SANI POWDER OVERVIEW
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ECOridge
PRODUCTS

More Information

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ECOridge LLC
Products Developed for Success

Sani-Powder

Sani-Powder is a newly developed, EPA registered, commercial grade Sanitizer for the future fight against old and new Bacteria, Viruses, Molds, and Funguses popping up around the world today. This report is designed to help Ecoridge customers understand the development and chemistry of this amazing product along with its history, description, and many uses. It is important to everyone of us at ECOridge to help our customers remain safe from outside pathogens that create worldwide pandemic such as the ones we see today. ECOridge is dedicated give customers the tools to fight against these pandemics. Our goal is to provide safe and highly effective products combined with best practices for use so that customers can have confidence they, their customers, family, and friends will remain safe.

Definition of Key Terms Used

In the world of sanitizing, and disinfecting there are many acronyms used, special procedures to follow, and complicated terminology used on the EPA registration and printed instructions. It is important to take some time and ensure you understand these most commonly used terms.

PPM – "Part per million" This is the term used to highlight the concentration of any active ingredient in a product. In our case, PPM refers to one part per million of active ingredient per part of water. This is important to understand so you know how strong of solution you are using. Just as per cent means out of a hundred, so parts per million or PPM means out of a million. PPM usually describes the concentration of something in water or soil. One PPM is equivalent to 1 milligram of something per liter of water (mg/l) or 1 milligram of something per kilogram soil (mg/kg). The EPA and several other regulatory agencies will tell us we need certain PPM's in our solution to be able to kill specific things.

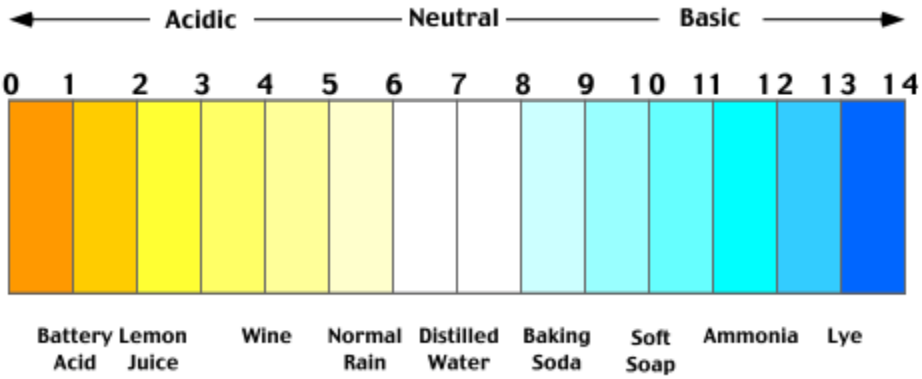
FAC – "Free Available Chlorine" Free available chlorine is the part of the total chlorine measurement that has not yet reacted with contaminants. Therefore, it is called available or free. The total chlorine in this case is the sum of combined available chlorine and free available chlorine, also called total residual chlorine. FAC is a term to describe the concentration of the specific active killing agent in HOCL, NaOCl, ClO2 and several other chlorine-based products (as measured in PPM). Chlorine is a general term used for this category of killing agents but is a broad term for the use of this product. There are several chemistry examples of how chlorine kills, but it is important to know it is one of the most effective and safest ways to eliminate pathogens in the market today.

Dwell Time – This is a term used by the EPA and other agencies to tell the consumer how long the specific product needs to remain wet on any surface to eliminate specific pathogens safely. Harmful pathogens need to be eliminated effectively and safely. If a consumer sprays a product on any surface without knowing what they want to eliminate, or how strong of solution it takes to eliminate the desired pathogen, or how long the product needs to sit wet on the pathogen to

eliminate it: the pathogen may not be eliminated. The consumer could well be expecting a safe environment and the surface, only to discover the surface is still infected… and the pathogen can easily spread from person to person or surface to surface. Ensure you know what you want to eliminate, use the recommended strength to eliminate it, and follow the guidelines for the length of wetting time the product requires for the specific application. Then please follow the rest of the instructions to ensure a safe environment once the pathogens have been eliminated.

Efficacy – Efficacy refers to the ability to produce a desired or intended result. This is a general term used for what bacteria, virus, mold, or fungus the product can kill. Any company that has registered their product and label with the EPA has been required to do 3rd party lab testing of their active ingredient and submit those findings to the EPA to validate their ability to kill specific pathogens. These specific claims will be listed on the active ingredient efficacy report or in kill claims. The EPA will not only tell you what your product is registered to kill but they will also list the PPM solution you need to kill it and how long the product needs to sit "dwell time", wet on the surface to complete the kill. Each pathogen will have different strengths and dwell times to eliminate. This is why it is especially important to read the label, EPA registration, general instructions, and recommendations on each product you use to ensure you can eliminate the desired pathogens. The EPA gives these details for several reasons, to help ensure you are effective in eliminating these pathogens and to instruct you how to eliminate these pathogens correctly. It is also designed to help you and anyone around the product to be safe before, during, and after the product has been used.

pH- pH is a measure of how acidic/basic water is. The range goes from 0 to 14, with 7 being neutral. pH's of less than 7 indicate acidity, whereas a pH of greater than 7 indicates a base. Solutions with extremely low or high pH's are considered potentially dangerous.



Log Kill: Definition of LOG KILL (L) means the difference between the logarithms of viable test microorganisms or indicator microorganism spores before and after treatment**.** LOG KILL (L) means the difference between the logarithms of viable test microorganisms or indicator microorganism spores before and after treatment**.**

Log kill is a microbiologist's way of expressing killing power. One log is 90% kill, two logs are 99% kill, three logs are 99.9% kill and so on (Each log represents an additional 9). To summarize, the bigger the log kill the more effective the product is against the pathogens we are trying to eliminate.
Below is a provided log kill claim based upon the label of some of the common products sold on the market today and in most homes compared to Sani-Powder. Also included is the safety information on how toxic each product is (all are in liquid form).

Product Name	**Label Log Kill**	**Toxicity level based on SDS**
Clorox Bleach	99.9	Category 2
Lysol	99.9	Category 2
Sani-Powder (HOCL)	99.9999	Not Hazardous

HOCL Chemistry

Basic Research:
Initially, hypochlorous acid was produced by an electrical current passed through a medium of salt water and sometimes an acid. This process is complicated and has many operational issues.

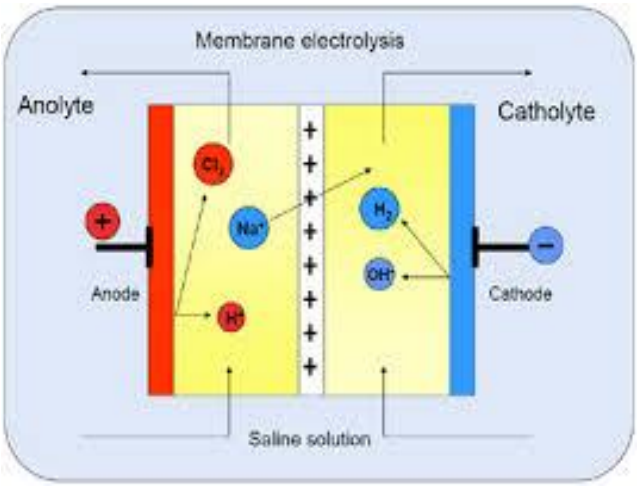


Figure 1: Simplified Electrolysis Diagram

In addition, once the solution is produced there is a relatively short lifetime for its efficacy. One of the unique qualities of hypochlorous acid , is that it dissipates naturally and leaves practically no impact on the environment. Unfortunately, this quality also implies a relatively short shelf life of 30 to 60 days or less. Because of this, the electrolyzed produced product has never really taken off like it should due to the incredible logistics issues of shipping a relatively dilute liquid stream to customers with a relatively short shelf life.

Electrolyzed water (Anolyte) has been well studied and the beneficial aspects of its ability to control a wide variety of viruses and bacteria are well documented. As an example, published data from IET Incorporated as shown below in Figure 2:

EcaFlo® Anolyte
US EPA Reg. No. 82341-1

GLP Efficacy Tests to Support EPA Label Claims

Pathogen	Category	Claims	Organic Soil Load	Contact Time	ppm FAC
Staphylococcus aureus (ATCC 6538)	Bacteria	Hospital Disinfectant	5%	10 min.	500
Pseudomonas aeruginosa (ATCC 15442)	Bacteria	Hospital Disinfectant	5%	10 min.	500
Salmonella enterica (ATCC 10708)	Bacteria	Hospital Disinfectant	5%	10 min.	500
Methicillin-Resistant *Staphylococcus aureus* (MRSA) (ATCC 33591)	Bacteria	Disinfectant	5%	10 min.	250
Listeria monocytogenes (ATCC 7644)	Bacteria	Disinfectant	5%	10 min.	205
Vancomycin Resistant *Enterococcus faecalis* (ATCC 51229)	Bacteria	Disinfectant	5%	10 min.	205
Klebsiella pneumonia New Delhi Metallo-Beta Lactamase (NDM-1) Carbapenem Resistant, Clinical isolate reference number 10002	Bacteria	Disinfectant	5%	10 min.	205
Escherichia coli (ATCC 11229)	Bacteria	Disinfectant	5%	10 min.	205
Clostridium difficile – spore form (ATCC 43598)	Bacteria	C. difficile HSD	0%	10 min.	410
Human Immunodeficiency Virus Type 1 (HIV-1), strain IIIB (clade B); ZeptoMetrix	Virus, enveloped	Virucidal, Bloodborne Pathogen	5%	10 min.	410
Swine Flu Virus (H1N1) A/Swine/1976/31 (ATCC VR-99)	Virus, enveloped	Virucidal	5%	10 min.	500
Mycobacterium bovis, BCG (Tuberculosis)	Mycobacterium	Tuberculocidal; CDC Intermediate-Level Disinfectant; OSHA Bloodborne Pathogen Standard	5%	10 min.	410
Candida albicans (ATCC 10231)	Yeast	Yeast	5%	10 min.	410
Standard Test Method for Efficacy of Sanitizers, Inanimate Non-Food Contact Surfaces (Dilutable) *Enterobacter aerogenes* (ATCC 13048), *Staphylococcus aureus* (ATCC 6538) 200 ppm	Bacteria	Sanitizer, Non-Food Contact	5%	2 min.	205
AOAC Available Chlorine in Disinfectants (Food Contact Sanitizer) *Salmonella enterica* (ATCC 6539), *Staphylococcus aureus* (ATCC 6538) (50, 100, 200 ppm)	Bacteria	Food Contact Sanitizer; Hand Sanitizer	0%	60 sec.	205

NOTE: Current label claims are highlighted in red.
Others are pending EPA final review.

Figure 2: Published data from IET Incorporated.

The above listed applications and many more reported, works best if electrolyzing units are available at the use site as the electrolyzed solution can decay in 24 hours if produced in membrane free units.

Though slightly more stable when produced in membrane containing units, the anolyte still decays rapidly with time, as shown in Figure 3 below:

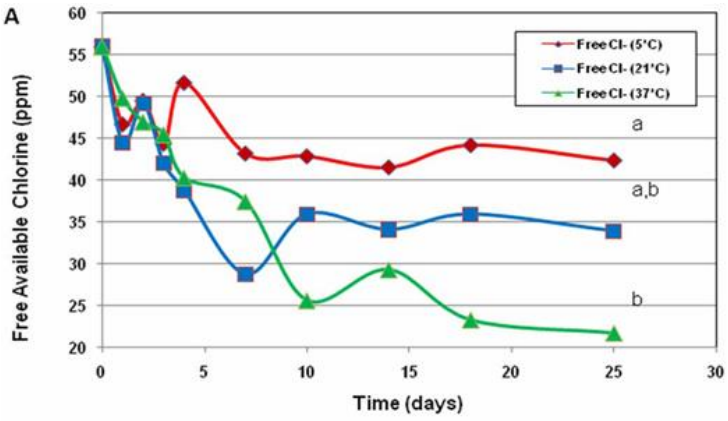


Figure 3: Decay of electrolyzed produced HOCL based on temperature

With the rapid decay in Free Available Chlorine (FAC), such solutions in most cases will lose their strength before they get to the end user, making production/shipment logistics nearly impossible. Electrolytic HOCL has numerous issues associated with manufacture, shipment, and storage

- Once the product is produced, it immediately begins to decay making storage a huge issue.
- In addition, processing problems create more uncertainty in terms of actual concentration of the desired HOCL.
- ECA saw this problem and focused on how to create the same product using a non-electrolytic pathway.
- The goal was to create a safe granular product with a long shelf life that could easily dissolve in water and create an equal performance as compared to electrolytic HOCl.
- Result is ECA SANI POWDER which solves the problem of manufacturing, storage/shipment and allows an end user to create a precise HOCl solution at the time and place of their choosing.

ECA SANI POWDER granular when dissolved in water, produces HOCL as shown by the following equation.

$$2H_2O + NaCl_2C_3N_3O_3 \rightarrow NaH_2C_3N_3O_3 + 2HOCL$$

In electrolyzed water, the reaction produces some NaCl, NaOCl and other miscellaneous ions in addition to HOCl. None of these by-products affects the HOCL performance. HOCL produced by the two different methods is essentially the same as noted below.

1. pH of the same strength (FAC) solutions produced by the two methods are same 5.5-6.5
2. Both solutions have same oxidation reduction potential (ORP)
3. The Na based electrolytically produced ions have no effect on efficacy.

4. Both solutions are totally clear
5. Both solutions have the capability of killing same list of bacteria and viruses

ECA recognized the need to create a better substitute product in a granular form (vs. liquid), that once dissolved produces the same hypochlorous acid consistent with that produced by electrolysis. The advantages of this are clear– the granular product has a long shelf life, it is easy to ship, and the customer can produce their own product at any desired concentration merely by adding to water. Once the product has been dissolved in water at an equivalent concentration to electrolyzed produced hypochlorous acid (known as anolyte), the product performs the same- albeit with better logistics.

Sani-Powder vs Other Products on the Market

When it comes to the world of cleaning, sanitizing, and disinfecting there are only a hand full of products that are EPA approved to use safely. Not every product is as safe as another and some are not safe at all. In any case, the EPA tries to regulate the use of these products by having manufacturers of each product provide very detailed instructions for mixing, use, and cleanup/disposal. It is important for Ecoridge, as it should be for every company utilizing any of these chemistries, to help educate their customer on safe mixing and use of all products being used in the marketplace. A shot list of these chemistries are as follows:

HOCl "Hypochlorous Acid" Products sold: Sani-Powder, Excelyte, Anolyte, ECA water and several other products listed and sold in many applications. The pH of these products ranges from 5.0 to 8.4 and are a mild solution with the ability to outperform any other products. Sani-Powder has a 6.8 pH and is very stable at any normal PPM FAC required needed. FAC represents free available chlorine which is the killing ingredient. A significant advantage of this product is that the kill mechanism is unique and does not allow the pathogens to develop immunity. The key with Sani-Powder verses one of the many machine-made solutions is the inability most of the machine-made solutions must control the pH and produce high enough FAC to eliminate the desired pathogens effectively. A significant disadvantage machine made product also has, is a noticeably short shelf life.

NaOCl "Sodium Hypochlorite Bleach" Products sold – Clorox, and numerous other products marked with "Clorox" or "Bleach" as the active ingredient. This is the most popular sanitizer/ disinfectant on the market today because it is inexpensive to produce and has proven kill claims. It has a standard pH above 13 that is very harmful to skin, fabrics, and many other porous surfaces. This product is known as the grandma product because it was around back when grandma cleaned her kitchen. Therefore, because of this, many people do not read the instructions of use, or how to treat a surface after the product has been used. This has led to corrosion and loss of fabrics, metals, and other assets along with rashes, severe inhalation problems, and in extreme cases has resulted in death. It is effective in many applications but is also one of the most widely misused products on the market today. Given the extremely high pH,

it is particularly important to follow all instructions and use recommendations listed by the EPA or other regulatory programs.

ClO2 "Chlorine Dioxide" This product was developed to clean water and other large industrial applications and not necessary as a home/commercial sanitizer because of its unstable composition. Recently new technology has become available to make this product more stable and safer to the user and environment. That said, it is still exceedingly difficult to control and has a lot of the negative characteristics of bleach. From a price point, it is relatively costly to produce a stable product capable of being used in a residential or commercial setting. In some cases, the product needs to be mixed with other chemistry to stabilize the solution. Some of the other added ingredients are also unstable and have safety implications.

Quaternary Ammonium "Quat" "Far too long of a chemistry chain to list" has become one of the most used products in the cleaning world. This product was designed to combat dangerous pathogens in the cleaning world and over the past several years has been made stronger and stronger to fight these pathogens that have adapted to its killing ability. This product kills by trying to starve the pathogen from its life source such as oxygen or food. If the product killing ability wears off before the pathogen dies, then the pathogen becomes stronger and will become immune to any further attempts to eliminate the pathogen. It has been known as a very dangerous chemistry in higher concentrations and needs to have the instruction label followed religiously to help prevent dangerous side effects and problems with mixing of other chemistry. It also emits an odor that is uncomfortable to many. Like the other products in the market this product is not used properly and has created several side effects because of misuse.

Sani-Powder When added to H20 creates the chemistry HOCL as listed above. It is registered with the EPA in several applications and strengths. In the correct strength, it is safe enough to have a drinking water disinfectant EPA claim. In a much stronger solution, it is strong enough to eliminate even the hardest pathogens known in a hospital setting. Unlike all the other products listed above, HOCL is one of the only registered sanitizers listed that has been recommended by the EPA to spray on the appropriate surface and leave the product on the surface until dry. Most other products not only need to be wiped off so there is no harmful residual left behind, but in most cases the user is instructed to go back to the surface and wash the residual left behind with fresh water. This is a procedure that almost no one follows but if the consumer would read the label on each of the listed products there would be a list of instructions they currently do not follow.

Safe Instructions for Use on The Popular Products.

It is important that a consumer not only knows what needs to be done to eliminate the known, dangerous pathogens on surfaces today, but equally important in understanding how to use each product safely. This will help everyone around the product including the user, ensure that surfaces are being cleaned properly. When dealing with any chemistry, there are often several ingredients that went into the products used to help make the product effective in its recommended use. In cleaners, there are soaps and surfactants, in sanitizers/disinfectants there are active ingredients with the ability to kill bacteria, viruses, mold, and fungus. Humans are obviously much larger than the small pathogens we want to kill, and it makes sense that it would generally take much more of the active ingredient in these chemicals to kill us or even make us sick. However, it is noticeably clear in higher strengths and doses these same chemicals can do serious harm to us as well.

The potential toxicity of many products makes it even more import for users to follow the very detailed instructions listed on each particular product. Some ingredients are very harmful and that is why the EPA requires it to be wiped off or requires a secondary wash after to eliminate these harmful chemicals left behind. The harmful chemicals can create rashes, sores, and even lung problems.

The recommendation from the EPA on Sani-Powder gives you the option to spray the surface and wipe after the appropriate dwell time or spray the recommended PPM (at levels of 600 PPM or less) on the surface and walk away from the product allowing it to dry and stay on the surface (this applies to hard surfaces only). This means it is safe enough to have it remain without any of the rashes or harmful side effects of other products. Even with water, always pretest any sensitive fabric or high-quality surface before use.

To help explain our point, we have added the instructions and EPA registration recommendations on three very popular products along with their strength of active ingredients and killing ability.

Clorox Kitchen and Bath:

Instructions on web. Note the dwell time “a few minutes”. This

1. Turn
   Nozzle to ON.
2. Tilt
   Bottle at a downward angle while spraying.
3. Wait
   A few minutes.
4. Wipe
   With sponge or cloth.

ON EPA Registered Label

Add 8 pumps of Clorox' bleach to 10 gallons of 65·75 of (room temperature) water in the sanitizing sink compartment

Check Chlorine concentration with standard test strip .Concentration should not exceed 200 PPM of available chlorine

Wash and rinse. Soak pots/pans/serving trays/utensils and food equipment for at least 1 minute in Clorox bleach solution, Drain & air dry

Please note their website does not tell you the dwell time you need for each pathogen or application. The actual EPA instructions are more detailed and in some cases the product can be put on and wiped after 1 to 4 minutes dwell time based upon specific PPM of FAC and then washed off to eliminate residue. Other applications utilize lower PPM and at this lower PPM the solution can be left on to dry. This would tell the consumer at the lower PPM the product is not toxic enough to need a second wash. The EPA registration for Clorox strength needed and the dwell times were spelled out to help the consumer know how to effectively eliminate the desired pathogen.

Lysol:

Directions for use: It is a violation of federal law to use this product in a manner inconsistent with its labeling. Read the entire label before using the product. Pre-clean surfaces prior to use. Hold can upright 6" to 8" from surface. Spray 2 to 3 seconds until covered with mist. To deodorize: spray on surfaces as needed. To sanitize: let stand for 30 seconds then allow to air dry. To disinfect: let stand for 10 minutes then allow to air dry. Rinse toys and food contact surfaces with potable water after use. Fabric sanitizer. For spot treatment (2" x 2" area) only. To spot sanitize soft surfaces: spray until fabric is wet. Do not saturate. Fabric must remain wet for 30 seconds. Let air dry. For difficult odors repeat application. To control and prevent mold & mildew: apply to pre-cleaned surface. Allow to remain wet for 3 minutes. Let air dry. Repeat applications in weekly intervals or when mold and mildew growth appear. Do not use on polished wood, painted surfaces, leather, rayon fabrics, or acrylic plastics. Do not use on silk, rayon acetate or satin fabrics. Always test on a hidden area of fabric. Storage and disposal: Store in original container in areas inaccessible to small children. Do not reuse empty container. Do not puncture or incinerate! Discard in trash or offer for recycling if available.

On EPA Label:

To Clean (and) (Deodorize) (and) (Remove Allergens): Dilute 1-1/4 oz. [2-1/2 tbsp.] per gallon of warm water. Apply with (cloth) (sponge) or (mop) to wet all surfaces thoroughly. Wipe with a clean (cloth) (sponge) (or) (mop).

To Disinfect (Hard, Non-porous Surfaces): Remove heavy soil first. then add 1-1/4 oz. [2-1/2 tbsp.] to one gallon of water and apply with a sponge or mop. wetting all surfaces thoroughly. Let stand for 10 minutes. then wipe away excess. Rinse all food preparation areas with clean (potable) water. (Prepare a fresh bucket of solution every time you clean or more often if necessary.)

For Hospital Disinfection: Add 4 oz. [1/2 cup] to one gallon of water and apply with sponge or mop, wetting surfaces thoroughly. Let stand for 10 minutes, then wipe away excess. Rinse all food preparation areas with clean (potable) water. (Prepare a fresh bucket of solution every time you clean or more often if necessary.)

To Clean &Disinfect Toilet Bowl: Flush first. Add 1 oz. [2 tbsp.] full strength into bowl water. Brush all surfaces including under the rim. Let stand for 10 minutes and then flush again.

Sani-Powder

Instructions for USE:

Mix granular/tablet to tap water as directed for each use.

To sanitize heavy touch points (Example doorknobs, faucets, handrails, and toilet hardware) spay thin layer of the premixed Sani-Powder on treated surface and let sit for 3 minutes and wipe remaining liquid off surface. For spray and leave instructions spray thin layer of premixed Sani-Powder onto surface and let sit until dry.

EPA Instructions:

HARD SURFACE SANITIZATION

This product is recommended for use as a hard surface sanitizer on:

- household/domestic dwellings indoor premises,
- residential floors,
- laundry (household and coin operated),
- toilet bowls (interior surfaces),
- bathroom premises/hard surfaces,
- refuse/solid waste containers (garbage cans)

RINSE OR SPRAY METHOD –

Clean equipment surfaces in the normal manner and rinse with potable water. It may be necessary to remove gross filth and heavy soil from surfaces by a pre-scrape, pre-flush, and where necessary, a pre-soak treatment. Prior to use, rinse all surfaces thoroughly with the sanitizing solution, maintaining contact with the sanitizer for at least 2 minutes. Do not rinse equipment with water after treatment and do not soak equipment overnight.

The same solution may be used in the feed tanks of spray type machines providing at least one-minute contact time to sanitize equipment.

IMMERSION METHOD –

Clean equipment in the normal manner. Prior to use, immerse equipment in the sanitizing solution for at least 2 minutes and allow the sanitizer to drain. Do not rinse equipment with water after treatment and do not soak equipment overnight.