



Anthrax

SURFACE SAMPLING

DEPARTMENT OF HEALTH AND HUMAN SERVICES
Centers for Disease Control and Prevention
National Institute for Occupational Safety and Health



Agenda

- Introductions
- Background
- Objectives
- Swab Collection Procedure
- Sponge Collection Procedure
- Sample Decontamination
- Sample Shipment
- Exercise
- Debrief
- Evaluation
- Adjournment



Why Do Anthrax Surface Sampling?

- Confirm or identify contamination
- Assess extent of contamination
- Determine risk for human exposure
- Inform medical treatment
- Guide decontamination



Background

These sampling procedures were prepared by the Centers for Disease Control and Prevention (CDC) to

- Standardize collection procedures
- Ensure samples can be analyzed
- Obtain comparable results



Background

These procedures are meant to be used on smooth, nonporous surfaces:

- Stainless steel
- Painted wallboard
- Floor tiles
- Wood laminate



Sampling Plan

- Collection should be part of a sampling plan including
 - Objectives
 - Approach
 - Analytical and laboratory coordination
 - Handling, packaging, and transport
 - Interpretation of results

Health and Safety Plan

- Follow a health and safety plan for protection during sampling:
 - Personal protective equipment (PPE)
 - Medical countermeasures (antibiotics and vaccinations)
 - Decontamination procedures for both responders and samples



Health and Safety Plan

- Recommendations on protecting yourself from getting sick can be found on the NIOSH website at www.cdc.gov/niosh/topics/anthrax/workers.html



Sampling Team



- At least 2 people
- At least 1 sampler and 1 assistant
- Minimizes chance of cross-contamination

Sampling Team

- Decide who will sample, who will assist
- *Do not change roles during sampling*
- Assistant handles all supplies
- Sampler touches supplies only as assistant hands them over
- Minimize contact with potentially contaminated surfaces



Sampling Team

- Remember that all surfaces in the sampling area could be contaminated
- Bring a clean working surface such as
 - Disposable towel
 - Portable cart
 - 5-gallon buckets
- Take only the supplies that you need



Training Outcomes

You will...

- Observe macrofoam swab and cellulose sponge sampling
- Observe decontamination of samples
- Learn what material is required for sampling and decontamination
- Access sampling and decontamination procedures, as well as dangerous-goods regulations
- Demonstrate knowledge of sample collection, decontamination, and methods to limiting cross-contamination



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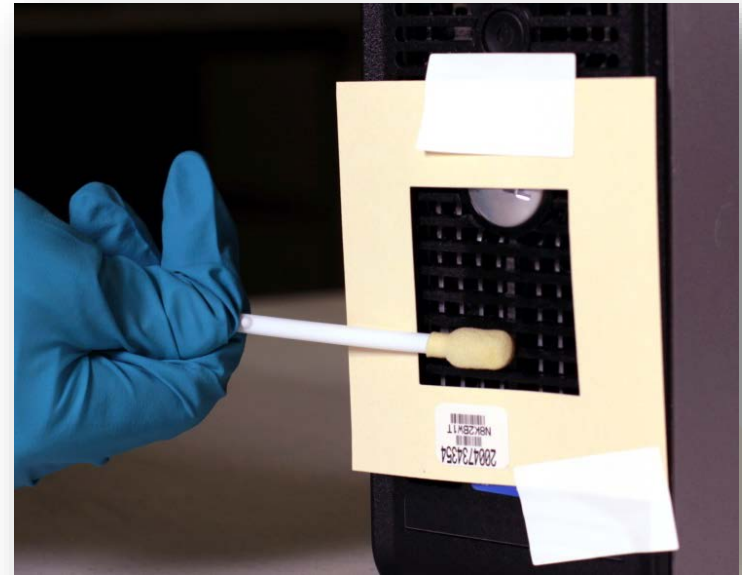


HOW TO SAMPLE WITH **Macrofoam Swab** ON NONPOROUS SURFACES

Appropriate Circumstances

Small surfaces equal to or less than 4 square inches

- Supply air diffusers
- Air-return grills
- Keyboards/computer fans
- Hard-to-reach places
- Crevices
- Corners



Supplies Needed, in Addition to PPE



Gloves



Template



Disposable Ruler



Tape



Macrofoam Swab



Buffer



Screw-cap tube



Paraffin film



Resealable Plastic Bag



Permanent Marker

See www.cdc.gov/niosh/topics/emres/surface-sampling-bacillus-anthraxis.html

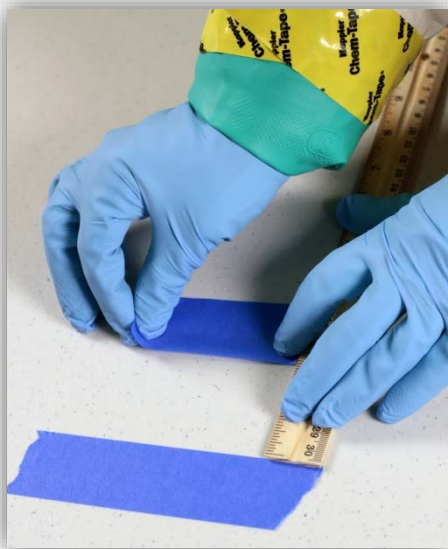
for specifications.

Step 1

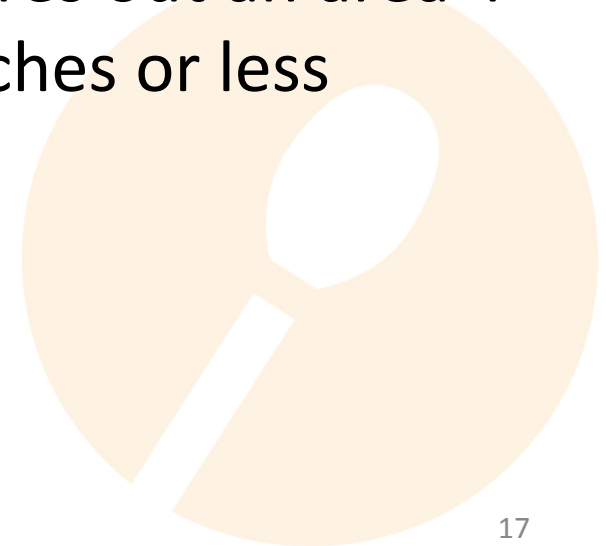
- Sampler and assistant put on new gloves
- Gloves go on top of normal PPE to prevent contamination of sample



Step 1, continued



- Sampler puts 2 x 2–inch template over sampling area
- Or measures out an area 4 square inches or less



Step 2

- The assistant opens the swab package without touching the swab or its handle
- The sampler removes the swab from the package by grasping only the swab handle
- When handling the swab, do not touch below the thumb stop



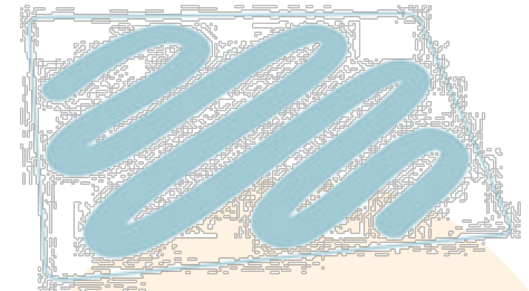
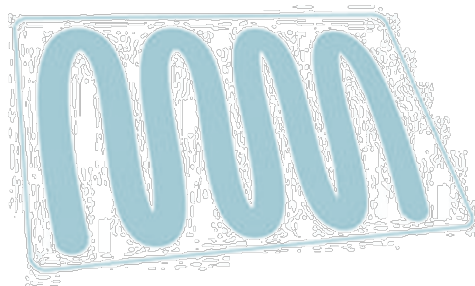
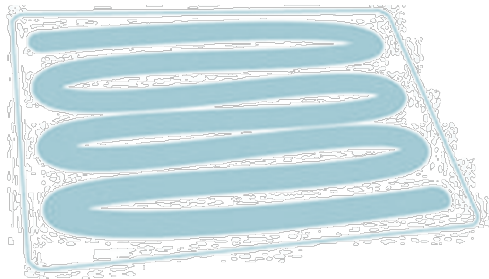
Step 2, continued



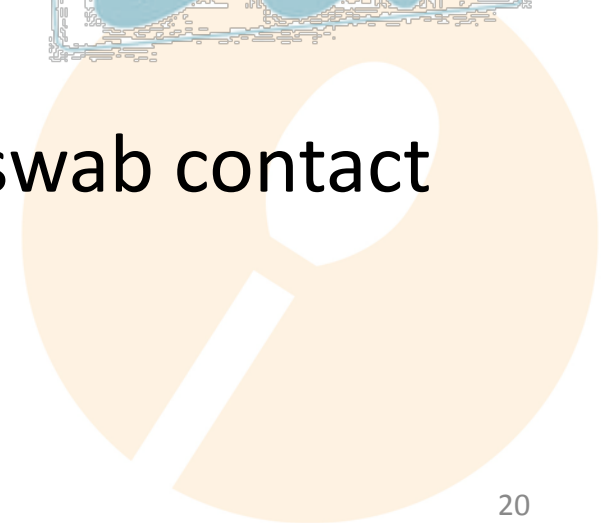
- Sampler dips swab (if not premoistened) into tube of neutralizing buffer solution
- Assistant opens and holds tube for sampler
- Sampler presses swab against inside of container to remove excess
- Throw away any leftover buffer and tube; do not use for next sample

Steps 3, 4, and 5

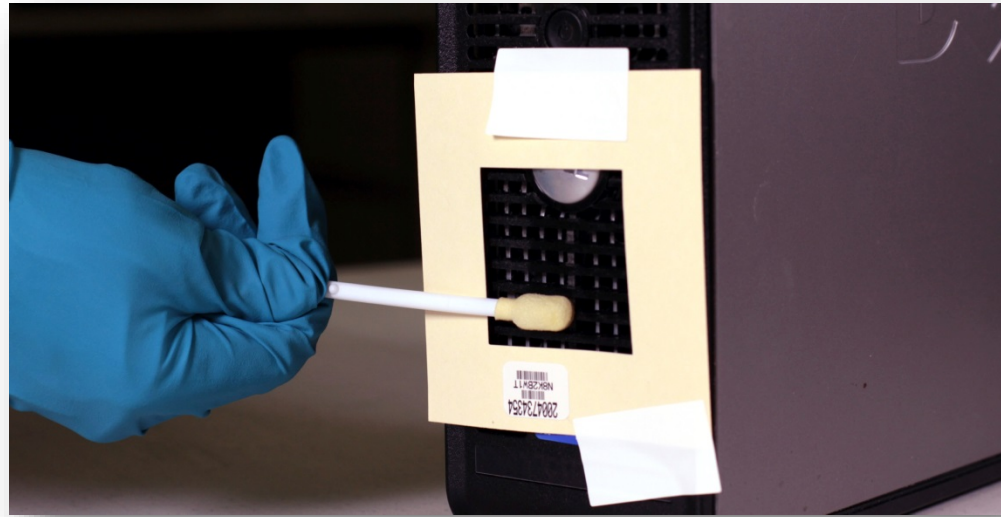
- Sampler makes 3 passes over sampling surface: horizontal, vertical, and diagonal



- A rolling motion will maximize swab contact with surface



Step 3: Horizontal Pass

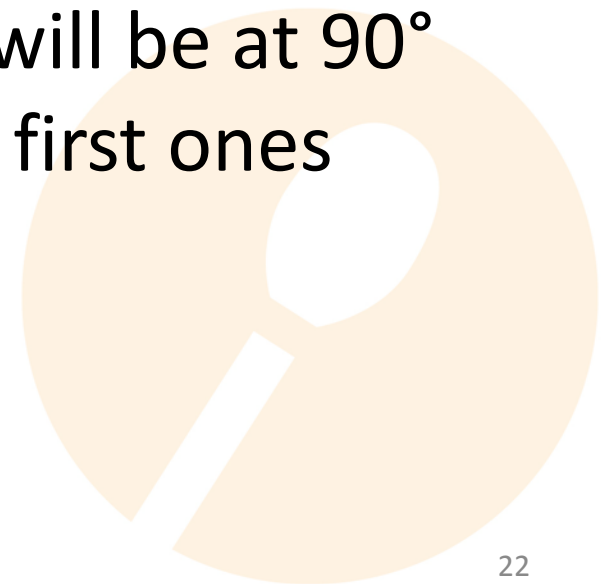


- Place side of swab on surface with gentle but firm pressure to ensure direct contact
- Use an overlapping 'S' pattern to cover entire surface with *horizontal* strokes

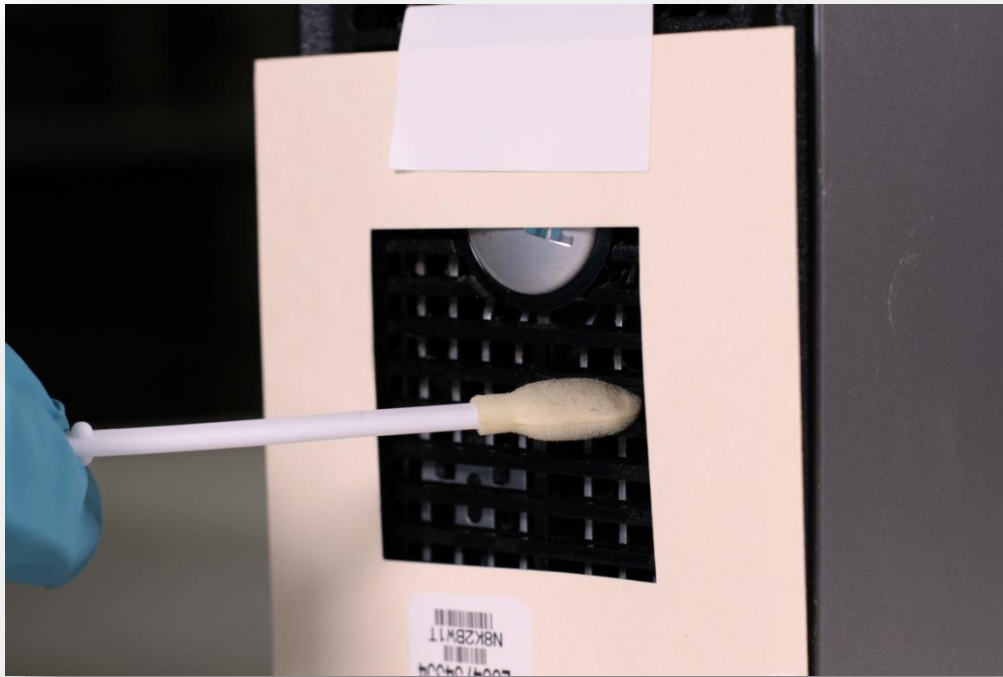
Step 4: Vertical Pass



- Rotate swab and cover area again, with *vertical 'S' strokes*
- Strokes will be at 90° angle to first ones



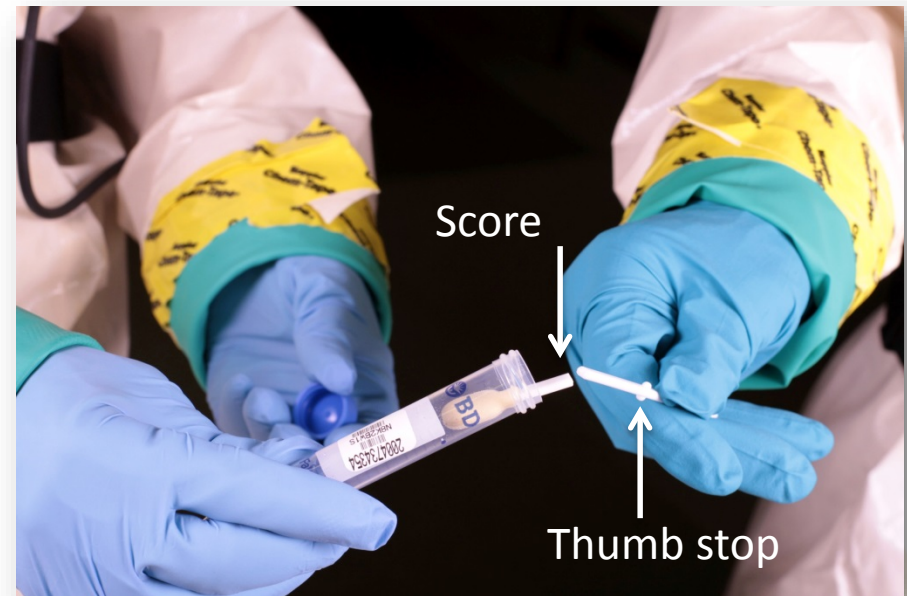
Step 5: Diagonal Pass



- Rotate swab once more and cover area again, with *diagonal 'S'* strokes
- Strokes will be at 45° angle to first ones

Step 6

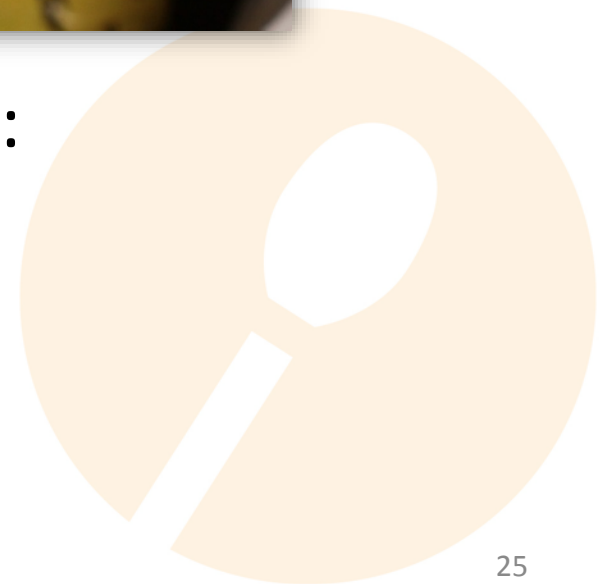
- Place swab into screw-cap tube
 - Assistant opens and holds tube
 - Sampler breaks off head of swab by bending handle at scoring
 - Do not insert handle beyond thumb stop



Step 6, continued



- **Assistant** caps and labels tube:
 - unique identifier
 - sample location
 - initials of collector
 - date and time



Step 6, continued



- Assistant wraps tube with paraffin film to prevent leakage during shipment

Step 7

- Assistant places sample into resealable bag
- Assistant seals and labels the bag with same information as on tube
- Check that the bag is watertight for decontamination



Steps 8

- Leave template in place after sampling
- Sampler and assistant remove outer gloves and discard
- Use new template and gloves for each sample





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HOW TO SAMPLE WITH **Cellulose Sponge** ON NONPOROUS SURFACES

Appropriate Circumstances

Areas of 100 square inches or less

- Countertops or tabletops
- Floor tiles
- Walls



Supplies Needed, in Addition to PPE



Gloves



Template



Disposable Ruler



Tape



Cellulose Sponge



Buffer



Screw-cap Specimen Container



Paraffin Film



Resealable Plastic Bag



Permanent Marker

See www.cdc.gov/niosh/topics/emres/surface-sampling-bacillus-anthraxis.html for specifications.

Step 1

- Sampler and assistant put on new gloves
- Gloves go on top of normal PPE to prevent contamination of sample



Step 1, continued

- Sampler puts 10 x 10–inch template over sampling area
- Or measures out an area 100 square inches or less



Step 2

- Assistant opens sponge package without touching sponge or handle
- Sampler removes sponge by grasping only handle
- Never touch below thumb stop



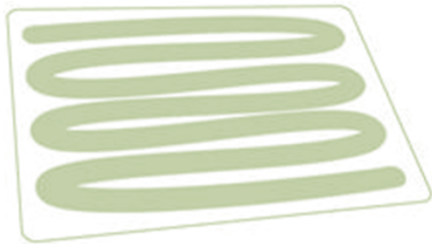
Step 2, continued



- Sampler holds sponge by handle, and assistant pours neutralizing buffer solution over it (if not premoistened)
- All 10 mL must be absorbed by sponge
- Discard solution container

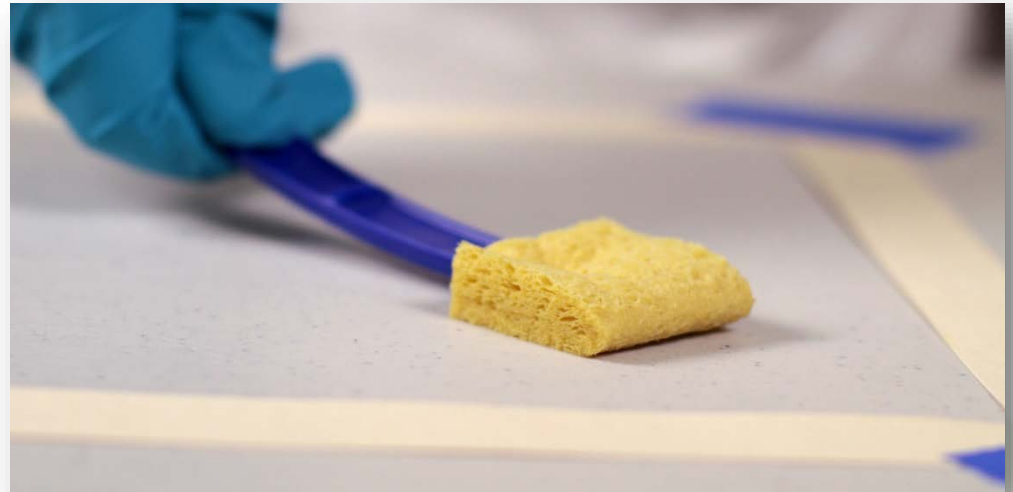
Steps 3, 4, 5, and 6

- Sampler makes 4 passes over sampling surface: horizontal, vertical, diagonal, and perimeter of template



Step 3: Horizontal Pass

- Place sponge flat on surface with gentle but firm pressure to ensure full, direct contact
- Using overlapping 'S' pattern, cover entire surface with *horizontal* strokes



Step 4: Vertical Pass



- Turn sponge over and use wide part to wipe area again, with *vertical* 'S' strokes
- Strokes will be at 90° angle to first ones

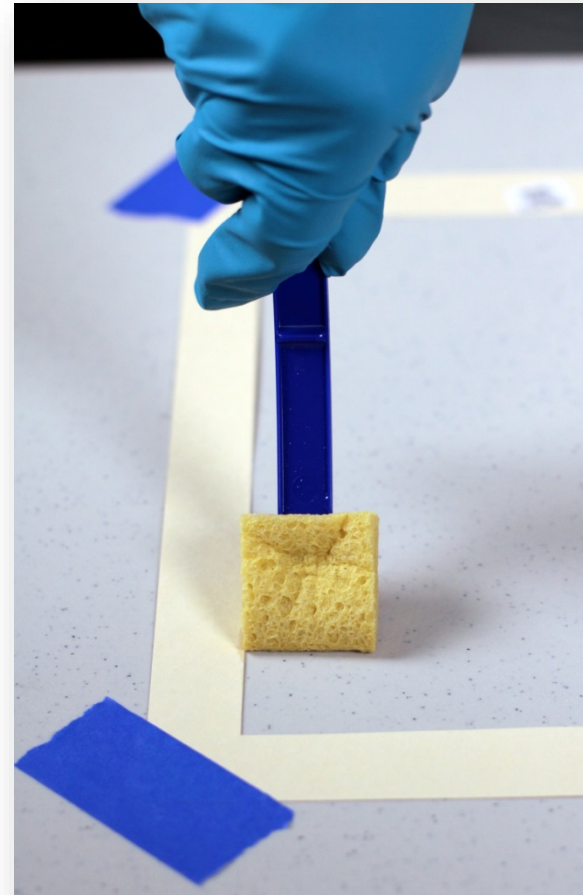
Step 5: Diagonal Pass

- Using narrow side of sponge, wipe once more, with *diagonal 'S'* strokes
- Strokes will be at 45° angle to first ones



Step 6: Perimeter Pass

- Using full width of sponge tip, wipe perimeter of sampling area once



Step 7

Place sponge into specimen container:

- Assistant opens and holds container
- Sampler breaks off head of sponge by bending handle at scoring



Step 7, continued

- Assistant caps and labels container:
 - unique identifier
 - sample location
 - initials of collector
 - date and time



Step 7, continued



- Assistant wraps container with paraffin film to prevent leakage during shipment

Step 8

- Assistant places sample into resealable bag
- Assistant seals and labels the bag with same information as on container
- Ensures bag is watertight for decontamination



Step 9



- Leave template in place after sampling
- Sampler and assistant remove outer gloves and discard
- Use new template and gloves for each sample



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HOW TO

Decontaminate

SAMPLES



Bagging and Handling of Samples



Double-bag and seal

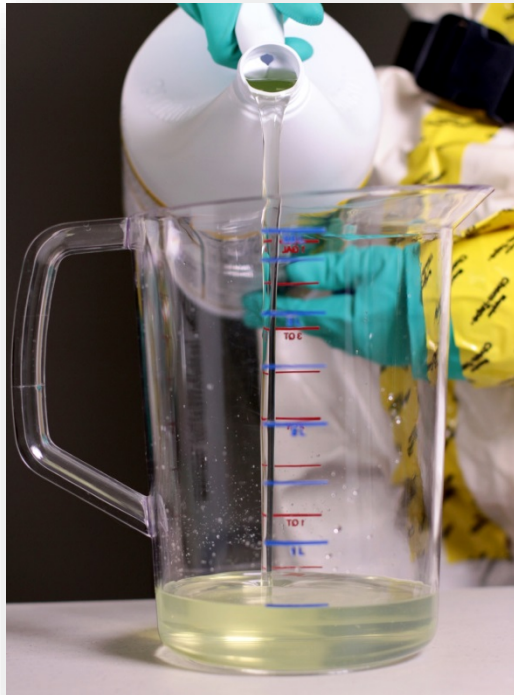
- For a group of samples: put into a second, larger resealable bag
- For a single sample: put into a second bag of same size
- Remove as much air as possible for shipping; bags cannot be opened once decontaminated

Decontamination Supplies



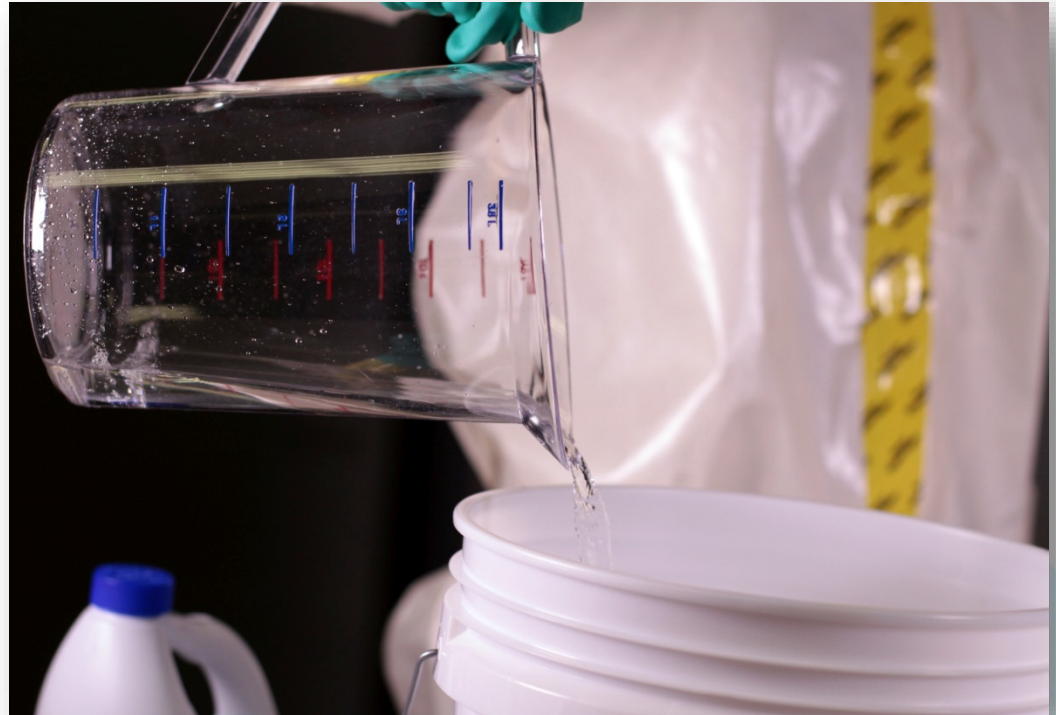
Household bleach, white vinegar, water, measuring device, container, and disposable paper towels

Step 1



Mix 1 part bleach with 5 parts water.

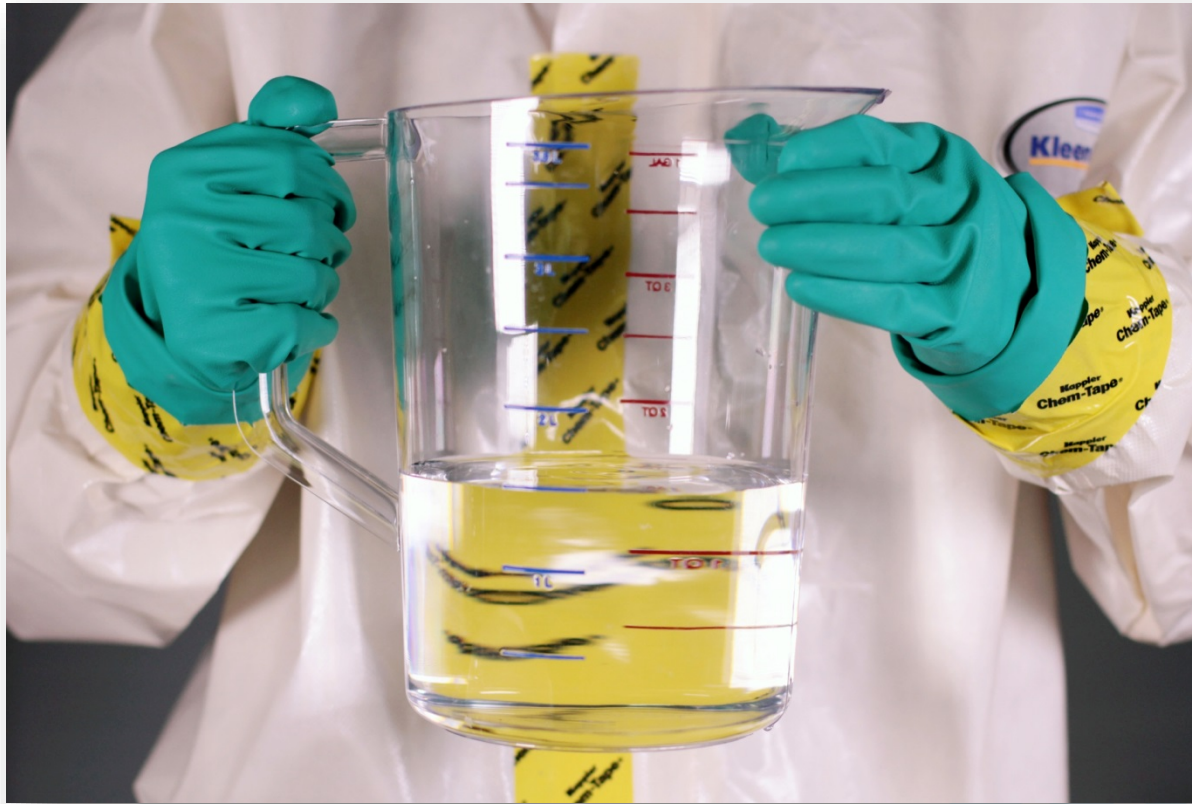
Step 2



Add 1 part white vinegar.



Step 3

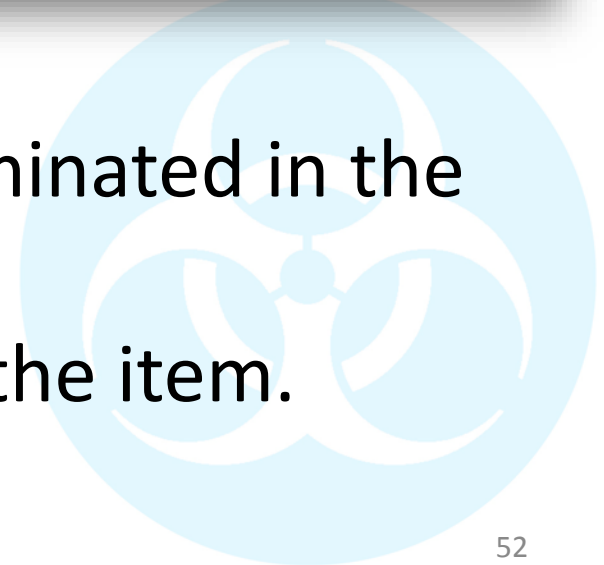


Add 3 parts of additional water.

Steps 4 and 5



4. Submerge item to be decontaminated in the solution for 10 minutes.
5. Thoroughly dry the outside of the item.





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HOW TO **Ship/Transport** SAMPLES



How to Ship Samples

- Coordinate shipment with the local Laboratory Response Network (LRN) lab
- Transport all samples to processing laboratory on ice or cold packs
- Samples should be processed within 48 hours of collection

Shipping Dangerous Goods

- Prepare and ship containers and documentation according to appropriate regulations (Division 6.2, Infectious substance)
- See these sources for regulations:
 - U.S. Department of Transportation
 - International Airline Transportation
 - U.S. Postal Service, Domestic Mail Manual
- Adherence to current, appropriate regulations is *your* responsibility

Chain of Custody

- Follow chain-of-custody guidelines set by law enforcement and laboratory
- Place the chain-of-custody forms between the outer packaging and inner packaging
- Do not put chain-of-custody forms inside the inner packaging





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Exercise



Exercise



- Demonstrate comprehensive application of anthrax surface sampling by macrofoam swab and cellulose sponge methods
- Use the checklists provided to assist you

Additional Resources

NIOSH has additional resources on anthrax, available at www.cdc.gov/niosh/topics/anthrax/:

- Overview of anthrax
- Recommendations for protecting workers
- Environmental sampling
- Past responses and investigations
- Other resources



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