

Autoclave Safety

Autoclaves use pressurized steam to destroy microorganisms and are the most dependable systems available for the decontamination of laboratory bio-waste. By using pressurized steam, autoclaves present many hazards to workers and their environment. Utilize the following autoclave safety guidelines:

Preparation and Loading

- *Always* use polypropylene bags and containers in the autoclave.
- *Do not* tie, twist, or tape bags closed.
- *Always* put bags into pans to catch spills.
- Add ¼ to ½ inch of water to the tray so that bottles will heat evenly (*if using liquid cycle*).
- *Do not* autoclave items containing corrosives (e.g. acids, bases, phenol), solvents, volatiles (e.g. ethanol, chloroform), radioactive materials, or wax.
- *Always* check and clean the drain screen before loading.
- Fill liquid containers only half full.
- Loosen caps or use vented closures.
- Leave space between items to allow steam circulation.
- Make sure door of autoclave is fully closed (latched), but do not over-tighten. Over-tightening will cause handle knobs to crack.

Cycle Selection

- Use liquid cycle (slow exhaust) when autoclaving liquids to prevent contents from boiling over.
- Use fast exhaust for glassware. The fast exhaust reduces the time needed for the autoclave to return to atmospheric pressure.
- Use fast exhaust and dry cycle for wrapped and low moisture items. The negative pressure created during a dry cycle removes most condensation from plastic and glassware.

Time Selection

- Take into account the size of the articles to be autoclaved. A 2L flask containing 1L of liquid takes longer to sterilize than four 500mL flasks each containing 250mL of liquid.
- Materials with high insulating capacity (e.g. animal bedding, high sided polypropylene containers) increase the time needed for the load to reach sterilizing temperatures.
- In general:

Gravity Displacement Autoclaves*	121°C (250°F)	90 minutes
Vacuum Autoclaves	132°C (270°F)	45 minutes

*All autoclaves at VHS are considered Gravity Displacement Autoclaves.

Removing Load

- *Always* check to make sure chamber pressure is zero before opening the door.
- *Always* wear lab coat, eye protection, heat insulating (and cut resistant, if necessary) gloves and closed toe shoes.
- *Always* stand behind door when opening. Slowly open door only a crack. *Beware of rush of steam!*
- Before removing items from chamber, wait 5 minutes for loads containing only dry glassware and 10 minutes for autoclaved liquid loads.
- Allow non-liquid loads to stand 15 minutes and liquid loads to stand 60 minutes outside of autoclave before touching with ungloved hand.
- *Never* leave a load in the autoclave overnight.

Remember: MONTHLY SPORE TESTS!

- Test a load monthly with *Bacillus stearothermophilus* spores and record the result in the Autoclave Log.

Figure 1. Autoclave Schematic View

