

Nano Technology For Better Environment



PROPHYLAXIS®

RELYON® Chlorine Dioxide



Company Introduction

As the global experience of our core team about microbial problems have been arising in most of industries. Where the water has been utilized. We found it is to be potent to get rid of these type of most of disinfectant and it's harmful by-product without harm to nature which are dangerous to human and environmental health. We have been vigorous since then. **PROPHYLAXIS** has established in 2009 soon after grand success. We are the inventor and manufacturer of innovative **RELYON** Chlorine Dioxide (ClO_2) and our company is certified by an ISO 9001:2008 Quality Management system. The company provides wide range of water treatment solutions.

Mission

To preserve human life by providing the world class environmental nano technology of stabilized **RELYON** Chlorine Dioxide as a water disinfectant. We intend to be the prominent global diversified health care company.

Vision

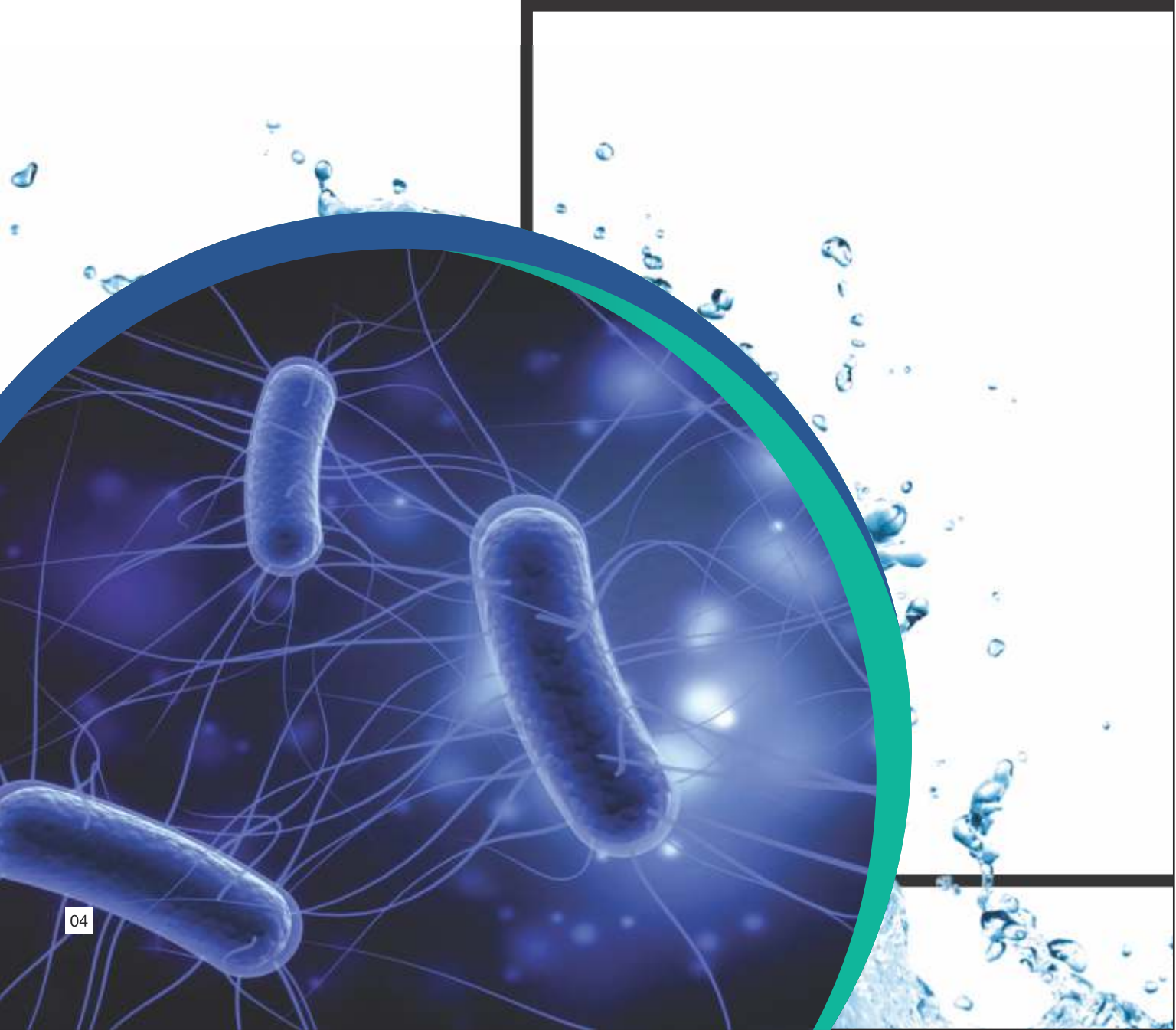
Microorganism FREE world with Healthier way to Life...

Product Introduction

Uniqueness of **RELYON** is stable, >99% pure and in liquid form which generates NO harmful by-products. Particularly MX (Mutagen X), THM (Tri Halo Methanes), HAA (Halo Acetic Acids), Alkali metal Sulfates, Chlorites, Chlorates, Chloramines, free chlorine...etc. The end products are a fraction of sodium sulphate (Na_2SO_4) and sodium chloride (NaCl). These substances are most common in water. **RELYON** process for preparation of liquid chlorine Dioxide comprises addition of two component systems in watery solution, each component having shelf life of more than two years. This does not employ any type of generator for production of ClO_2 . The process can be performed at any place, has almost no explosion hazards and it is very safe for storage & handling. The chlorine dioxide obtained by using **RELYON** Components having shelf life of 30 days kinetic half-life.

The above performance has been analyzed and proven by NABL, MOEF and Gujarat Health Ministry approved laboratories. Chlorine Dioxide is approved by World Health Organization (WHO), Environmental Protection Agency (EPA) USA and number of world class testing Laboratories and research centers have declared to be the most effective disinfectant with no side reactions or side effects, no harmful by-products & environmental use. Especially **RELYON** is an excellent disinfectant for any type of water treatment including river water which is mainly used for drinking.

RELYON®



RELYON Chlorine Dioxide Performance Plate Count 100,000cfu/ml

- Escherichia coli (200 ul **RELYON** Chlorine Dioxide solution/ litre tested water, Time: 2 min.; reduction:99.99%)
- Enterokokken(200ul **RELYON** chlorine Dioxide solution/ litre tested water, Time: 10 min.;reduction:99.99%)
- Coliform germs (200 ul **RELYON** chlorine Dioxide solution/ liter tested water, Time: 10 min.; reduction:99.99%)
- Legionella pneumophilia (200 ul **RELYON** chlorine Dioxide solution/liter tested water, Time :15 min.; reduction:99.99%)
- Fec.colif.(200 µl **RELYON** Chlorine Dioxide solution/ liter tested water, Time:10 min.; reduction:99.99%)
- Fecal strep.(200 µl **RELYON** Chlorine Dioxide solution/ liter tested water, Time:10 min.; reduction:99.99%)

Special Tests

- HIV(1000 µl **RELYON** chlorine Dioxide solution/liter tested water, Time: 10 min.; reduction:99.99%).
- H1N1(1000 µl **RELYON** chlorine Dioxide solution/ liter tested water, Time:10 min.; reduction:99.99%).
- Polio 1 (1000 µl **RELYON** chlorine Dioxide solution/ liter tested water, Time:10 min.; reduction:99.99%).
- Hepatitis A (100 µl **RELYON** chlorine Dioxide solution/ liter tested water, Time:05 min.; reduction:99.99%).

Why RELYON ?

RELYON Chlorine Dioxide kills microorganism by attacking and penetrating their cell wall and disrupting the transport of nutrients across the cell wall and inhibiting protein synthesis. Since this action occurs regardless of the metabolic state of the organism, **RELYON** is highly effective against dormant organisms and spores including Giardia Cysts and poliovirus as well and it has been analyzed by NABL, MOEF and Zambia Health Ministry, KEBS (Kenya Bureau of standards) approved laboratories.

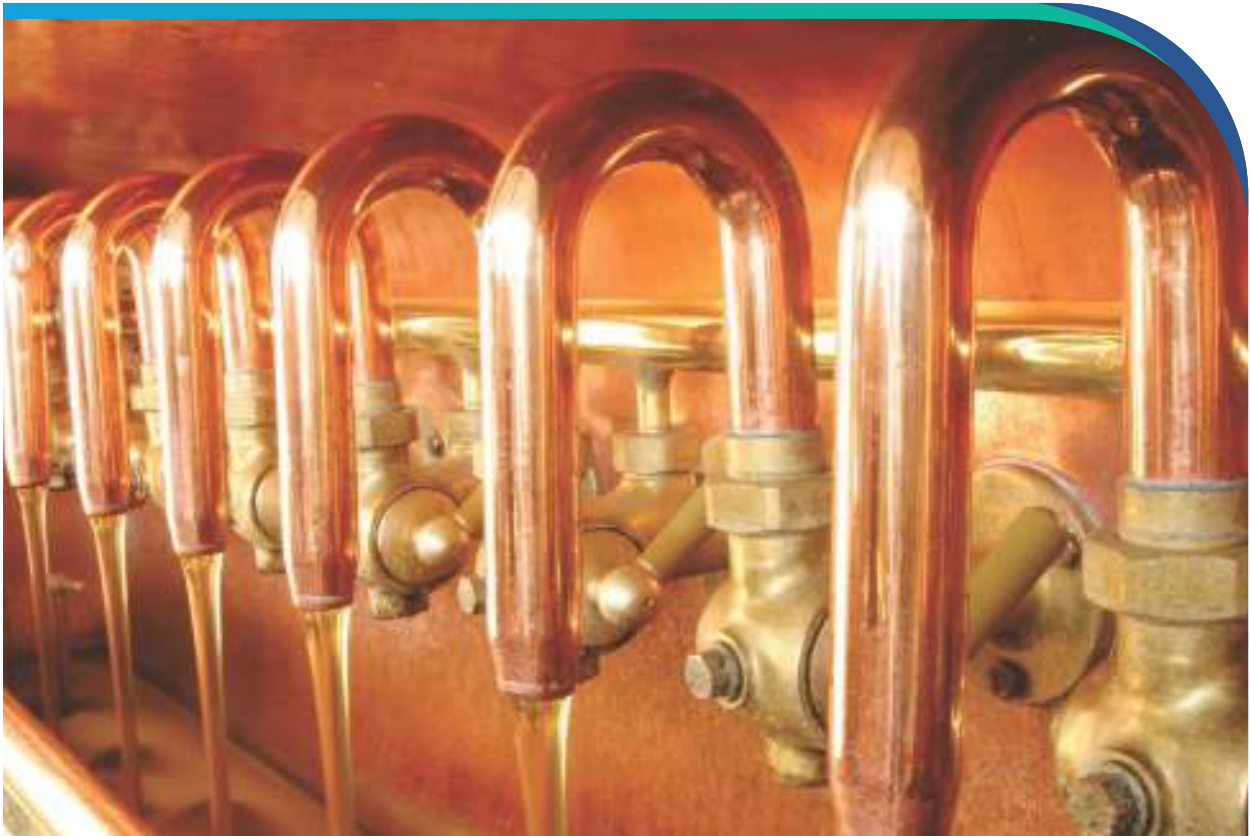
Chlorine Dioxide is approved by World Health Organization (WHO) and number of world class testing Laboratories and research centers have declared to be the most effective disinfectant with no side reactions, no harmful by-products & safe to use. Equally good for drinking water as well.

- **RELYON** has proven more biocidal Power than CHLORINE.
- **RELYON** has at least 10 times more oxidation power than CHLORINE.
- **RELYON** removes & controls Manganese, Iron & cyanide.
- **RELYON** removes Bio-film & Algae.
- **RELYON** does not corrode pipes, vessels & Equipment.
- **RELYON** kills all types of MICRO ORGANISM including VIRUSES.
- **RELYON** controls the odour of the water.
- **RELYON** is a Non-Chlorinating agent.
- **RELYON** has broader pH working range (4-10).
- **RELYON** is broad spectrum biocide.

- RELYON does not required any reactor or generator.
- RELYON does not create resistance building.
- RELYON dose not produce MUTAGENS,TRIHALOMETHANES,HALOACETIC ACID or any injurious to health by-products.
- RELYON reduces threat of cancer,Tumor of the thyroid Glands,Liver,Adrenal glands, Hepatitis A &E.
- Norovirus, Rotavirus,micro-organism such as Legionella Pneumophila& Mycobacterium Avium Complex.
- RELYON is the good choice for Industries, Beverages, Breweries, Drinking water treatment, cooling Towers,
- Refrigeration, Food processing,Agriculture, Hospitals, Gardens, Date Farms,Vegetable Growing etc.
- RELYON is safe & easy to use.
- RELYON eliminates the use of bulky,harmful,irritant and dangerous chlorine gas cylinders and associated costly equipment. It also saves man power and electricity.
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Application Of
RELYON ClO₂



| Cleaning In Process (CIP)

RELYON was selected as an alternative sanitizer based on its known anti microbial effectiveness over wide range of pH and temperature, further more **RELYON** does not produce tri halo methane or chloro phenolic by products,as important environmental consideration.The use of **RELYON** chlorine dioxide replaced the use of the water step in the total cleaning in place (CIP) cycle. The use of **RELYON** solution produced no degradation in microbial control when compared with hot water sanitation. Other benefit includes reduction in CIP cleaning time, reduce energy consumption and equipment stress caused by repeated heating and cooling.



Drinking Water Disinfection

RELYON is safe Liquid Oxidant, ideal for use in water treatment applications where growth of micro organisms, bio-films are to be restricted for the water in use. **RELYON** has a proven bactericidal, algacide, fungicidal, sporicidal and veridical efficacy. **RELYON** has at least 10 times more oxidation than CHLORINE. **RELYON** has proven more biocidal power than CHLORINE. **RELYON** kills all type of MICROGANISMS including VIRUSES as well. **RELYON** removes & controls the bad odour from the water. **RELYON** removes & controls manganese, Iron, Cyanide, Phenol, ALGAE & BIO-FILM. **RELYON** does not corrode pipes.



Fruits & Vegetables

As is known, the peel of fruits and raw vegetables, while having high contents of vitamins and mineral salts, contains on the surface many microbes, bacteria and other polluting substances originating from the fertilizers employed in the production, as well as from various birds, animals and insects, atmospheric agents, etc. Tossing fruits and vegetables into basket or boxes may not leave visible bruises and damage, but decay will begin under the skin. Seemingly sturdy vegetables such as sweet potatoes are actually quite tender and will not store well if bruised. Endemic in nature so impossible to predict where it will occur next. The largest issue facing the fruit & vegetable industry is improving the shelf life of the produce.

RELYON is an excellent product for washing vegetables. It has the ability to kill spores, fungi and viruses at low concentrations. **RELYON** is a proven product that can be used to solve many food related problems. It does not affect taste, odor or appearance.



Brewery

RELYON is a safe and effective sanitizer for use in a variety of brewing and packaging applications. **RELYON** can be applied to water systems, processing equipment, and environmental surfaces to reduce or eliminate brewery spoilage organisms.

Pitching yeasts collected from brewery fermentations are never absolutely free of microbiological infection. In spite of whatever care and sanitary precautions are taken, some bacteria and wild yeast will contaminate the pitching yeast. The pitching yeast can contain healthy yeast cells and trub (dead yeast cells and organic residues) and may contain 5 to 15 % dry solids (35). To minimize microbiological infection, **RELYON** an alternative to distilled water or acid washing, is relatively new to the brewing industry and is gaining acceptance as a method for washing yeast. It kills microbes by reacting chemically with sulfur-containing amino acids, the building blocks of protein which are used to form cell membranes.

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Food Processing /Meat /Seafood /Slaughter House

Freshly slaughtered poultry or other meat products are contaminated with pathogenic microorganisms. These microorganisms are present in both on the surfaces of the animals as well as in the intestinal tracts immediately after slaughter. To insure product safety, recent federal regulations require microbiological testing rather than visual inspection. These regulations require that carcasses be tested for salmonella, Shigella, protozoa & Fungial.

Deeping of meat product by **RELYON** ensure free from all type of microbes and retarded freshness, Odour control & increase selflife.



Milk Processing

Milk is also a very nutritious medium for microbial growth, and spoils very quickly if not handled properly after collection. In addition, many pathogenic bacteria can also grow in milk, for example, *Listeria monocytogenes*, *salmonella* spp, and *Escherichia coli*.

RELYON is a safe and effective sanitizer for use in a variety of milk processing and packaging applications. **RELYON** can be applied to water systems, processing equipment, and environmental surfaces to reduce or eliminate milk spoilage organisms. **RELYON** can be used for disinfecting parts of dairy machine, cans and tankers etc; also deeping paneer & khoa with **RELYON** is retarded freshness & increase self life.



Poultres

Diseases and infections have always been a major concern to the poultry industry especially in the hatchery. Microorganisms are everywhere! Some are relatively while others are highly pathogenic. Some pose a lethal threat to one species of animal while remaining harmless to another species. Some organisms are easily destroyed while other are very difficult to eliminate. Treat all microorganisms as if they are a severe threat to the chick's livelihood.

RELYON with its broad spectrum antimicrobial activity, can deliver kills against a wide range of microorganisms over shorter periods of contact time. When properly applied, minimizes toxic residues as it doesn't produce halogenated organic by products.



Aqua Culture

Control of water quality is the key factor for a successful culture of aquatic animals like fish, prawn and shrimp. An open water system with sufficient good water quality may ensure successful aquaculture. However, if proper quality or sufficient quantity of water is not available, purification of water by eliminating polluting substances including toxic metabolites and growth inhibiting substances which originate mainly from fish or shrimp excretion and excessive feed is necessary. Under these lower water quality conditions there are chances for occurrence of mortalities by diseases due to viral, bacterial, protozoa, fungal pathogens. High populations of aquatic animals can be kept healthy under successful semi-closed and closed systems by maintaining proper sanitization. The increased demand in water quality and quantity in shrimp and fish culture has resulted in a growing interest in using water sanitizers and disinfectants. **RELYON** is a broad spectrum micro biocide as effective as chlorine against viruses, bacteria & fungi.



Horticulture

Algae control is one of the more frustrating challenges for farmers. This problem has steadily become worse in recent years and growers are recognizing significant financial losses attributed to algae and the production problems they cause. It is frustrating because while algae are living organisms, eliminating them does not fall under the normal protocols of pest control. Algae are not insects and cannot be controlled by insecticides. Nor are they a fungus that can be controlled by fungicides. Algae and bio-film are able to form a symbiotic relationship-what one needs, the other provides. It's a relationship that keeps feeding itself, which is a major point in understanding why algae control is so difficult. Bio-film is able to provide algae with enough nutrients to substitute for their need of light to create such nutrients. This allows algae to flourish in irrigation lines.

RELYON is an effective sanitizing agent for water treatment. In horticulture, it is used at a high concentration to remove established bio-film that lines irrigation systems, clogs emitters and can potentially harbor pathogens. For continuous application, a low concentration of **RELYON** can be used to maintain clean irrigation lines and to inhibit algae and diseases.



Hospital/hospital Wastes

Legionella, a life-threatening microbial contaminant, was detected in the hospital's domestic hot and cold water systems. Because the contaminated water system was a source for dangerous waterborne pathogens, it posed a serious risk for a Legionella outbreak among hospital patients who already suffered from compromised immune systems. The safety of its patients is in jeopardy, surrounding a potential Legionella outbreak in the hospital.

In the normal course of operation, hospital generate a variety of waste which is not suitable for normal disposal. While some or most hospital waste may be harmless, it is difficult to distinguish such harmless waste from infectious waste. As a result, all of the waste from a hospital must be treated as if it may harmful.

Because of its bio- cidal characteristics, ClO_2 is ideal for water hygiene applications in hospital and healthcare facilities. It has consistently been shown to be the best molecule for eradicating the causative organism of Legionnaires' disease. ClO_2 is strong biocide at low consistently been shown to be 0.1 ppm. With minimal contact time, it is highly effective against many pathogenic organisms including Legionella, Giardia cysts, Ecoli, and cryptosporidium. ClO_2 can greatly reduce and eliminate bio-film populations and discourages bacterial re growth. In cooling system of hospital also [RELYON](#) can be use.



Hotel Industry

When we talk about hotel industry is in the full flag growing stage and now a day's people wants safety from all around . Hotel management also take care about everything. If we talk about application of **RELYON** in hotel industry there is number of ways to apply.

- Drinking water disinfection
- Bathing water disinfection
- Storage water disinfection
- Swimming pool water treatment
- Odor control
- Sanitization.
- Fruits & vegetables disinfection
- Floor cleaning
- Bad site cleaning



Ethanol

Maintaining a rigorous cleaning and sanitation program is the most important element in controlling bacterial contamination in ethanol production. Sanitation also has a direct relationship to consistent ethanol yield during fermentation. **RELYON** is a versatile antimicrobial that can be used in sanitation applications. In addition to being effective the development of resistant bacteria, it works against spores, viruses, fungi and algae over wide temperature and pH ranges.

Bacterial contamination is a major concern in ethanol process. Bacterial contamination not only results in significant loss of ethanol yield and impacts batch profitability, it also causes debilitating problems for plant operations. Today antibiotics are the most common treatment for preventing and controlling bacterial infections, but effectiveness, resistance to certain bacterial strains, and antibiotic residuals in spent grains for feed remain a concern. **RELYON** is an oxidizer that rapidly attacks harmful acid producing bacteria in the fermentation cycle without attacking yeast, enzymes or other desirable mash components.



Power Plant

RELYON is one of the most widely used removes possible bio-films, scale in the power plant industry, providing a high- quality, low- cost disinfectant in process. **RELYON** treatment is superior to chlorine disinfectant processes in that it virtually eliminates all dioxin discharges into the environment, and has accordingly, helped power generation to employ environmentally friendly processes and to meet environmental requirements. Accordingly, the use of **RELYON** treatment is Improves Operating Efficiency, Increases DM Plant Throughput, Enhances Corrosion Control Program, Decreases plant Operating Costs and Improves Heat Exchanger Efficiency in process.

RELYON have wider operating Range of Ph 4-10 in process.



| Paper & Pulp

RELYON is one of the most widely used delignification/ bleaching agents in the pulp and paper industry, providing a high- quality, low- cost delignification and bleaching process. **RELYON** treatment is superior to chlorine bleaching processes in that it virtually eliminates all dioxin discharges into the environment, and has accordingly, helped pulp and paper manufactures to employ environmentally friendly processes and to meet environmental requirements. Accordingly, the use of **RELYON** treatment is increasing and most pulp and paper mills now have at least one **RELYON** delignification or bleaching stage. **RELYON** treatment has also been used to treat wastewater, sludge and other process streams.



Oil & Gas

It is well known that during the production life of oil and/ or gas wells, the well formations tend to become plugged with iron sulfides and sulfates or polymers added to injection water for increasing water viscosity and sweep efficiencies. Such plugging decreases well production. In response to this problem, a well-established technique is to inject **RELYON** into the well. **RELYON** rapidly oxidizes the naturally occurring iron compounds, and also is effective at breaking up and removing organic solids and added polymers.

RELYON Chlorine Dioxide treatments reduces:

- Iron sulfide (FeS) – ClO₂ destroys the FeS it contacts. The FeS will not re-precipitate, as it can with conventional acid jobs.
- Bactericide- ClO₂ is a biocide that kills bacteria by destroying the bacteria's cell walls, leaving the water sterile.
- Polymers & Residue – ClO₂ breaks most frac & polymers and reduces or eliminates polymer residue.
- Hydrogen sulfide (H₂S)- ClO₂ oxidizes on contact, reducing H₂S levels significantly. Since ClO₂ destroys bacteria, bacteria-generated H₂S can be dramatically reduced. ClO₂ is dispersible in oil, water and organic solvents.



Waste Water Treatment

The main work in waste water treatment is that to control of COD and BOD.

The levels of these pollutants are measured by the B.O.D. (Biological Oxygen Demand) or C.O.D. (Chemical oxygen Demand) C.O.D. **RELYON** gives best results to control COD & BOD then other chemicals .

RELYON will penetrate the slime and bio-film layers, eliminating the nutrient source for pathogens to colonies. **RELYON** offers a highly effective treatment for handling Sulphite Reducing Bacteria (S.R.B's), including odor destruction. **RELYON** is effective against aerobic and anaerobic residual bacteria with no potential for immunity development via mutation. **RELYON** destruct manganese, Iron & cyanide form the waste water.



BY-Product Facts

Disinfectant	Disinfectant by products
Chlorine/Hypochlorite	Trihalomethanes (THMs), Haloacetic Acids, Haloacetonitriles, Haloketones, chloral Hydrate (trichloroacetaldehyde), chloropicrin (Trichloronitromethane), cyanogen chloride, chlorate, chloramines, Mutagen X (MX)
Ozone	Bromate, Aldehydes, Ketones, ketoacids, carboxylic Acids, Bromoform
"In situ" Chlorine Dioxide	Chlorine, chlorate, chloride, free chlorine
RELYON	None

Comparison Facts

	Classical Cl ₂ -Method	RELYON Chlorine Dioxide Method
	Cl ₂ : gas NaOCl: liquid	Component A: Liquid Component B: Liquid
Stability of Ingredients	Very Limited	Unlimited
Composition of ClO ₂ solution	Containing Free Chlorine Containing Chlorate Containing Chloride Containing Chlorite Explosive	No Free Chlorine No Chlorate No Chloride No Chlorite Non-explosive

Stability of RELYON Chlorine dioxide

Kinetic Half Time >30 days

(In solution form when storage conditions are respected.)

Comparison Facts

Compound	Chlorine ("Elementary Chlorine")	Chlorine Bleach	Hypochlorite	Hydrogen Peroxide	RELYON Chlorine Dioxide
Chemical Formula	Cl ₂ , Gas Form	NaOCl/NaOH/Cl	e.g. Ca(OCl) ₂	H ₂ O ₂	ClO ₂
Application Form	Defined concentration in liquid solution, "Chlorine Water"	Solution	Defined concentration in liquid solution	Defined concentration in liquid solution	In liquid solution.
Minimum concentration for water disinfection	50mg "free chlorine"/ L	50mg "free chlorine"/ L	50mg "free chlorine"/ L	150mg/L	0.1mg/L (can be lower!)
Micro biocide working	Broad effect against most bacteria, Fungi and (with limits) viruses and protozoan.	See Chlorine	See Chlorine	Not always effective against bacteria, fungi and yeast.	Effective against all in water living micro organisms (including bacteria, fungi, protozoan and viruses)
Working Limitations	In low concentrations "Chlorine Resistance Building"	See Chlorine	See Chlorine	Micro organisms with peroxides-system are extensive protected	No resistance building by targeted micro organisms.
Side Effects	Decrease of pH-values due to building of hydrochloric acid (Hcl)	Increase of pH-values by the level of NaOH	Corrosive due to a high level of NaCl	Hardly any corrosive effect on metal. Plastics become brittle.	Very material friendly, pH-neutral etc.
Application Limitations	Not suitable for installation systems with corrosion sensitive materials	See Chlorine	See Chlorine	By catalytic decomposition in water and oxygen no depot effect	No material Limitations



Service Technical Support

Our Technical Team would be obliged to serve you their expertise to solve your queries pertaining to the RELYON Chlorine Dioxide and also provide you needful suggestions about the application for the benefit of your field as well

FAQ (Frequently Asked Questions)

Q:1 How does Chlorine Dioxide work?

Chlorine Dioxide is an oxidizing biocide. It deactivates micro organisms by attacking and penetrating their cell wall, disrupting the transport of nutrients across the cell wall and inhibiting protein synthesis. Since this action occurs regardless of the metabolic state of the organism, oxidizing biocides are effective against dormant organisms and spores (Giardia Cysts and Poliovirus).

Q:2 Is there Chlorine in RELYON Chlorine Dioxide?

No, there is no Chlorine in RELYON Chlorine Dioxide. Although Chlorine Dioxide has the word Chlorine in its name but RELYON's two chemicals have completely different chemical structures of it's revolutionary formula. The additional oxygen atom radically changes the molecule and creates completely different chemical behaviors and by-products. Their differences are as profound as those between hydrogen, the explosive gas, and hydrogen combined with oxygen, which creates di-hydrogen oxide - commonly called water. RELYON Chlorine Dioxide is 99% pure, stable and generates NO harmful By-products.

Q:3 Is chlorine dioxide pH dependant?

Because chlorine dioxide is a dissolved gas, it does not ionise to form weak acids (as chlorine and bromine do) in aqueous solutions. This allows ClO_2 to be effective over a wide pH range.

Q:4 Why not use chlorine instead?

Chlorine changes the tastes and odour of water. Chlorination will also produce harmful by-products called Trihalomethanes (THMs) which are linked to incidence of cancer and Bromates which are highly carcinogenic. Chlorine will not remove biofilm, is more corrosive, environmentally unsound, may not be used at temperatures of 40°C or over and has a very narrow pH band within which it has any useful action.

Q:5 How does chlorine dioxide affect the environment?

Chlorine dioxide is a highly effective, eco-friendly microbiocide that carries US EPA, FDA and UK Government approvals for many of its uses... Chlorine dioxide does not persist in the environment and has even been shown to have positive environmental effects where it has replaced the use of chlorine...more?

Q:6 What's so great about RELYON Chlorine Dioxide?

1. RELYON Chlorine dioxide removes all of the health & safety issues associated with traditional chlorine dioxide production and delivery technologies. **2.** RELYON Chlorine dioxide produces a chlorine dioxide product stream of 7600ppm. **3.** RELYON Chlorine dioxide produces a product stream with "ZERO" residual chlorite – unlike traditional and other chlorine dioxide technologies. **4.** RELYON Chlorine dioxide has "ZERO" chlorine in the product stream – unlike traditional and other chlorine dioxide technologies. **5.** RELYON Chlorine dioxide, due to the simplicity of its process and design, provides unequalled reliability of operation and effectiveness.

Healthier Way to Life

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