

AQUAECA



**MODERN TECHNOLOGIES
OF WATER TREATMENT AND DISINFECTION**

BORA LLC is a scientific research & production enterprise. They manufacture a wide range of disinfectant solutions and equipments based on ECAS- electrochemical activation of water and saline solutions.

The ECAS treatment of low-mineralized saline water solution ($\text{NaCl} + \text{H}_2\text{O}$) transforms it into activated solution called "AQUAECA", which is capable of eliminating all kinds of pathogens and microorganisms (bacteria, viruses, fungi and protozoa), while ensuring no harm to human and animal cells, as well as cells and tissues of any higher organisms.

ECAS Technology

ECAS culminates to produce green, environmental friendly washing/disinfecting and sterilizing solutions. ECA of solutions is necessarily associated with alteration of their chemical composition, acidity and (or) alkalinity within a wide range. ECAS is based on the changes of reactional and catalytic abilities of aqueous solutions subjected to electrochemical unipolar (either anodic or cathodic) treatment. This technology has been scientifically researched and tested.

Effective application of AQUAECA

- Disinfection and washing of equipment and materials: medical equipment, endoscopes, operational tools, clothes, shoes, rubber items etc.
- Disinfection, washing and elimination of odors in premises: corridors, operating rooms, toilets, canteens in the hospitals/clinics and recreation centres; air disinfection; sanitary transport, equipment etc.
- Use as skin antiseptic: hand disinfection of doctors and medical staff; treatment of injection and operation areas; treatment of doctors' elbow folds.
- Waste disinfection: single-use items - bandages, clothes etc., biological extractions, food waste disinfection etc.



In addition to basic treatment, AQUAECA can also be used for Cure of burns, trophic ulcers, dermatitis, festering wounds, post-traumatic, post-operative, and other purulent complications, mastitis, bursitis, nonspecific ulcerative colitis, ulcerous illness, hypertension, allergic diseases (including asthma), salmonellosis of gastrointestinal kind, colitis, immunodeficiency illnesses, gingivitis, acute bacterial dysentery, stomatitis, anaemia, periodontitis, viral hepatitis A and B, illnesses of kidneys, liver, biliary, stenocardia, diabetes, metabolic imbalances (obesity, stagnation of cartilages, keratosis), diathesis, reduction or elimination of antibiotics by the cure of osteomyelitis, treatment of fungus diseases, piles etc.

AQUAECA is further destined for:



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- Disinfection and cleaning in hospitals and health centres (including clinical laboratories, diagnostic and bacteriological department of the hospital nursery, nurseries), child care centres and correctional institutions, furnitures as well as sources of infection for carrying out disinfection current prophylactic final. Articles of patient care and personal hygiene
- Surfaces of medical devices, Technical devices and equipment.
- Kitchen utensils (including laboratory equipment and disposables) Articles for washing dishes and cooking equipment)
- polypropylene carpet, rubber equipment and cleaning materials, toys, sporting goods
- Disinfection of medical equipment (including couveuse, hyperbaric chambers, anesthesia and respiratory equipment, etc.)
- Disinfection (including a combination of pre-sterilization cleaning and disinfection) in a manual and mechanized (in the ultrasound equipment of any type) of devices (including rigid and flexible endoscopes, instruments for this purpose, surgical and dental instruments, including rotation, as well as dental suction systems, vacuum systems and spittoon, dental materials - reprints of alginate, silicones, polyester resins, dental preparations for metals, ceramics, plastics and other materials).
- Prior Llimpieza final, manual and mechanized (in ultrasound facilities of any kind) medical equipment (including rigid and flexible endoscopes, instruments for them, surgical instruments (including microsurgery) and dental care, including rotation and dental materials. Disinfection of endoscopes, Sterilization of medical products etc.)
- The disinfection of medical waste - medical devices for single use, dressings, disposable underwear before use in health facilities and food scraps.

- For disinfecting blood and body fluids (blood, stool, sputum, vomiting) in hospitals and clinical diagnostic laboratories in the stations and points of blood transfusion and blood sampling, medical transportation.
- Disinfection of medical transportation and transportation of food.
- Air disinfection and elimination of odors through the spray of the solution in various facilities.
- Disinfection, ventilation and air conditioning (household air, split systems, split multi-zone systems, air conditioners, ceiling, etc).
- In addition, AQUAECA can be used as an antiseptic for the skin in medical institutions of any kind (including pediatric, dental, surgeries, sexually transmitted infections, obstetrical and gynaecological offices including neonatology, the blood transfusion stations, etc), in ambulances, medical transport at sites of infection in clinical, microbiological.
- For hygienic hand treatment by medical personnel.
- For the treatment of the hands of surgeons and others involved in operations and other invasive procedures.
- Decontamination and degreasing of the skin and the injection areas and operational areas;
- For the treatment of skin donor elbows.

The Solution

AQUAECA solution is a colourless transparent liquid with the mild chlorine smell. With the compounds of active chlorine and oxygen, AQUAECA solution is produced by processing an aqueous solution of sodium chloride (NaCl) in membrane electrolyzers. One of the most salient features of Aquaeca is that according to GOST 12.1007-76 it corresponds to low- toxic compounds of the 4th (the least dangerous) class of toxicity.

AQUAECA is dissociated spontaneously after use and does not require neutralization.

AQUAECA solution has the following characteristics:

pH	7,2-8,4
RedOx	600-900 mV
The concentration of active chlorine	100-500 ppm depending on the purpose

List of oxidants (active ingredients) of the solution AQUAECA

Active oxygen compounds		Active chlorine compounds
Hydroxyl anion	OH-	hypochlorous acid
Hydroxyl radical	HO	hypochlorite ion
Peroxide anion	HO ₂	hypochlorite-radical
Radical hydrogen peroxide (perox ide-radical)	HO ₂	Chlorine-radical (chlorineatom)
Hydrogen ion (hydronium ion)	H+	Chlorine dioxide
Hydrogen Radical	H	Chlorite-radical
Hydrogen superoxide	HO ₂	Chlorite-anion
Hyperoxic anion	HO ₂	
molecular oxygen	1O ₂	
Hydrated electron	eaq-	
Ion-radical of molecular oxygen (superoxide anion or anion hyperoxic)	O ₂	
Dioxygen cation, containing one unpaired electron	O ₂ ⁺	
Oxygen ion	O ₂	
Peroxide anion	O(2-)	
Ozone	O ₃	
Anion-radical molecular ozone	O ₃ ⁻	
Cation peroxonio	HO ₂ ⁺	
Molecular anion of water	HO-	
Atomic oxygen	O	
Ión de hidroxonio (catión de hidronum)	HO ⁺	

Instructions for storage

Although the key feature of the equipment is that we have the facility for the instant production of this solution at site. In case there is a need, it can be stored for 180 days while retaining the disinfectant properties of the solution, however it should be stored in closed glass, plastic or enamel container at room temperature and away from solar light.

Properties

AQUAECA disinfectant is effective against

- Antimicrobial activity against Gram-negative and Gram positive (including pathogens of nosocomial infections, and anaerobic infections and Mycobacterium tuberculosis),
- Viruses (including adenovirus, influenza virus, parainfluenza, avian influenza, swine and other agents of the influenza virus respiratory infections acute enterovirus, rotavirus, polio virus, virus, enteral, parenteral, hepatitis, herpes, SARS, HIV) etc,
- Fungi of the genus Candida and Trihofiton (ringworm), molds, and has sporcidal activity and washing properties.

Security/safety to User

- Disinfectant AQUAECA corresponds to the class 4 low hazard compounds (the least dangerous) class of toxicity.
- The skin irritant effect by single and repeated application according to the recommended methods of application has not been identified, the agent has a weak local irritant effect on mucous membranes of the eyes, has no action on the skin.
- Operational solutions with concentrations of 500 ppm (active chlorine) do not cause, by inhalation (as steam), upper respiratory tract irritation.
- AQUAECA is dissociated spontaneously after use and do not require neutralization.

Devices

These are portable equipment to produce AQUAECA solution.. The main component is electrolytic cells, which is an independent flow electrochemical cell. The solution is produced from the mixture of salt and water when it comes in contact with the surface of electrodes. This results in a change of balance in the structure of water and the formation of active ingredients as listed in the previous section.

Image 1. AQUAECA-40 Semi Automatic model

Technical Specifications

Productivity, l/hour.....	40
Power supply.....	220 V, 50 Hz
Power, Wt.....	400
Consumption of NaCl for 1 liter of ECAS solution, g/l.....	max. 5
Concentration of initial NaCl solution, % 10
pH value.....	7,7± 0,5
Concentration of active chlorine compounds, Ca.x, %	001± 0,05
Dimensions, mm	350 x 160 x 400
Weight, kg.....	4,8
Technical resort, hours.....	17000

