Responsible Processes for Electrostatic Sprayer Systems

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Abstract

The advent of more efficient and effective electrostatic spraying technologies has made it possible to maintain cleaner and healthier facilities than ever before. Yet, this opportunity has also given rise to new risks that must be addressed responsibly. Electrostatic disinfection processes must be standardized to increase compliance. In addition, it's important to establish simplified and easily scalable cleaning protocols and training programs to maximize efficiency and replicate results. Ultimately, cleaning protocols tailored around electrostatic technology should meet five criteria to truly support compliance: cost effectiveness, accessibility, practicality, safety and scalability.

Main Article

History of Spraying Technologies

Before electrostatic technology was introduced in industrial market sectors over 50 years ago, traditional spray equipment had problems with transfer efficiency: the measure of how much chemical reaches the surface versus the percentage lost to the floor and surrounding environment. In industrial painting applications, this typically meant about 25% of the paint adhered to the surface while 75% was lost to other areas.[1,2] For agricultural crop spraying, typical pesticide waste averaged 50% with traditional spray methods, posing pesticide contamination risks to public water ways and the surrounding environment due to wind drift.[3]

With the emergence of electrostatic spraying technology, which creates a magnetic attraction between the spray droplets and the targeted surface, transfer efficiencies skyrocketed to 80%, even upwards of 95% percent in certain industries.2 For auto assembly lines, this meant car painting could be done 80% faster, with over 50% savings in paint usage for the same process, and for agriculture, pesticides could be contained to target areas.

Today, industrial grade electrostatic spraying systems are widely used in many sectors and have proven to be one of the fastest and most economical methods for applying chemicals and surface coatings.

Sanitation Applications

The challenges plaguing cleaning professionals worldwide are often not a result of ineffective chemicals but rather lack of time, resources, and budget necessary to stay ahead of ever-growing public health threats. Consequently, it would seem that electrostatics would have been adopted for disinfection purposes decades ago. However, it was not until the past few years that electrostatic spraying technology became portable, economical and simple enough to use making it a more reasonable and practical option for facilities managers and service contractors to consider.

Current cleaning protocols require staff to physically touch every surface to eliminate pathogens. This is where

touchless electrostatic disinfection technology becomes fundamental in empowering users with the ability to eliminate pathogens more effectively.

Surface Coverage Data

One of the chief concerns has been the inability to achieve more complete surface coverage within a limited timeframe. The CDC estimates that 50% of hospital room surfaces are left uncleaned.[4] Outside of healthcare, the percentage is even higher. The job of a cleaning professional is not an easy one. Using traditional tools like mops, buckets or rags takes an unrealistic amount of time to effectively clean, sanitize or disinfect all surfaces thoroughly enough to eliminate pathogens. At a time when the stakes are higher than ever before, addressing time constraints, reaching more spaces and increasing compliance are critical but, with cleaning budgets continuing to decline, hiring additional staff isn't the answer.

Now, rather than using traditional approaches to reactively contain outbreaks once the public is already ill, the cleaning industry can proactively prevent infectious outbreaks with enhanced disinfection measures. New electrostatic technologies offer promising potential for 80% faster disinfection time and 3-times greater surface coverage per ounce while using 60% less chemicals per square foot.[5] The ability to apply disinfectants at a rate up to ten-times greater than traditional tools is a winning proposition for most cleaning professionals (Figure 1).[6]

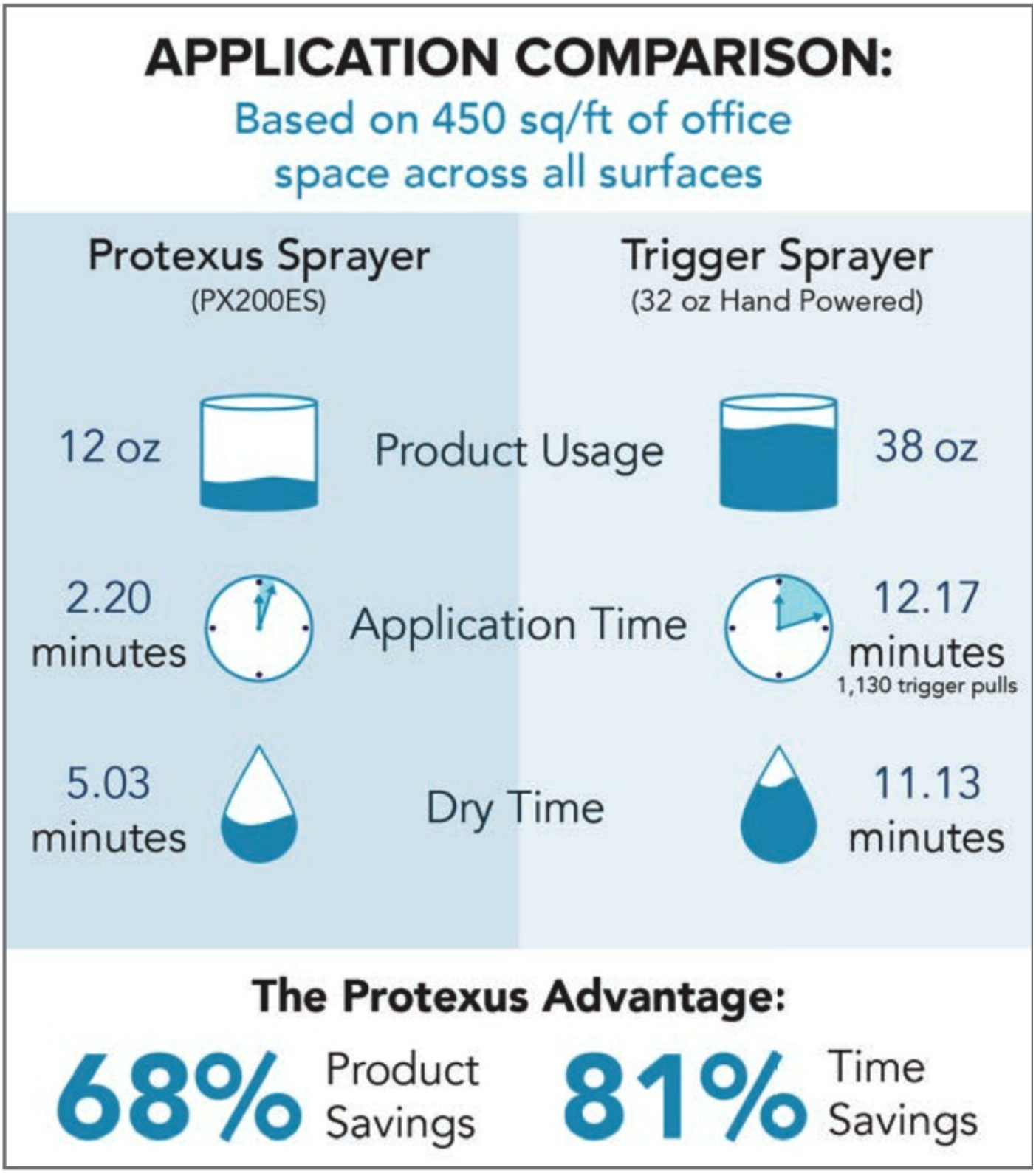

Figure 1: Example of application and chemical usage comparison.
Source: EvaClean PX200ES Brochure

Responsible Processes for Safer Chemical Application

With wide-scale adoption of this revolutionary technology comes the responsibility to implement proper usage guidelines. Processes must be established to ensure safe and effective application of chemicals in a manner that protects the public health as well as that of custodial teams.

Without standardized processes for safe and compliant use, the benefits of electrostatics could be outweighed by the potential for reckless misuse. The responsibility lies with both the equipment and chemical manufacturers to ensure that sprayer specifications are properly aligned with the right chemistry so that the resulting protocols are consistent with the registered chemical claims as well as the regulatory guidelines for worker safety.

While there are chemicals available that are well suited for electrostatic application, there are others that are not due to potential safety hazards or material incompatibilities, and it is the responsibility of all parties to ensure that those considerations are taken into account. Features such as droplet size, spray patterns, sprayer output, charge mechanism, and chemical equivalency are all part of an electrostatic disinfection system which, when properly designed, can optimize processes to ensure they are as practical and affordable as they are safe, effective, and scalable.[7] It is important for operators to remember that electrostatics is not a free pass to blanket the world in more chemicals, but rather to leverage the technology's efficiency to do more with less.

Cleaning Industry Compliance

Compliance is another key challenge the cleaning industry continuously faces. Levels of compliance are directly proportional to cleaning success. Low levels of compliance not only lead to poor results, but make it difficult for managers to achieve consistency across teams of different sizes. Ultimately, cleaning protocols tailored around electrostatic technology should meet five criteria to truly support compliance: cost efficacy, accessibility, practicality, safety and scalability.

Quality control and accountability measures should be implemented to ensure proper usage and results over time. To achieve a basic pass / fail "clean" verification, ATP meters may suffice. However, there is growing evidence that ATP meters are actually quite poor at measuring clean. For truly in-depth measurable data, there are now fast and cost-effective swab culturing programs that can help better predict trends and ensure the effectiveness of any electrostatic disinfection protocol.

Standardization of cleaning and electrostatic disinfection processes is essential to addressing compliance concerns. Once programs are standardized and time saving efficiencies are realized, teams should increase the frequency disinfection protocols as much as possible to improve their ability to prevent outbreaks, rather than waiting for the outbreaks to occur.

Simplified Protocols

In the cleaning industry, where multi-lingual staff and high turn-over are prevalent, it's crucial for training programs and processes to be as clear and streamlined as possible so they can be replicated and easily scaled. Assistive technology like electrostatics helps bridge gaps in staff experience levels and ensuring a more consistent outcome.

Simplifying processes also means consolidating around one universal broad-spectrum disinfectant that works for every stage of the cleaning process, instead of expecting users to understand multiple chemical usage guides and dwell times.[8] Less chemical variation improves safety and effectiveness. Implementing a touchless disinfection protocol also allows teams to make safer and more environmentally preferable choices for the cleaning products they use to physically remove soil. One set of directions for both cleaning and disinfecting increases worker safety, eliminates chemical hazards and exposure, while also ensuring a higher level of compliance.

Conclusion

Outlining well-defined safety precautions and clear guidelines before wide-scale implementation of electrostatic disinfection sprayer systems is a necessary responsibility both equipment and chemical manufacturers share. High level compliance around industry best practices for electrostatic technologies will deliver quantifiable quality results, create healthier populations by mitigating the spread of infectious diseases, and lead to safer, cleaner facilities.

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