



WHAT IS HYBRID DECON?

A GUIDE TO THE LATEST IN DECONTAMINATION TECHNOLOGY

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THREATS HAVE EVOLVED. DECON HASN'T. UNTIL NOW.

FACE IT.

Traditional soap-and-water decon lines were used in World War I. Today, many Hazmat teams are still using those same tools, techniques, and practices. **Why?**

Are you still using other dated technologies in any other parts of your operations? Why are you still clinging to shower and pool decon lines? There's now a better way to decon called hybrid decontamination and it improves every aspect of the decontamination process.

Because hybrid decon is so new, many people have questions they want answered before they implement it. This guide is designed to answer those questions.

If you still have questions, please give us a call at **+1.703.955.7510** or email **decontact@firstlinetech.com**.





WHAT IS HYBRID DECON?

Until now, HazMat teams had two choices of decontamination processes: Wet or dry decon.

Wet decon is effective, but time consuming and generates contaminated runoff that must be disposed of safely.

To overcome the disadvantages of the wet process, people have attempted a dry decontamination process using a powder decontaminant. These powders were never very effective and a pain to deploy and clean up.

Now, two scientific breakthroughs have made it possible to get all the advantages of both wet and dry decon without the long operational times, large logistical footprint, and expensive disposal costs.



Dahlgren Decon decontamination solution was developed by the U.S. Navy to reduce the logistical footprint of traditional decontamination processes.

It is a surfactant microemulsion that acts like a liquid sponge to lift and hold contamination while an oxidizer component rapidly chemically destroys the threat.

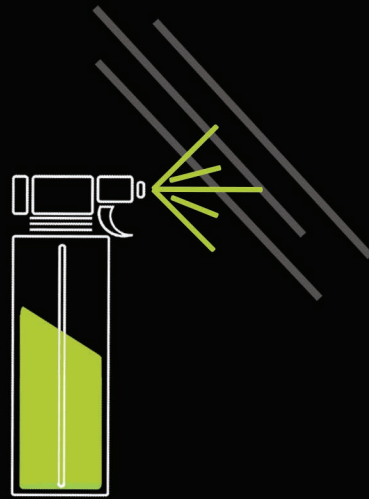


FiberTect wipes and mitts are made of a fibrous activated carbon material that absorbs and adsorbs contaminants and their off-gasses.

Used together, they are a complete hybrid decon solution that can handle hundreds of known and emerging threats. Hybrid decon is better than both wet and dry decontamination processes because Dahlgren Decon and FiberTect do not just remove the contaminant, they chemically neutralize it.



BLOT



APPLY



REMOVE

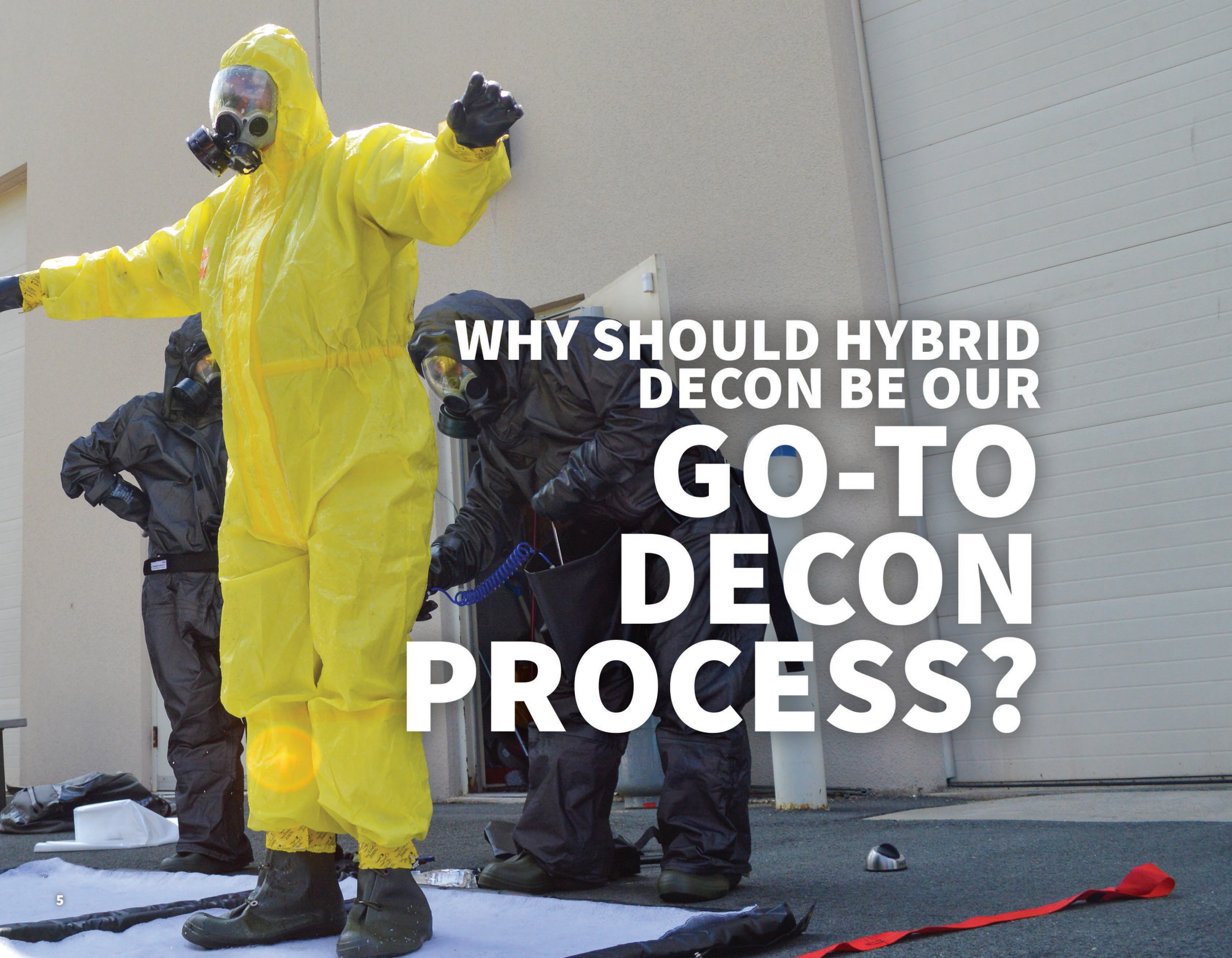
THE B-A-R METHOD

Hybrid Decon follows the B-A-R Method: Blot, Apply, Remove.

BLOT: Blot to remove visible bulk contamination. This step is important in order to reduce the amount of surface contaminant that needs to be destroyed while also reducing the amount of liquid decontaminant needed. Blotting is more effective than wiping because it allows the absorbent materials to work more effectively. By not spreading localized contamination over a large area and potentially making it more dangerous and difficult to remove, the blotting process is the safest method of removal.

APPLY: Liquid decontaminant can be applied by any type of sprayer, equipment, or PPE. For skin decontamination, apply Reactive Skin Decontamination Lotion.

REMOVE: Any remaining decontamination solution can be removed with a clean FiberTect wipe, or if the situation permits, by rinsing with clean water.



**WHY SHOULD HYBRID
DECON BE OUR
GO-TO
DECON
PROCESS?**

Because Dahlgren Decon is highly effective against Fentanyl, some only use it when neutralizing synthetic opioids.

However, hybrid decon utilizing Dahlgren Decon and FiberTect is the fastest, simplest, and most effective broad-spectrum decontamination process for hundreds of known and emerging threats.

Dahlgren Decon can replace dozens of single or limited use decontamination solutions on your truck and in your storage room. You can reduce your logistical footprint and procurement costs.

Dahlgren Decon has a ten-year shelf life and is stable at temperatures ranging from -40°F to 160°F, making it perfect for both cold weather decon and in-vehicle storage in extreme temperatures.

EFFECTIVE AGAINST



CHEMICAL WARFARE AGENTS (CWAs)



BIOLOGICAL WARFARE AGENTS (BWAs)



TOXIC INDUSTRIAL CHEMICALS +
MATERIALS (TICs / TIMs)



PESTICIDES



SYNTHETIC OPIOIDS



EMERGING THREATS



**EVERYTHING YOU NEED TO KNOW
ABOUT DAHLGREN DECON IN THE
PALM OF YOUR HAND.**

[REGISTER](#) [LOGIN](#)

THE DECON FIELD GUIDE MOBILE APP GIVES USERS ACCESS TO

DELL



HOW DO WE KNOW IF DAHLGREN DECON WILL WORK ON A PARTICULAR THREAT?

We've got you covered.

First Line Technology has developed the **Decon Field Guide** available on Apple and Android devices, as well as on the web, for instant expert guidance.

Simply search by name, CAS number, or synonyms for your identified threat in the comprehensive threat library to see if Dahlgren Decon will neutralize the threat as bulk contamination or on contaminated surfaces. The Decon Field Guide also displays reactivity concerns, suggested ratios, and dwell times.

Additionally, complete mixing and application instructions are included for multiple Dahlgren Decon configurations.

No internet access? The Decon Field Guide works offline to ensure you're never without guidance.

Register for the Decon Field Guide online at <http://dfg.firstlinetech.com>. All users must be verified and approved by First Line Technology.



SCAN THE QR CODE TO GO TO [DFG.FIRSTLINETECH.COM](http://dfg.firstlinetech.com) + DOWNLOAD THE DECON FIELD GUIDE



WHY IS HYBRID DECON BETTER?

Decontamination is a balancing act.

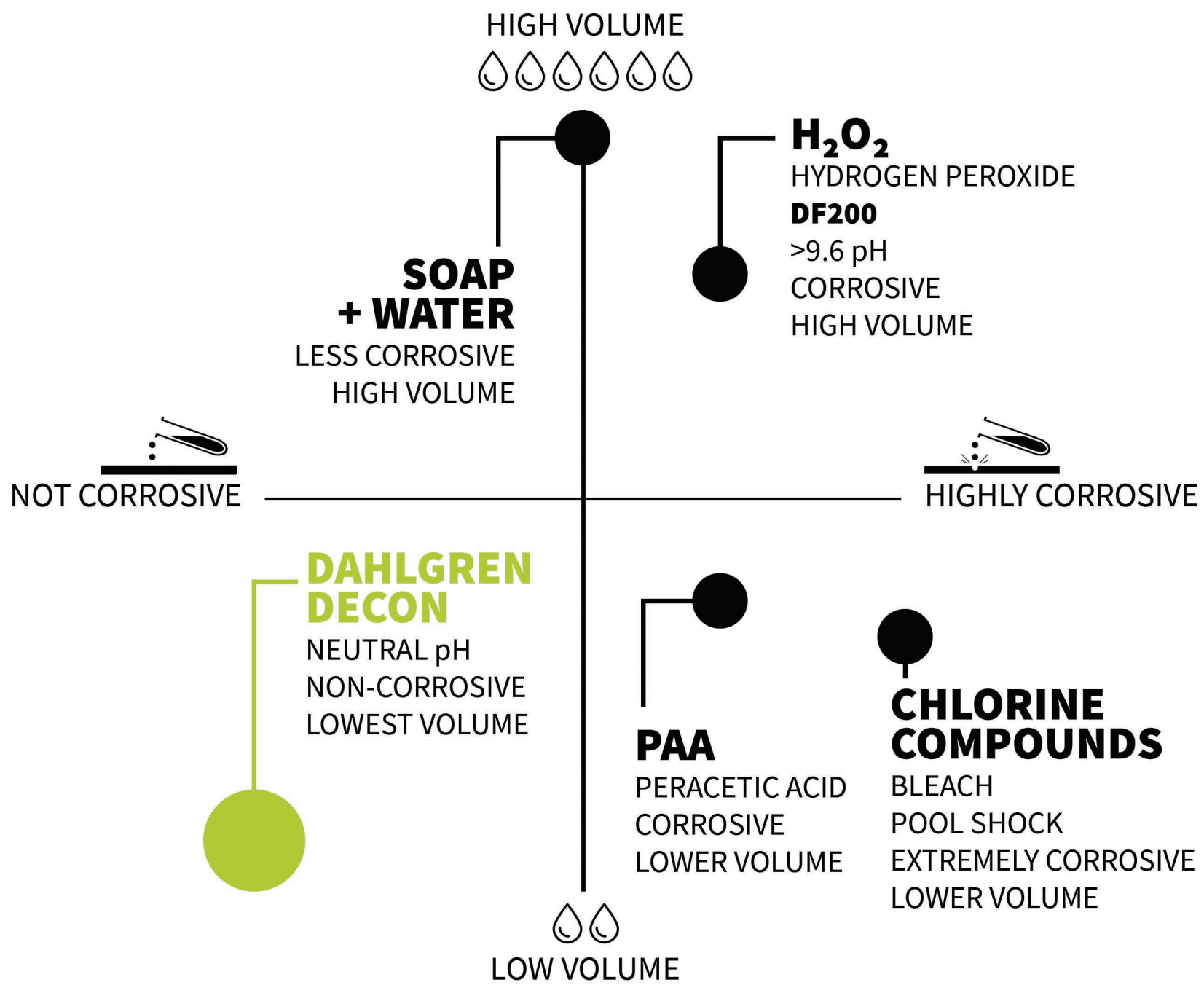
You want complete decontamination with the least amount of corrosion and smallest volume of liquid. Each decontamination solution has a different profile of effectiveness with corrosion and runoff.

Water is not corrosive but requires a very large volume of liquid and only physically removes the contaminant.

Bleach is extremely corrosive, must be diluted with a large volume of water, and only neutralizes select contaminants.

Hydrogen peroxide-based (H_2O_2) decontamination agents like DF200 and Sandia Decon are highly corrosive, especially to metal and rubber. While they are effective on a broad range of contaminants, they require a large volume of foam.

Peracetic Acid (PAA) based decontaminants are highly effective on a broad range of toxic substances and require a low volume of decontaminant. Dahlgren Decon is formulated to provide a high level of PAA while keeping a non-corrosive neutral pH.



WHY IS REDUCING DECONTAMINATION TIME IMPORTANT?

Time and contamination wait for no one.

When a contaminant lands on a surface, several factors affect how toxic it will be and whether you can completely decontaminate it.

The porosity of the material affects how quickly the material absorbs the contaminant.

Time affects both the evaporation and absorption of the contaminant.

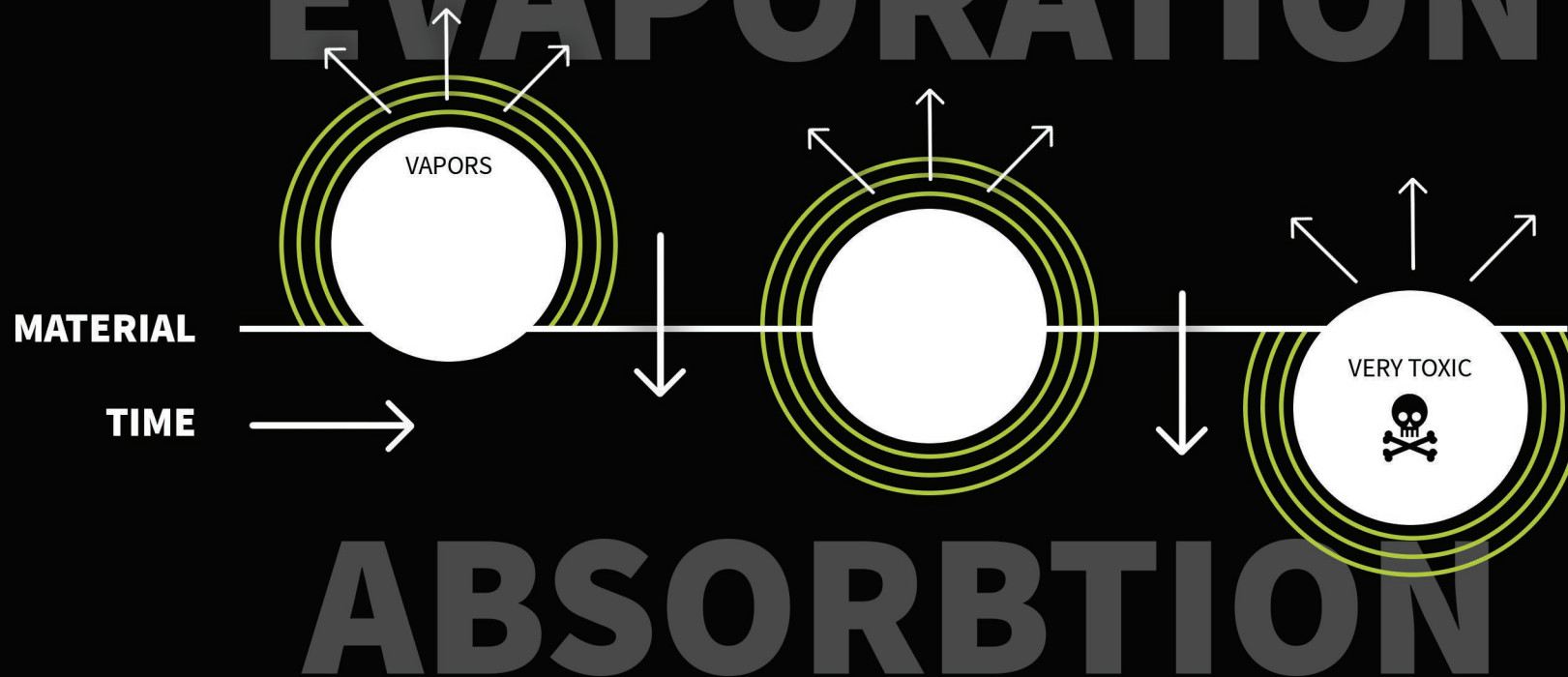
Initially, the immediate danger of the contaminant is the vapor given off through evaporation.

Over time, more of the contaminant is absorbed into the surface, making it difficult or even impossible to decontaminate effectively. With most toxic substances, if your decontamination effort is delayed by fifteen minutes from the time of contamination, you are losing the battle.

Traditional soap-and-water and hydrogen peroxide decontamination processes may take up to an hour to set up.

Hybrid decontamination using FiberTect enables you to remove up to 95% of the contaminant immediately and contain the off-gases. This reduces the amount of residue, making it easier to decontaminate the surface.

EVAPORATION



Excerpt from: J. Phys. Chem. C 2012, 116, 546–554. Corresponding Author: Matt Willis



HOW DO WE MIX DAHLGREN DECON?

If you've ever made a cup of coffee with cream and sugar, you can mix Dahlgren Decon.

Dahlgren Decon comes in three parts, each in their own package.

Part A (the coffee) is a surfactant. It breaks the surface tension of the contaminant and encapsulates the toxins.

Part B is a solid oxidizer divided into two components packaged separately.

Part B1 (the cream) is Sodium Hydroxide. Its role is to balance the pH level and to enhance the performance of Part B2 on certain agents.

Part B2 (the sugar) is PES-Solid, peracetic acid that contains borate salt and provides ~4.8% PAA when dissolved in water.

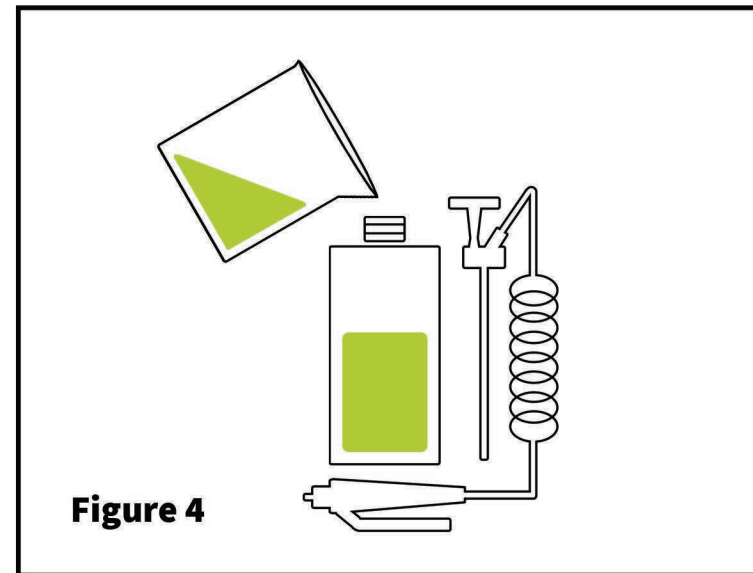
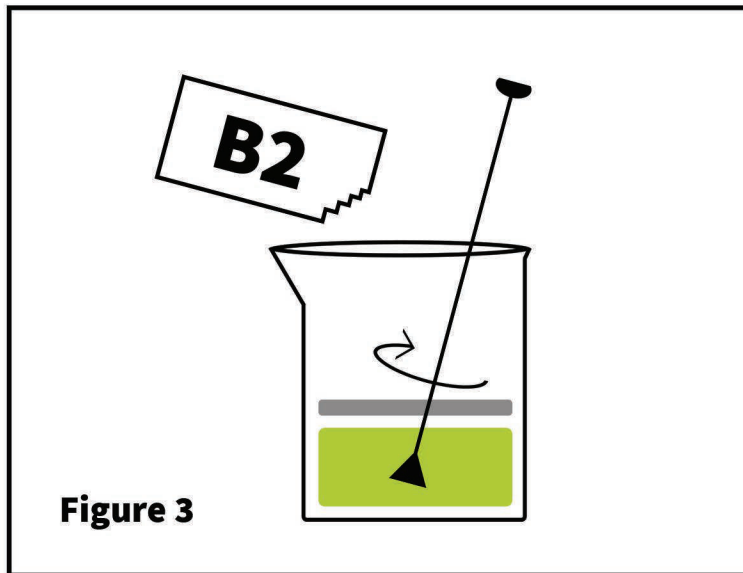
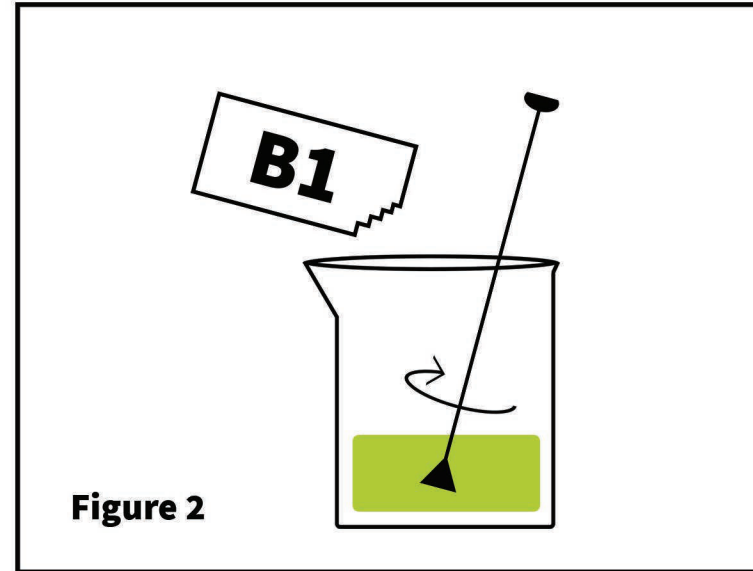
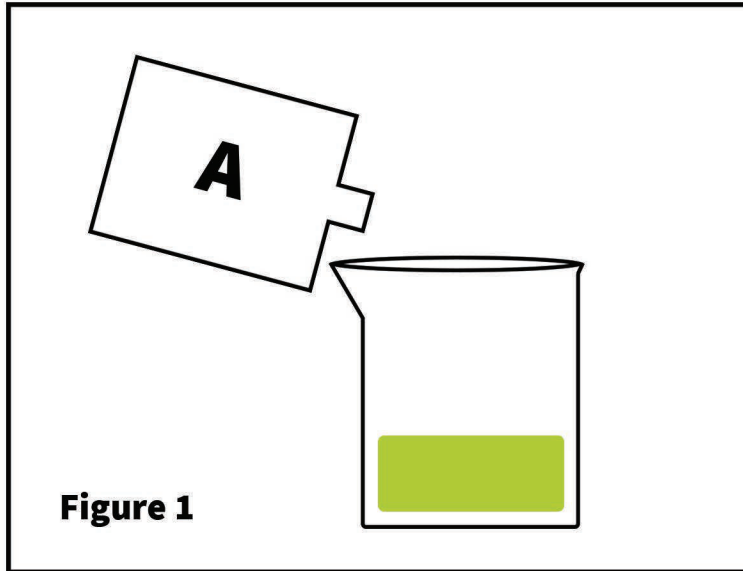
To mix Dahlgren Decon, start by pouring all the liquid in the Part A pouch into a beaker or other mixing vessel (**Figure 1**). There is no need to add additional water with a ready-to-use (RTU) formula.

Carefully pour Part B1 into the Part A solution (**Figure 2**). Stir, DO NOT SHAKE (you don't shake coffee, do you?), until the B1 particles completely dissolve.

Next, gradually add Part B2 to the solution (**Figure 3**). Continue to stir until all the B2 is dissolved. Break up any clumps.

Finally, allow the foaming reaction to settle and transfer the Dahlgren Decon into any sprayer (**Figure 4**).

Dahlgren Decon is sprayer agnostic, meaning it can be used in anything that can spray liquids like electrostatic, pressurized, or pump sprayers.

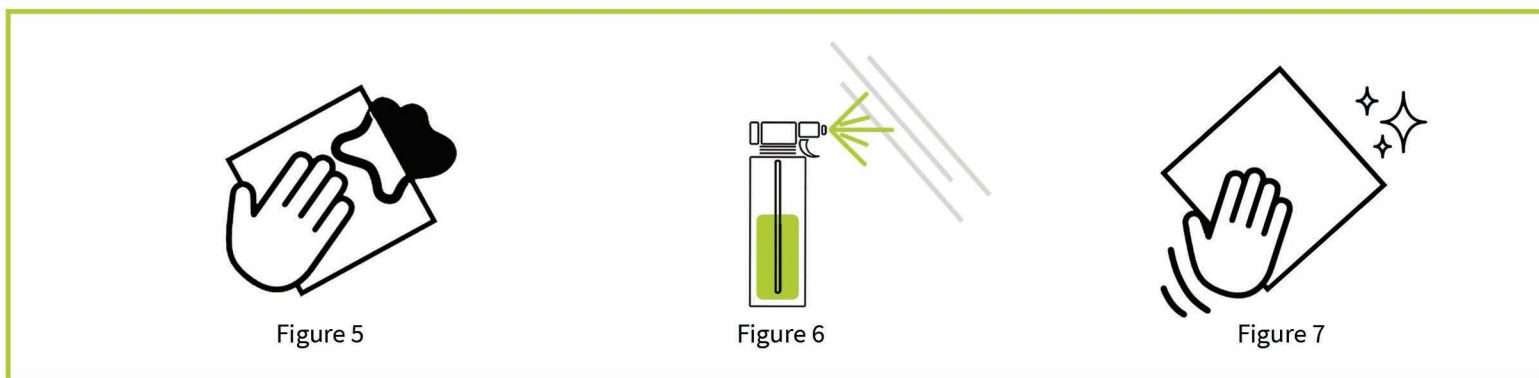


A person wearing a full-body yellow hazmat suit, a respirator mask with a clear visor, and black gloves is holding a green and white spray nozzle. The person is standing outdoors in front of a building with a metal railing and stairs. The background shows a clear blue sky and some greenery.

**HOW DO WE USE
DAHLGREN DECON + FIBERTECT
IN THE FIELD?**

Once Dahlgren Decon is mixed and transferred it into a sprayer, hybrid decon is a **simple, three step process** starting with dry decontamination.

According to the Primary Response Incident Scene Management (PRISM) Report, 2nd edition released by the U.S. Department of Health and Human Services in 2018, “For non-caustic, liquid contaminants (including chemical warfare agents), emergency dry decontamination should be the default approach as it is safer and at least as effective as wet decontamination and the resulting waste is easier to contain than water. Dry decontamination is less likely to spread contamination over hair and skin surfaces.”



You can fold a FiberTect wipe so that you have multiple surfaces to use. Start by blotting and wiping the bulk contaminant to remove as much from the surface as possible (**Figure 5**). To improve the performance of the process on some contaminants, spray a small amount of Dahlgren Decon on the FiberTect before wiping.

Typically, this blotting process can remove up to 95% of the contaminant, making it much easier to neutralize the residue.

Next, spray Dahlgren Decon on the remaining contaminant and contaminated surface (**Figure 6**). Allow the Dahlgren Decon to remain on the surface for the recommended dwell time. This will allow for complete neutralization, making the remaining contaminant safe for removal.

Use new, clean FiberTect to remove the residue (**Figure 7**) and dispose of it safely.

ISN'T DAHLGREN DECON MORE EXPENSIVE?

Until now, the traditional way to compare two decontamination solutions was by cost per gallon for their acquisition. However, all decontamination solutions are not created equal, and therefore cost per gallon can be misleading. Some have more reactive potential in similar volumes and are subsequently more effective, and thus, more cost effective.

When looking at cost, you should consider the total life cycle. With cost as an independent variable, you should not be focused on cost per volume. The real question is; how much does it cost to cover and effectively decontaminate a particular amount of contaminated surface area? Focusing on cost per coverage area gives us a much better understanding of the actual cost of decontamination.

For example, one decontaminant may cost only \$25 per gallon, and another \$100 per gallon. If they both cover and effectively decontaminate 75 square feet, the \$25 per gallon solution is going to be more cost

effective for that size area (**Figure 8**).

However, if you need to decontaminate 2,500 square feet of surface, you would need many more gallons of the \$25 per gallon solution than the \$100 per gallon decontaminant.

One gallon of Dahlgren Decon, against any chemical or biological agent besides VX, may be able to effectively decontaminate up to 1,900 square feet when sprayed on a vertical surface using an electrostatic sprayer. That comes out to 14.85 square feet per ounce or 30.5 cents per square foot based on current pricing.

If you reduce the bulk contaminant with FiberTect prior to the application of Dahlgren Decon, you may be able to cover over 10,000 square feet effectively.

For more information, download our free white paper, "The True Cost of Decontamination" at

<https://www.firstlinetech.com/cost-to-cover>.

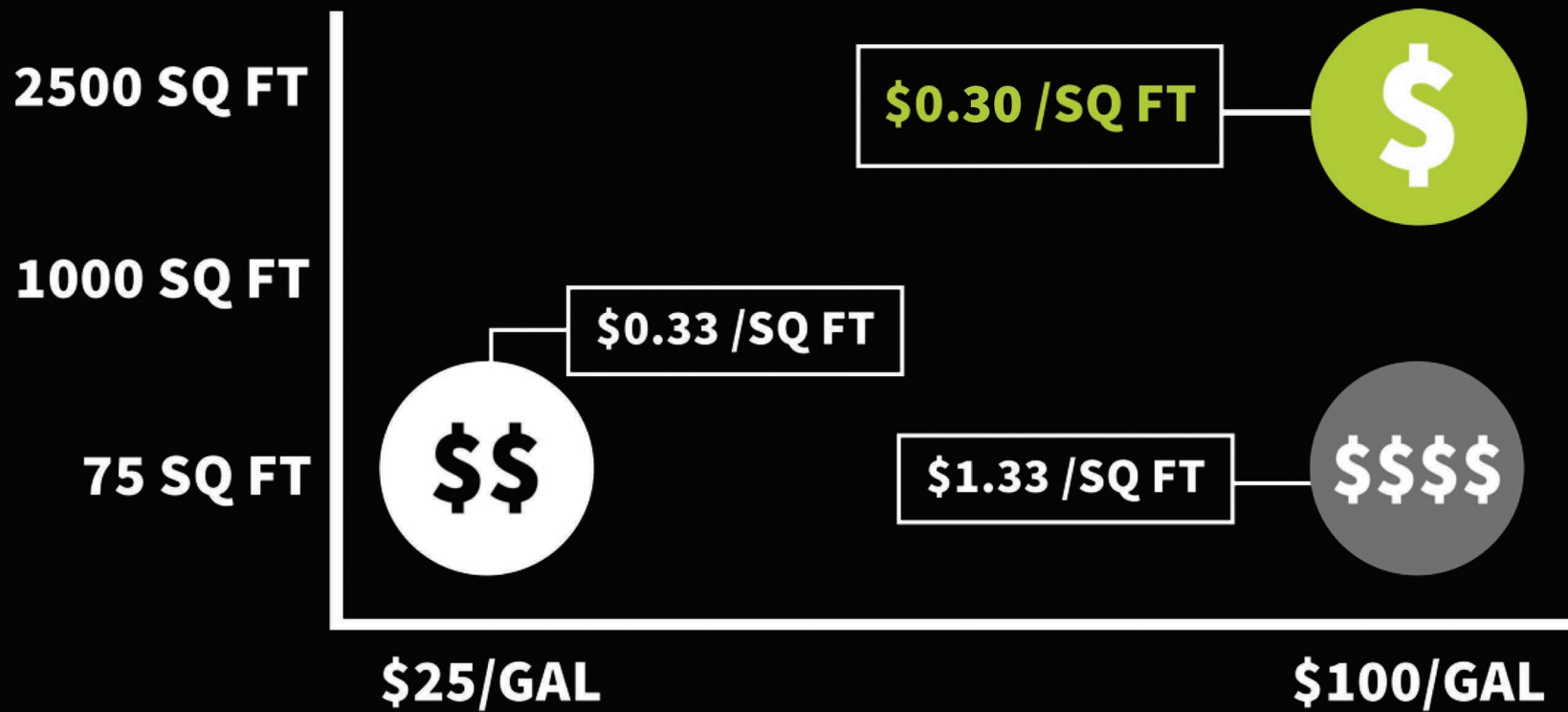


Figure 8



WHAT DO WE NEED FOR HYBRID DECONTAMINATION?

Other than your existing PPE, all you need for hybrid decon is an appropriate amount of FiberTect, Dahlgren Decon, and your choice of sprayer. However, depending on the scale of the threat you are handling, you may want other items and additional quantities of FiberTect and Dahlgren Decon to make your decontamination process more manageable.

First Line Technology offers a wide range of decontamination kits from individual use to large-team decon including:



PERSONNEL DECON KIT (PDK)

ID: PDK-06-612/2

TEAM SIZE: INDIVIDUAL

Neutralize Fentanyl, other synthetic opioids, TICs, TIMs, CWAs, and BWAs quickly and easily. The Personnel Decon Kit (PDK) allows any user to remove bulk contamination with FiberTect, then neutralize and kill any remaining contaminant with Dahlgren Decon.



RESPONDER DECON KIT (RDK)

ID: RDK-42-612/2

TEAM SIZE: INDIVIDUAL

The Responder Decon Kit (RDK) is a must-have for law enforcement, fire departments, HazMat teams, EMS, and other responders. Each RDK includes FiberTect and an FDA-approved skin decontamination lotion for Chemical Warfare Agents (CWAs).



SYNTHETIC OPIOID SAFETY KIT (SOS KIT)

ID: FLT-SOS-K

TEAM SIZE: INDIVIDUAL

Quickly neutralize small amounts of synthetic opioids with the SOS Kit designed specifically for patrol officers, narcotics agents, and any public safety professional who may encounter illicit synthetic opioids.



2-MAN DECON KIT (2DK)

ID: 2DK-022-612/4

TEAM SIZE: 2

The 2-Man Decon Kit (2DK) allows any user to remove bulk contamination with FiberTect wipes, then neutralize and kill remaining contaminants with Dahlgren Decon for a variety of immediate, tactical, operational, and cold weather decontamination needs for a two-man team.



FASTGRAB

ID: FGD-EMS-001

TEAM SIZE: 2-6

The FastGrab Decontamination Kit is a quick response bag for scenarios in which contamination is a problem. It brings together three members of First Line Technology's Decon Family into a quick response kit that is easily stored and deployed. The kit contains FiberTect, Responder Decon Kits (RDKs), and Dahlgren Decon.



ELECTROSTATIC DECON KIT (EDK200 / EDK300)

ID: FR-EDK-1-DG / EDK300

TEAM SIZE: 2-6

The Electrostatic Decon Kit (EDK) combines top of the line technology from Victory Innovations and First Line Technology to offer users the easiest, most efficient way to decontaminate threats. Stored in a military-grade hardshell case from SKB Cases, the electrostatic spraying system can easily be charged while staying organized inside the case for rapid deployment when needed. Available with either MG200 or MG300 Electrostatic Sprayers.



ENHANCED DECON SYSTEMS KIT (EDS)

ID: FLT-EDS-6-S / FLT-EDS-12-S / FLT-EDS-24-S

TEAM SIZE: 6, 12, OR 24

The Enhanced Decon Systems Kit (EDS) has the power to decon 6 – 24 personnel and brings together all your decon needs for easy accessibility and rapid deployment within a soft-shell duffel to keep EDS contents safe and secure when in the field.



MODULAR DECON KIT (MDK)

ID: FLT-MDK-H

TEAM SIZE: 7 - 50

Ideal for mass casualty incidents, the Modular Decon Kit (MDK) brings convenience and ease to the decon process of teams ranging from 7-50 personnel. The MDK includes seven different decontamination tools and comes in a rugged, hard-shell Pelican Case to maintain integrity of all products included.



HOW DO WE LEARN HYBRID DECON?

First Line Utilization Academy (FLUA) offers a comprehensive Train-the-Trainer course designed to prepare trainers and HazMat team leaders to return to their organizations and conduct hybrid decontamination training. Participants will receive a template lesson plan, presentation, and a quick-reference book. Class size is limited to 6 - 10 participants.

First Line Utilization Academy will also offer customized training for First Responders, Law Enforcement, Medical Professionals, and Correctional Workers to be hosted by their organizations.

For information on customized training, email training@firstlinetech.com or call **+1.703.955.7510**.





FOR USE CASES, VIDEOS, FREQUENTLY ASKED QUESTIONS, AND OTHER INFORMATION, PLEASE VISIT OUR WEBSITE

WWW.FIRSTLINETECH.COM/DECONTECT

**SCAN THE QR CODE BELOW TO DOWNLOAD THE FREE WHITE PAPER:
THE TRUE COST OF DECONTAMINATION**

