

A **Multi-Clean** White Paper

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## Chemical Free: Reality or Just Marketing Hype?



### ***Chemistry Works!***

‘Chemical Free’ seems to be the latest buzz word in the commercial and institutional cleaning industry. This White Paper reviews two separate but closely related subjects; Chemical Free Cleaning and Chemical Free Stripping. A review of the available technologies and scientific basis commentary is included.

This white paper is not a comprehensive assessment, but tries to cut through some of the marketing “hype” to allow readers to make an informed judgment.

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### Disclaimer

The author of this White Paper acknowledges that as an employee of Multi-Clean, a certain bias maybe implied.

## Introduction

Several companies in the commercial cleaning industry have introduced what they claim are proprietary processes that have the same effectiveness as chemicals. The marketers are trying to vilify the word “CHEMICAL” and that all chemicals are toxic and bad. We use chemical preparations to wash our hair, clean our skin, brush our teeth, wash our clothes, process our food, and so on. The information and claims are misleading, and the purpose of this white paper is to look at what is being claimed and hold up these claims to the mirror of science and hopefully, offer up a dose of reality.

Starting with this White Paper we hope to educate readers that chemicals bring value to

everyday life and that quite simply CHEMISTRY WORKS!

## Definitions

**Chemical Free Cleaning:** A cleaning process that claims to effectively remove contaminants from surfaces without the need for any cleaning chemicals.

**Chemical Free Stripping:** This is more specific and related to resilient and non-resilient flooring that has been coated with a sacrificial Floor Finish (aka Floor Wax) designed for easy removal with a chemical stripper. In this case the definition is any process that removes multiple coats of floor finish without a floor finish stripper.

**Reference:** Multi-Clean published a White Paper titled [Chemical Free Stripping: Fact or Fantasy?](#) which was recently updated:

**Ozone:** colorless gas (O<sub>3</sub>) soluble in alkalis and cold water; a strong oxidizing agent; it can be produced by electric discharge in oxygen. Ozone is known as an effective air purifier, deodorizer, and has been used in water purification.

**Electrolyzed Water:** An electrolysis process that utilizes salt (Sodium Chloride) as an electrolyte that produces an alkaline sodium hydroxide solution and hypochlorous acid (acidic bleach) solution. The solutions can be separated into stable solutions.

**Steam Vapor:** When water is heated above its’ boiling point of 212 degrees, it turns to gas. It is this gas that is used in cleaning processes. By virtue of temperature, it is capable of killing some bacteria and viral agents.

**Spray and Vac:** A system that uses high pressure water and vacuum recovery as means of cleaning.

Marketers are trying to vilify the word CHEMICAL and would have us believe that all chemicals are toxic and bad. The purpose of their misinformation, of course is to sell you something.

## Chemical Free Cleaning

Some companies have tried to turn the word “chemical” into a dirty word. Yet we live with chemicals all around us. Our bodies are made up a variety of chemicals. These marketers will have you believe the word chemical and toxic go together.

Now some companies would have you believe a giant leap is being taken forward with systems that use only water to clean surfaces. These companies make varying claims that the systems they are selling clean as effectively as a chemical cleaning product.

Think about this, we all know the chemical that we use to wash our hands (aka soap) works. We can see that when our hands are visibly dirty, simply washing with water doesn't do much, but add a little soap and like magic, the dirty comes off. Do you really think using some magically altered water would do the same? This is highly unlikely.



## Electrolyzed Water

The process of passing current between two electrodes immersed in water and a dissolved electrolyte (salt or sodium chloride being the most common) is well understood. Collection

of two separate solutions can be achieved, one being an acidic bleach (hypochlorous acid), the other a mild alkaline (sodium hydroxide). This is the basis for the Tennant's Orbio® 5000 Sc

<i>Manufacturer</i>	<i>Product</i>	<i>Technology</i>
<b>Mednora</b>	EVA	Electrolyzed Water
<b>Mednora</b>	Sophia	Ozonized Water
<b>Tersano</b>	Lotus® pro	Ozonized Water
<b>ActiveIon</b>	Ionator EXP™	Electrolyzed Water
<b>Advanced Vapor</b>	TANCS®	Steam vapor
<b>Tennant</b>	ec-H2O™	Electrolyzed Water
<b>Tennant</b>	Orbio®5000 Sc	Electrolyzed Water
<b>Kai-Vac</b>	No Touch Cleaning® Sys.	Pressure Spray, Vac, Recovery

system. The problem, bleach doesn't clean and its sanitizing ability is quickly inactivated by organic soil. A mild solution of sodium hydroxide is hardly a cleaning agent in and of itself.

The Tennant ec-H2O™ and ActiveIon system suffer from a similar fate above. However in this case, the claim is made that the

acidic bleach and hydroxide ions peacefully coexist in solution after exiting their device to make an effective cleaner for 45 seconds. After 45 seconds, it re-converts to normal water. It seems unlikely that this is possible, but perhaps Tennant has the scientific data to back up this claim.

## Spray & Vac Systems

The No Touch Cleaning® Systems from Kai-Vac use high pressure and vacuum recovery as a means to clean restrooms. This company now

claims they can produce sanitary conditions with just water. Certainly again, the physics of force by using high pressure water and vacuum recovery is similar to using an automatic scrubber with just plain water.

## Ozone

The ability of ozone to sanitize and deodorize is well known. Now, some companies are making the leap that ozone dissolved in water is an effective cleaner. We do not believe this to be true, as like the other technologies above, ozone does have some value, but it is not a powerful cleaner.

At the recently concluded ISSA exhibition, several cleaning devices that generate ozone were shown. These include hand held sprayers for surface cleaning, scrubbers equipped with ozone generating devices, and even a hand sanitizing station that sprays ozonized water as a hand sanitizer.

Ozone is an excellent sanitizing agent and has the ability to destroy odors. The odor destructions certainly offers promise as a way to enhance the “cleaning” effect, but it does not offer stand alone cleaning capability that is comparable to a chemical cleaning product.

## Heat / Steam

Hot water and/or steam can definitely kill bacteria. Using steam to clean has some merit, and several companies have introduced cleaning devices. But just subjecting dirt to steam is not cleaning, because it does not remove the contamination. Using this process almost certainly requires the soils loosened by the steam must be vacuumed or somehow physically removed.

## What’s Really Going On Here?

All of the equipment and corresponding processes mentioned in this white paper talk of comparable cleaning without any chemicals.

***Can physical aggression and just water achieve some level of cleaning?*** The answer is yes, but limited, as any scrubber using plain water that is equipped with an abrasive brush/pad and vacuum recovery will undoubtedly remove some soil from a surface.

In the case of the Tennant ec-H<sub>2</sub>O™, we can ask the simple question, ***does an ec-H<sub>2</sub>O™ equipped scrubber produce a cleaner surface than other scrubbers that use only tap water?***

Tennant’s competitors don’t seem to think so, as several companies have shown test data suggesting that there is no improvement in cleaning performance over just using any scrubber with plain water. Of course, Tennant vehemently denies this and points to the sales success of the ec-H<sub>2</sub>O equipped scrubbers.

## Science: Chemistry Works!

None of the technologies described in this paper address the basic scientific problem with just using water to clean. Chemically speaking, water has a high surface tension, meaning water molecules tend to stick together like the beading effect we often see when putting water on surfaces.



By adding a simple chemical compound in tiny amounts, water is transformed into a powerful cleaning solution. CHEMCIAL Free systems cannot show such a dramatic effect.

### Surface Tension of Water

Plain Water      Water + Surfactant



Go back to the simple idea of washing your hands. Soap works because it transforms ordinary water into an effective cleaner by lowering the surface tension of the water and allowing it to suspend dirt from your skin. You won’t get these results by washing your hands with Chemical Free Systems. Why should we expect it to work on cleaning surfaces?



**Chemical Free Stripping**

The stripping of floors remains one of the most labor intensive and reviled processes in the maintenance of finished floors.

<i>Manufacturer</i>	<i>Product</i>	<i>Technology</i>
<b>Clarke</b>	Boost™	Orbital
<b>Square Scrub</b>	Square Scrub EBG-20	Orbital
<b>Advance</b>	Adfinity™ X20R REV	Rotational and Orbital
<b>Windsor</b>	Cylindrical Stripping Rollers	Abrasive Cylindrical Rollers (replaceable)

Advances in machinery, pads and brushes for have focused more aggression towards the finish to make removal faster and more efficient. Propane powered stripping machines, special highly abrasive pads and brushes are increasingly used in stripping floors.

Now, some companies are selling cleaning equipment that they claim enables floors to be stripped without the use of chemicals.

**What's Really Going On?**

Although some companies use the term 'chemical free stripping', they all clarify that this process is more of a preparation process that removes multiple coats of finish dry or with just water. This is not nor does it replace true bare floor stripping.

**Pro:** Many companies including Multi-Clean have advocated for years the route to stretching out the strip-finish cycle was an effective scrub and recoat program. These systems appear to

make the recoat process more effective and simpler. They also can help stretch that strip-finish cycle, which is great! But wait, how many coats do you want to remove?

**Con:** Removing too many coats is wasteful and unnecessary. Systems that remove an excessive number of coats during the recoat preparation process are wasteful, requiring more coats of finish each time. This is hardly green. If a system can consistently remove up to 2 coats of finish, this is ideal to insure all dirt embedded finish is removed before top coating.

What about the flooring itself? Uncoated VCT floors are sensitive to aggressive abrasives which causes VCT tile to become more porous overtime. Systems that use aggressive abrasive pads that claim to truly strip floors could a negative effect on the tile itself if not used as directed. Commercial resilient tile manufacturers such as Armstrong warn against using abrasive pads that are too aggressive on their flooring. Follow the link, see page 8. <http://www.armstrong.com/assets/commflooringna/literature/downloads/F8663.pdf>

All of the Chemical Free Stripping Systems depend upon using a more abrasive pad, brush, or surface to achieve results. 3M Company pioneered the idea of Chemical Free Stripping with their Surface Prep Pads and others have followed.

[CLICK HERE to view SPP brochure](#)

### What about shake, rattle and roll?

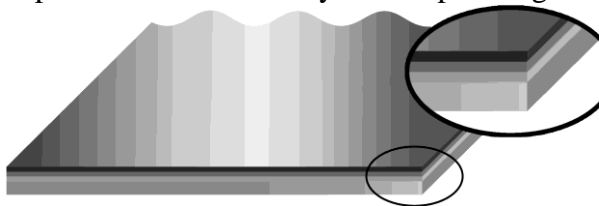
Random orbital action means continuous vibration of equipment. Purchasers should ask questions about the possibility of reduced life and/or more frequent repairs.

It is also fair to note that machines that may have been designed to optimize chemical free stripping may not be so good at daily scrubbing. Always evaluate the machine on how it performs as a scrubber first, as that will be what the machine is used for most frequently.

### Is it Really Stripping?

Technically, the various processes described is indeed surface stripping or removing 1 or more coats of finish through abrasion

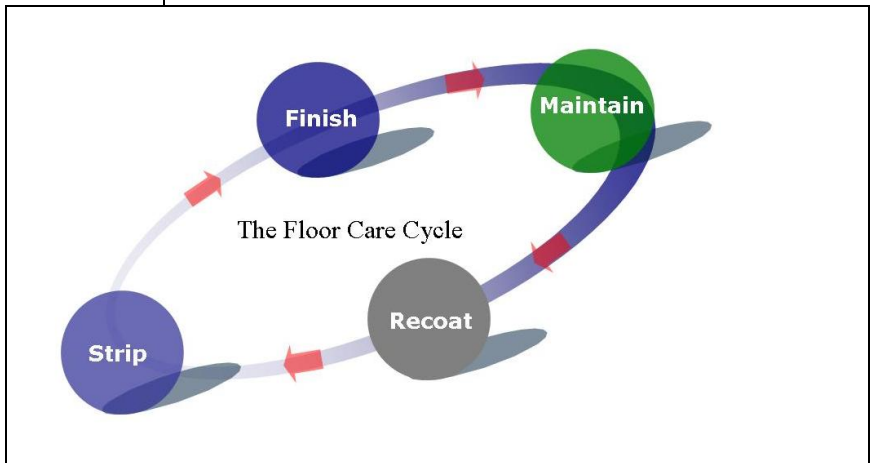
Removal of 2 coats is all that is necessary to expose a suitable base layer for topcoating.



The Boost® Machine, the Adinity XR™ 20 REV, and Square Scrub depend upon the SPP pad technology to more aggressively remove finish prior to recoating.

### The Green Magnifying Glass

Lengthening the strip-finish cycle should be everyone's goal. Using a more aggressive deep scrub pad can be beneficial, particularly in high traffic situations. Judgment about whether these systems are green depends on how many coats are being removed. Removing anything more than 2 coats is unnecessary and wasteful, requiring more coats of finish for protection and appearance.



### The Real World

Many of us already know that even a seemingly flat vinyl floor has many subtle peaks and valleys. A rotary or orbital machine can easily miss low spots. In the case of stripping without chemicals, it is inevitable that finish residue will remain. The idea of extending the strip-finish cycle by using more effective scrub and recoat techniques has and continues to be one of the key methods used to increase the life of finished floors.

### Chemical Free Stripping Q & A

**Q. Can floors be completely, 100% stripped without the use of chemicals?**

**ANSWER:** No, the highs and lows of floors make this unrealistic. However, more aggressive deep scrubbing can help extend the strip-finish cycle.

**Q. Is this process exclusive to a specially designed machine?**

**ANSWER:** No, the results of achieving more finish removal before recoating is due to the use of the more aggressive SPP pad.

**Q. Can other automatic scrubbers accomplish similar results?**

**ANSWER:** Yes, using the 3M Surface Prep Pad will typically remove more coats of finish in the scrub and recoat process.

## The Last Word

Improving floor care results and maximizing budget dollars requires exploring new ways to do more with less. Prevention strategies that capture dirt before it has a chance to destroy floors should include entryway maintenance, and regular removal of soils from floors. Stripping of floors should only be considered when and where it is truly needed.

**Chemical Free Stripping** tools and techniques offer the potential to help extend the strip-finish cycle and enhance productivity of maintenance crews. But be aware, a process that is too aggressive may needlessly remove too much finish, requiring the need to put on more coats, which may actually end up being more costly.

The fact that CHEMISTRY WORKS to make cleaning jobs easier should not be forgotten when the marketers claiming they can do it without chemicals. Using chemical ingredients that are safer with minimal environmental impact is the responsibility of every cleaning product manufacturer. Using these products correctly, at proper dilutions and dilution control devices make these systems even more effective.

As we continue to hear more about **Chemical Free Cleaning**, we will continue to challenge any misleading marketing claims of some companies that say their exclusive technology works as well as chemical cleaners. As the saying goes, if it doesn't clean, it is not green.

If you enjoyed this white paper, you can find others at [www.multi-clean.com](http://www.multi-clean.com), then click on the resources tab..

- **Chemical Free Stripping: Fact or Fantasy**
- **LEED the Way To GREEN**
- **Greening Our Schools is a ClassACT**
- **You Decide: Magic Water or Powerful Cleaner from Ordinary Tap Water.**
- **Cleaning for Health in Healthcare**
- **The Next Level: Sustainable Cleaning**

## CHEMISTRY WORKS

