

In a new series Dr Christina Baxter, of [Emergencyresponsetips.com](http://Emergencyresponsetips.com), offers helpful advice for first responders. This issue is Electrostatic Sprays.

# Keeping you safe!



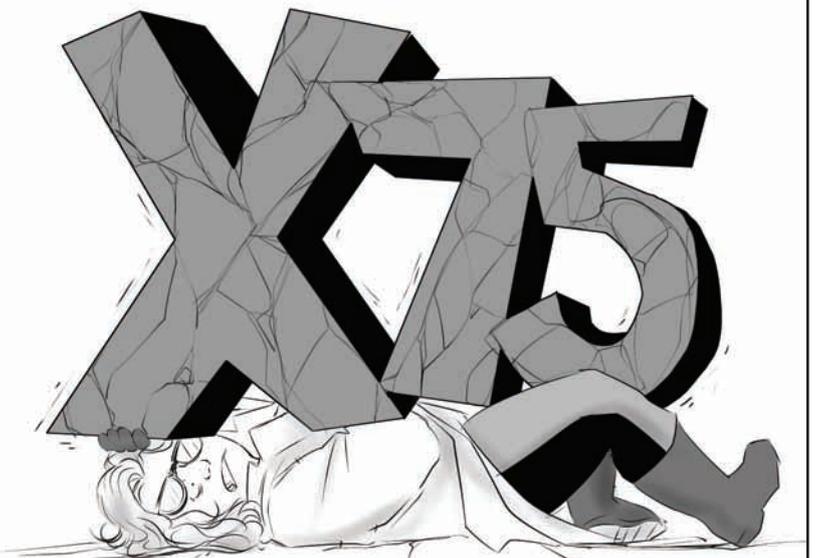
This column is intended to provide operational guidance to the hazmat/CBRNE community regarding the selection and performance of equipment and tactics. In this issue we will focus on the appropriate use and application of electrostatic sprayers for decontamination.



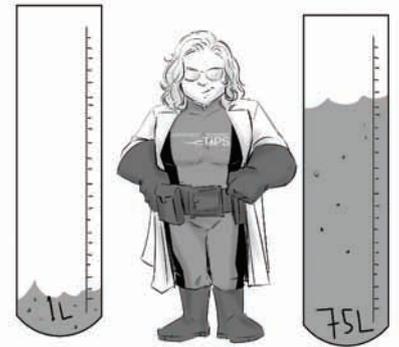
Electrostatic sprayers have been used in agricultural, healthcare and painting industries for many years. My first foray into electrostatic sprayers for hazmat/CBRNE decontamination was in 1999, during Project Atlanta at the Georgia Tech Research Institute. Using technology developed at the University of Georgia, a 'new' technique for applying decontaminants to a surface was evaluated. Unfortunately, the 500-gallon bladder on the system proved a little too much for us to incorporate into emergency operations at the time! In 2003, Clean Earth Technologies developed a smaller system which was man-portable, under contract to the Department of Defense. Today, there is a range of products encompassing battery operated handheld and backpack systems, man-portable, rolling suitcase systems and large capacity, large area systems.



Operationally, a solution is pulled through the spray nozzle where turbulent air flow shears off droplets into small, reproducible sizes. A positive electrical charge is applied to the droplets before they leave the nozzle orifice. Because the droplets exit the system with a positive charge, they repel one another en route to the surface to be decontaminated. This results in an even distribution of decontaminant across the surface and a 'wraparound' effect whereby the spray finds its way into hard to reach areas. The forces attracting the positively charged droplets to their target (most surfaces are either negatively charged or neutral) are approximately 75 times the force of gravity!

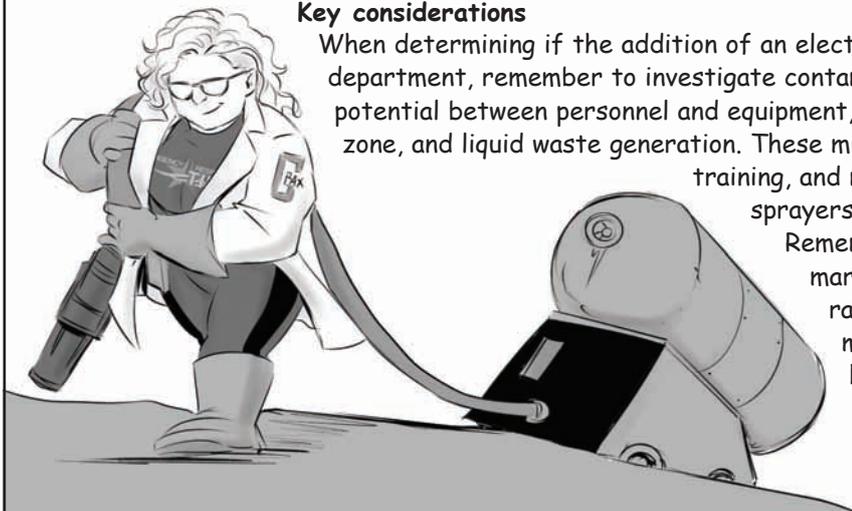


This minimises the chance of droplets aggregating and then falling to the ground, as seen with traditional sprayers. Regardless of the decontamination application technology that you use, remember that best practice needs to be adhered to...it's not magic, it's a tool to provide enhanced decontamination efficiency. Studies by the US Environmental Protection Agency (EPA) have demonstrated that electrostatic decontamination methods are more efficient, reduce waste, and deliver a more uniform distribution of liquids over uneven surfaces. The EPA found that electrostatic backpack sprayers used 75 times less decontaminant than the traditional backpack sprayers. Another EPA study demonstrated that the electrostatic sprayer had double the efficacy against biological agents due to the minimal amount of runoff moving spores prior to their deactivation.



**Key considerations**

When determining if the addition of an electrostatic sprayer is suitable for your department, remember to investigate contaminant efficacy, cross-contamination potential between personnel and equipment, spread of threat material beyond the warm zone, and liquid waste generation. These must be balanced against the increased cost, training, and maintenance required for electrostatic sprayers when compared to conventional sprayers. Remember, there are many products on the market today for electrostatic decontamination ranging through handheld, backpack-mounted, man-portable and transportable. While the handheld and backpack systems offer great flexibility, they also tend to get heavy when full of decontamination solution for extended periods.



It might make more sense to use the smaller systems for decon line operations and small area decontamination, while the large systems would be beneficial for large area decontamination and vehicle decontamination. Finally, be sure to validate the compatibility of your system with your chosen decontamination solutions. If you have problems with your electrostatic sprayer, general points of failure are the nozzle (remove and realign to ensure not offset; ensure no residue buildup) and circuit board (measure voltage across nozzle with voltmeter). Otherwise, happy spraying!



Until next time,



**CBax away!**

Images are courtesy of Phil Buckenham  
<https://philbuckenhamart.wixsite.com/philbuckenham>