



## AUTOCLAVE SAFETY POLICY

An autoclave is a commonly used piece of equipment in biomedical laboratories. Autoclaves pose many hazards including physical hazards (e.g. heat, steam and pressure) and biological hazards. This policy is intended to provide practical information that can be utilized by all researchers to safely operate the autoclaves at USC. Individual labs are encouraged to use this policy as a guide for training new personnel on the safe use of autoclaves.

Controls for different brands of autoclaves may have unique characteristics for loading, load sizes, and cycle types and settings. The type of materials you sterilize will determine the type of sterilization cycle you use. For this reason, it is important to review and understand the owner's manual before using any autoclave for the first time. Always ensure the owner's manual is readily available in case questions or concerns arise during operation.

### **General Autoclave Safety Practices:**

1. Before using the autoclave, check inside the autoclave for any items left by the previous user that could pose a hazard (e.g. sharps).
2. Clean the drain strainer before loading the autoclave.
3. Load the autoclave properly as per the manufacturer's recommendations.
4. Individual glassware pieces should be within a heat resistant plastic tray on a shelf or rack and never placed directly on the autoclave bottom or floor.
5. Make sure the door of the autoclave is fully closed (latched) and the correct cycle has been selected before starting the cycle.
6. When the cycle is complete, open the door slowly. Keep your head, face, and hands away from the opening.
7. Wear heat-resistant gloves when opening the autoclave door after a cycle. If there is a sharps hazard (e.g. biological waste), wear heat AND cut resistant gloves.
8. At a minimum, when removing items from an autoclave, a rubber apron, rubber sleeve protectors and heat-resistant gloves should be worn.
9. **Do not autoclave items containing corrosives, solvents or volatiles or radioactive materials.**

### **Additional Practices for Autoclaving Liquids:**

1. When running an autoclave cycle with liquids, the cycle time is longer, but uses lower temperatures to minimize evaporation of the liquids being sterilized.
2. **To prevent bottles from shattering during pressurization, the caps of containers with liquids must be loosened before loading.**
3. Use only borosilicate glass (Pyrex™ or Kimax™) which can withstand the high autoclave temperature.
4. Use a tray with a solid bottom and walls to contain the contents and catch spills.
5. Before removing autoclaved items, wait 10 minutes for autoclaved liquid loads.
6. Let liquids stand for a full hour before touching with ungloved hands. Be sure others in the area know a heat hazard is present.

### **Additional Practices for Autoclaving Dry Loads:**

1. Add 1/4 to 1/2 inch of water to the tray so the bottles will heat evenly.
2. Check plastic materials to ensure they are compatible with the autoclave.
3. Before removing autoclaved items, wait 5 minutes for loads containing only dry glassware.
4. For dry loads, let the glassware cool for 15 minutes before touching it with ungloved hands.

### **Autoclave Monitoring & Maintenance:**

Autoclave monitoring and maintenance is an important aspect of a properly functioning autoclave. Follow the manufacturer's recommendations for preventative maintenance and ensure all contractors are approved by the manufacturer. Autoclave operators should ensure that each autoclave is monitored as follows:

- **Heat Sensitive Tape Monitoring** – Operators should use heat-sensitive sterilization indicator tape for **each load** to indicate the load has undergone an effective steam sterilization process. This tape only indicates that the proper temperature has been reached, but does not indicate it was heated for the proper length of time. Additional monitoring is not required because all red bag infectious waste is picked up by EHS after autoclaving, and removed from campus by a contracted firm for incineration.

### **Recordkeeping:**

Operators should maintain documentation of any autoclave preventative maintenance or repairs. These records should indicate who performed the work, the type of maintenance or repairs conducted, and the date the autoclave was serviced. The records should be maintained either in the room with the autoclave, or signage should be posted indicating the location of any records that document autoclave maintenance or repairs.

### **Training:**

Each laboratory must develop and implement an autoclave safety training program. All users must be trained before operating an autoclave and the laboratory PI/supervisor is responsible for ensuring each person in the lab is appropriately trained. All training must be documented and records should be maintained in the lab with your other safety training certificates. The laboratory PI/supervisor is encouraged to use this policy as a guide for training new personnel.

### **Autoclave Failure:**

Discontinue use immediately if an autoclave is not working properly. Post a sign alerting others not to use the autoclave. Mechanical failure needs to be attended by a trained technician. Contact the service company responsible for maintenance of your autoclave or your department's safety representative for further guidance.

### **Burn Emergency:**

If you are burned, you should seek medical treatment as soon as possible. Burns to the face, third-degree burns, or burns over large areas of the body should be treated as emergencies. Minor burns should be treated by using first aid procedures. These procedures would include immersing the burn in cool water immediately, removing clothing from the burn area, and keeping the injured area cool for at least five minutes (preferably longer). Any burns to the face or eye or any burns that blister should be seen by a physician. Regardless of the degree of severity, report the burn to your lab supervisor or Principal Investigator as an occupational injury.