Biological Decontaminant Accelerated Spray Plus
Operator Manual

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Section One

1. Introduction

1.1 Purpose of this Manual

This manual is designed to familiarize operators with the Decon7 Biological Decontaminant Accelerated Spray (BDAS+) System. By reviewing each section and understanding proper use of the BDAS+, users will gain valuable information in preparation to utilize BDAS+ units at a tactical level.

1.2 Audience

Decon7 Systems LLC designed this manual with the user in mind. Focus of this manual is to simplify proper use and exploit capabilities of the BDAS+.

1.3 Manual Layout.

Key learning objectives are grouped into the four modules listed below.

Section 1: Introduction

Section 2: Product Description

Section 3: Proper use

Section 4: Limitations and considerations

1.4 WARNINGS

 If BDAS+ has been tampered with or modified DO NOT USE.

 Causes serious eye damage.

 Causes skin irritation.

 Contains gas under pressure; may explode if heated.

Section Two

2. Product Description

2.1 Summary

Decon7 Systems has solved the complex chemical and engineering issues of containing the world's most effective military grade decontaminant in an individual rapid response application system, enabling the user access to a truly immediate decontamination solution. The Decon7 BDAS+ is ready-to-use, lightweight, portable, and rapidly deployable. It neutralizes chemical and biological warfare agents, hazardous industrial chemicals, volatile organic compounds, bodily fluids, bacteria and viruses. Allowing up to a 15 ft. standoff distance, direct contact with contaminants is avoided so exposure is reduced and potential spread of contamination is minimized. It is applicable and efficacious on virtually any surface, including concrete, asphalt, wood, ceramic, fabric, carpet, leather, steel, aluminum and many others.

2.2 Characteristics of the BDAS+

2.2.1 Specifications

2.2.1.1 BDAS+ Weight/Dimensions

6.6” Width x 2.3” Depth x 13” Height (17cm x 6cm x33cm) and 1.7 lbs (.77 kg)

2.2.1.2 Contents

Standard 315 mL (10.65 ounces) dispenser. The formula contained in the BDAS+ system is three parts. Part one: Quaternary Ammonium Compounds and Surfactants. Part two: Hydrogen Peroxide 7.9%. Part three: Diacetin.

BDAS+ Parts & Components

- Handle
- Trigger
- Safety
- Nozzle
- Selector Switch
- Canisters (Pressurized, with Nitrogen)

2.2.2 Spray Settings

The BDAS+ has two modes to select: 1) MIST spray or 2) direct STREAM.

Note: *BDAS+ units come standard set to the mist setting.*

2.2.3 Distance/Diameter

2.2.3.1 Mist

The mist spray setting can reach a distance of 3 feet (1 meter) with a diameter of 16 inches (40 centimeters).

2.2.3.2 Direct Stream

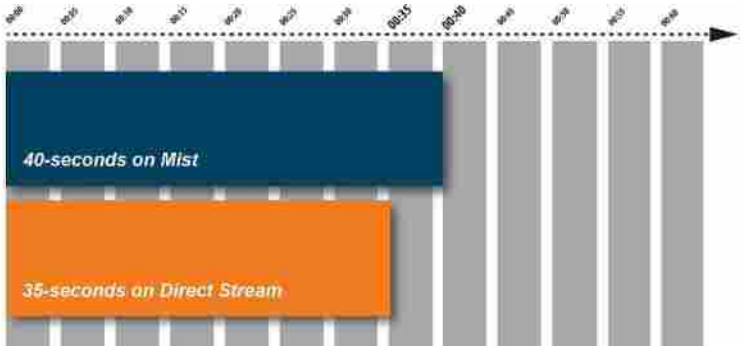
The direct stream setting allows up to a 15 foot (4.5 meter) standoff distance.

2.2.4 Spray Coverage Area

The BDAS+ can cover 18.3 square feet (approximately 1.5 square meters) with the mist setting on hard nonporous surfaces.

2.2.5 Spray Duration

The BDAS+ will spray for approximately 40 seconds on the mist setting and 35 seconds on the direct stream setting.



2.2.6 Safety Features

BDAS+ has a safety device that must be removed prior to use. Safety feature is removed by pulling on the yellow tab.

2.2.7 Propellant

BDAS+ uses bag on valve technology pressurized by nitrogen.

Note: *The BDAS+ unit contains gas under pressure, therefore may explode if heated. A Boiling Liquid Expansion Vapor Explosion (BLEVE) could occur. It is recommended that the BDAS+ under fire or head, be cooled off from a safe distance to avoid injuries.*

2.3 Intended Use

BDAS+ units are intended for immediate and operational decontamination of biological and chemical threats, including weaponized agents.

2.3.1 Conditions

BDAS+ can be used within the range of 32-140 degrees Fahrenheit (0 -60 degrees Celsius).

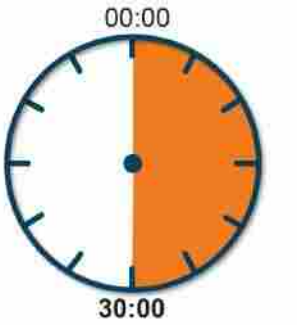
Note: *BDAS+ will freeze at 32 degrees Fahrenheit (0 degrees Celsius) but can be used after thawing.*

2.3.2 Applicable Surfaces

BDAS+ can be sprayed with either mist or direct stream on multiple surfaces including: concrete, asphalt, wood, ceramic, carpet, fabric, leather, steel, aluminum and more.

2.3.3 Decontamination Time

Contact time (dwell time) is the amount of time a surface must remain wet in order to neutralize the contaminant. See appendix A for list.



Note: *For unknown threats, a thirty (30) minute contact time is recommended.*

Section Three

3. Proper Use

The BDAS+ is easy to use in that it allows for an immediate decontamination solution.

3.1 Personal Protective Equipment (PPE)

The simplicity of BDAS+ allows the user to be able to use the system in different types of PPE, including Level A Hazardous Material suits, self-contained fully encapsulated suits and Mission Oriented Protective Posture IV gear.

Note: *It is recommended that BDAS+ users wear the proper gear established by their agency regulations and/or the Incident Commander.*

Minimum PPE requirements include:

- Eye Protection: Safety Glasses with side-shields.
- Hand Protection: Protective Gloves.
- National Institute for Occupational Safety and Health approved respiratory protection.

3.2 Instructions for Use

⚠ If BDAS+ has been tampered with or modified DO NOT USE.

Note: *Do not use if nozzle or assembly is damaged in any way.*

Step 1: Conduct site survey/scene size-up from a safe distance.

Step 2: Identify that an area has been contaminated.

Step 3: Pre-clean surface by removing any gross filth if applicable.

Step 4: Don proper PPE for the situation.

Note: *Wear protective gloves, eye protection, and face protection.*

Step 5: Remove safety to expose nozzle.

 Never point the spray nozzle at your face.

Step 6: Adjust nozzle to direct stream if needed.

Step 7: Hold BDAS+ system upright 10” to 18” from the desired application surface.

Step 8: Squeeze and hold trigger firmly for 2 to 3 seconds, or until covered with mist and/or wet spray. Apply in a sweeping motion.

Step 9: Ensure area is covered with BDAS+ formula.

For best results: *When applying outdoors, spray when wind is calm or with the wind if breeze is blowing.*

Step 10: Keep the contaminated area wet with BDAS+ Agent in accordance with the dwell time chart in Appendix A.

Note: *BDAS+ formula must make contact with contaminants in order to eliminate the threat.*

Note: *For unknown substances, a minimum of 30 minutes is recommended.*

Step 11: Used BDAS+ system and equipment should be disposed of in accordance with your agency regulations.

Note: *Cleaning residue is only required on food contact surfaces.*

3.3 Disposal

Equipment and material should be disposed of in accordance with your agency regulations.

3.4 Storage

3.4.1 Conditions

BDAS+ units should be stored in a cool, dry, well-ventilated area. Do not store in direct sunlight. Keep units secured in an upright position. BDAS+ should be properly marked, and the Safety Data Sheet should be accessible.

Note: *Always wear proper PPE when handling BDAS+.*

Note: *Keep away from open flames and sources of ignition.*

Note: *Avoid contact with eyes*

Note: *Avoid breathing vapors or mists.*

Note: *Do not store near strong acids, alkalis, and oxidizing agents.*

Note: *Do not store in direct sunlight.*

Note: *Follow National Fire Protection Association 30B "Code for the Manufacture and Storage of Aerosol Products".*

 Contents under pressure, DO NOT puncture or incinerate system.

3.4.2 Shelf Life

BDAS+ System shelf life is 3 years in ideal storage conditions. Ideal storage conditions are considered a temperature-controlled area, between 50-100 degrees Fahrenheit (10-38 degrees Celsius).

Section Four

4. Limitations and Considerations

4.1 Contact Times

It is important to remember that contaminated surfaces must remain wet for the entire recommended contact time in order to neutralize the contaminant.

4.2 Shipping and Handling

4.2.1 Department of Transportation Ground

Shipping package must be marked "Other Regulated Materials for Domestic transport only" and be within the limited quantity stated by the Department of Transportation regulations. Use United Nation 1950 (UN 1950) Non-Flammable Gas Class 2.2 Aerosols, with a limited quantity when required.

4.2.2 International Air Transport Association

Use United Nation 1950 (UN 1950) Non-Flammable Gas Class 2.2 Aerosols, with a limited quantity.

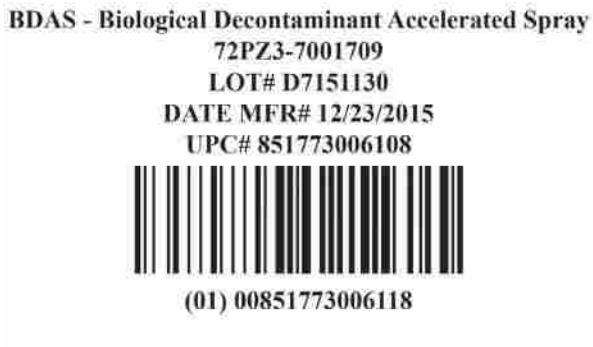
4.2.3 International Maritime Dangerous Goods

Use UN 1950 Non-Flammable Gas Class 2.2 Aerosols, with a limited quantity.

Note. *Always consult transportation regulations prior to shipping.*

Note. *Military shipping should consult the most current regulation manual to ensure compliance*

4.3 Identification Features



4.3.1 BDAS+

Cans are stamped with product ID, lot number, date of manufacture, Universal Product Code, and barcode.

4.3.2 BDAS+ Training Units

Training units have different identification information and are clearly identified by blue cans.

4.4 Other Considerations

In order for the BDAS+ to be effective, users must understand some considerations.

Below are some considerations that will ensure effective and efficient use of the BDAS+.

- Ensure adequate amount of BDAS+ for the situation.
- Check BDAS+ unit for any damage prior to use.
- Wear personal protective clothing as directed.
- Ventilate areas of spray if indoors.
- Clean off BDAS+ residue if used on food contact surfaces.
- Properly dispose of BDAS+ units per agency regulations.
- Properly store BDAS+ upright and securely while stored and in transport.
- Do not attempt to refill the BDAS+ System.

Appendix A "Dwell Times"

For unknown substances, allow a minimum 30-minute dwell time to ensure neutralization.

ND = No Detection

Biological Agents				
Minutes	**1**	**10**	**15**	**30**
Bacillus Anthra (Anthrax)	**-**	**-**	**ND**	
Y. Pestis (Plague)	**-**	**-**	**ND**	
Botulinum	**-**	**ND**		
Ricin	**-**	**ND**		

Chemical Agents				
Minutes	**1**	**10**	**15**	**30**
HD (Mustard)	**94**	**97**	**98**	**ND**

GA (Tabun)	-	**ND**		
GD (Soman)	**99**	**ND**		
GB (Sarin)	-	**ND**		
VX	**91**	**99**	**ND**	

Toxic Industrial Chemicals				
Minutes	**1**	**10**	**15**	**30**
Malathion	**89**	-	**95**	**ND**
Hydrogen Cyanide (gas)	**>99**			
Sodium Cyanide (solid)	**93**	-	**98**	**>99**
Phosgene	**98**	-	**>99**	
Butyl Isocyanate	**ND**			
Carbon Disulfide	**ND**			
Capsaicin	**ND**			
Anhydrous Ammonia	**ND**			
Muriatic Acid	**ND**			
Nitric Acid	**ND**			
Sulfuric Acid	**ND**			
Phosphoric Acid	**ND**			
Phoshine	**ND**			
Chlorine	**ND**			
Sulphur Dioxide	**ND**			
Nitrogen Dioxide	**ND**			
Tear Gas (CS or CN)	-	**ND**		
Pepper Spray	**ND**			
Lewisite	-	-	-	**ND**

Appendix B: BDAS+ Efficacy Chart

Chemical & Biological Weapons

- GA (Tabun)
- GD (Soman)
- GB (Sarin)
- VX Nerve Agent
- Mustard Gas (Blister)
- Botulinum (Toxin)
- Bacillus Anthracis (Anthrax)
- Ricin (Toxin)
- Lewisite (Blister)

Biological Organisms

- Aspergillus niger Bird Flu H5N1
- Bervibacterium ammoniagenes
- Burkholderia cepacia
- Campylobacter jejuni
- Candida albicans
- Clostridium difficile
- Corynebacterimammoniagenes
- Enterobacter aerogenes
- Enterobacter cloacae
- Enterobacteriaciae (with extended beta Lactamase resistance)
- Entrococcus faecalis
- Entrococcus faecium (Vancomycin resistant)
- Escherichia coli
- Escherichia coli (antibiotic resistant)
- Escherichia coli 0157:H7
- Hantavirus
- Hepatitis B Virus
- Hepatitis C Virus
- Herpes Simplex Type 1
- Herpes Simplex Type 2

- HIV/AIDS
- Human Coronavirus
- Legionella pnuemophila
- Influenza A/Brazil Virus, H1N1
- Klebsiella pneumonia
- Klebsiella pneumonia (antibiotic resistance)
- Listeria manocytogenes
- Norovirus Feline
- Norovirus Murine
- Proteus mirabilis
- Proteus vulgaris
- Pseudomonas aeruginosa
- Pseudomonas aeruginosa (antibiotic resistant)
- Respiratory syncytia virus
- Salmonella enteric
- Salmonella typhi
- SARS
- Norovirus Feline
- Norovirus Murine
- Proteus mirabilis
- Proteus vulgaris
- Pseudomonas aeruginosa
- Pseudomonas aeruginosa (antibiotic resistant)
- Respiratory syncytia virus
- Salmonella enteric
- Salmonella typhi
- SARS
- Serratia marcescens
- Shigella dysenteriae
- Shigella sonnei
- Staphylococcus aureus
- Staphylococcus aureus (antibiotic resistant)
- Staphylococcus aureus (Methicillin resistant) (MRSA)
- Staphylococcus pyogenes
- Trichophyton metagrophytes
- Tuberculosis
- Vaccinia virus
- Vibrio cholera

Chemicals

- Q-Alkyl Phosphonofluoridates, such as Sarin and Soman
- Q-Alkyl Phosphonofluoridates, such as Tabun
- O-Alkyl, S-2-Dialkyl Aminoethyl Alkyphosphonothiolates and Corresponding Alkylated or Protonated Salts, such as VX
- Mustard Compounds, Including 2-Chloroethyl chloromethyl sulfide, Bis (2-Chloromethyl) sulfide, Bis (2-Chloromethio) Methane, 1,2-Bis (2-Chloromethylthio) Ethane, 1,3 Bis (2-Chloroethylthio)-N-Propane, 1,4 Bis (2-Chloroethylthio)-N-Butane, 1,5-Bis (2-Chloreothylthio)-N-Pentane, and Bis (2-Chloroethylthiomethyl) Ether
- Methylamine, Saxitoxin
- Lewisites including 2-Chlorovinyldichloroarsine, Bis (2-Chlorovinyl) Chloroarsine, Tris (2-Chlorovinyl), Arsine, Bis (2-Chloroethyl) Ethylamine, and Bis (2-Chloroethyl)
- Alkyl Phosphonyldifluoride and Alkyl Phosphorites
- Chlorosarin & Chlorosoman
- Amiton, 1,1,3,3,3,-Pentafluoro-2(Triliuoromethyl)- 1-Propene, 3-Quinuclidinyl Benzilate
- Methylphosphonyl Dichloride
- Dimethyl Methylphosphonate
- Dialkyl Phosphoramidic Dihalides
- Dialkyl Phosphoramidates
- Arsenic Trichloride
- Diphenyl Hydroxyacetic Acid
- Quinuclidin-3-Ol
- Dialky Aminoethyl-2-Chlorides
- Dialky Aminoethan-2-Ols And Dialkyl Aminoethane-2-Thiols
- Thiodigylcols
- Pinacolyl Alcohols
- Phosgene
- Cyanogen and Thionyl Chloride
- Hydrogen Dyanide and Chloropicrin
- Phosphorous Oxychloride, Phosphorous Trichloride, Phosphorous Pentachloride and Alkyl Phosphites
- Sulfur Minochloride, Sulfur Dichloride