undertaken in an environmentally sensitive and sustainable way, and save costs as well as the environment.



RESEARCH AND COLLABORATION PROJECTS

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RESEARCH COLLABORATION PROJECTS

Centrego is active in scientific research projects with collaboration partners, including The University of the West of England, The Royal College of Surgeons, Chelsea Technologies.

INDIAN WATER PROJECT

Over 150,000 children under the age of 5 in India alone die annually from water-borne diseases due to a lack of clean drinking and washing water. In a project jointly sponsored by the UK and Indian Governments, Centrego partnered with the University of the West of England, Chelsea Technologies and Frank Water to prototype simple ECA systems to disinfect water storage tanks in rural areas with limited infrastructure and utilities. Centrego designed and built several systems which were then field tested in Indian villages to assess reductions in microbial levels in the water. The Centrego Water Tank Guard system delivered excellent results and the systems remain in place, providing protection to the local communities.

Opposite page:

--Forward by Prof Darren Reynold

--Photo of water tank in India where the Water Tank Guard is being used.



ON-DEMAND MANUFACTURE OF POTABLE & STERILE WATER FOR EMERGENCY MEDICAL, HUMANITARIAN & HEALTHCARE APPLICATIONS USING ELECTROCHEMICAL ACTIVATION PRODUCTION TECHNOLOGIES

A collaborative research project partnering Centrego with The University Court of the University of Edinburgh, The Royal College of Surgeons, and The University of The West of England, sponsored by the UK NHS and the Ministry of Defence was established to evaluate the practicalities of generating HOCl solutions in battlefield and emergency response environments for use as surgical disinfectants, instrument sanitization and water disinfection. Centrego designed two systems – i) the BioCarry unit for sterilization and ii) the Flow-20 unit for high-grade HOCl production. Both systems are compact, portable and robust for operations in zones where there is no or very limited infrastructure.

Opposite page: --Photos of Biocarry and Flow-20



RESEARCH AND COLLABORATION PROJECTS

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SUSTAINABLE INITIATIVES IN THE NHS

Centrego is partnering with the University West of England and Edinburgh University to participate in an NHS initiative to increase sustainability in the UK care sector. Centrego is supplying ECA systems to test in clinical environments for efficacy, ease of use and environmental sustainability.

Logos of Centrego, NHS, UWE, Royal College of Surgeons, University of Edinburgh and University West of England

Opposite page:

--Photos of Flow-40 Plus



HOCL IN-A-CAN

Centrego is working with The University of the West of England to assess the efficacy, composition and shelf-life of HOCl in an aerosol form for potential development as a domestic and commercial product for disinfecting surfaces and air for bacteria, viruses, fungi, molds and spores.



WHO USES CENTREGO PRODUCTS?

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SUSTAINABLE INITIATIVES IN THE NHS

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Opposite page:
--Photos of Flow-40 Plus



TERMS & ABBREVIATIONS

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The Environment – “The environment” refers to all the things that surround us. This includes living things like plants and animals as well the air we breathe, the ground we step on, and nearby bodies of water.

Environmental Impact – Environmental impact is the effect we have on the environment by our actions.

Climate Change – Climate change refers to changes in weather patterns all around the world.

Greenhouse gasses – Greenhouse gases trap heat in the atmosphere and are a major cause of global warming.

Carbon dioxide CO₂ – one of the most common greenhouse gases. Human activities that lead to carbon dioxide emissions come primarily from energy production, including burning coal, oil, or natural gas, and from burning timber, scrub and grassland.

Methane CH₄ – over 20 times more potent than CO₂ as a greenhouse gas, methane emission sources include landfills, oil and natural gas systems, agricultural activities, coal mining and certain industrial processes.

Sustainability – human practices that do not result in the permanent damage, alteration or depletion of the environment, ecosystems, species or natural resources.

Single Use – Single-use items are products and materials that can only be used once before being discarded. The most common single use material is plastic.

Green energy – “Green energy” includes wind and solar energy, geothermal energy, and energy harnessed from the sea – natural sources of energy that don’t harm the environment and are continuously replenished.

Carbon Emissions – the amount of CO₂ emitted by a process of building, using and disposing of goods

Carbon Footprint – a carbon footprint is the amount of carbon that’s emitted as a result of our actions – a measure of the effect that our actions have on the environment.

Carbon neutral – Carbon neutrality is a state of net-zero carbon dioxide emissions. This can be achieved by balancing emissions of carbon dioxide with its removal or by eliminating emissions from society.

Carbon Zero – Carbon neutral refers to a policy of not increasing carbon emissions and of achieving carbon reduction through offsets. Net zero carbon means making changes to reduce carbon emissions to the lowest amount – with offsetting as a last resort.

Carbon Offset – A carbon offset is a reduction or removal of emissions of carbon dioxide or other greenhouse gases made in order to compensate for emissions made elsewhere – for example, planting trees to offset CO₂ used for other purposes.

Carbon Credit – a carbon credit is an instrument that represents ownership of one metric tonne of carbon dioxide equivalent (using CO₂ as a unit to measure different greenhouse gases) that can be traded, sold or retired.

Greenwashing – A form of corporate misrepresentation where a company will present a green public image and publicise green initiatives that are false or misleading.

CHEMICALS

FAC – Free Available Chlorine
Active substance - Any ingredient that provides a biologically active or other direct effect in the elimination of microorganisms

NaCl – salt

H₂O – water

HOCl – hypochlorous acid

NaOCl – sodium hypochlorite

NaOH – sodium hydroxide

K₂CO₃ – Potassium carbonate

ABBREVIATIONS AND DENOTATIONS

ppm – parts per million, denoting very low concentrations

pH – means ‘potential of hydrogen’ or ‘power of hydrogen’. It is a scale used to specify the acidity or alkalinity of an aqueous solution.

ORP – Oxidation Reduction Potential or Redox potential is a measure of the tendency of a chemical species to acquire electrons from, or lose electrons to, an electrode and thereby be reduced or oxidised respectively. Redox potential is expressed in volts (V).

Conductivity – of an electrolyte solution is a measure of its ability to conduct electricity, measuring the ionic content in a solution.

Salinity – Salinity is the saltiness or amount of salt dissolved in a body of water, called saline water or brine. It is usually measured in g/l or g/kg.

Log reduction - Log reduction is the mathematical term used to express the relative number of living microbes that are eliminated by disinfection. A log reduction of 1 is equivalent to a 10-fold reduction.

CONVERSION RATIOS

ppm conversion to grams. One gram in 1000 ml is 1000 ppm and one thousandth of a gram (0.001g) in 1000 ml is one ppm. One thousandth of a gram is 1 milligram and 1000 ml is one liter, so that 1 ppm = 1 mg per liter = mg/Liter.

Milliliters and litres – 1000mls in 1 litre

1litre water = 1kg. 1000kgs = 1tonne.

Grams to ounces – 1gram = 0.035274 ounces

Litres to fluid ounces - 1 liter = 33.814 US fluid ounces.

ELECTRODES

Anode – The anode is the electrode where electricity moves into. The anode is usually the positive side. It acts as an electron donor. In an electrolytic cell, oxidation reaction takes place at the anode.

Cathode – The cathode is the electrode where electricity is given out or flows out. A cathode is a negative side. It acts as an electron acceptor. In an electrolytic cell, a reduction reaction takes place at the cathode.

Anolyte – the solution generated at the anode (positive) electrode, usually hypochlorous acid

Catholyte – the solution generated at the cathode (negative) electrode, usually sodium hydroxide



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