

ECOQUEST LaundryPure™ System

Household Laundry Advanced Oxidation Radiant Catalytic Ionization System

The Problem:

Traditional laundering involves hot water and a chemical soup of phosphates, chlorines and perfumes (detergents). These chemicals do clean our fabrics. However, they also embed themselves into the fabric resulting in:

- Possible allergic reactions
- Weighing down of the fabric (loss of volume)
- Dulling of the colors
- Creation of a sticky surface from residual detergents that acts as a magnet for grime and contaminants
- Phosphate and chlorine pollution of our water resources

The Solution:

EcoQuest's LaundryPure

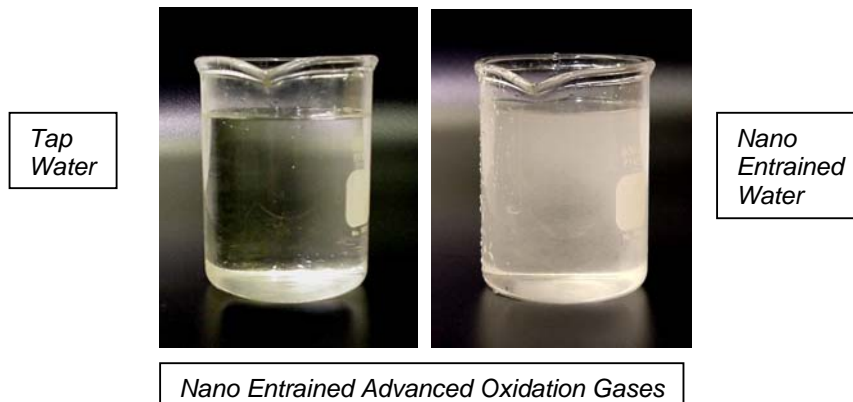
ECOQUEST has taken a relatively new laundry technology and enhanced it! Ozone has been used in hotels, commercial laundries and hospitals for over 10 years with outstanding results. Now, ECOQUEST has taken this technology to the next level with Radiant Catalytic Ionization™. The proprietary ECOQUEST Advanced Oxidation Technology provides six of nature's most powerful and disinfecting technologies for your laundry.



The ECOQUEST Laundry Pure Cleaning Process:

- **Oxidation Gases.** The Radiant Catalytic Ionization™ Cell utilizes ozone, high intensity UV light on a hydrated quad-metallic target to create:
 - Ozone
 - Ozonide Ions
 - Hydro peroxides
 - Hydroxides
 - Free oxygen molecules
 - Super oxide ions

These Advanced Oxidizers become entrained in the water to break down oils and grime and disinfect the fabric and work best with cold water.



- **Pure Oxygen Aeration.** A byproduct of the Radiant Catalytic Ionization™ process is pure oxygen aeration, which performs two functions. First, it enhances the enzyme action. Second, the aeration creates an effervescent cleaning action similar to club soda's cleaning action where escaping gases release grime and stains from fabrics.
- **Silver Ionizer.** Silver ions are added to the oxidized water solution to provide silver's unique bactericide ability. These silver ions will also be trapped in the fabric to provide ongoing protection against odor-causing bacteria. Here are Petri dishes showing the reduction in bacteria after treatment of water with Laundry Pure:
- **Water Cleaning.** It is important to start with clean water, as it will retain more of the oxidation gases and is aggressive to contamination. The ECOQUEST Springhouse Water Treatment System (sold separately) provides clean chlorine-free water for the entire home, or an optional single canister carbon filter will be offered.
- **Enzymes.** An active, natural blend of enzymes are added to aid in stain breakdown. The enzymes are enhanced by the oxygen enhancement of the water.
Note: The use of enzymes is optional. Pre-treatment of stains using EcoQuest Eco-H has also proven to be effective.

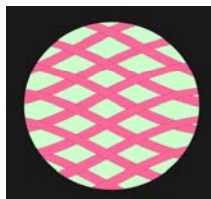
SPECIFICATIONS

Dimensions	9.3" H x 27" W x 4.1" D
Connections:	3/4" hose for cold water spigot
Electrical	120 VAC, 60 Hz, 0.5 Amps
Max. Pressure:	80 PSI
Min. Pressure	40 PSI
Silver Ions	20 ppb
Advanced Oxidation	UV & Ozone, Hydro Peroxides, Oxide Ions
Water Flow Rate	2 gallons per minute (typical)

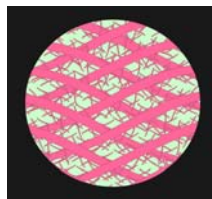
The Benefits of a Radiant Catalytic Ionization laundry system include:

- **Increased fabric life**

Typical laundry detergents can contain up to **50% Zeolites** (see picture at right). Zeolites act as an abrasive to work stains out of clothing. Zeolites also break down the fibers in clothing, causing them to break down much faster. Clothes washed in the ECOQUEST LaundryPure™ System clothes will last longer than clothes washed in standard laundry detergent.



New Fabric



After 20 Washings
in Standard Detergent

- **Reduced bacteria counts**

The ECOQUEST LaundryPure™ System is an advanced washing technology with superb bacteria killing capabilities. Imagine 400 billion silver ions dissolved in water to make a super cleaning solution that affects your clothes at an almost molecular level.

Its sterilizing ability and lasting antibacterial action will redefine your idea of purity.

SILVER WASH utilizes 99.99% pure silver for a lasting investment for your health and garments.

EFFECTIVE FABRIC SANITIZATION - LaundryPure™ uses nano technology to electrolyze pure silver during wash and rinse cycles. Over 400 billion silver ions are released and penetrate deep into fabric for effective sanitization.

ENDURING SANITIZATION POWER - Silver Nano particles are dispensed in the washing and rinsing cycles. These silver particles can sanitize and disinfect fabrics throughout the life of the washing machine...And not only does its effect protect your fabrics, it also disinfects your drum and all its internal parts.

HOW IT WORKS – Through Electrolysis of pure silver probes, billions of Silver Nano Ions are added to the laundry providing 99.9% sterilization (kills 650 different types of bacteria). And for up to 30 days after the clothes come out of the washer they retain an Anti bacterial due to the silver nano coating on the fabric.

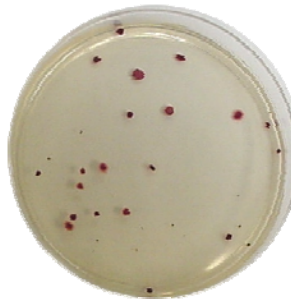
WHY SILVER? - Since ancient times, silver has been used for medicines and household items as the non-toxic precious metal. It has the power to sterilize and deodorize. Recent advancements in technology increased consumer awareness for health-promoting products have given rise to many new items that use silver for highly effective sterilization.

Overview

- Potent antimicrobial
- Kills microbes
- Use on wound to control infection
- Reported to improve healing
- Reported to decrease rubor
- Non-Toxic to Human tissue

Biological Properties of Silver

- Antibacterial activity
- Anti-fungal activity
- Induction of white cell apoptosis
- Stimulates dermal regeneration
- Stimulates epidermal regeneration
- Decrease in surface wound zinc
- Decrease in excess wound
- Metalloproteinase activity
- Antipruritic activity



Tap Water Only



Tap Water treated with Laundry Pure Silver Nano Ions

- **Increased fabric volume**

Normal detergents are never fully rinsed from our clothing after a wash cycle. These detergents continue to build up and can cause fabric fibers to mat. The ECOQUEST LaundryPure™ System not only doesn't leave a residue, it can pull the entrained detergent from clothing previously washed in typical detergents to allow the fibers to move freely thereby making the clothes fluffier. The only complaint you might have is your clothing will need more shelf or cabinet space than it did when washing with detergents.



Detergent gets trapped in fabric (left). Fabric becomes volumized after using LaundryPure™ (on right – shown after 7 washings)

- **Eliminates harmful detergents**

Normal detergents dump millions of tons of Phosphate and chlorine into the waterways of the world yearly, polluting our water resources. The ECOQUEST LaundryPure™ System using Advanced Oxidation Radiant Catalytic Ionization System is a totally Eco-Friendly cleaning system leaving nothing but clean Oxygen and Hydrogen as its byproduct.

- **Saves hot water**

The ECOQUEST LaundryPure™ System is designed to use only cold water for washing. Using cold water saves hot water and therefore saves energy.

- **Eliminates allergies caused by detergents**

For the same reason the ECOQUEST LaundryPure™ System volumizes fabrics, the system also can also reduce skin irritation. Normal detergents are never fully rinsed from our clothing after a wash cycle. These detergents continue to build up (see graphic) and can cause skin irritation. The ECOQUEST LaundryPure™ System not only doesn't leave a residue, it can pull the entrained detergent from clothing previously washed in typical detergents.



Detergents get trapped in fabric

- **The elimination of trapped detergents make color more vibrant**

For the same reason the ECOQUEST LaundryPure™ System volumizes fabrics and eliminates allergies caused by detergents, the system also makes the clothing with bright colors more vibrant. Normal detergents are never fully rinsed from our clothing after a wash cycle. These detergents build up and dull the colors. The ECOQUEST LaundryPure™ System not only doesn't leave a residue, it can pull the entrained detergent from clothing previously washed in typical detergents which



Shirt washed many times using leading powdered detergent



Same shirt washed 7 times using the ECOQUEST LaundryPure™ System

will brighten the colors. Our experience shows some clothes once thought to be permanently faded can come back to life using LaundryPure™.

QUESTIONS & ANSWERS:

How is it Installed?

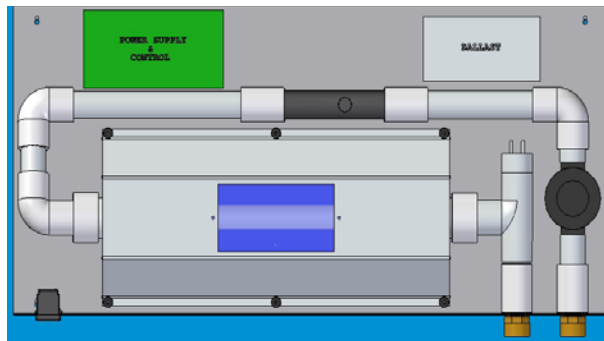
Installation can be performed using common household hand tools. The unit is designed to be mounted above the washer or dryer (10" of space between the washer and any cabinet or shelf is required) or on an optional floor stand which will allow the unit to be placed next to the washer.

Steps:

1. Attach the wall mounting bracket to the wall with supplied screws. The bracket is designed with multiple holes to allow attachment to at least two wall studs if mounting on drywall. If wall studs are not accessible, standard molly bolts can be used (not provided).
2. Attach the ECOQUEST LaundryPure™ to the bracket and secure using the two screws provided.
3. Disconnect the cold water hose from the washing machine
4. Attach hose to the ECOQUEST LaundryPure™ fitting marked "Inlet"
5. Using the water hose provided, attach one end to the ECOQUEST LaundryPure™ fitting marked "Outlet", and the other end to the cold-water inlet on the washing machine
6. Disconnect the washing machines power cord from the outlet and plug it into the ECOQUEST LaundryPure™ power cord receptacle.
7. Connect the ECOQUEST LaundryPure™ power cord to the outlet

How does it work?

- ECOQUEST LaundryPure™ senses power being drawn from the washing machine and automatically turns on the LaundryPure™ System and it stays on throughout the wash cycle.
- As a safety feature, a safety valve is on the inlet to shut the water off to the LaundryPure™ System as well as to the Washing Machine whenever the washer is turned off.
- Once the Washing Machine power is turned on, and the LaundryPure™ is activated, the safety valve opens and water flows through an injector and then into the Reactor Chamber. The Reactor Chamber is the "heart" of the system. It contains:
 - Two 14" high intensity UVX bulbs
 - RCI catalytic target
 - Pickup tube for the Advanced Oxidation Gasses. These gasses include Ozone, Hydro Peroxides, and Super Oxide Ions. The gasses are pulled into the tube and injected upstream into the water.
 - Quartz glass tube which the water passes through. This allows the advanced oxidation gasses which are entrained in the water to be broken down into hydroxyl radicals by the 254nm light coming from the high intensity UVX bulbs.
 - After exiting the Reactor Chamber, Silver Ions are created and injected into the water prior to exiting the system.



How much does it cost to operate?

LaundryPure™ draws power equivalent to a 100 watt light bulb. The unit runs only when the washing machine is running so the cost to operate is very low. And don't forget, you actually save on energy because you no longer need to use hot water to wash (actual savings is dependent on type of water heating system and cost for energy – EcoQuest is developing typical cost savings).

Does this unit get out tough stains without pre-treating?

Tough stains will still require pre-treatment. Tests are being run Enzyme Pre-treatment products as well as using Eco-H and allowing the stain to soak 30 minutes before washing. We are also looking at other options for additional environmentally safe pre-treatment to recommend.

Will a fabric softener still be required?

Testing indicates you may NOT have to use fabric softener. In most cases fabric softener is required to overcome the entrained detergent left in our clothing from typical detergents. With the clothes being free from this detergent, the natural fabric no longer requires fabric softeners – either liquid or softener sheets.

When will this unit be ready?

LaundryPure™ is scheduled for release in March 2006. Pre-sales are currently being offered.

Can I become a Beta Tester?

As of 12/20/2005 there are approximately 40 LaundryPure units being tested by EcoQuest dealers. Some of the testers are Dealers, some CMIT's and some Managers, but the rumor that all Beta Testers are Master Managers is not true. Unfortunately EcoQuest does not have unlimited prototype units and so determination of who receives a unit is based upon several factors such as trying to get a variety of influent water quality, a variety of washer types including High Efficiency front-loading machines as well as more typical top-loading machines. We appreciate our Beta Testers and their willingness to provide weekly reports on their experience with the product.

What is the monthly or yearly savings on the cost of electric & detergent and corresponding return-on-investment (ROI)?

TBD – currently being calculated.

If the unit kills bacteria how will this work with a septic system that requires bacteria?

LaundryPure™ does an effective job of killing bacteria in the wash, but considering the relatively small volume of water coming from the household laundry going into a septic system in comparison to overall volume, the antimicrobial effect of LaundryPure™ is negligible. Overall, a homes septic system will be much healthier by removing the Phosphates and Chlorine from the waste water, and the resulting ground water will be much healthier as well.

Is there risk of ozone causing the elastic in underwear to fall apart or gaskets in a washing machine to deteriorate by using LaundryPure™?

If LaundryPure™ used entrained ozone as the only oxidizer there may be a potential risk. The good news is LaundryPure™ uses an advanced oxidation process. The way it works is ozone, along with ozonide ions, hydroperoxides, hydroxides, free oxygen molecules and super oxide ions are created in the Reactor Chamber. The Reactor Chamber contains two broad spectrum UV lamps and catalytic target material made up of the quad-metallic coating and the interaction between these creates oxidation gasses. These oxidation gasses, which include relatively high ozone levels, are pulled into a tube and injected in the water. This water with the AOP gasses then passes thru the Reactor Chamber inside of a quartz glass tube. As the water with the gas bubbles pass through the chamber, the two high intensity UV bulbs shine on the water and the gas bubbles allowing the UV to break down nearly 100% of the ozone into other oxidizers including Hydroxyl Radicals. The result is undetectable ozone levels entering the washing machine and no risk of deteriorating gaskets or clothing with elastics.

An operator of an EcoQuest Authorized Service Center in Charlotte, NC is John Eicher. He is one of the Beta test sites and provided this report:

We know you've got reports with impressive results on cloths being washed, but here is one where rubber bands have been washed and exposed to the RCI gases. The end result of these tests provides more evidence that the LaundryPure will not affect elastic and the inner workings of washing machines

I've done tests in the past and taken note of how Ozone affects elastic in clothing and with rubber bands. We all have seen for years now how the Ozone in higher levels can break down these materials rather quickly, so naturally I have concerns about the gaskets, o-rings, pump seals and hoses being affected by our RCI technology over time as all of us should be.

I have a Sales Manager who had an ozone producing Air Purifier on trial in a vacuum cleaner shop. The shop had a room with dozens of belts hanging on the wall supported on hooks with standard 3" rubber bands. The unit was mistakenly left in this 600 sq. ft. room for 2-1/2 days on a setting of 1500 sq. ft. (It should be noted that this unit was improperly set and not used in accordance with the owner's manual). At the end of the 2-1/2 days the rubber bands were broken and all the belts were piled up on the floor. The owner of the vacuum shop was not amused.

In order to verify we will not have a similar occurrence with LaundryPure, I began a comprehensive LaundryPure Rubber Band test on 12/4/05. Rubber bands were placed:

- 1. In front of the UV/RCI chamber where there's a slot that allows some RCI gas to escape*
- 2. In a pint jar that had been filled with water filling the washing machine tub.*
- 3. In the discharge water. By linking several paper clips together and attaching 5 rubber bands on the end clip to where they are long enough to hang down into the drain pipe in the path of the discharging stream from the washer.*

AS OF 12/15/05 I HAVE SEEN NO CHANGE IN THE RUBBER BANDS... FROM THEIR CHARACTERISTICS WHEN NEW. I am planning to continue with this testing, other methods and other materials and give follow-up reports.

Does the LaundryPure™ work with all forms of water including hard water?

LaundryPure™ will work with all water qualities but the better the incoming water quality the better the results you will have. If hard water exists a water softener is recommended. Testing also indicates best results are achieved when a Springhouse™ or similar filter system is treating the incoming water to remove chlorine from city water systems. Chlorine can reduce the effectiveness of the LaundryPure™ system.

Does the LaundryPure™ work as good on front loader machines as on top loaders, since the front loader uses less water??

LaundryPure™ is designed for all washing machine types and will work equally well with Front-Load machines as it does with Top-Load machines.

Will the LaundryPure™ work with Commercial Washing Machines?

LaundryPure™ is designed for residential use. The limiting factor is water flow rates. The LaundryPure™ can treat approximately 2 gallons per minute depending on water pressure. In the case of a commercial laundry, a much higher flow rate would be needed.

There are numerous High Efficiency (HE) washing machines on the market. The directions for these machines say the only laundry detergent that can be used must have the HE designation. Does the LaundryPure™ have the HE designation?

From the Soap & Detergent Association web site www.cleaning101.com :

Compared to traditional washers, **HE** washers work in a completely different way. As a result, the detergents used in **HE** washers need to work differently, too. That's why **The Soap and Detergent Association** and **washing machine experts** from around the country have worked together to bring you this handy resource.

HE Detergents – The *Only* Choice for your **HE** Washer Detergents formulated for **HE** washers work with energy-saving technology to provide the best possible cleaning in only 20% to 66% the amount of water used in traditional washers. **Use HE detergents to:**

- Get the **maximum cleaning performance** that **HE** detergents and washers can deliver.
- Achieve **energy and water savings**.
- Keep your **HE** washer in **top working condition**

It's common sense, really: because of the low-water wash and rinse cycles in **HE** washers, **HE** detergents must work *differently* from traditional laundry detergents in order to be effective. As a result of extensive research, **HE** detergents are formulated to be **low-sudsing** and **quick-dispersing** to get the best cleaning performance with **HE** washers.

- **Excess suds can cause problems** in **HE** washers by “cushioning”— or even preventing — the tumbling action. This can impact proper cleaning.
- **HE** detergents also hold soils and dyes in suspension in **low water volumes**, so they don't re-deposit onto cleaned clothes.

The issue is Standard detergents can cause over-sudsing. Consequently manufacturers of HE machines require HE detergent.

LaundryPure™ does not use detergent. Enzyme tablets, if the customer chooses to use them, create little or no suds. We have tested the LaundryPure™ with front load HE washers with very positive results.

Can EcoQuest produce a large scale LaundryPure™ for industrial applications like a Hospital or Hotel?

EcoQuest is not involved with industrial installations and our technology partner RGF has chosen not to pursue commercial laundry units. RGF has in the past produced custom integrated systems. In a recent interview with Walter Ellis, Vice President of Research & Development for the RGF Environmental Group, Walter spoke about Commercial Laundry installations and why RGF is not currently in that business segment: “To do it right, commercial laundries all require interfacing our units with the machines PLC's. This means upfront engineering and software. We like to design our systems for long term trouble free service so we have heavy duty redundant features. Doing so, they become very expensive and customers try every means possible to cut corners on the cost (and then when they do have a problem, expect it to work the same as originally designed but were not willing to pay for). Laundry units cannot shut down in commercial applications as this directly costs them money. So when a component eventually fails or needs to be replaced, the units need to be serviced immediately. Most industrial distributors of ours have no experience in this arena so it becomes very problematic to service a unit. We have to fly personal out at a moments notice for repair. We have found the upfront haggling over cost and the limited service ability of local distributors really makes this segment problematic. We have had very good successes with customers truly willing to invest in the best available technology. Unfortunately, in this industry there are very few willing to make the investment needed. Due to this, we have internally made the decision to pull away and focus on other industries.”

Is a Plumber required to install LaundryPure?

Some customers may prefer to have a plumber perform the installation although LaundryPure can be installed in most homes by the home owner using standard hand tools. It should be noted there are potential problems which can arise during the installation depending on the condition of the plumbing in the home and the configuration and location of the washer. If the cold water valve is stuck or the washing machine needs to be moved back which may require re-leveling, a plumber may be required. EcoQuest International is not liable for improper installation or damage caused from improper installation. Appropriate warnings and concerns are included in the owner/installation manual.

What is the purpose of the enzyme tablets?

Some people confuse enzymes with bacteria. In actuality enzymes are chemicals that are produced by bacteria for a myriad of specific biological purposes. When we use enzymes to clean clothes, in essence what we are doing is using specialized chemicals produced by bacteria, to replace or enhance the chemicals historically utilized and produced by man for this purpose. Mother Nature has provided specific types of enzymes to handle specific types of organics (literally millions of different types of enzymes are available to choose from). Generally the enzyme categories best suited for laundry use are called protease (these go after protein based soils), lipase (these go after fat or lipid based soils), and amylase (these are effective on carbohydrate based soils). Enzymes work by attacking soils in the linen and breaking them down into small, loose particles that can be washed away in the wash water. The combination of multiple enzymes allows for removing a more complex stain. A simple food stain is a perfect example why a multi enzyme approach is more effective, as it will contain both starch and fat components (it may even have proteins involved as well). By having multiple enzyme types available, the soiled linen can be washed much more effectively. A key advantage of enzymes over conventional detergents is that you do not need to use hot water (in fact too hot of a wash water actually reduces their effectiveness). Enzymes are actually protein based chemicals, which mean they can be completely broken down by nature, eliminating the harmful chemical pollutants historically produced. Enzymes are considered non-toxic to plants, animals, and the environment. Enzymes are produced by "growing" the specific bacteria in massive quantities in large fermentation vats. The enzymes produced by the bacteria are then extracted from the bio-mass contained within these vats. Next, the enzymes are concentrated, with the final step being formulation (where the different concentrated enzymes are then combined to form the desired enzyme mixture).

The use of enzymes is not a requirement in the ECOQUEST LaundryPure™ System. Enzymes can enhance the cleaning power and extensive tests are ongoing to determine how and under what circumstances EcoQuest will recommend enzyme tablets for laundry.