



If biological waste is infectious or causes odor problems, it must be disposed of as indicated in [Safety Instruction #29 Waste: Infectious](#).

Introduction

Autoclaves are common laboratory tools that must be properly used to be effective. They utilize moist heat in the form of saturated steam under pressure to destroy microbial life. This process, which is dependent on temperature, time, contact, and moisture to be effective, is the most reliable method of destroying biohazardous or infectious waste.

Successful Components of Sterilization

- **Temperature:** Recommended temperature is 121-123 degrees C (250-254 degrees F), and an operating pressure of 15 psi.
- **Time:** The time required for sterilization should be 30-40 minutes for small loads, 60 minutes or greater for large loads, after the proper temperature has been attained.
- **Contact:** Steam must contact all areas of the load. To safely decontaminate bagged waste, leave the bags closed and place them in secondary containment. Steam must contact all surfaces of the bag. The load must not exceed the capacity of the unit.
- **Moisture:** Steam saturation is essential for maximum heat transfer. Air pockets or inadequate steam supply will cause sterilization failure. Water can be added to the containers to add moisture.

Autoclave Sterilization and Safety Procedures

- Choose the appropriate exhaust setting:
 - **Slow Exhaust** for liquids
 - **Fast Exhaust** for non-liquids.
- Most people are aware that autoclaves contain live, pressurized steam. Burns can result if the autoclave door is not properly seated or if the autoclave is opened while there is still pressure in the chamber. If you are not sure how to prepare the autoclave, seek help before starting the run.
- Infectious or biohazardous waste must be transported from the laboratory to the autoclave in lidded, leak proof containers. Containers must be labeled to indicate the laboratory of origin, the agents present, and the fact that the material has not been autoclaved.
- Wear heat-resistant gloves and a lab coat when removing items from the autoclave.
- Never place any sealed container in an autoclave. Large bottles with narrow necks can simulate sealed containers if filled with too much liquid.
- Do not autoclave items containing more than traces of solvents, volatile or corrosive chemicals (phenol, trichloroacetic acid, ether, chloroform, etc.), or any radioactive materials. Call EH&S at 7-2273 if you have unusual decontamination or waste disposal needs.
- It takes longer for a few large volumes of liquid to be sterilized than if the liquid is divided into several smaller volumes.
- While most autoclaves have safety interlocks which prevent the door from opening while the temperature inside is greater than 80 degrees C, a puff of steam may still be ejected if the autoclave is opened immediately after the cycle. It is safest to wait until the load has cooled and to avoid standing directly in front of the door when opening when opening it after a run.
- When bottles containing liquid are removed too soon after autoclaving, the superheated liquid may boil over, splashing any personnel in the area with scalding media. This possibility is more likely as the amount of liquid in the container increases.
- If there is a possibility of the liquid leaking from bags, support them in shallow pans or trays. When autoclaving large vessels, leave the covers off and don't stack other items on top of them. Pipette cans should be loosely capped and dried in an oven after autoclaving, if necessary.
- The recording and/or indicating thermometer on the autoclave must be checked annually for calibration by a technician certified by the manufacturer.
- The autoclave must be on a preventive maintenance program that is performed annually by a technician certified by the manufacturer.

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