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## HEALTHY CLEANING IN SCHOOLS: AQUEOUS OZONE VS. TRADITIONAL CHEMICAL CLEANERS

Most consumers purchase cleaning products with only one thing in mind - cleaning. From a household perspective, we use a wide variety of cleaning products including soaps, detergents, bleach along with other specially formulated cleaning products for various uses. This can be also said in the education sector where school staff is constantly using various products to clean classrooms, offices, gymnasiums and other common areas.

While these cleaning products work hard to clean and deodorize, they are also potentially toxic not only to those that use them but also staff, teachers and students in surrounding areas. Not removing toxic chemicals from education facilities puts many at risk and the concern for using healthier cleaning solutions is taking a forefront stance in today's education sector.

More and more schools, at all levels, are putting chemical cleaning aside and taking on a more natural approach to cleaning. To understand why, we need to first shed light on typical cleaning products in the industry which will then show why schools are making the switch.

### ways to go green



Conserve Energy



Water Conservation



Eliminate Chemicals



Reduce Paper Use



Energy Efficient Lighting



Recycle And Reuse

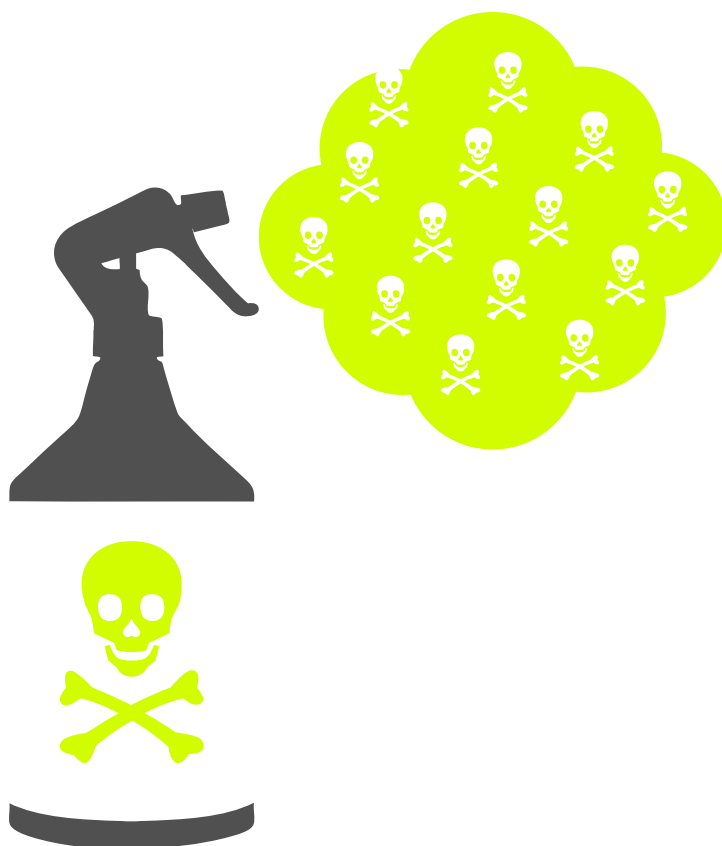
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## THE TRUTH ABOUT TOXIC CHEMICALS

The challenge is how to educate our community about more organic methods of cleaning. Let's face it, after years of using cleaning products with toxic chemicals, it is difficult for most to move to new alternatives. However, when being enlightened on what we have been using as a cleaning solution, you will be shocked to learn the real truth about toxic chemicals and just why many are moving toward a healthier solution for everyone.

Chemical cleaners are terrific at eliminating dirt but they also cause a vast amount of indoor pollution. With the average person spending 87% of their time indoors<sup>1</sup>, it is no surprise why this is not the best option. Most people are not aware that chemical cleaners can have this effect and assume that because it is sold in a store, it's safe to use.

Most cleaning products on the shelf do not list all of their ingredients. In fact, 80% of chemicals lack detailed toxic information<sup>2</sup>, as manufacturers are not required to list all the ingredients on the label of their cleaning products. With this in mind, we are unaware of what we are using and the short and long term effects that it may have at any level of exposure. Whether used on floors, desks, washrooms, or common areas such as gymnasiums, cafeterias and hallways, we are continually exposing students, staff and teachers to cleaning products that may or may not have adverse effects due to possible toxicity levels. Though some companies may voluntarily list ingredients, we will never be 100% sure that the list is complete.



Each year, the average American reportedly used 40 pounds of toxic cleaning products<sup>2</sup>. When done cleaning, whether it is flushed down the toilet, poured down the sink, tossed in the trash on a cleaning towel, or sprayed into the air that we breathe, most of these toxic chemicals are continually emitting odors and fumes into our environment.

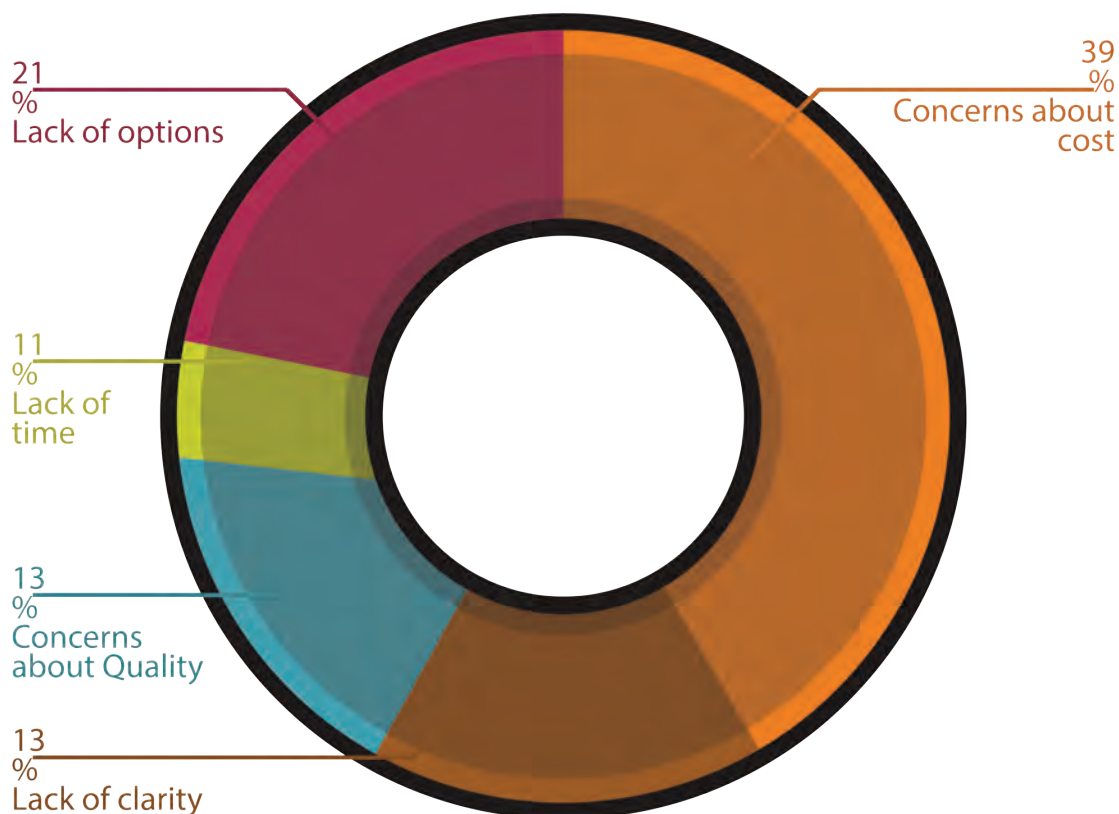
At the end of the day, chemical cleaners will always be an option and for some, they will never make the switch. However, those that do will find that there are much healthier options on the market that will provide a more effective cleaning solution with long and short term benefits for everyone.

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## THE CHALLENGES OF GOING GREEN

Today more and more organizations and businesses are jumping on the green movement. In fact 61% of small businesses are actively trying to go greener and about 70% anticipate going green in the next two years<sub>3</sub>. This is the time to switch processes and implement changes to the way we normally do business everyday. The most common ways that companies are going green include: recycling, buying energy-efficient products, reducing water use and seeking non-toxic products.

However, there are always concerns and challenges when businesses implement change and for some this causes a true lack of understanding why change is needed. Some of the main challenges of going green:



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All of the challenges above are relevant to chemical cleaning in any industry. Each concern is extremely important and a key driver when looking to make a switch from typical chemical cleaning options to alternatives today. In fact, 53% of the office products small businesses would like to see cleaning chemicals converted to greener choices in the future<sub>3</sub>. Variables such as cost, options, quality, clarity and time are all important hot buttons that need to be addressed before making the switch.

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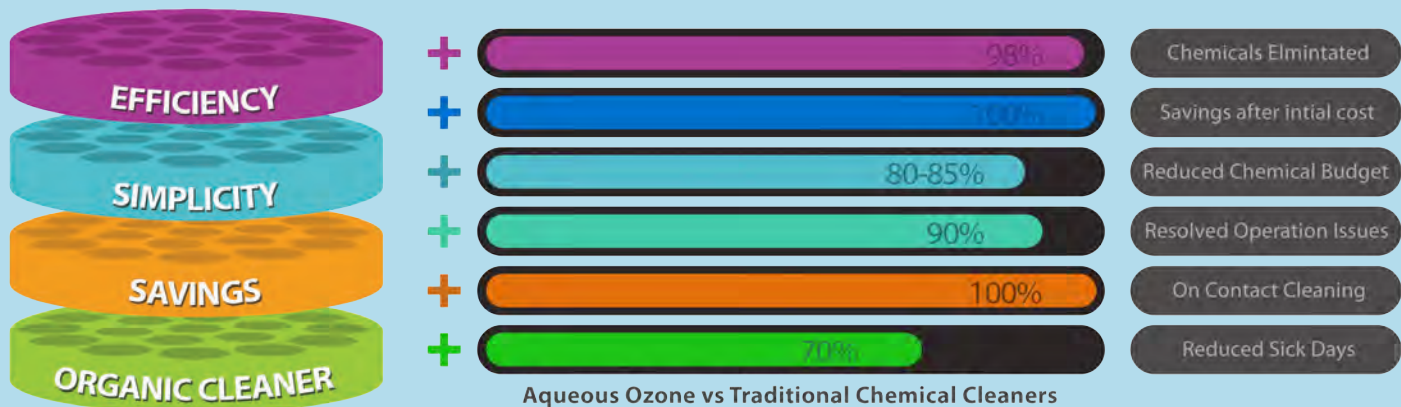
# THE PERFECT COMBINATION

A top priority in today’s environment for most of the population is using safe cleaning solutions for everyday needs. Phasing out harsh chemical cleaners can begin with looking at more benign cleaning solutions that can be used in their place. Focusing on providing reduced-chemistry alternatives to cleaning such as aqueous ozone can help us as a society become more sustainable.

Utilizing ozone as a key cleaning ingredient is not a new technique and is by no means new to the industry. In fact, the technology has existed for over 100 years including cleaning swimming pools used in the Olympics venues and larger applications. Only recently has this alternative technology become realistic for uses in smaller venues like cleaning common work areas, classrooms and residence halls.

However, this cleaning option is somewhat misunderstood in how it is capable of providing a powerful cleaning solution without using typical harsh chemicals as we are so used to doing over the years. That is why it is important to truly understand how and why sustainable cleaning solutions are the best option and how ozone plays a key role in completing this equation.

Aqueous ozone is a unique alternative which is a water-based ozone cleaner. Tap water is saturated with ozone which eliminates pathogens and contaminants through oxidization. Products such as the unit patented by Tersano Inc. creates this cleaning solution by filtering oxygen molecules (O2) from the air, passes them through an electrical field, which turns it into ozone (O3), and then infuses the ozone into water. Aqueous ozone when used as directed eliminates germs, odors, stains, mold, mildew and other contaminants on any item or surface before changing safely back into water and oxygen. It is environmentally more benign than many alternatives as it reverts to water and oxygen after cleaning. This option can be used on all types of surfaces and is considered a multi-purpose cleaner.



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## AQUEOUS OZONE AT WORK

Aqueous ozone is created when introducing an extra oxygen atom to an oxygen molecule and water molecules. This combination creates a highly effective cleaning agent that breaks down dirt, grease, and other contaminants in the same way as toxic cleaners, but naturally.

When used as a sanitizer/disinfectant, aqueous ozone is a broad range anti-microbial agent that works faster and more effectively against pathogens than chlorine bleach and hydrogen peroxide, without fumes and toxic residues like dioxins and tri-chloramines. Because of its toxin-free sanitizing action, aqueous ozone is considered safe and environmentally friendly.

The process can be show in four simple steps:



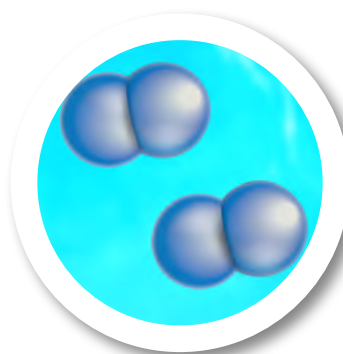
Oxygen from the air is safely turned into ozone then infused into ordinary tap water.



The ozone is attracted to germs, stains and bacteria.



Harmless to people, the ozone quickly attacks and eliminates contaminants it comes in contact with.



Only pure oxygen and water remain after the ozone cleans and sanitizes.

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## AQUEOUS OZONE VS. CHEMICAL CLEANERS?

Ozone is one of the most powerful cleaners that can be used in a multitude of ways in numerous industries. Ozone contains a powerful anti-microbial character that is much stronger than bleach. Because of this, ozone is more powerful than chlorine and much faster at destroying microorganisms.

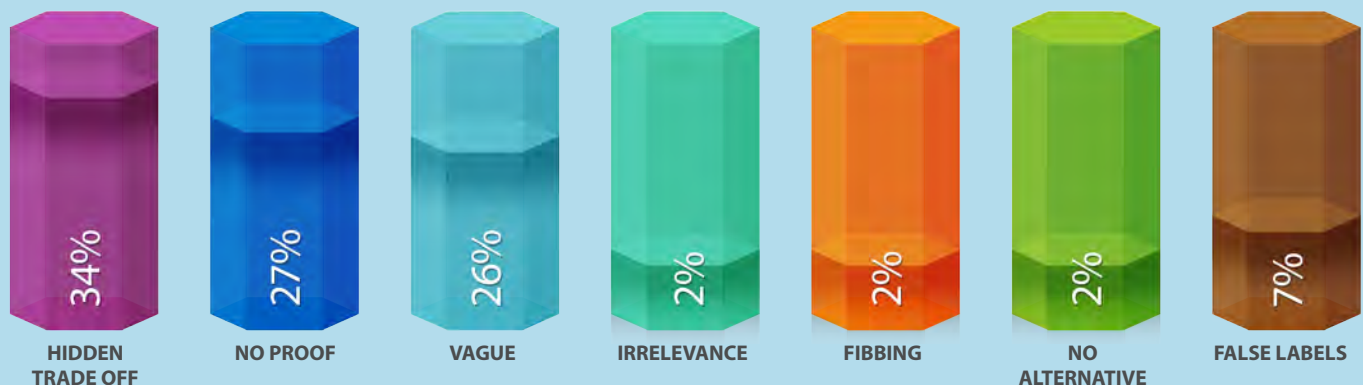
Ozone is an extremely effective, safe, and economical method of reducing common household bacteria, fungi, molds, mildew, and viruses on surfaces in our rooms, kitchens, common areas, work place areas, bathrooms and health care facilities. Ozone's powerful oxidizing action quickly reduces trapped chemical residues to harmless by-products.

Some other benefits of using aqueous ozone to clean include:

- No chemical residue
- Scent-free
- Powerful anti-microbial power
- No need to purchase harmful and expensive chemicals
- Less harsh on metal, wood, carpet and fabrics
- Reduces chemical handling and storage
- Flexible uses in most industries and applications
- One time training for staff to use
- Safer cleaning option for employees
- Cost effective

## chemical greenwashing

According to one set of standards, only 2% of products claiming in some way to be "green" actually measure up. The rest are making false claims that mislead consumers into thinking a product is sustainable.





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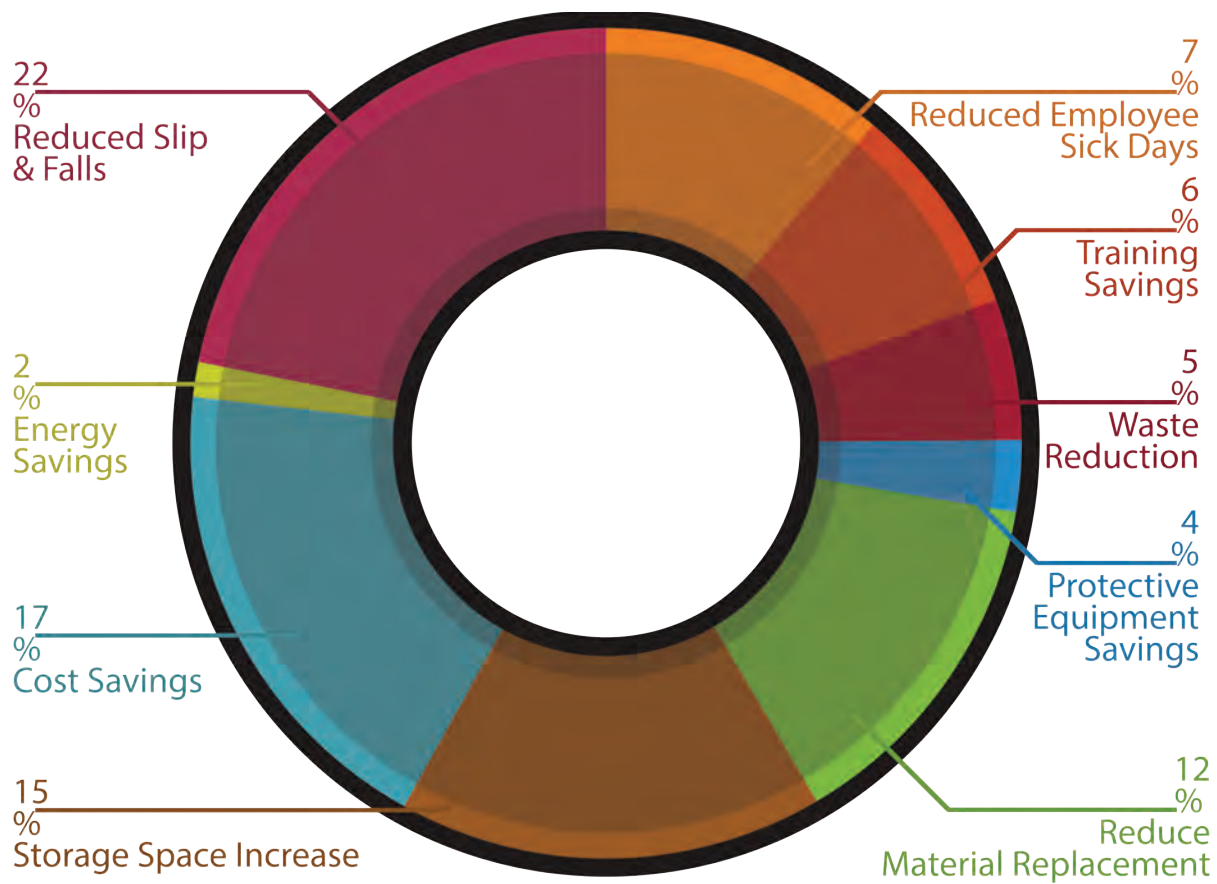
## ORGANIC COMMERCIAL CLEANING SOLUTION

An organic commercial cleaning system produces aqueous ozone using tap water and electrical power, for on-the-spot and on demand cleaning. The aqueous ozone produced by lotus® PRO is a broad range anti-microbial agent that works faster and more effectively against pathogens than chlorine bleach, without fumes and toxic residues.

Ordinary tap water is transformed into aqueous ozone which works faster and more effectively than a chemical cleaning solution. As a natural all-purpose cleaning and sanitizing agent, lotus® PRO works for hours, after which point it converts back into water and oxygen.

This system is unprecedented in its ability to clean and deodorize efficiently while reducing the need for rinsing, chemical handling, mixing, storage and training. This powerful product can be used for a multitude of applications and is specially formulated to provide the right cleaning solution for all educational facility needs.

The lotus® PRO system is a single solution for all cleaning requirements eliminating the need for multiple cleaners and toxic chemicals - whether it is used in classrooms, gymnasiums, labs, cafeteria, play equipment, washrooms, common areas or study halls.



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## THE EDUCATION SECTOR

Using aqueous ozone as cleaning solution brings environmental sustainability to a whole new level in educational facility cleaning. Using this natural solution for all cleaning requirements eliminates the need for multiple cleaners and toxic chemicals - from dorms to common areas to study halls.

With zero toxic residuals and zero down-drain containments, aqueous ozone goes “beyond green”, enhancing the educational experience for teachers, students and staff.

By reducing exposure to chemicals, bacteria, pathogens and other toxic chemicals, students, staff and teachers will be surrounded by a cleaner environment. In fact, healthier school environments have been shown to improve student focus, retention, and test scores; enhance teacher performance; and lower absenteeism among both students and teachers.<sup>4</sup>

In addition to providing a safe clean environment in our schools, an aqueous ozone system eliminates the need to buy, store, dispose and train your custodial staff on the complexity of chemical cleaners.

Saving money in operations is yet another reason to use a more natural way of cleaning. By using an aqueous ozone cleaning option, you will get more cleaning for less money. Reducing your operating costs is easy because there no need for expensive chemical cleaners all while providing a safe and effective cleaning solution for your school. By freeing up funds that you would be spending on expensive chemical cleaners, there will be a substantial cost savings that can be recalculated in the schools for more teachers, supplies, equipment, activities and other learning tools.





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## SUMMARY

There are so many reasons why schools should eliminate harsh chemicals from their cleaning supply shelves and switch to a more natural cleaning option. Studies show that more improved air quality will improve health and reduce student absenteeism. A healthier indoor environment leads to a better learning environment for our schools. It is vital that students, staff and teachers have the opportunity to learn in an environment that is a safe, healthy and free of harmful toxins.

Recognizing the fiscal and budgetary challenges facing educational school systems today, it is important to find creative ways to eliminate the unnecessary need for expenses in our schools each year. Replacing harsh chemical cleaners is just one small step to reduce costs while incorporating a healthier and safer cleaning alternative into our schools. The fact is that designing schools that follow “green” practices and incorporate safe cleaning methods will save schools money in the long run.

More importantly, it is about creating a healthier environment for students, staff and teachers in the education sector. These are not just buildings where we educate; they are much more than that. They provide a place for our kids to foster learning and academic achievement and shape their future successes.

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**Written by Tersano Inc.**  
**[www.tersano.com](http://www.tersano.com)**  
**1.800.808.1723**