

The Region's Leading Cleaning Industry Magazine

CLEAN

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**RON'S ENVIRO CARE
UNLEASHES CUTTING-EDGE
HYDRO JETVAC SOLUTIONS**



Nanotechnology

*Something small brings big benefits to the cleaning industry, finds **Mark Sisson**.*



Mark Sisson
Co-founder, NanoTouch

Let's be realistic, we're either cleaning to improve health and reduce absenteeism or to create a visibly cleaner environment to positively affect people's perception of a facility or business. In fact, the reality is that many facilities view routine cleaning as a necessary evil. Something they spend money on for little or no business benefit.

The science of 'small'

Before we talk about the big benefits to the cleaning industry, let's talk about the science of 'smallness'. It turns out that when you change the scale of certain materials, new and amazing properties emerge. Microfiber cloths, for example, benefit from Van der Waals forces. The same forces that allow geckos to stick to glass with millions of microscopic hairs on their feet

create an attraction between the microfiber threads and contaminant particles. But, nanotechnology is much, much smaller.

One such material that has unique properties at the nano level is titanium dioxide. TiO₂ is one of the most widely used pigments in the world, whitening everything from paints to milk, toothpaste and sunscreen. In 1971, nano-scale TiO₂ was discovered to create a photocatalytic oxidation reaction when exposed to UV light.

As part of a \$2 million research and development grant, we've been working with TiO₂ formulas that are energized by any visible light, not just UV. And with the addition of additives and material science, we've been able to create surfaces that work indoors to continually break down contaminants. These nanocrystals are around 8 nanometers. To put it into perspective, DNA is around 2 nanometers and a typical bacteria is a whopping 200 nanometers

The science of self-cleaning surfaces

It's not too difficult to imagine how useful a substance could be that creates an oxidation reaction from light...a surface that is essentially self-cleaning. This self-cleaning process actually happens in two ways. First, the basic oxidation process breaks down organic contaminants into base elements like water and carbon dioxide. The second process, which will be of special interest to infection prevention professionals, involves the oxidation of water molecules, producing hydroxyl radicals. While hydroxyl radicals have extremely short lifespans, existing for less than 1 millionth of a second, they are deadly to microorganisms like bacteria and viruses.

Self-cleaning facilities become a reality. Healthcare facilities, especially acute care, are a great fit for broad application of nanotechnology. Some hospitals are now spray coating entire emergency rooms and operating rooms with a variety of self-cleaning coatings. This makes sense when you want a sterile environment.

In just about all other facilities, a sterile environment is not only unnecessary, but less healthy. The vast majority of microbes in our environment are harmless or even beneficial. So with office buildings, schools, hotels and

other public facilities, we take a rifle-shot approach, using self-cleaning "skins" on high-traffic touchpoints like door handles, and self-cleaning mats on reception counters and even work surfaces. Now let's be clear... self-cleaning surfaces aren't meant to replace traditional cleaning and disinfection. You can look at these applications as either a method to reduce cleaning labor and supply costs, or it can be a cleaning multiplier...a continuous cleaning action in between routine cleanings when you want a higher level of clean.

While traditional cleaning and disinfection is necessary, surfaces become contaminated from the very next touch and from airborne contaminants. Just think about a restroom door handle. Research has shown that only around 50% of people wash their hands after using the restroom. So the other 50% are contaminating touch points throughout a facility.



A clean that changes how people feel...

After conducting extensive market research into people's perceptions of cleanliness, we discovered that a great deal of the value was not in what the surfaces did, but how it made people feel. When we created our self-cleaning facility touch points, instead of using a clear film, we used a printed design that told people what the surface was.

What we never anticipated was how that communication made people feel. People knew where the cleaner touch points in a facility were because they could now see them. Research showed that when a patient saw a self-cleaning touch point at their physician's office, they assumed the rest



of the facility was cleaner, and even made positive assumptions about their healthcare in general. Simply seeing self-cleaning surfaces had a positive effect on patient experience.

“Our patients love the NanoSeptic touch points and other self-cleaning products in our facility,” says Lauren Bennett, former Director of Communications and Experience with Central VA Family Physicians. “Now we can have these products professionally maintained and replaced for as little as \$1 per day per facility. That’s an amazingly low price to pay for the peace of mind this service provides for our patients and staff.”

“We maintain a very clean facility with assistance from Nanoseptic Self-Cleaning Surfaces. LUCOM is a high traffic facility with nearly 500 individuals weekly and multiple touch points throughout,” says Christopher Breedlove, Director of Marketing at Liberty University College of Osteopathic Medicine. “Partnering with NanoSeptic helps us in our continual goal of maintaining a quality of health. It is our hope that this will translate into the lives of our student-doctors and one day, their future patients.”

This same effect was observed in industries outside of healthcare. Placing a self-cleaning mat in the TSA security bin at the airport or

placing a self-cleaning placemat on the hotel vanity positively affected traveler experience. In fact almost two thirds of respondents said that self-cleaning surfaces would affect their buying decisions...what hotel they stayed in, what school they sent their children to, and what dental office they visited.

New revenue opportunities for the cleaning industry

Not only can consumer perception be affected by this technology, but the perceived value that cleaning companies deliver can be boosted as well. We all know that the commercial cleaning industry has become commoditized. Cleaning services are generally invisible, generating very little perceived value. Service providers compete based on price, each trying to be the low bidder. This vicious cycle leads to margin compression and reduced investment in training, equipment and innovation.

Cleaning companies can now deliver value-added services based on nanotechnology that works continuously, and generates new revenue at higher margins. BSCs (building service contractors), which handle janitorial and maintenance services, are already providing facility services on a regular basis. Installing and maintaining self-cleaning surfaces was a natural add-on service.

About the Author: Mark Sisson is the **Co-founder of NanoTouch** - winner of the 2016 and 2017 ISSA Innovation Awards. NanoSeptic mats and skins turn dirty high traffic, public touchpoints into continuously self-cleaning surfaces. Powered by light, NanoSeptic surfaces utilize mineral nanocrystals rather than chemicals, toxins or heavy metals. NanoTouch has distributors in 30 countries and their products can be found in a variety of facilities from medical schools to airports and YMCAs. ●

