Autoclave

Standard Operating Procedure

Revision Date: 15 July 2020

This standard operating procedure (SOP) outlines the use of autoclaves. Review this document and supply the information required in order to make it specific to your laboratory. In accordance with this document, laboratories should use appropriate administrative controls and personal protective equipment when using autoclaves.

# Description [Provide additional information as it pertains to your research protocol]

Autoclaving is a process used to destroy microorganisms and decontaminate biohazardous waste and microbiological equipment used at Biosafety Level 1, 2, 3 and 4. Autoclaves use high pressure and high temperature steam for sterilization.

The potential safety risks for the operators include:

• Heat burns from hot materials and autoclave chamber walls and door.

• Steam burns from residual steam coming out from autoclave and materials on completion of cycle.

• Hot fluid scalds from boiling liquids and spillage in autoclave.

• Hand and arm injuries when closing the door.

• Body injury if there is an explosion.

# Work Practice Controls [Provide additional information as it pertains to your research protocol]

All personnel using the autoclave must be fully trained in its proper operation.

## Loading the Autoclave

* Wear lab coat, eye protection, heat-insulating gloves, and closed-toe shoes.
* Place material in autoclave. Do not mix incompatible materials.
* Do not overload; leave sufficient room for steam circulation. If necessary, place the container on its side to maximize steam penetration and avoid entrapment of air.
* Close and latch door firmly.

## Operating Autoclave

* Close and lock door.
* Choose appropriate cycle (e.g., gravity, liquid, or dry cycle) for the material. Consult the autoclave manual for assistance in choosing a cycle. The manuals for operation of the autoclave should be located near the autoclave.
* Set appropriate time and temperature if you are using a customized cycle.
* Start your cycle and fill out the autoclave user log with your contact information. A completed cycle usually takes between 1-1.5 hours, depending on type of cycle.
* Do not attempt to open the door while autoclave is operating.
* If problems with your autoclave are perceived, abort cycle and report it to your PI immediately.

## Unloading Autoclave

* Wear heat-insulating gloves, eye protection, lab coat, and closed-toe shoes.
* Ensure that the cycle has completed and both temperature and pressure have returned to a safe range.
* Wearing Personal Protective Equipment (PPE), stand back from the door as a precaution and carefully open door no more than 1 inch. This will release residual steam and allow pressure within liquids and containers to normalize.
* Allow the autoclaved load to stand for 10 minutes in the chamber. This will allow steam to clear and trapped air to escape from hot liquids, reducing risk to operator.
* Do not agitate containers of super-heated liquids or remove caps before unloading.
* Wearing heat-insulated gloves remove items from the autoclave and place them in an area which clearly indicates the items are ‘hot’ until the items cool to room temperature.
* Shut autoclave door.

## Autoclave Use Log

* Entries must be placed in the log book each time the autoclave is used. These records are used for maintenance/service schedules and reporting of incidents, accidents and/or faults.
* Entries should include: operator's name, phone number, date, time and duration.
* The log book must be kept adjacent to the autoclave.
* An Autoclave Use Log example is provided in this document.

# Alarms or Monitors

If the autoclave alarm sounds or it does not operate as expected, do not attempt to fix the problem. Attempt to stop the cycle and equipment turned off. Notify PI immediately and place OUT OF ORDER sign on unit until problem is resolved.

# Standards

* The face velocity, which is the air moving into the fume hood entrance or access opening, should be 100 fpm for standard fume hoods.
* No other types of exhaust can be connected to the fume hood exhaust system without a proper engineering assessment by Plant.
* Use of perchloric acid requires a special fume hood. For more information, contact EHS at (254) 710-2900.

# Maintenance

Only qualified professionals are permitted to make repairs. Autoclave repairs and maintenance are performed by your service contract or any other contractor you choose to hire. No person shall operate the autoclave unless the autoclave is in good repair and has passed a sterilization validation test prior to use for decontamination of biohazardous waste.

# Protective Equipment [Provide additional information as it pertains to your research protocol]

Appropriate personal protective equipment (PPE) must be worn. Lab coats must be buttoned. Gloves should be pulled over the wrists of the coat, not worn inside the coat. Additional PPE to be used as recommended.

# Autoclave Validation

All autoclaves must have monthly or quarterly sterilization validation tests run to ensure that the autoclave is meeting minimal sterilization requirements for disposal of biological waste. See the Autoclave Biological Indicator Quality Control Checklist on the EHS Biosafety website.

# Exposures/Unintended Contact [Provide additional information as it pertains to your research protocol]

If the employee is in need of emergency medical attention, call x2222 immediately.

Contact EHS for advice on symptoms of chemical exposure, or assistance in performing an exposure assessment.

Report all work related accidents, injuries, illnesses or exposures to Work Connections within 24 hours by completing and submitting the Incident Report form.

# Spill Procedure [Provide additional information as it pertains to your research protocol]

* Spills may occur from a boil-over or breakage of containers.
* No operation of the autoclave is allowed until the spill is cleaned up.
* The operator is responsible for clean-up of spills. Contain the spilled material using paper towels. Use your laboratory’s spill kit if necessary. Wait until the autoclave and materials have cooled to room temperature before attempting clean-up.
* Review the Safety Data Sheet if appropriate, to determine appropriate PPE, spill cleanup and disposal protocols that are necessary.
* Dispose of the waste following the protocol appropriate for the material (e.g., red biohazard bag). If materials have been intermingled, follow the clean-up and disposal protocol for the most hazardous component of the mixture.
* Cracked glassware must be disposed of properly.
* Record the spill and clean-up procedure in the autoclave log book.

# Emergency Reporting

Report all emergencies, suspicious activity, injuries, spills, and fires to Baylor University Police (BPD) by calling 254-710-2222.

# Training of Personnel

All personnel are required to complete the ***Autoclave Training*** available through BioRAFT. Furthermore, all personnel shall read and fully adhere to this SOP when using a fume hood.

# Certification

I have read and understand the above SOP. I agree to contact my Lab Director if I plan to modify this procedure.

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### Major Revisions (Tracking purposes only -- Do not print as part of SOP)

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| Date | Revision |
| 15 Jul 2020 | Autoclave SOP Template Created |
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