

BIOLOGICAL WASTE

What is biological waste?

Biological waste is any waste that is living or was once living that was used in research. This includes waste equipment and materials such as pipettes, needles, and glassware that is used in biological research.

What do you do with biological waste?

In Massachusetts, all biological research waste (noninfectious and infectious) must be deactivated by autoclaving or chemically treated before being disposed of as Municipal Solid Waste (MSW). Massachusetts currently prohibits medical sharps (needles, syringes, etc.) and research animal carcasses from entering the MSW stream. These items are removed by an outside contractor for incineration.



How do you deactivate biological waste?

There are several methods used to deactivate biological waste. The deactivation method depends on the waste characteristics as follows:

- Solid biological wastes are typically deactivated by autoclaving;
- Liquid wastes are deactivated either by autoclaving or chemical disinfection;
- Biologically contaminated sharps and animal carcasses, as well as human blood samples, are shipped off-site to be deactivated by incineration.

Autoclave

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. Therefore, we recommend that bags are opened for best steam penetration during the autoclave run. Other factors that influence treatment efficiency include: waste destiny, physical state, size, and organic content.

In order to ensure effective disinfection, autoclaves must be validated by spore testing quarterly and inspected yearly by a professional. Autoclave logs are required by the Massachusetts Department of Public Health and are available on the EH&S web site at: www.ehs.umass.edu. Please read the autoclave fact sheet also on the EH&S web site, for more information.

What can be autoclaved?

- Cultures and stocks of noninfectious and infectious biological waste;
- Human, animal, and plant cell lines;
- Discarded materials contaminated with biological materials;
- Preparations made from genetically altered living organisms and their products.

Chemical Deactivation

Liquid cultures and some solids may be deactivated by a chemical disinfectant such as chlorine or iodophor compounds. To chemically deactivate, the disinfectant is added to the liquid to the appropriate concentration. The concentration required will depend on the disinfectant and the amount of liquid waste (i.e., for bleach, the final concentration should be 10% volume by volume). Therefore, add one part Clorox bleach to nine parts liquid waste. Let sit for twenty minutes then pour down the drain. Please note that 10% bleach solutions must be prepared daily because it will begin to degrade within 24 hours.

Incineration

Animal carcasses, blood samples, and sharps (needles, syringes, scalpels, etc., which are collected in red puncture proof sharps containers) are packaged in double biohazard bags and placed in cardboard boxes for off-site incineration. Please contact EH&S for packaging materials, sharps containers, and waste pick-up requests via our web site (www.ehs.umass.edu), or by calling 545-2682.

How should I collect and dispose of waste after decontamination?

Liquid biological waste may be collected in containers for autoclaving or chemical disinfection. Autoclaved or chemically disinfected liquid biological wastes can be disposed via the laboratory drainage system. (Do not pour melted agar into sink. Allow it to cool and solidify for disposal as a solid waste.)

Solid biological waste procedures:

1. Collect the biological waste in clear, unlabeled, high strength polymer autoclave bags (imprinted with process indicator, if possible).
2. All biological waste bags should be held in secondary biohazard-labeled plastic containers with a lid.
3. Before autoclaving, remove all biohazard labels. Ensure that words like “pathogenic,” “infectious” or “biohazardous” have been removed from all autoclaved materials.
4. Autoclave and cool the waste.
5. Place the autoclave bag into a black polypropylene trash bag.
6. Put the bags into a second black polypropylene trash bag.
7. Ensure that the contents cannot puncture the black polypropylene trash bags.
8. Place the bags in an approved location/dumpster.



Questions?

Please contact EH&S Biosafety Program Head at: 545-2682, with questions about disposal of biological waste.