

AUTOCLAVED WASTE

(Treated Infectious Waste)

What is an autoclave?

An autoclave, or steam sterilizer, is an insulated pressure chamber in which saturated steam is used to elevate the temperature. Autoclaves are found in research, diagnostic and microbiology laboratories, health centers and other places that require high-level disinfection.



How does an autoclave work?

An autoclave uses pressurized steam to decontaminate infectious waste. Laboratory autoclaves normally operate at a temperature of 250°F (121°C), a pressure of 15 pounds per square inch (psi) and a minimum cycle time of 30 minutes. The effectiveness of an autoclave depends on the time, temperature and direct steam contact with infectious agents. Other factors that influence treatment efficiency include waste density, physical state and size and organic content.

How do I use the autoclave?

Autoclaves come in many different styles. Therefore, always follow the manufacturer's instructions when using the autoclave.

What can be autoclaved?

In New Hampshire, almost all infectious waste can be autoclaved and disposed as Municipal Solid Waste (MSW). However, UNH currently prohibits medical sharps (needles, syringes, etc.) and research animal carcasses^o from entering the MSW stream. These items must be removed by an outside contractor according to their specifications.



The following infectious waste products may be autoclaved^o and disposed as treated infectious waste (in the MSW stream):

- Cultures and stocks of infectious agents.
- Laboratory wastes from medical, pathological, or pharmaceutical laboratories that were exposed to infectious agents.
- Pathological wastes, including tissues, organs and body parts.
- Non-research animal tissues/carcasses weighing less than five pounds.
- Human blood waste and human blood-products.
- Dialysis wastes in contact with blood.
- Blood, biological waste and discarded materials contaminated with excretion, exudates, or secretion from humans or animals.
- Discarded equipment and parts in contact with infectious agents.
- Preparations made from genetically altered living organisms and their products.

What cannot be autoclaved?

Types of waste that should not be autoclaved include cancer drugs, toxic and volatile chemicals, radioisotopes, hazardous waste or any other harmful material that can be vaporized and disseminated with heat. In general, do not autoclave **flammable, reactive, corrosive, toxic or radioactive materials**. Human limbs and recognizable human organs, excluding teeth and contiguous gum tissue, must be disposed by incineration or interment by an outside company. Preserved specimens (i.e. formaldehyde) must not be autoclaved; they can be thrown in the trash and disposed as MSW (if the excess liquid preservative has been removed).



Which autoclaves can be used?

Several autoclaves at UNH have been validated by spore testing as outlined in the State of New Hampshire's infectious waste regulations. The following autoclaves are validated on a quarterly basis to ensure effective disinfection:

- Gregg Hall, Room 237
- Jackson Laboratory, Room 202
- Kendall Hall, Room 302
- Rudman Hall, Room G61, #1
- Rudman Hall, Room G61, #2
- Rudman Hall, Room 163, #1
- Rudman Hall, Room 229
- Rudman Hall, Room 263, #1
- Rudman Hall, Room 263, #2
- Rudman Hall, Room 363, #1
- Rudman Hall, Room 363, #2

How should I collect and dispose the waste?

Liquid infectious waste may be autoclaved or chemically disinfected and then disposed via the laboratory drainage system. (Do not pour melted agar into sink or floor drains. Allow it to cool and solidify for disposal as a solid waste.)

Follow these disposal procedures for solid infectious waste:

1. Collect the infectious waste in clear, unlabeled, high strength polymer autoclave bags (imprinted with process indicator if possible) in an approved location.
2. Remove all biohazard labels. Ensure that words like "pathogenic," "infectious" or "biohazardous" have been removed from all autoclaved materials.
3. Autoclave and cool the waste.
4. Place the autoclave bag into a black polypropylene trash bag.
5. Put the bags into a second black polypropylene trash bag.*
6. Ensure that the contents cannot puncture the black polypropylene trash bags.
7. Place the bags in an approved location/dumpster. Contact your hazardous waste coordinator for more information.



* Bags must not weigh more than 20 pounds.



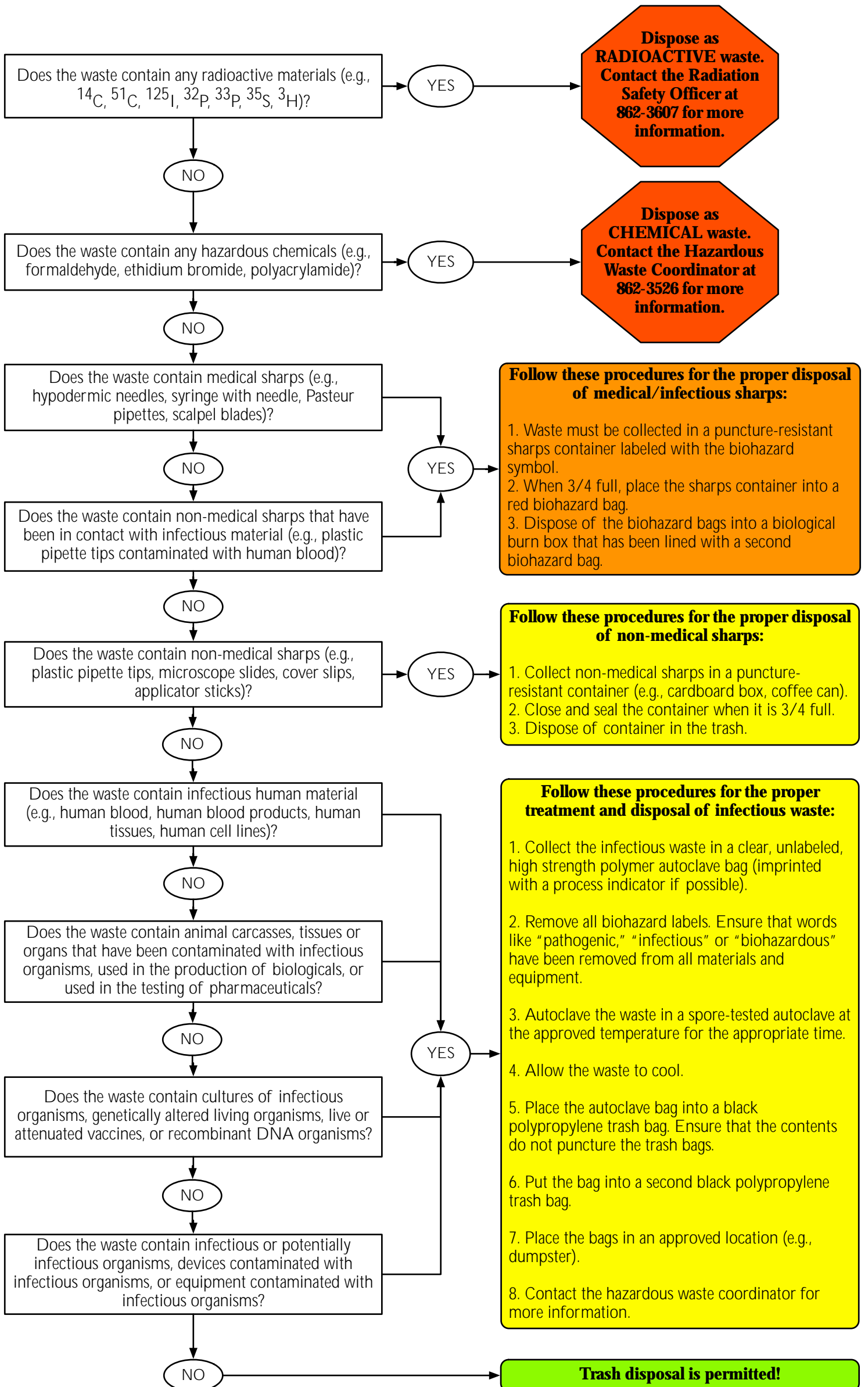
Questions?

Contact the Office of Environmental Health and Safety at 862-4041 with questions about the disposal of infectious waste.

^o All research animals must be disposed according to IACUC and Animal Resources Office procedures.

^o All autoclaves must be validated by spore testing at least quarterly, according to State of New Hampshire regulations (ENV-SW 904.03)

INFECTIOUS WASTE DISPOSAL FLOWCHART





UNIVERSITY of NEW HAMPSHIRE

Procedures for Disposing Infectious Waste

The following procedures have been developed to assist you in the proper disposal of infectious waste at the University of New Hampshire. If you have any questions regarding this process, please contact the Office of Environmental Health and Safety at 862-4041.

When using an autoclave, consider the following:

1. Never autoclave **FLAMMABLE, REACTIVE, CORROSIVE, TOXIC or RADIOACTIVE MATERIALS.**
2. Always wear safety glasses, goggles or face shield, lab coat or apron, and heat-protective non-asbestos gloves when opening door or removing item(s) from autoclave.
3. Open door slowly. Beware of rush of steam.
4. Open door only after chamber pressure returns to zero. Leave door open for several minutes to allow pressure to equalize and for materials to cool.
5. Do not mix loads which require different exposure times and exhaust.
6. Materials that will melt (plastic lab wear) and block chamber exhaust drain should be placed in a shallow stainless steel autoclave pan.

Packaging and Treatment

Materials contaminated with infectious materials must be collected in the appropriate containers and sterilized or disinfected before disposal. Specific requirements for handling, sterilizing, and disposing infectious waste must be followed.

A. Liquids containing Biohazardous Agents

- Collect liquids in leak-proof containers such as flasks or bottles.
- Liquid waste containers designed to withstand autoclaving temperatures must be used when steam sterilization is utilized. To allow pressure equalization, they should not be sealed.

B. Solids Containing Biohazardous Agents

- Non-sharp, solid laboratory waste (empty plastic cell culture flasks and Petri dishes, empty plastic tubes, gloves, wrappers, absorbent tissues, etc.) which may be, or is known to be, contaminated with infectious material must be collected in autoclavable bags. If this waste is not autoclaved immediately, it must be stored in autoclavable bags displaying the biohazard warning symbol.
- Autoclavable bags should be used for solid, non-sharp, infectious waste only and disposed of appropriately. They should not be used for the collection of other solid hazardous or non-hazardous waste that may require other treatment or disposal methods.
- For laboratories generating large volumes of agar gel in disposable Petri dishes and tubes requiring sterilization, such waste should be collected in an autoclavable plastic pail in the laboratory. Autoclavable bags filled with plastic ware containing agar gel tend to leak fluids during and after the sterilization process. The pail will contain the liquids released by the agar gel.

C. Sterilization and Disinfection

- Inactivate the biological agents by employing steam sterilization procedures. Autoclaving (steam sterilization) is the preferred (and generally regarded as the most reliable) method of sterilizing biological waste. Depending on the volume of waste to be sterilized, it may be necessary to extend the duration of exposure to high temperature steam under pressure.
- Steam sterilization is generally not recommended for laboratory waste contaminated with or containing a combination of viable biological agents and significant amounts of hazardous chemical or radioactive materials
- Containers of liquid waste must be placed in an autoclavable tray or pan of sufficient capacity to contain all liquid in the event of vessel failure or breakage inside the autoclave chamber. Use extreme caution when handling autoclaved liquids since they are hot and may boil over.
- Autoclavable bags of solid waste should be gently closed (but not sealed airtight) to allow steam penetration before they are placed into the autoclave chamber.
- After autoclaving and cooling, these bags of autoclaved waste must be placed into double-lined black plastic garbage bags (available at most stores and through many vendors). The international biohazard symbol must be removed from all autoclaved materials.
- When full, close the black bag by gathering the opening and applying a twist tie, string, tape, or tying a knot.

Labeling

No specific labeling is required. Make sure there are no biohazard stickers on the treated infectious waste and associated bags. Wording such as "infectious," "pathogenic," "biohazardous," etc. must be removed prior to placing the black garbage bags into an approved dumpster. Contact OEHS at 862-4041 for more information.

Storage and Disposal

Following steam sterilization innocuous liquids may be disposed of via the laboratory drainage system. Contact the Office of Environmental Health and Safety at 862-3526 with any questions about disposing waste down the drain.

Note: Do not pour melted agar into sink or floor drains. Allow it to cool and solidify for disposal as a solid waste in black garbage bags.

Collection Schedule

If an on-site functional autoclave (steam sterilizers) is not available and the conventional use of chemical disinfectants for the inactivation of hazardous biological agents in laboratory waste is not practicable or not efficacious, other waste handling and disposal methods must be considered. Please contact the Office of Environmental Health and Safety at 862-4041 for alternatives or additional information.



AUTOCLAVE SPORE TESTING

Using *Bacillus atrophaeus*, formerly *Bacillus subtilis* var. *Niger*, Spores

I. Spores

You have the option of buying spores from various laboratory safety supply companies or you may make them in your lab. Follow the manufacturer's instructions if you purchase them from a safety supply company. If you choose to create your own spores, please follow these procedures:

Bacillus atrophaeus (formerly *Bacillus subtilis* var. *Niger*) is streaked onto Tryptic soy agar and incubated for 24 hours at 37°C. A single, typical (dry, flat and orange) colony is picked and transferred to a 18mm x 150 mm tube containing 10 mL of Tryptic soy broth. The broth is incubated at 37°C over night, with shaking. 0.1 mL of this culture is spread onto 150 mm plates of Sporulation agar and incubated at 37°C for 24 hours and then transferred to 30°C and incubated for 5 days. These now sporulent cultures are harvested with sterile distilled water, 15 mL/plate, washed 3 times by centrifugation, heat treated at 55°C for 1 hour to kill any vegetative cells, and then stored at 4°C until used. The spore stock is then enumerated using the spread plate technique on Tryptic soy agar.

The spore stock produced by the UNH Microbiology Department (June 2004) contained 1.5×10^{11} spores/mL.

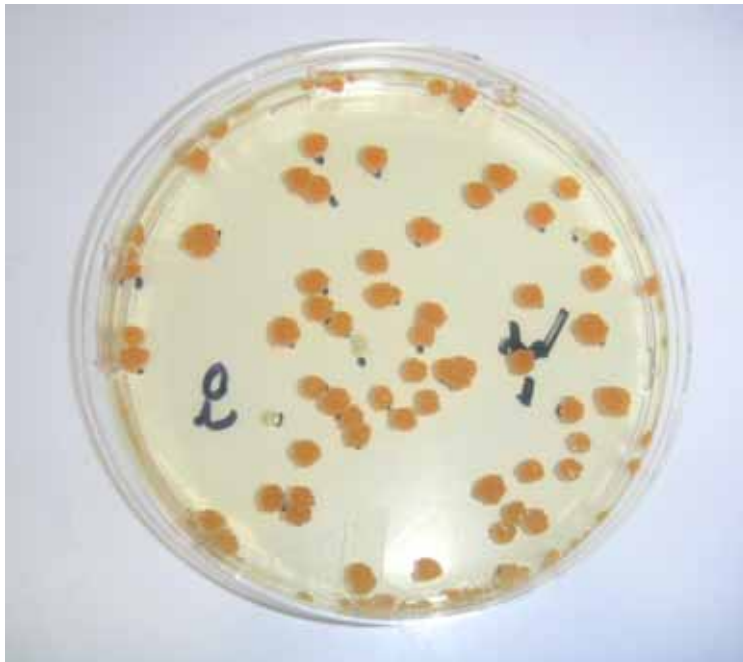


Figure 1. A spread plate of *Bacillus atrophaeus*.



Figure 2. *Bacillus atrophaeus* spores in phosphate buffered saline. 10^{11} spores/mL, 10^9 spores/mL 10^7 spores/mL (left to right)

II. Autoclave Testing

Spores are diluted in phosphate buffered saline to give a stock solution containing 1.5×10^8 spores/mL. Add 0.15 mL (2.3×10^6 spores) of this stock is to Phenol Red broth tubes, containing 0.5% glucose as the carbon source, for the test. The actual spore titer is confirmed by spread plate counting on the day of testing.

Three tubes per autoclave are tested. Test tubes are placed in the front, middle and back positions on the bottom rack. These test tubes are supported in the autoclave by 125 mL Erlenmeyer flasks containing 100 mL of water.

Autoclaves are run for a **minimum of 30 minutes at 121°C**. Immediately after autoclaving, the test samples are cooled and then incubated for 48 hours at 37°C.



Figure 3. *Bacillus atrophaeus* spores ($\sim 10^6$ spores/mL) after autoclaving. Rudman Hall, Room 163 – Front, Middle, Back, Positive Control, Negative Control (left to right)

III. Controls and Reactions

A spore containing, non-autoclaved tube is the positive control. A non-inoculated tube of media is the negative control. These tubes are incubated along with the test samples.

Phenol Red is a pH indicator that is red above pH seven and yellow below pH seven. Growth (positive reaction) in the tubes produces acid that turns the indicator yellow. The non-inoculated control remains red (negative reaction).

Passing/Failing

If any of the inoculated samples turn yellow, then the autoclave test fails and it may no longer be used to disinfect infectious waste. If all the inoculated samples remain red, then the autoclave test passes.

IV. Recordkeeping

UNH is required to retain maintenance and autoclave spore testing records for a minimum of 3 years.¹ The following information must be recorded during each autoclave test:

- Location of autoclave.
- Autoclave serial or identification number.
- Date of spore testing.
- Time of spore testing.
- Operator's name.
- Autoclave temperature, pressure, and length of time the load is sterilize.
- Pass/fail.

Note: A copy of this autoclave log should be made available to the Office of Environmental Health and Safety at least annually. A copy of the autoclave print-out and a copy of the autoclave maintenance records should be kept by each department and made available upon request.

An example autoclave log can be found on the next page.

¹ State of New Hampshire Regulation, Env-Wm 2604.07(c) – Testing and Reporting Requirements: “The facility shall maintain the records of quality assurance/quality control efficacy testing for a minimum of 3 years.”

V. Approved Autoclaves

Several autoclaves at UNH have passed the spore-testing requirements outlined in this document. These autoclaves are tested on a quarterly basis to ensure effective disinfection. These autoclaves include the following:

Gregg Hall, Room 237
Jackson Laboratory, Room 202
Kendall Hall, Room 302
Rudman Hall, Room G61 #1
Rudman Hall, Room G61 #2
Rudman Hall, Room 163 #1
Rudman Hall, Room 229
Rudman Hall, Room 263 #1
Rudman Hall, Room 263 #2
Rudman Hall, Room 363, #1
Rudman Hall, Room 363, #2

Questions regarding the status of these autoclaves should be directed to Robert Mooney (Microbiology), David Shay (Jackson Laboratory), Robert Gibson (Kendall Hall) and Vasiliki Partinoudi (Gregg Hall).

VI. Autoclave Bags

Biological waste may be collected in autoclave bags (please see the next page for examples of autoclave bags). If the biological waste is sterilized in an approved (spore-tested) autoclave, then the waste can be disposed as regular trash. **If infectious waste is collected and autoclaved at a later time**, it must be placed in a sturdy container (cardboard box, bucket, etc.) **with a visible biohazard symbol on the container.**



After the bag has been autoclaved, remove all biohazard stickers (the waste is no longer considered infectious). Place the autoclaved waste into a black polypropylene garbage bag (double-bagged is preferred). The black bag can then be disposed into a special dumpster. No other labeling is required.

Examples of Autoclave Bags



Manufacturer: Baxter Healthcare Corporation

Catalog #: A9513-12

Size: 19" x 23"

Name: Scientific Products, S|P Brand Autoclave Bag

Note: Caution! Do not seal bag tightly during autoclaving. Refer to Instructions for Use.



Manufacturer: VWR International

Catalog #: 14220-042

Size: 25" x 35"

Name: Autoclave Bags | Clear 2.0 PP

Note: Caution! Do not seal bag tightly during autoclaving. Refer to Instructions for Use.



Manufacturer: Fisher Scientific

Catalog #: 01-815A

Size: 12" x 24"

Name: Autoclave Bags

Note: Caution! Do not seal bag tightly during autoclaving. Refer to Instructions for Use.

GREGG HALL AUTOCLAVE

Room 237

Tuttnauer Brinkman 3870

The Tuttnauer Brinkman 3870 steam autoclave located in Room 237 in Gregg Hall was tested on Monday May 15, 2006 by Vasiliki Partinoudi for its ability to reduce spores by at least 4 log 10. Sample enumeration took place on Tuesday May 16, 2006.

Spore Stock Preparation

DAY 1

Bacillus atrophaeus (formerly *Bacillus subtilis* var. *Niger*) was streaked onto Tryptic soy agar and incubated for 24 hours at 37°C.

DAY 2

A single, typical (dry, flat and orange) colony was picked and transferred to a 18mm x 150 mm tube containing 10 mL of Tryptic soy broth. The broth was incubated at 37°C over night, with shaking.

DAY 3

0.1 mL of this culture was spread onto 150 mm plates of sporulation agar (Lab Lemco Agar) and incubated at 37°C for 24 hours (plate inverted).

DAY 4

The plates were transferred to 30°C and incubated for 5 days (room temperature-ok/plates must always be inverted).

DAY 9

These sporulent cultures were harvested with sterile distilled water (15 mL/plate), washed 3 times by centrifugation, heat treated at 55°C for 1 hour to kill any vegetative cells, and then stored at 4°C until used.

In order to wash the cells: Spin at 10,000g for 5 minutes at 4°C. Resuspend pellet in 10mL DI sterile water (discard supernatant (18-20mL)). Repeat 3 times.

DAY 10

The spore stock was then enumerated using the spread plate technique on Tryptic soy agar.

DAY 11

Count CFU per plate

The concentration of the stock was found to be 1×10^{11} spores/mL.

Autoclave Testing

The stock was diluted in sterile bottles containing 99 mL of sterile water. Eight serial dilutions were performed. The bottle containing the 7th dilution was used to make 8 bottles of the 8th stock dilution. The actual spore titer on this dilution was confirmed by filter counting on the day of testing and was found to be 1×10^{11} spores/mL.

Six dilution bottles were autoclaved. Two dilution bottles were placed in the front, two in the middle and two in the back positions on the bottom rack of the autoclave.

The autoclave was run for 45 minutes at 121°C. Immediately after autoclaving, the test samples were cooled, filtered and then incubated for 24 hours at 37°C.

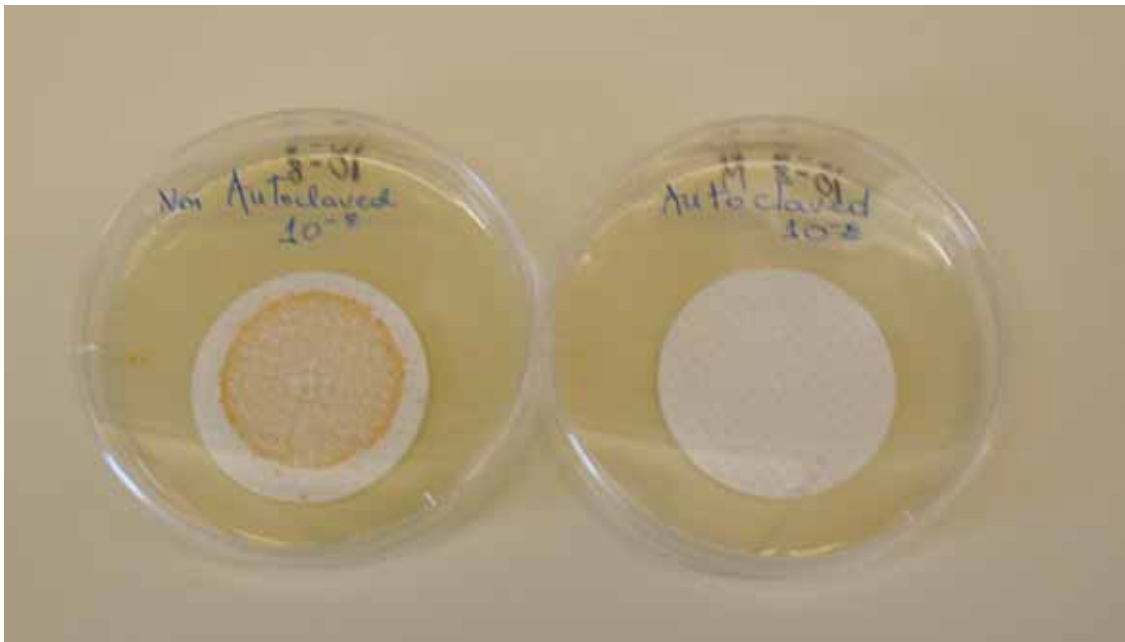
Controls

A spore containing, non-autoclaved, filtered sample was the positive control. The negative control was a filtered sample of sterile water.

Passing/Failing

According to the instructions provided by D. Gillum, if a reduction of less than 4 log 10 is achieved by the autoclave, then the autoclave test fails and it may no longer be used to disinfect infectious waste. If a reduction of more than 4 log 10 takes place, then the autoclave test passes.

On the left hand side picture the reader can see a side by side comparison of the non-autoclaved and autoclaved samples tested in the Gregg Hall Room 237 autoclave. The autoclave provided more than a 4 log 10 reduction as no spore colonies were detected in the filters. It can be observed that the Gregg Hall Room 237 autoclave provided a removal of more than 11 log 10 of spores.



Conclusions

Based on the above experimental procedure it can be concluded that the Gregg Hall Room 237 autoclave exceeded the removal requirements of more than 4 log 10 reduction of *Bacillus atrophaeus* (formerly *Bacillus subtilis* var. *Niger*) spores, recommended by D. Gillum and thus can be used to disinfect infectious waste.

For more information on the method used to test this autoclave please contact:

Vasiliki Partinoudi
Project Director
Water Treatment Technology Assistance Center
University of New Hampshire
Gregg Hall
Room 342
35 Colovos Road
Durham NH 03824
tel: (603) 862-1412 fax: (603) 862-3957
vasiliki.partinoudi@unh.edu www.unh.edu/erg/wttac

OPERATION OF THE AUTOCLAVE

1. THERE ARE ONLY TWO REASONS TO PUSH THE ABORT BUTTON

- i) You accidentally put in compounds that should not be autoclaved
- ii) You have started to autoclave liquids on the hard or wrapped goods setting (see below)

What happens when you push abort?

- The autoclave must still go through a complete post-conditioning cycle (NO time is saved!)
- The Fault light will come on and the door may not open at the end of the post-conditioning
- The autoclave may not work for the next person

2. USE THE CORRECT CYCLE SETTING

Liquid cycle – for loads containing any liquid (this includes solidified agar which becomes liquid when heated); has a slow steam release cycle to prevent superheated liquids from boiling out of their containers

Suggested settings: Temp: 123°C Autoclave Time: 20 min (25minutes if autoclave is very full or if containers hold more than 1 liter of liquid)

Hard goods cycle – for loads containing dry items, like foil-wrapped forceps or empty glassware; has rapid steam release; items will be wet

Suggested settings: Temp: 123°C Autoclave Time: 20 min

Wrapped goods cycle – for loads containing dry items, like foil-wrapped filter paper or pipet tip boxes; contains a drying cycle so that items come out dry

Suggested settings: Temps: 123 °C Autoclave Time: 15 min Dry Time: 5-6 min

3. DO NOT OVERFILL CONTAINERS

Containers with liquid in them should not be more than $\frac{3}{4}$ full (i.e., 750 ml in 1 liter flask)

4. CONTAINERS WITH LIQUID MUST BE IN A NON-PERMEABLE TUB

Tubs of autoclavable plastic or metal are best. Tubs must be large enough to hold the liquid if all of the containers should break during autoclaving. It is very important that solutions do NOT go down the autoclave drain.

5. IF YOUR CONTAINERS EXPOLDE OR LEAK, YOU MUST CLEAN UP THE AUTOCLAVE IMMEDIATELY.

You may turn off the power to let the machine cool slightly before cleaning, but be sure to leave a note indicating that no one else should use the autoclave until you have cleaned it.

6. LEAVE THE DOOR OPEN WHEN YOU ARE FINISHED

Otherwise, the door gasket may get stuck to the door and then rip when the door is re-opened.

7. CLEAN THE AUTOCLAVE DURING YOUR LAB'S SCHEDULED TIME.

SEE YOUR LAB MANAGER IF YOU HAVE ANY QUESTIONS

IF PAPER OR RIBBON NEED TO BE CHANGED

IF YOU DON'T KNOW THE CLEANING PROCEDURE

State of New Hampshire – Infectious Waste Rules

PART Env-Sw 904 INFECTIOUS WASTE

Env-Sw 904.01 Applicability.

(a) The rules in this part shall apply to management of infectious waste and treated infectious waste which is not ash residue, from the point of origin to the point of final disposal, including the following:

- (1) Cultures and stocks of infectious agents and associated biologicals, including:
 - a. Cultures and stocks of infectious agents from research and industrial laboratories;
 - b. Wastes from the production of biologicals, discarded live and attenuated vaccines; and
 - c. Culture dishes and devices used to transfer, inoculate and mix cultures;
- (2) Pathological wastes, including tissues, organs, and body parts that were removed during surgery or autopsy;
- (3) Waste human blood and products of blood, including:
 - a. Serum, plasma and other blood components;
 - b. Containers contaminated with a. above which were used or intended for use in either patient care, testing and laboratory analysis or the development of pharmaceuticals; and
 - c. Items saturated or dripping with human blood or items that were saturated or dripping with human blood that are now caked with dried human blood or blood components;
- (4) Sharps that have been used in human or animal patient care or in medical, research, or industrial laboratories, including hypodermic needles, syringes, pasteur pipettes, broken glass and scalpel blades;
- (5) Contaminated animal carcasses, body parts, and bedding of animals that were exposed to infectious agents during research, production of biologicals, or testing of pharmaceuticals;
- (6) Wastes from human or animal patient care, surgery or autopsy that were in contact with infectious agents, including soiled dressings, sponges, drapes, lavage tubes, drainage sets, underpads, and surgical gloves;
- (7) Laboratory wastes from medical, pathological, pharmaceutical, or other research, commercial or industrial laboratories that were in contact with infectious agents, including slides and cover slips, disposable gloves, laboratory coats, and aprons;
- (8) Dialysis wastes that were in contact with the blood of patients undergoing hemodialysis, including contaminated disposable equipment and supplies such as tubing, filters, disposable sheets, towels, gloves, aprons, and laboratory coats;
- (9) Discarded medical equipment and parts that were in contact with infectious agents;
- (10) Biological waste and discarded materials contaminated with blood, excretion, exudates or secretion from humans or animals who are isolated to protect others from communicable diseases;
- (11) Any discarded preparations made from genetically altered living organisms and their products; and
- (12) Such other waste material that results from the administration of medical care to a patient whether human or animal by a health care provider and is found by the director in consultation with the division of public health services or state veterinarian to pose a threat to human health or the environment due to its infectious nature.

(b) The rules in this part shall not apply to the following types of waste:

- (1) Gloves, gowns, underpads or any other materials that come in contact with patients, but not saturated with blood, body fluids or secretions, through routine examination or patient care;
- (2) Animal carcasses not included in (a)(5) above; and
- (3) Household infectious waste, provided that:
 - a. Sharps shall be enclosed inside rigid, puncture-resistant containers;
 - b. Containers encasing sharps shall be sealed and labeled "not for recycling"; and
 - c. The waste shall be disposed at an authorized facility only.

Source. (See Revision Note at PART Heading for Env-Wm 101) #5172, eff 7-1-91; ss by #6535, INTERIM, eff 7-1-97, EXPIRES: 10-29-97; ss by #6619-B, eff 10-29-97; ss by #8459, eff 10-28-05 (formerly Env-Wm 2604.01)

Env-Sw 904.02 Collection, Storage and Transfer Requirements.

- (a) Collection, storage and transfer of infectious waste shall comply with the requirements of Env-Sw 400 and this section.
- (b) The waste shall be stored in a pre-designated location, protected from water, rain and wind.
- (c) Storage containers and packaging shall be labeled conspicuously in a legible manner with the words "infectious waste," or "biohazard waste," or with the universal biohazard symbol.
- (d) Waste stored at generator facilities shall be maintained in a nonputrescent state, using refrigeration when necessary.
- (e) Waste shall not be stored at room temperatures in excess of 72 hours.
- (f) Outdoor storage areas containing the waste, such as dumpsters, sheds, tractor trailers, or other storage areas, shall be locked to prevent unauthorized access.
- (g) Access to on-site storage areas shall be limited to authorized persons.
- (h) The waste shall be stored in a manner that shall provide protection from animals and shall not provide a breeding place or a food source for insects or rodents.
- (i) Storage containers and packaging shall be of sufficient structural integrity to ensure that the waste shall not be released to the environment during storage.
- (j) The contents of damaged or ruptured containers shall be re-packaged.
- (k) Infectious waste shall be transferred by the generator to authorized facilities only.
- (l) Facilities which receive infectious waste from off-site generators shall not store the waste in excess of 7 days from date of receipt.

Source. (See Revision Note at PART Heading for Env-Wm 101) #5172, eff 7-1-91; amd by #5297, eff 12-24-91; ss by #6535, INTERIM, eff 7-1-97, EXPIRES: 10-29-97; ss by #6619-B, eff 10-29-97; ss by #8459, eff 10-28-05 (formerly Env-Wm 2604.02)

Env-Sw 904.03 Processing and Treatment Requirements.

- (a) Except as noted in Env-Sw 904.08, the generator of infectious waste shall assure that the waste is treated at an authorized facility to achieve high-level disinfection plus a 4 log 10 reduction of *Bacillus subtilis* or *Bacillus stearothermophilus*.
- (b) Facilities that process or treat infectious waste in New Hampshire, including generator facilities, shall meet the requirements of (a) above in conformance with the requirements of Env-Sw 500 and the following:

(1) All infectious waste managed by the facility shall be collected and stored as specified in Env-Sw 904.02, pending treatment in accordance with (a) above;

(2) If the facility processes or treats infectious waste by methods other than incineration, the efficacy of the processing or treatment method shall be demonstrated by testing as specified in Env-Sw 904.07; and

(3) If the facility is an incinerator that treats the infectious waste by combustion, the facility shall meet the requirements of Env-Sw 700.

(c) Infectious waste treated under (a) above shall not be combined or mixed with other waste prior to disposal, unless authorized by the receiving disposal facility.

Source. (See Revision Note at PART Heading for Env-Wm 101) #5172, eff 7-1-91; amd by #5297, eff 12-24-91; ss by #6619-B, eff 10-29-97; ss by #8459, eff 10-28-05 (formerly Env-Wm 2604.03)

Env-Sw 904.04 Disposal Requirements.

(a) Infectious waste shall not be landfilled in New Hampshire unless treated to achieve the standard specified in Env-Sw 904.03(a).

(b) Treated infectious waste shall be disposed at authorized facilities only.

(c) Notification shall be given by the transporter to the receiving facility prior to the disposal of treated infectious waste.

(d) Liquid infectious waste may be disposed via a sanitary sewer, subject to the provisions of local sewer ordinances and regulations, only if the receiving wastewater treatment facility includes secondary treatment.

Source. (See Revision Note at PART Heading for Env-Wm 101) #5172, eff 7-1-91; ss by #6535, INTERIM, eff 7-1-97, EXPIRES: 10-29-97; ss by #6619-B, eff 10-29-97; ss by #8459, eff 10-28-05 (formerly Env-Wm 2604.04)

Env-Sw 904.05 Reuse Requirements and Limitations.

(a) Infectious waste shall not be reused or certified for distribution and use pursuant to Env-Sw 1500, except as provided in (b) below.

(b) Materials or equipment contaminated with infectious waste, for example surgical equipment, maintenance carts, bedding, waste containers and the like, may be salvaged and reused in-kind pursuant to Env-Sw 1503.04, subject to the following requirements:

(1) If reused within the generating facility, the materials and equipment shall be cleaned and disinfected prior to reuse to achieve the standards for disinfection prescribed by the facility's internal management protocol; and

(2) If sent off-site for reuse, the materials and equipment shall be cleaned and disinfected prior to leaving the generating facility to achieve at least the level of treatment specified in Env-Sw 904.03(a).

Source. (See Revision Note at PART Heading for Env-Wm 101) #5172, eff 7-1-91; ss by #6535, INTERIM, eff 7-1-97, EXPIRES: 10-29-97; ss by #6619-B, eff 10-29-97; ss by #8459, eff 10-28-05 (formerly Env-Wm 2604.05)

Env-Sw 904.06 Transportation, Packaging and Labeling Requirements.

(a) Infectious waste transported off-site for treatment prior to disposal shall be transported in conformance with the United States Department of Transportation hazardous materials regulations as provided in 49 CFR 171-180 or as specified in (b) below.

(b) The transportation of infectious waste not subject to 49 CFR 171-180 shall be subject to the following:

(1) Sharps as described in Env-Sw 904.01(a)(4) shall be segregated and encased inside rigid, puncture-resistant containers;

(2) Infectious waste and sharps containers shall be placed in a sealed nonpermeable 3 mil polyethylene bag or equivalent, which is itself placed in a second bag of similar construction and sealed; and

(3) The outermost container or package shall be labeled with the following:

a. Clear markings indicating the contents which shall include the words "Infectious waste," or "Biohazard waste" or the universal biohazard symbol; and

b. The name, address and telephone number of the generator and transporter.

(c) Transporters shall notify the receiving facility prior to delivering infectious waste to a New Hampshire landfill.

Source. (See Revision Note at PART Heading for Env-Wm 101) #5172, eff 7-1-91; ss by #6535, INTERIM, eff 7-1-97, EXPIRES: 10-29-97; ss by #6619-B, eff 10-29-97; ss by #8459, eff 10-28-05 (formerly Env-Wm 2604.06)

Env-Sw 904.07 Testing and Reporting Requirements.

Facilities, including generator facilities, which treat infectious waste by methods other than incineration shall be subject to the following:

(a) QA/QC efficacy testing shall be performed during initial facility operations to verify facility operating procedures meet the requirements of Env-Sw 904.03(a);

(b) Following verification as specified in (a) above, the facility shall perform QA/QC efficacy testing no less than 4 times yearly, to demonstrate compliance with Env-Sw 904.03(a); and

(c) The facility shall maintain the records of QA/QC efficacy testing for a minimum of 3 years.

Source. #6619-B, eff 10-29-97; ss by #8459, eff 10-28-05 (formerly Env-Wm 2604.07)

Env-Sw 904.08 Other Requirements.

Limbs and recognizable organs, excluding teeth and contiguous gum tissue, shall be disposed by incineration or interment.

Source. #6619-B, eff 10-29-97; ss by #8459, eff 10-28-05 (formerly Env-Wm 2604.08)