

JABSOM KAKA'AKO STANDARDIZED AUTOCLAVE PROTOCOL

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SIGN-UP SHEET/USER LOG

- It is **mandatory** for users to provide the following information on the sign-up sheet/user log while using the autoclave:
 - Your name (printed legibly; no initials)
 - Contact phone number (cubicle/lab or cell phone)
 - Principle Investigator's name
 - Start and End times
 - Cycle used (e.g. #1, #9, #10 - may vary depending on department's edits of cycle parameters)
- Usage is based on a "first come-first serve" basis per the sign-up sheet.
- "Blocking-off" or reserving time for more than one cycle is not permitted.
- Users with small individual loads may share autoclave cycles. Do not overcrowd the autoclave chamber, which can affect decontamination and proper functioning of the autoclave.

GENERAL PROCEDURE (Tuttnauer Model 5596 SP-1V)

1. **Turning Autoclave ON (Per JABSOM Facilities Management, the autoclaves should always remain ON)**
 - a. Flip green power switch from **STANDBY** to **ON**. Autoclave should turn on and computer screen will be visible.
 - b. If green power switch is already **ON** but computer screen is **BLANK**, press and hold power button (circle with line in it on the upper right corner of keypad) until it "beeps," computer screen will become visible. Autoclave is now on.
2. **Setting up for a RUN**
 - a. There are generally 3 programmed cycles for standard use (unless otherwise stated on the autoclave and these may vary depending on if departments have changed cycle parameters):
 - i. Cycle 1: 15 min sterilization, 10 min dry: **Sterilizing dry articles** such as clean glassware, tips, tubes, surgical instruments
 - ii. Cycle 9: 60 min sterilization, slow exhaust: **Decontamination Cycle** (Approximately 2 hrs long)
 - iii. Cycle 10: 15 min sterilization, slow exhaust: **Sterilizing Liquids**

Do not mix contaminated and clean items together during the same autoclave cycle. Clean items generally require shorter sterilization times while a bag of infectious waste typically requires a longer decontamination time to render all contents non-infectious. Use autoclave tape with each load as an indicator that proper temperature was reached and check the print out after each load to ensure the correct cycle parameters and that the temperature was maintained for the specified time.

- b. **For Waste Decontamination and Liquid Cycles, an autoclavable secondary container must be used to catch any leakage or spillage.**
- c. Place all articles to be sterilized into the CART. DO NOT place anything directly onto the chamber floor.
 - i. Do not overcrowd the cart; keep all items within the confines of the rack. An overpacked autoclave chamber does not allow efficient steam distribution. Considerably longer sterilization times may be required to achieve decontamination if an autoclave is tightly packed.
 - ii. Biohazard waste bags must be opened to allow for steam to escape; do not seal openings tightly (i.e. don't "goose-neck" or tie bags closed). It may also be necessary to add a cup of water to the waste for steam generation.
 - iii. **Never seal a liquid container with a cork or stopper. This could cause an explosion inside the autoclave.**
 - iv. Do not overfill an autoclave bag. Steam and heat cannot penetrate as easily to the interior of a densely packed autoclaved bag, so the innermost areas may not get decontaminated.
 - v. Use caution when handling an infectious waste autoclave bag, in case sharp objects were inadvertently placed in the bag. Never lift a bag from the bottom to load it into the chamber. Handle the bag from the top.
- d. Select cycle by using the arrow keys to SCROLL UP or DOWN to the desired cycle.
- e. Press **CLOSE** button, door closes by moving UP.
- f. Wait for **READY** signal on screen and for the compressor to stop working (that is the LOUD noise you will hear during this step; this condition may vary between units). Check that the Chamber Pressure is near 20 PSI.
- g. Press **START**; RUN LIGHT should show and the cycle will begin.

3. End of Cycle

- a. Cycle is complete when the **READY** and **OPEN** indicators are displayed. Press **OPEN** and allow the door to completely open and vent before removing items. **Avoid burn and hot steam hazards; use heat resistant gloves, safety glasses, and a lab coat when operating an autoclave and handling all items.** Pull the CART out onto the trolley and push cart to counter or to "decontaminated waste collection" area.
- b. Record your TIME OUT on the log sheet. **Leave the autoclave door OPEN.**
- c. After every third cycle, the gasket (red or brown rubber around door opening) should be sprayed with the provided silicon spray (spray available at the JABSOM stock room).
- d. ~~If you are the last to use the autoclave (after 4:30 pm), please POWER DOWN by turning the power button to **STAND-BY**. Per JABSOM Facilities Management, the autoclaves must remain ON at all times.~~

- e. For autoclaved, decontaminated solid waste, follow the guidelines below for proper disposal.

4. Problems or Questions

- a. If you need additional silicon spray, autoclave receipt paper rolls, or autoclave ink ribbon, visit the JABSOM stock room.
- b. For operational or mechanical issues, contact Raul Gomez (Facilities), gomezr@hawaii.edu, phone# 692-1880 and submit a Work Order Form.
- c. If there is uncontrollable flooding, contact security 692-1911 or 692-0911.
- d. Do not leave an autoclave operating unattended for a long period of time. Stay in the vicinity while running an autoclave cycle in case there is a problem.

QUALITY CONTROL & AUTOCLAVE PERMITS

- **Quality control tests (biological indicators) for autoclaves used for decontamination** will be conducted monthly by JABSOM EHSO. Tests will be coordinated with the primary users of the subject autoclave.
- The test results will be documented on a **LOG** posted near the autoclave; copies will also be on file with JABSOM EHSO. If “clean sterilization only” designated autoclaves are at any point used for decontamination of biohazardous waste, JABSOM EHSO must be contacted and quality control tests must be performed prior to disposal of any “decontaminated” waste.
- **Autoclave permits** are issued by the Hawaii Department of Labor Boiler and Elevator Branch. Copies of the permit are posted at or near each autoclave. Renewal Permits shall be coordinated by JABSOM Facilities and EHSO.

AUTOCLAVED WASTE DISPOSAL

OPTION 1: Required Packaging for autoclaved waste that will be collected by Custodial Staff.

- **NO LIQUIDS:** read the waste disposal guidelines for proper treatment and disposal of liquid biohazard waste.
- **NO METAL Sharps:** All metal sharps must be contained in puncture proof metal sharps collection containers; contact JABSOM EHSO.
- **EXCLUDED:** all waste from Vivarium, ABSL3, BSL3 facilities.

Properly Labeled

NON-HAZARDOUS WASTE
Date, Name, Phone #

May not exceed 20 pounds
May not exceed 2 ft x 2 ft x 2 ft

Anything larger must be placed into the trash compactor yourself.

Properly packaged; placed on the designated

For Autoclaved Solid Waste, including pipet tips, pipets, tubes, plates, gloves, absorbent materials, flasks, etc.:

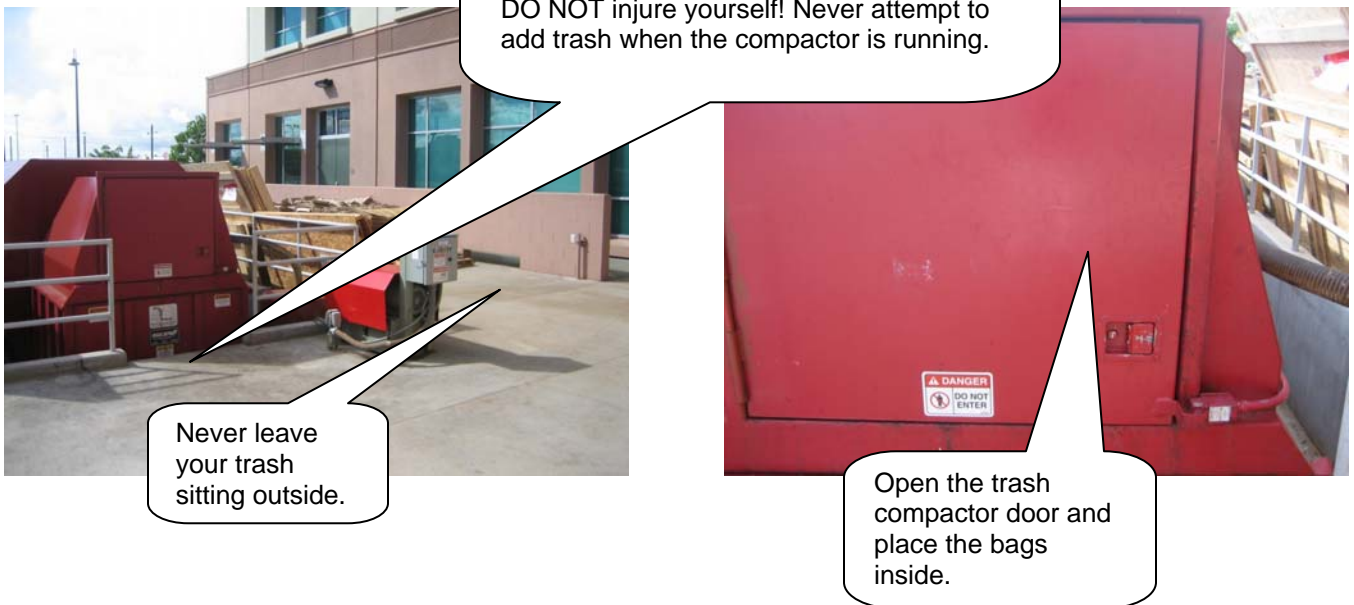
1. Waste must be properly decontaminated by autoclaving.
2. Waste must be allowed to cool to room temperature.
3. Be on the alert with handling pressurized containers or superheated liquids.
4. Ensure any agar media has been allowed to re-solidify.
5. Drain any liquids (liquefied agar must never enter the drain system).
6. Place the autoclave bag or any autoclaved containers (no metal) into heavy duty black trash bag(s) (available in the decontamination autoclave rooms), secure closed and ensure no leakage.
7. Place into a cardboard box, tape the box closed and label *NON-HAZARDOUS WASTE, Date, Responsible Person's Name and Phone Number*.
8. Place packaged autoclaved waste in designated areas ONLY:
 - IBR: outside of autoclave room, or outside of the labs with your trash cans
 - 204: on the designated cart outside of 204
 - 239A: on the designated cart outside of 240 (the dishwasher room)
 - 304: on the designated cart outside of 304
 - 334A: on the designated cart outside of 335 (the dishwasher room)
9. All leaks and spills shall be immediately cleaned up by the responsible individual; the custodial staff will not clean up any spills or leaks!!! Allow autoclave to cool before attempting to clean up a spill. If glass breaks in the autoclave, use tongs, forceps or other mechanical means to recover the fragments. Do not use bare or gloved hands to pick up broken glassware.
10. EHSO shall be notified of any improperly packaged waste, questionable waste, or leaking waste. If non-compliance becomes a problem, the custodial staff will be instructed to discontinue collection of autoclaved waste from your area and all those affected will have to place their autoclaved waste



OPTION 2: NOT BOXED & LABELED = NO CUSTODIAL PICK-UP

For all solid, non-metal sharps autoclaved waste that you choose not to box, you must take it to the trash compactor and place it inside yourself.

1. When the autoclaved waste has cooled to room temperature, place it into the heavy duty black trash bag(s), and place it into the trash compactor.
2. Do not allow your bags to leak any contents while transporting to the trash compactor. If there is a spill, immediately clean it up; do not leave any liquid on the floors as this will pose a slip hazard.
3. Do not leave any autoclaved waste sitting outside of the trash compactor; if the compactor is full, contact Security or Facilities.



NOTES

1. Tuttnauer Model 5596 SP-1V is the most commonly used autoclave in the BSB, therefore the protocol was tailored to this model.
2. All users must complete the required applicable safety trainings (contact JABSOM EHSO 692-1854). The entire Cancer Center Wing is cleared for **Radioisotope Activity**; any users of their autoclaves must have completed EHSO Annual Radiation Safety Training and have clearance to be in the wing.
3. In the event that a laboratory's primary autoclave is not operational the wastes to be autoclaved shall be autoclaved at the nearest secondary autoclave and transported in a closed-top, leak-proof, puncture-proof container. Communicate to all users that the autoclave is "not operational." Contact Facilities – Raul Gomez at 692-1880 – and submit a work order.

4. In the event that primary and secondary autoclaves are not operational, store biological wastes in a laboratory refrigerator, freezer, or cold room until the autoclaves are repaired. If this cannot be done, please call the JABSOM Biosafety Officer (692-1853) or JABSOM EHSO (692-1854) to authorize an alternative, including chemical treatment, as per your biohazardous wastes written contingency plan.
5. All biohazardous wastes must be transported in a leak-proof, puncture-proof, secondary container to autoclave rooms. If transport through common areas, such as the lobbies, is required, waste must be transported in a closed-top, leak-proof, puncture-proof secondary container. (Exterior surfaces of secondary container must be decontaminated before and after transport). Gloves or dirty hands shall not be used to handle common areas such as door handles and elevators.
6. All autoclave bags must be red or clear Polypropylene (PP) bags. Bags must be slightly opened during autoclaving, they must not be sealed.
7. **Comply with the Kaka'ako BSB Waste Disposal Guidelines.** (See link at <http://www.hawaii.edu/ehso/jabsom/reference.htm>)
8. Biological items containing solvents, volatile or corrosive chemicals (phenol, trichloroacetic acid, chloroform, etc), chlorinated compounds (HCL, bleach), chemotherapeutic agents, or any radioactive materials must not be autoclaved; autoclaving of chemical-biological waste at 120 to 130 °C may result in the volatilization or release of the chemical constituent; autoclaving waste containing flammable liquids may result in a fire or explosion. Contact JABSOM EHSO (692-1854) about proper treatment of these “mixed” wastes.

FREQUENTLY ASKED QUESTIONS

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 laboratories, healthcare centers and other places that require high-level disinfection.

How does an autoclave work?

An autoclave uses pressurized steam to decontaminate infectious waste. Decontamination autoclaves must operate at a temperature of 121°C, a pressure of 15 PSI, and a minimum cycle time of 60 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?

Follow manufacturer's instructions and the Kaka'ako BSB Standardized Autoclave Procedures for the Tuttnauer autoclaves built into the BSB. A Tuttnauer training video is available for viewing, contact JABSOM EHSO for more information.

What wastes can be autoclaved?

Follow the guidelines set forth in your USDA, CDC, and HDOA permits for the decontamination of your study's biohazardous waste. Refer to the Kaka'ako BSB Disposal Guidelines for more information.

The following are examples of infectious waste products which may be autoclaved and then disposed as decontaminated biohazardous waste into the regular trash or into the sanitary sewer (sink drains):

- Cultures and stocks of infectious agents
- Laboratory wastes that were exposed to infectious agents
- Human blood waste and human blood-products

- 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 waste cannot be autoclaved?

Types of waste that must not be autoclaved include cancer therapeutic drugs, toxic and volatile chemicals, radioisotopes, hazardous chemical waste or any other harmful material that can be vaporized and disseminated with heat. Do not autoclave flammable, reactive, corrosive, toxic or radioactive materials. Contact JABSOM EHSO for assistance with the proper treatment and disposal of preserved tissues or specimens, do not autoclave these items. Contact JABSOM EHSO for assistance with the proper treatment and disposal of animal tissues and body parts and human body parts or organs. When metal sharps are autoclaved, they must be submitted to JABSOM EHSO because metal sharps may never enter the regular trash.

Which autoclaves can be used?

There are two autoclaves designated for “clean” sterilization only and therefore may not be used to decontaminate waste, CRCH 240 & Trop. Med. 335.

The following autoclaves may be used for both decontamination and clean sterilization and have been validated by monthly quality control spore testing. Be sure that autoclave users have entry clearance and all required trainings/certifications.

- IBR/Anatomy 166 (restricted access)
- CMB 204
- CRCH 239A (designated radioisotope work wing/floor)
- SNRP II & Trop. Med. 304
- Trop. Med. 334A

How should I collect and dispose the waste?

Follow the guideline set forth in your permits or protocols.

In general, liquid infectious waste may be autoclaved or treated with hypochlorite solutions (by approved method) and disposed via the laboratory sink drain.

For solid infectious waste, follow the disposal procedures described in the Kaka'ako Waste Disposal Guidelines or contact JABSOM EHSO for more information.

Questions and Resources:

Contact the JABSOM Environmental Health & Safety Office with waste disposal questions.

<http://www.hawaii.edu/ehso/jabsom/>
692-1854; 692-1855; BSB 112