



Personal Decontamination Kits

Market Survey Report

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FOREWORD

The U.S. Department of Homeland Security (DHS) established the System Assessment and Validation for Emergency Responders (SAVER) Program to assist emergency responders making procurement decisions. Located within the Science and Technology Directorate (S&T) of DHS, the SAVER Program conducts assessments and validations on commercial equipment and systems, and develops knowledge products that provide relevant equipment information to the emergency responder community. The SAVER Program mission includes:

- Conducting impartial, practitioner relevant, operationally oriented assessments and validations of emergency response equipment
- Providing information, in the form of knowledge products, that enables decision makers and responders to better select, procure, use, and maintain emergency response equipment

SAVER Program knowledge products provide information on equipment that falls under the categories listed in the DHS Authorized Equipment List (AEL), focusing primarily on two main questions for the responder community: “What equipment is available?” and “How does it perform?” These knowledge products are shared nationally with the responder community, providing a life- and cost-saving asset to DHS, as well as to federal, state, and local responders.

The SAVER Program is managed and executed by the National Urban Security Technology Laboratory (NUSTL). NUSTL is responsible for all SAVER activities, including selecting and prioritizing program topics, developing SAVER knowledge products, coordinating with other organizations, and ensuring flexibility and responsiveness to first responder requirements. NUSTL provides expertise and analysis on a wide range of key subject areas, including chemical, biological, radiological, nuclear and explosive weapons detection; emergency response and recovery; and related equipment, instrumentation, and technologies. For this report, NUSTL conducted a market survey of commercially available personal decontamination kits (PDKITs). PDKITs fall under AEL reference number 08D1-01-KITD titled “Kits and Packets, Personal Decontamination.”

Visit the SAVER website at www.dhs.gov/science-and-technology/SAVER for more information on the SAVER Program or to view additional reports on PDKITs and other technologies.

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1. INTRODUCTION

Personal decontamination kits (PDKITs) are lightweight, ready-to-use kits first responders use to remove or neutralize chemical, biological, or radiological agents and toxic industrial materials (TIMs) that have accumulated on personnel and equipment. Many of these substances can be used as chemical warfare agents (CWAs) with the capacity to kill or incapacitate individuals even when present in small quantities. These kits are not intended to replace a complete decontamination process but rather to assist first responders when immediate action is needed and hazardous material resources are not yet available.

To provide emergency responder and law enforcement organizations with information on PDKITs, the System Assessment and Validation for Emergency Responders (SAVER) Program conducted a market survey on commercially available PDKITs. Information on PDKITs was gathered between January 2016 and September 2016 from vendor websites, industry publications, and a government-issued Request for Information (RFI) posted on the Federal Business Opportunities (FedBizOpps) website (<https://www.fbo.gov>).

For inclusion in this report, a PDKIT had to meet the following criteria:

- It is a commercial off-the-shelf (COTS) product
- It can remove or neutralize chemical, biological, or radiological agents
- It is portable.

Due diligence was performed to develop a report that is representative of products in the marketplace.

2. PERSONAL DECONTAMINATION KITS OVERVIEW

When a person is exposed to a dangerous substance, the amount of time the chemical remains on the skin is crucial. Immediate treatment can help prevent serious burns and injuries. PDKITs can be used by responders that are first on the scene and are unaware of a hazardous substance release. In the event that responders become contaminated prior to donning adequate personal protective equipment, PDKITs provide responders with the capability to decontaminate themselves and fellow responders from chemical agents, biological agents, radiological agents, and TIMs. The kits are used as a mitigation technique until more formal decontamination procedures such as showers are established. PDKITs were originally designed and manufactured by the military to maintain operational effectiveness in the event of a chemical, biological, radiological, nuclear (CBRN) attack. PDKITs similar to the military kits, as well as some military PDKITs, are now commercially available to the civilian first responder community. Some kits can also detect and identify specific chemical or biological agents and collect and transport wet or dry chemical and biological samples.

The rapid and correct use of PDKITs requires training in procedures and techniques for both self-aid and assisted-aid decontamination. Self-aid refers to decontamination measures that responders can apply in helping themselves while assisted aid consists of quickly removing possible contamination from a fellow first responder should the responder be incapable of administering self-aid.

2.1 Current Technologies

Decontaminants can be removed through physical methods or chemical neutralization. Physical removal from the skin prevents cross contamination and secondary transfer of contamination. Physical processes include flushing with water and abrasion. Chemical neutralization involves reactive compounds, which can take part in hydrolysis or oxidation reactions converting CWAs into nontoxic products. Contaminants may be chemical, biological, or radiological.

Chemical contaminants include nerve and blister agents and TIMs. The most common chemical agents are the nerve agents, Tabun (GA), Sarin (GB), Soman (GD), GF and VX, and the blister agents sulfur mustard (HD) and nitrogen mustard (HN). TIMs are not as toxic as chemical agents but are more accessible to terrorists and available in large quantities. These substances may also be encountered by responders in industrial, military, or medical settings during a response that has nothing to do with terrorism. They are used in a variety of settings, such as manufacturing facilities, maintenance areas, and chemical storage areas. Examples of TIMs are ammonia, chlorine, hydrogen cyanide, and pesticides. If a chemical contaminant contacts the skin, it must be removed quickly. The extent of injury increases the longer the contaminant remains on the skin. Chemical agent and TIM decontamination can be accomplished by physically removing the agent or chemically neutralizing the agent. Chemical decontamination converts the toxic agent into innocuous products that can be safely handled. Physical decontamination involves mainly absorption of toxic agents and removal with a mitt or sterilized pad.

Common types of biological agents include bacteria, viruses, and toxins. Anthrax, plague, brucellosis, botulism, small pox, and ricin are examples of biological agents. Chemical decontamination renders these agents harmless by the use of disinfectants and chemical solutions. Physical decontamination techniques include absorption, heat, and radiation. PDKITS do not provide heat and radiation techniques.

Radioactive particles usually do not provide enough of a radiation dose to cause acute injury, but should be removed as quickly as possible to prevent the spread of contamination and uptake by the body. If available, soap and warm water are recommended as the initial removal method by the National Council on Radiation Protection, DHS, the International Atomic Energy Commission, and other international agencies. Cold water tends to close pores and trap radioactive contamination, while hot water may increase absorption of any contaminant through the skin. The skin should not be harshly scrubbed or broken. Many of the other products recommended in the past for radioactive decontamination, such as bleach, hydrogen peroxide, and potassium permanganate can cause burns if not diluted correctly and are irritating to the skin. Several patent pending, proprietary, water-based solutions have been developed that remove radioactive contamination to acceptable levels by dislocating radioactive ions, enabling them to be removed. These solutions are effective on radioactive halogens (iodine and fluorine), transition metals (cesium and cobalt), and actinides (uranium, plutonium, and americium). The effects of internal contamination can be reduced by administering specific diluting or chelating agents.

2.2 Applications and Considerations

First responders should be able to quickly decontaminate themselves and their equipment in case they are exposed to chemical agents, TIMs, biological agents, or radiological agents from either an accidental release or terrorist attack. Rapid removal of these toxic chemicals from the skin is

essential in reducing the level of injury and likelihood of death after exposure. Whether they are responding to a weapon of mass destruction, a hazardous materials (HAZMAT) incident, or a toxic chemical incident, responders must be familiar with the proper techniques for quickly decontaminating themselves and their fellow responders. They should be trained in the correct use of the kits, where a set of concise, pictorial instructions are made available to them.

Results of a focus group meeting on this subject indicated responders were worried about negative health effects associated with the decontaminating agents. When first responders were questioned about features they considered important in a PDKIT, ease and speed of opening and using a kit, health considerations associated with leaving the product on skin, removal of product from skin, and the ability to decontaminate rescue animals were listed. The responders were also concerned with the weight of the PDKIT, effect of extreme temperatures on effectiveness of the product, and the shelf life and storage requirements.

2.3 Standards/Regulations

At present there are no federal standards for PDKITs. Defining performance parameters for the kits and test methods by which to assess performance is on the 2012 InterAgency Board standards development list but has not yet been completed. However, some of the individual contents of the kits are subject to U.S. Food and Drug Administration (FDA) clearance. The FDA is the federal agency responsible for protecting the public health by assuring the safety, efficacy, and security of drugs and medical devices.

2.4 Emerging Technologies

A good decontaminant should quickly and completely neutralize contaminants, be non-corrosive, user-friendly, function in all weather and environmental conditions, and not require immediate rinsing with water. Nanosized particles of magnesium oxide, aluminum oxide, and calcium oxide are potential reactive sorbent materials that have been used as advanced decontaminant materials. Due to their high surface area, strong absorbability, and high reactivity, nanosized particles remove an agent rapidly from the contaminated surface and degrade it *in-situ* rendering the agent nontoxic. These nanosized particles are generally not corrosive and are easy to apply and clean up, making them applicable for use on skin, metals, and sensitive equipment. The French have developed a nano-emulsion used in oil and water as a chelator of uranium.¹ Nanoparticulate magnesium oxide was found to possess bactericidal, viricidal, and sporicidal properties as well as the ability to absorb and deactivate aflatoxins. Nanoparticles have the potential to be a universal solution for both chemical and biological warfare contamination.

3. PRODUCT DATA

The products in Table 3-1 are PDKITs that can be used by first responders for emergency decontamination. This market survey report includes nine PDKITs from seven manufacturers, with six kits focused on chemical and biological decontamination and three kits on radiological decontamination. Prices range from approximately \$50 to \$400 per kit.

¹ Tazart, A., Berard, P., Leiterer A., and Menetrier, F., Decontamination of Radionuclides from Skin: An Overview, Health Physics 105(2):201-207; 2013

Products are listed in alphabetical order by company. Product data was obtained directly from the manufacturer, distributor or their websites. The information obtained has not been independently validated by the SAVER program.

Features in Table 3-1 are defined as follows:

Company indicates the manufacturer or distributor of the PDKIT.

Product indicates the product name of the PDKIT.

Cost indicates the price of the PDKIT rounded to the nearest dollar as quoted by the vendor in U.S. dollars. If a cost range is given, this indicates that the price of the system varies according to options that the buyer may choose.

Contents of Kit lists the main items included in each PDKIT.

Type of Agents indicates if the kit is effective at decontaminating chemical, biological or radiological contaminants.

Safe for Use on Skin indicates if the product is safe for use on skin or recommended for use on personal equipment.

Collects Sample for Analysis indicates if the kit has the capability to collect and transport wet or dry chemicals and biological samples for future analysis.

Weight indicates the weight of the kit in pounds.

Usable Temperature Range indicates the temperature, in degrees Fahrenheit, at which the kit can be used.

Shelf Life indicates how long the kit can be stored in years.

Storage Temperature Range indicates the temperature, in degrees Fahrenheit, at which kits should be stored.

GSA Schedule indicates if the PDKITs are available for purchase through the General Services Administration.

Table 3-1. Personal Decontamination Kits Product Comparison Matrix

| Company | Product | Cost (\$) | Contents of Kit | Type of Agents | Safe for Use on Skin | Collects Samples for Analysis | Weight (lbs) | Usable Temperature Range (°F) | Shelf Life (years) | Storage Temperature Range (°F) | GSA Schedule |
|---|---|----------------------------------|---|--|--|-------------------------------|--------------|--|--------------------------------|--------------------------------|-------------------------|
| e-Horizon Group | M291* | NA | Pad impregnated with Ambergard XE-555 resin particles | Chemical | Yes | No | 0.1 | NA | NA | NA | NA |
| Emergent Biosolutions | Reactive Skin Decontamination Lotion (RSDL) | 2,635 per case of 50 packs | RSDL | Chemical | Yes | No | 0.1 | | 5 | 59 to 86 | No |
| First Line Technology | Personal Decon Kit (PDK6) | 98 | Fibertect, Dahlgren Decon | Chemical TIMs Biological Radiological | Fibertect Yes, Dahlgren Decon not intended for skin | Yes | <1 | -40 to 140 Fibertect, down to -40 for Dahlgren Decon | 5 Dahlgren Decon, 10 Fibertect | 59 to 86 | Not currently available |
| First Line Technology | Responder Decon Kit | 98 MSRP 76 GSA | Fibertect, RSDL | Chemical TIMs Biological Radiological | Yes | Yes | 0.32 | -40 to 140 Fibertect, 59 to 86 RSDL | 5 RSDL, 10 Fibertect | 59 to 86 | Yes |
| Luxfer Magtech Inc. | M295 Decontamination Kit* | 4-pack 45 Case, (20) 4-packs 673 | Mitt filled with an alumina based sorbant | Chemical | No, used for individual equipment | No | NA | NA | NA | cool | NA |
| Nukepills | Dirty Bomb Emergency Kit™ * | 120 | Radriage detector, Radiacwash spray mist and towlettes, Rad-Wipes | Radiological | Yes | No | NA | > 32 | + | > 32 | NA |
| Radiation Decontamination Solutions LLC | Emergency RadDecon Kit™ | NA | 2 quarts Quick Decon™ Mass Effect™ solutions, Rad-Wipes | Radiological | Yes | No | 7.7 | > 32 | 10 | > 32 | No |

Table 3-1. Personal Decontamination Kits Product Comparison Matrix

| Company | Product | Cost (\$) | Contents of Kit | Type of Agents | Safe for Use on Skin | Collects Samples for Analysis | Weight (lbs) | Usable Temperature Range (°F) | Shelf Life (years) | Storage Temperature Range (°F) | GSA Schedule |
|---|------------------------------------|-----------|---|--|----------------------|-------------------------------|--------------|-------------------------------|--------------------|--------------------------------|-------------------------|
| Radiation Decontamination Solutions LLC | M7 Rad-Wipe | NA | M7 Rad-Wipes | Radiological | Yes | No | 0.55 | > 32 | 10 | > 32 | No |
| United Tactical Supply | Individual Decontamination Systems | 400 | Activated carbon cloth mitt, spray canister | Chemical TIMs Biological Radiological | Yes | No | 3 | Extreme temperatures | 10 | NA | Not currently available |

Notes

NA Information not available.

* Product information was obtained from website only; vendor did not reply to request for information.

† Shelf life of different components varies from 1 to 10 years. See Section 3.6.

3.1 E-Horizon Group, M291 Skin Decontamination Kit

The M291 Skin Decontamination Kit is used to decontaminate skin when it has come in contact with liquid chemical agents. The kit consists of a wallet-like, soft-pack carrying pouch, containing six individual decontamination packets. Each packet contains a non-woven fiber fill laminated pad impregnated with a decontamination compound. Each pad provides the individual with a single step, non-toxic, and non-irritating decontamination application, which can be used on the skin, including the face and around wounds. Instructions for use are marked on the case and packets. The individual decontamination pads are impregnated with the decontamination compound Ambergard XE-555 resin, a black, free-flowing, resin-based powder. As the pad is scrubbed over the exposed/contaminated skin area, the chemicals are rapidly transferred into, trapped, and retained in the interior of the Ambergard XE-555 resin particles. The presence of acidic and basic groups in the resin promotes the destruction of trapped chemical agents. Care must be taken to avoid exposure of the eyes and lungs to the black dust that may be created during use. In an emergency, the kit can be used to decontaminate the outside of protective masks, rubber gloves, hoods, and individual equipment.

3.2 Emergent Biosolutions, Reactive Skin Decontamination Lotion Kit

Reactive Skin Decontamination Lotion (RSDL) Kit is a proprietary skin decontamination device intended to remove or neutralize CWAs including organophosphate-based pesticides, T-2 toxin, and many pesticide-related chemicals from the skin within two minutes. The RSDL kit was originally developed by the Canadian Department of National Defense and has been adopted by several military services around the world. The FDA cleared the kit for use in 21- and 42-milliliter (ml) packets in 2002. One 21-ml packet is sufficient to decontaminate hands, neck, and face. It has since received approvals in Europe, Australia, and from DHS. RSDL removes or neutralizes CWAs, rendering them non-toxic, ensuring no off-gassing of toxic chemicals.



42 ml RSDL Packet with Sponge
Courtesy of Emergent Biosolutions

The product contains Dekon 139 and a small amount of 2,3-butanedione monoxime dissolved in a solvent and water. The solvent system promotes rapid decontamination by actively desorbing, retaining, and separating the chemical agent while the Dekon 139 chemically reacts with, and neutralizes, the CWA, usually within two minutes. The product is applied with a sponge and comes in single use, tear-open packets tested for seal integrity. Its liquid texture allows the user to feel where the RSDL has been applied, even with eyes closed. During emergency situations the RSDL does not require immediate removal from the skin, but should be rinsed as soon as it is safe to do so. There may be some minor skin irritation if the product remains on the skin for an extended period of time. Care must be taken to separate RSDL from solid powdered calcium hypochlorite or solid powdered super tropical bleach, which are commonly used decontamination products. Spontaneous combustion can occur if RSDL comes in contact with these products.

The product should be stored in the original container protected from direct sunlight in a dry, cool, and well-ventilated area. The container should be tightly closed and sealed until ready for use. Storage temperature should be between 59° Fahrenheit (F) and 86°F.

The product has undergone extensive testing.²

3.3 First Line Technology, Personal Decon Kit

The Personal Decon Kit (PDK6) is a self-contained kit that uses the combination of FiberTect and Dahlgren Decon (DD) in a systematic approach to achieve effective decontamination of personal protective equipment (PPE) and small surfaces. The kit includes two pieces of FiberTect (6 inches x 12 inches), 200 ml of DD, and a personal 200-ml sprayer. The components along with pictorial instructions are individually sealed, labeled, and placed into a resealable plastic bag, which is vacuum sealed closed.



Personal Decon Kit with Fibertect and Dahlgren Decon

Courtesy of First Line Technology

FiberTect is an activated carbon wipe that will absorb and adsorb CBRN agents including most TIMs. DD is a non-corrosive, solid state oxidizer that is sprayed on surfaces with the included mister to neutralize chemical and biological agents. When used together, FiberTect provides bulk decontamination allowing DD to be more effective. FiberTect can also be used after DD is applied to wipe away any residue or dead spores. Detailed lists of the decontamination efficacy for various toxins, as determined by the U. S. Department of Defense and other laboratories, are available from the manufacturer for each component. FiberTect is capable of producing more than a 95 percent reduction of chemical agents on most surfaces (results vary by agent, materials, sit time, etc.) and physically removes TIMs from surfaces and traps toxic vapors within the carbon.

In addition, FiberTect will physically remove vegetative bacteria, fungi, viruses (living/dead/spores), and powders, including radiological contamination, from surfaces, including PPE. DD has been proven effective against biological agents. It will hydrolyze substances similar to a G-agent (organophosphate nerve agent) and oxidize V-agent (persistent nerve agent) type materials. Live-agent testing results from in-situ nuclear magnetic resonance spectroscopy analysis indicate that the surfactant based decontamination formula in DD is capable of 100 percent neutralization of HD in less than two minutes, 100 percent neutralization of GD in five minutes and approximately 95 percent neutralization of VX in 15 minutes with no toxic byproducts observed.

The PDK6 opens in seconds and the application process can be tailored to the threat agent. FiberTect is used first in a blotting wipe motion to perform a bulk decontamination prior to neutralizing with DD. FiberTect has no adverse reaction on the skin. DD is like a soap and skin irritation testing is ongoing. This kit has the ability to collect and transport wet or dry chemical and biological samples. The outer layers of the FiberTect traps particles based on their size while the central carbon layers captures their vapors. There are no active ingredients in FiberTect that would affect sample analysis. The PDK6 comes in a resealable plastic bag that can be used to store and dispose of used FiberTect, DD packaging, and sprayer. FiberTect is a green technology that is biodegradable depending on the type of contaminate. Overtime, mixed DD will break down into vinegars and salts that are safe to pour down the drain. FiberTect is operable in extreme conditions

² https://chemm.nlm.nih.gov/countermeasure_RSDL.htm

(-40°F to 140°F). DD has a glycol additive that enables operation in the extreme cold, down to -40°F.

The RDK comes with a one-year warranty.

3.4 First Line Technology, Responder Decon Kit

The Responder Decon Kit (RDK) is a self-contained kit that uses FiberTect and RSDL to achieve better skin decontamination than either of the individual components could provide. FiberTect is an activated carbon wipe that will absorb and adsorb CBRN agents. RSDL is the only FDA-approved product for the neutralization of CWA and T-2 mycotoxins from the skin. RSDL is discussed further in section 3.2. The components along with pictorial instructions are individually sealed, labeled, and placed into a resalable zip lock bag, which is vacuum sealed closed. The RDK opens in seconds and the application process can be tailored to the threat agent. The FiberTect wipe is used first in a blotting motion to perform a bulk decontamination on the skin prior to neutralizing with RSDL. FiberTect or water, if available, should be used to remove the RSDL. FiberTect has no adverse reaction on the skin. RSDL should be removed as soon as possible but can be left on the skin for 24 hours.



Responder Decon Kit with Fibertect and RSDL

Courtesy of First Line Technology

FiberTect can remove more than 95 percent of the chemical agents on most surfaces and physically removes TIMs from surfaces. It also traps toxic vapors within the carbon. In addition, Fibertect will physically remove vegetative bacteria, fungi, viruses (living, dead, spores), and powders, including radiological contamination, from surfaces. This kit has the ability to collect and transport wet or dry chemical and biological samples. The outer layers of the FiberTect trap particles based on their size while the central carbon layers capture their vapors. There are no active ingredients in FiberTect that would affect sample analysis. The RDK comes in a resealable plastic bag that can be used to store and dispose of used FiberTect, RSDL, and their wrappers. FiberTect is a green technology that is biodegradable depending on the type of contaminate. FiberTect is operable in extreme conditions, -40°F to 140°F. RSDL should be stored at 59°F to 86°F to maximize shelf life but its operational temperature is much wider.

The RDK comes with a one-year warranty and is available on the GSA schedule.

3.5 Luxfer Magtech Inc., M295 Decontamination Kit

The M295 Decontamination Kit provides decontamination of individual equipment through physical removal and absorption of chemical agents, with no long term harmful side effects to the user. It is mainly used by the military and each kit can decontaminate two complete individual equipment operations, including chemical-biological protective masks/hoods, gloves, footwear, weapons, helmets, and load-bearing equipment. The M295 kit consists of a pouch containing four individual wipe-down mitts, each enclosed in a soft, protective packet. The packet is designed to fit comfortably within a pocket of the battle dress overgarment. Each individual wipe-down mitt

in the kit is comprised of a decontaminating powder contained within a pad material and a polyethylene film backing. In use, powder from the mitt is allowed to flow freely through the pad material. Decontamination of liquid contaminants is accomplished through sorption of contamination by both the pad and the decontaminating powder.

The M295 is sold in cases of 20 kits.

3.6 Nukepills, Dirty Bomb Emergency Kit™

The Dirty Bomb Emergency Kit includes a RADtrriage radiation detector, 16-ounce Radiacwash™ Spray Mist, one radiation water filtration straw, four Radiacwash towelettes, 10 Rad-Wipes, one Rad-Waste bag, two N95 Face Masks, and two pairs of vinyl gloves. The RADtrriage Radiation detector is a wallet card/badge colorimetric personal dosimeter that detects radiation exposure in the event of a dirty bomb or nuclear reactor incident. It has a shelf life of one year when stored below 77°F and kept out of direct sunlight. This military-grade dosimeter was tested by DHS as documented in the [*Department of Homeland Security Final Test Report on the RADTrriage \(SIRAD\)*](#). The radiation water filtration straw removes radiological and other contaminants from up to 25 gallons of water and has a shelf life of five years. Radiacwash is a general purpose decontamination solution that can be safely used on surfaces and human skin. It controls radioactive contamination and removes radioactive particles by sequestering radioactive metallic ions and then suspending the particles, allowing the contamination to be rinsed away with water or wiped away with Rad-Wipes. It acts as a surface-wetting sequestering agent, chelater, carrier, ion-exchanger, emulsifier, solvent, complexer, peptizer, and detergent. Radiacwash discussed by DHS in their report [*Guide for the Selection of Chemical, Biological, Radiological, and Nuclear Decontamination Equipment for Emergency First Responders*](#). It should not be used on mucous membranes or open wounds. Radiacwash towelettes, individually packaged paper towels saturated in Radiacwash solution, can remove contamination from hands and small objects. Rad-Wipes have an absorbent layer which can absorb up to 12 times their weight and a plastic backing to prevent seep through of the contaminated liquid. They do not contain decontaminating solution. Radiacwash spray has a shelf life of 10 years while the towelettes have a five-year shelf life.

3.7 Radiation Decontamination Solutions LLC, Emergency RadDecon Kit™

The Emergency RadDecon Kit (ERK001) includes a proprietary and patent-pending Quick Decon™ Mass Effect™ solution for radiation decontamination. By flooding a radioactive surface with these solutions, the radioactive material is lifted off the surface and suspended in solution where it can be wiped up and removed as radioactive waste. The water-based liquids come in convenient-to-use, color-coded, 32-ounce bottles with accompanying trigger sprayers. One bottle is used for transition metals such as cobalt, cesium, strontium, and thallium and one for actinides such as uranium, plutonium, technetium, and radium. A halogen mass effect solution, which works on fluorine, iodine, and chlorine is sold separately. The solutions are made from cosmetic-grade, FDA-approved materials and are not radioactive before use. An extra empty plastic bottle for filling with regular water for final wash down and rinse (with accompanying trigger sprayer), three pairs of synthetic gloves, specialized Rad-Wipes (45 per package), two Rad-Waste Trash Bags, and caution labels are included in the kit. Instructions for use are displayed on the inside lid of the plastic carrying case. An instruction and information manual is included. To apply product the user would don gloves, place a trigger sprayer on a bottle of Mass Effects solution, and thoroughly wet the affected area. After a brief dwell time, the individual would use the included wipes to remove the solution. This time could be used applying solution to another victim. The entire process should take only a few minutes. The product should not be left on the skin for an extended period of time since it may dry and be difficult to remove. The solutions should only be used on intact skin. The waste would be put in collection bags and disposed of based on the activity level of the radionuclides.



Emergency RadDecon Kit™
 Courtesy of Radiation Decontamination
 Solutions LLC

Pricing is based on volume and the type of customizations. There is a one-year warranty against manufacturer defects. The efficiency of the Quick Decon solution's removal of radioactivity from porous surfaces was tested by the EPA.³

³ <http://www.raddecon.com/pdfs/EPA600R-11-086.pdf>

3.8 Radiation Decontamination Solutions LLC, M-7 Rad-Wipes

M-7 Rad-wipes are a two-part personal decontamination wipe packaged in easy to use pouches. The first wipe removes transition metals while the second wipe removes actinides from both intact human skin and hair and surfaces. They can also be used on canines. If the identity of the contaminant is known only the appropriate wipe needs to be used. It takes 10 seconds to open package and apply product. The solution should be removed quickly since it will become difficult to remove if allowed to dry on skin. The used wipe must be treated as radioactive waste.



M7 RadWipes
 Courtesy of Radiation
 Decontamination Solutions LLC

The Rad-Wipes can be purchased alone or as part of a customizable kit. Price of the Rad-Wipe is dependent on the volume purchased. There is a one-year warranty against manufacturer defects. The Rad-Wipes have a 10-year shelf life. Bulk quantities are available for emergency stockpiles.

3.9 United Tactical Supply, Individual Decontamination System

The Individual Decontamination Systems (IDS) kits are compact, lightweight, mobile decontamination systems designed to outfit individual personnel against CBRN agents. The systems are designed to be placed into a vacuum-sealed pack or packaged in a compact Molle bag. The IDS kits contain both wet and dry decontamination media. A Nanosweep™ activated carbon fabric cloth wipe is used for dry decontamination. The wipe, which is shaped like a mitt, effectively removes 90 percent of CWAs from a variety of sensitive equipment items in one pass. According to the manufacturer, the kit can be used on both undamaged skin and open wounds. It can also be used on canines. The removed contaminants do not off-gas because they are locked in the fabric pores, where they are broken down naturally over time. The wipe will not scratch delicate surfaces or leave behind contaminated powder particles. The wipes have an ambidextrous design that uses a Velcro closure for on-hand stability, allowing for effective cleaning while wearing cumbersome decontamination gear. The wipe will also remove a broad range of non-volatile hazardous organic chemicals, such as pesticides. It is easily transportable and is packaged in a hermetic re-sealable pouch for a long shelf life. After use the wipe can be placed back into the original pouch, which serves as a secondary hermetic envelope for safe handling. It is disposed of by immersion in a bleach solution



Individual Decontamination Kit
 Courtesy of United Tactical Supply



**Nanosweep™ activated carbon
 fabric decontamination wipes**
 Courtesy of United Tactical Supply

or by incineration. Wet decontamination is administered by a rapidly deployable spray canister. The kit is effective against HD, GD, VX, malathion, parathion, carbaryl carbamate and captan carboximide, among others. Anthrax, smallpox, tularemia, cholera, foot and mouth disease, e. coli, salmonella, staphylococcus, saccharomycetales fungi, and various mold species are among the biological agents the kit is effective against.

The kit costs approximately \$400.00 depending upon the configuration. A volume purchase discount is available and the company is in the process of obtaining a GSA schedule listing.

4. VENDOR CONTACT INFORMATION

Additional information on the products included in this market survey report can be obtained from the following vendors.

Table 4-1. Vendor Contact Information

| Company | Product | Address/Phone Number | E Mail/Website |
|---|---|--|--|
| e-Horizon Group | M291 Decontamination Kit | 646 Plank Road Clifton Park, NY 12065 (518) 373-2254 | info@ehorizongroup.com www.ehorizongroup.com |
| Emergent BioSolutions | Reactive Skin Decontamination Lotion (RSDL) | 400 Professional Drive, Suite 400 Gaithersburg, MD 20879 (888) 773-3266c | customerservice@ebsi.com www.emergentbiosolutions.com |
| First Line Technology LLC | Personal Decon Kit Responder Decon Kit | 3656 Centerview Drive Suite 4 Chantilly, VA 20151 (703) 955-7510 | sales@firstlinetech.com www.firstlinetech.com |
| Luxfer Magtech Inc. | M295 Decontamination Kit | 2940 Highland Avenue Unit 210 Cincinnati, OH 45212 (800) 503-4483 | info@heatermeals.com www.luxfermagtech.com |
| Nukepills | Dirty Bomb Emergency Kit™ | 112-A. Argus Lane STE 401 Mooresville, NC 28117 (866) 283-3986 | info@nukepills.com www.nukepills.com |
| Radiation Decontamination Solutions LLC | Emergency RadDecon Kit™ M-7 RadWipe | 141 Stevens Avenue Suite 9 Oldsmar, FL 34677 (813) 854-5100 | bscmidt@raddecon.com www.raddecon.com |
| United Tactical Supply | Individual Decontamination System | 595 Sterling Drive Red Lion, PA 17356 (443) 212-8228 | sales@unitedtacticalsupply.com www.unitedtacticalsupply.com |

5. SUMMARY

PDKITs are portable, easy-to-use kits that enable first responders to self-decontaminate or administer assisted aid following exposure to potentially hazardous materials. The kits are designed for immediate use when formal decontamination procedures are not available. In the past many of these decontaminating solutions were corrosive, flammable, or themselves toxic. Research has led to products that reduce damage to the skin and lessen the likelihood of inhalation of toxic substances during the removal process. Highly mobile, field deployable sensors that could assist in assessing potential biological or chemical threats before exposure would reduce the need for PDKITs. Barrier materials that could be worn or applied to the skin blocking exposure to CWAs would be beneficial to first responders. Old-fashioned soap and water and the absorbent Fuller’s earth can also be used for skin decontamination. However, Fuller’s earth may irritate the skin and respiratory tract after prolonged exposure.

This market survey includes nine PDKITs from seven manufacturers, six focused on chemical and biological decontamination and three on radiological decontamination. Two of these kits are meant for the decontamination of personal equipment and not for use on skin. Responder organizations

considering the purchase of PDKITs should understand their local jurisdiction's emergency preparedness plans determine how the PDKITs would be used in conjunction with their existing decontamination procedures. They should also consider what types of hazardous materials first responders could be exposed to in their area.