

# ENVIRONMENTAL BLUEPRINT

## Demonstrating the Utilization of CLEANOVATION Laundry Care System to Drive Superior Ecological & System Improvements and Unmatched Environmental Stewardship

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The objective is to demonstrate and communicate aspects of clean ability, composition, ecological-impact, mode of action and overall value of the CLEANOVATION Laundry Care System.

### SAFE FOR THE ENVIRONMENT

Cleaner Solutions offers an innovative and environmentally responsible Laundry Care System called CLEANOVATION.

**CLEANOVATION is a Laundry Care System** consisting of Transformational Fabric and Environment Cleaning Technologies with Rapid Biodegradability's, 24/7 Eco-Safe Fabric Protection, Real-Time Integration, Tracking and Quality Control. The system eliminates the Use of Bleaches, Peroxides and other Oxidizing Chemicals. The CLEANOVATION Laundry Care System was introduced to achieve Cleaner Solutions vision of shaping a [CLEANERBLUE www.cleanerblue.com](http://www.cleanerblue.com) planet into the future. The vision centered on transforming and improving any environment our system was introduced that goes beyond current environmentally responsible expectation. For instance, our goal was to exceed current **EPA** standards and even the strict standards being realized under the **REACH** program operating within the EU guidelines. Similarly to the **EPA** environmental guidelines set forth in the U.S.A, **REACH** is designed to vigorously protect the environment – air, water, nature and biodiversity with ecological driven oversights and protections. [http://ec.europa.eu/environment/chemicals/reach/reach\\_en.htm#](http://ec.europa.eu/environment/chemicals/reach/reach_en.htm#)

CLEANOVATION is currently being utilized in commercial laundry operations in the United States and Europe. The authorization to sale ES8000-LT (BALANCE), a key component of the CLEANOVATION Laundry Care System, into the European marketplace is possible by the necessary approval and validity derived by a European operating company attesting and assuring its conformity through independent testing and verification. Ensuring, through numerous laboratory tests, all trace chemical elements and proper classifications are aligned and fall within the standard(s) set forth by **REACH**. The standard includes total ingredients, mixtures and formulations meeting certain criteria regarding **substances of very high concern (SVHC)**. Operating under SVHC, substances are not allowed to contain concentration levels of >0.1%. It's been verified in Europe, ES8000-LT meets all the current compliance requirements under **REACH**.

Additionally, the CLEANOVATION Laundry Care System does not discharge a supply of AOX (Absorbable organic halides) in the waste water. Thus, avoiding the traditional laundry operations routine use of these chemicals that could negatively impact worker safety, water quality, wildlife and the ecology. Most AOX's are chlorine-containing molecules. AOX's represent the organically bound halogens of chlorine, bromine, and iodine contained in a sample which can be absorbed on activated carbon. CLEANOVATION Laundry Care System is free from all chlorine and per-acids on a daily basis.

**Chlorine bleach** is often released into local waters along with other liquid industrial waste. Once it reaches the water, chlorine reacts with other minerals and elements to form a host of dangerous toxins. These toxins, including dioxins, furans are referenced as persistent organic pollutants because they linger in the water or soil and take many years to disappear.

Greenpeace calls dioxin one of the most dangerous chemicals known to science and warns that it can contribute to cancer, endocrine disorders and other serious health effects. The West Virginia University Extension also links chlorine-based compounds, like dioxins, with low sperm count, testicular cancer and breast cancer due to their ability to mimic human hormones. The World Wildlife Fund also warns that these chlorine-by-products can cause mutations, sterility and even extinction in wildlife species.

*Dioxins and furans are some of the most toxic chemicals known to science. A draft report released for public comment in September 1994 by the US Environmental Protection Agency clearly describes dioxin as a serious public health threat. The public health impact of dioxin may rival the impact that DDT had on public health in the 1960's. According to the EPA report, not only does there appear to be no "safe" level of exposure to dioxin, but levels of dioxin and dioxin-like chemicals have been found in the general US population that are "at or near levels associated with adverse health effects."*

*Dioxin is a general term that describes a group of hundreds of chemicals that are highly persistent in the environment. The most toxic compound is 2,3,7,8-tetrachlorodibenzo-p-dioxin or TCDD. The toxicity of other dioxins and chemicals like PCBs that act like dioxin are measured in relation to TCDD. Dioxin is formed as an unintentional by-product of many industrial processes involving chlorine. Source: <http://www.ejnet.org/dioxin/>*

## **ABSTRACT (PERACETIC ACID) BLEACH ALTERNATIVE**

*Concerns with chlorine disinfection have led to investigation of alternative disinfectants for use in the environmental arena. Are there environmentally safe alternatives to chlorine? Is peracetic acid one among these? Peracetic acid is one among several chemicals that have been touted as a replacement in recent years. Peracetic acid is very effective in killing bacteria, viruses, fungi, and spores over a wide pH and temperature range. Organic matter or storage time does not reduce the effectiveness of peracetic acid. The breakdown products of peracetic acid, hydrogen peroxide and acetic acid are reported to be environmentally friendly. This factor, along with recent improvements in stabilization techniques allowing longer storage periods and decreased costs have peaked the interest in peracetic acid as an alternative chemical for disinfection in the water and wastewater fields. Recent studies have discussed peracetic acid as an alternative chemical to chlorine for drinking water; wastewater treatment plant effluent and combined sewer overflow (CSO) disinfection. Advantages of peracetic acid over chlorine include lower chemical needs, shorter contact time, and its ability to be effective in the presence of organic matter. Another advantage is the absence of disinfection byproducts, which has led water and wastewater treatment professionals to believe that a quenching facility (i.e., similar to dechlorination) is not required.*

*Our experience and research has shown that it is a very potent chemical that can have negative impacts. Due to its high potency, it is very important to use utmost caution when applying this in CSO or treatment plant effluent disinfection applications. One of the biggest advantages of peracetic acid, i.e., its stability, is its greatest disadvantage in such applications. The breakdown*

*products may be environmentally friendly, but it takes a very long time for peracetic acid to decompose. Stabilizers used in the preparation of peracetic acid enable dilute solutions to maintain activity for a number of days. Consequently, excess chemical used in effluent and/or CSO disinfection remains active for a long time and can negatively affect receiving waters, continuing to kill microorganisms unless the excess chemical is quenched. Therefore, it is extremely important to determine the impacts of peracetic acid on microorganisms in the receiving water body and to evaluate the need for quenching. Dechlorination chemicals such as sodium bisulfite are effective in quenching peracetic acid also. Source: <https://www.environmental-expert.com/articles/peracetic-acid-is-it-an-environmentally-friendly-alternative-to-chlorine-24376>*

## **IMPROVES SYSTEMS VERSUS BURDENING THEM**

Nature implements bioremediation utilizing bacteria and enzymes as a natural clean up and recycling system. ES8000LT formula offers a high biodegradability rate, high active count and is an extremely safe product to handle. Consisting of non-pathogenic or good microbes which deliver a healthy bank of bacteria and enzymes to safely & effectively clean fabrics while contributing to cleaner water, land, drain lines, septic & sewer systems and other areas where stubborn organics build up. Designed to benefit a system by improving water quality, BOD (biological oxygen demand) and COD (chemical oxygen demand) levels which translates into cities gaining from less chemical burden to waste water treatment/processing plants and throughout related systems.

The CLEANOVATION Laundry Care System attempts to greatly exceed standard state and federal discharge criteria for substances of environment concern. ES8000-L functions as a "microbiology farm," that contributes a high active solution that continues to grow stronger and more bountiful after introduction into a system. When suitable conditions, nutrients and organics are available.

Water quality has a number of constituents including biological oxygen demand (BOD), chemical oxygen demand (COD). Microbes required to perform the degrading function in a healthy system will die if not provided with the correct balance of nutrients. As they oxidize they produce acid, which disrupts the total balance of the microbial populations. Due to the competitive nature of microbes, the non-beneficial bacteria will dominate, producing an excessive level of pathogens and toxins. This will lead to stalling or grid-lock and high BOD's that release foul smelling odors.

The indigenous microbial species found in typical wastewater systems are often overwhelmed by system upsets. Harsh chemicals, disinfectants and chlorination will have a detrimental effect on microbial populations making systems less efficient. Sludge build-ups occur, tank deposits, back-ups, floating grease pads, fouled drain fields are just some of the problems encountered when microbial populations are not maintained at optimum levels.

With a better understanding of the inhibitory factors which cause the desired microbial populations to diminish, ES8000-LT helps to re-populate the system with specific microbes via augmentation in the high actives counts of microbial growth found in the formation of colony units.

## **LEACHING ANTIMICROBIAL TECHNOLOGIES POSE PROBLEMS**

Antimicrobial residues can enter the aquatic environment in effluent from industries involved in the production of antimicrobial products or following direct disposal (intentional and unintentional)

into waste streams (landfill and wastewater). In addition, a significant quantity of the antimicrobial agents used therapeutically in human and veterinary medicine is shed into waste streams in urine or feces, in a form that is still biologically active.

Antimicrobial agents in water and wastewater are a potential problem in two ways: First, there is potential for direct human health effects through ingestion as chemical contaminants; second, there is potential harm if they change the microorganisms in the water. The immediate public health concern regarding the effect of antimicrobial agents in water is that microorganisms in water change to become more antimicrobial-resistant. There is also concern that antimicrobial agents may change the natural balance in the microbial ecosystem. Changes in the microbial cells and populations can last long after the antimicrobial agent has broken down or been removed. If people drink the water or swallow it during recreation, this may help to spread antimicrobial-resistant microorganisms over a large population very quickly.

THE CLEANOVATION Laundry Care System utilizes a patent-pending washing process and specifically formulated, water-soluble antimicrobial technology that now allows commercial laundry operators the ability to deliver a **non-leaching antimicrobial technology, covalently and permanently bonded to fabric** (does not cross the skin barrier to cause skin irritations) which is processed directly on fabric in the wash load on a periodic basis. The innovative technology is a renewable resources derived from coconuts and has a 100% affinity to fabric when being processed in the wash.

## **HIGH BIODEGRADABILITY FACTOR**

THE CLEANOVATION Laundry Care Systems deliver superior blend of non-ionic surfactant components, readily biodegradable (>60% in 10 days), classified as a GREEN (DfE) non-ionic surfactant.

The nonionic category of surfactants are chemical structures that contain active molecules with no electrical charge. Unlike molecules with surface properties due to a positive (cationic) or negative (anionic) charge, nonionic surfactants do not react with other ions. As a result, they do not form insoluble salts, can be used in strong acidic solutions and tend to have low toxicity profiles.

Many properties of surfactants that are useful in applications such as industrial cleaning can have undesirable effects on the environment. For example, surfactants frequently migrate to solid/liquid or liquid/air interfaces and exhibit foaming characteristics when they function as cleaning agents. These properties cause toxicity to aquatic life and unsightly foam, which also tends to minimize good oxygen transport from the air to lakes, streams, and other receiving waters. The U.S. Clean Water Act regulates discharge of surfactants and other chemicals to receiving waters by requiring permits to dischargers. They must show that the contents of the discharge do not foam or cause harm to aquatic life. These discharges, whether they originate from household or industrial and institutional waste, must be treated prior to entry into public waters. The heart of waste treatment today is an aerobic microbial process which converts organic materials like surfactants to products which are not deleterious to the environment.

What separates environmentally acceptable surfactants from those that are environmentally unacceptable is the capability of that surfactant to biodegrade during its residence time in the waste treatment process. The United States Environmental Protection Agency (EPA), the European Union (EU), and the Organization for Economic Co-operation and Development

(OECD) all have definitions of biodegradability. CLEANOVATION Laundry Care System is highly biodegradable by these definitions, and are biodegradable according to the criteria set forth in the EU Regulation No 648/2004 on detergents and have meet the most stringent biodegradability criteria and are classified as readily biodegradable.

## **MUNICIPALITIES TAKE ACTION**

The care of the environment is becoming more important every day. Some municipalities want to measure the amount of chemicals in the incoming stream in order to asses surcharges as a way of measuring how much additional treatment their plant will have to do in order to get the incoming water clean. You can imagine, how many harmful chemicals never make it downstream for water processing. They just wind up accumulating in the waterways, soils, plants, wildlife, etc. and ultimately foul up the whole system over time.

## **TRANSFORMING TECHNOLOGY**

ES8000-LT is a living technology utilizing microorganisms to carry out chemical transformations which has been applied for centuries in brewing, pharmaceutical and other livestock industries. Microorganisms are key elements in the recycling system of the planet. The total ES8000-LT laundry formulation is so gentle it allows for the hosting of good and beneficial living microbes to be ready for release to exponentially increase and beginning work to improve a system once introduced into a wash load. The only living detergent capable and safe enough to harbor microbial life and subsequently capable of binary fission to further create life from itself. ES8000-LT is in a league of its own...making it the greenest of the GREEN TECHNOLOGY.

Treatment of the organic waste involves biological breakdown of the organics and chemicals contained in the waste. ES8000-LT is a highly biodegradable formula and has the ability to pre-remediate organic matter. This mode of action is considered environmentally active biotechnologies that harness natural, self-purification processes for the biodegradation of organic matter and bioconversion of soluble nutrients in the wastewater back to harmless substances. Traditional detergents on the other hand are unable to breakdown, convert and transform tough organics into harmless substances or even capable of self-biodegrading safely or quickly. Ultimately, traditional, under-engineered and low-end detergents combined with all the related chemicals needed to clean fabric will eventually overwhelm, burden, accumulate and negatively impact the environment, wildlife and related systems.

CLEANOVATION Laundry Care Solution delivers the strongest environmental stewardship formula that's found in the market today. Our commitment to designing for the environment (DfE) extends well beyond chemical solutions to deliver safe fabric care, improved linen life, lower energy costs and better fabric quality by driving toward an ecological stewardship unmatched in scope and scale within the entire commercial laundry industry.

