Wake Forest University Health Sciences

Standard Operating Procedure (SOP)							
Title: WFUHS ENVIRONMENTAL HEALTH & SAFETY   STANDARD OPERATING PROCEDURE FOR THE   GENERAL AUTOCLAVE USE IN TREATING BIOWASTE							
Approved by: Mayuum David A. Brown, Director, EH&S	<i>Effective Date: March 1, 2002 Revised Date: February 2006 Review Date: February 2007</i>	<i>SOP #</i> BIO-001					

# PURPOSE

The purpose of this document is to provide standard operating procedures for common use autoclaves. Autoclaving is a process used to destroy microorganisms and decontaminate microbiological and Biosafety Level 1, 2, 3 and 4 isolation infectious biowaste.

# SCOPE AND APPLICATION

Environmental Health and Safety (EH&S) manages the use of common autoclaves within WFUHS. EH&S will maintain a list of competent users.

#### EQUIPMENT

> Common use Autoclaves are located as listed below:

Туре	
Steris Model 3041	Hanes 3068
Steris Model 3021	Hanes 5070
Steris Model 3041	M-level NRC

# **REQUIRED SUPPLIES**

- Orange polypropylene Autoclave bag, Fisher Scientific Catalog Number, 01-814 \* several sizes of bags are available.
- > Stainless steel pans or autoclavable polypropylene trays.
- Thermal Chart Recording Paper Steris # 129-359-008 Chart recording paper rolls for sterilizer product. (Provided by EH&S)
- Steris Verify # 810110 Integrator Chemical Integrator Strips for Steam or 3M Steam Integrator, # 1243A. (Provided by EH&S)
- Steris Verify Self-Contained Biological Indicators, #S3060 or 3M Biological Attest Indicator, cat# 1261. (Provided by EH&S)
- > 3M Biological Rapid Ready Enzymatic, # 2482. (Provided by EH&S)
- Strat-Line Autoclave Tape, Fisher #11-889, several sizes and packaging available
- Personal Protective Equipment
  - Nitrile Gloves
  - Heat resistant gloves
  - Eye Protection (Safety Goggles, glasses)
  - Lab coat

# SAFETY AND HEALTH

- 1. Physical Hazards
  - Needle Sticks

# Burns

• caused by contact with the outside of autoclave.

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- caused by contact when removing autoclaved items.
- caused by contact with pressurized steam.

Warning! Burn Hazards

Clogged lines, equipment malfunction or a failure in the steam supply may cause the autoclave chamber to fill with scalding water. If water leaks from front of the autoclave, DO NOT open the chamber door. Burns from scalding water may otherwise result.

2. Health Hazards

Potential exposure to infectious agents through either airborne, droplet or contact transmission.

#### Special Notes:

- When processing liquids, use only flasks and self-venting automatic sealing stoppers recommended by the manufacturer. This will help to prevent sealed bottles from exploding and liquids in glass containers from rupturing.
- Waste that contains bleach may harm an autoclave.

# PREPARATION, LOADING AND UNLOADING

Preparation for Daily Operation

- 1. Check to determine if paper is in the chart recorder.
- 2. Replace the recorder chart paper if necessary. Send recorded chart paper to the EHS Office.
- 3. Weekly, check the drain screen at the bottom of the chamber and clean if blocked. If the sieve is blocked with debris, a layer of air may form at the bottom of the autoclave, preventing efficient operation. EHS Personnel will perform the weekly check. See *Appendix 1* for the Weekly Inspection Log.
- 4. With each biowaste load, the sterilizer will be evaluated for effectiveness under full loading using the 3M Steam Integrator, # 1243A by the user. If a 3M steam integrator does not indicate sterilization has not occurred, call EH&S at 716-9375.
- If sterilizing biowaste containing <u>select agents</u> as defined by CDC, use a 3M steam integrator, a 3M Biological Rapid Read Enzymatic Indicator # 2482 and a 3M Biological Attest Indicator, # 1261.
- 5. For verification of the "failed" 3M steam integrator, a 3M Biological Rapid Read Enzymatic Indicator # 2482 will be evaluated on the next biowaste load.
- 6. Monthly, the EHS Personnel will verify the effectiveness of the sterilization using the 3M Biological Attest Indicator, # 1261. The results will be recorded on the Weekly Inspection Log.
- **Note:** EHS Personnel will keep the chart paper, the Weekly Inspection Log, and Autoclave Use List on file for 3 years.

#### Lab Preparation of Autoclave Waste

- 1. Wear a lab coat, eye protection, nitrile gloves and closed toe shoes.
- Using a Polypropylene bag(s), Fisher Scientific Catalog Number, 01-814 \*, place biowaste into bag. (Do not put sharp or pointed contaminated objects into an autoclave bag. Place them in an appropriate rigid sharp disposal container.)
- 3. Gather the top of the biowaste bag loosely and secure with a twist tie that comes with autoclave bag, a large rubber band or autoclave tape. (Leave autoclave bags loosely secured to allow steam to penetrate them.

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- 4. Use caution when handling an infectious waste autoclave bag in case sharp objects were inadvertently placed in the bag.
- 5. Transport the biowaste, using a cart, to the autoclave room.
- **Note:** Never lift a bag from the bottom to load it into the chamber. Handle the bag from the top.
  - > Do not overfill an autoclave bag.
  - > Do not overload an autoclave.
  - Fill liquid containers only half full
  - Loosen cap or use vented closures.

#### LOADING - Autoclave Room

- 1. Complete the AUTOCLAVE USE LIST (Appendix 2).
- 2. Place biowaste bag(s) in a stainless steel or polypropylene container.
- 3. Attach the provided chemical sterilization indicator on the outside of each autoclave bag using a stapler.
- 4. Open autoclave chamber door by turning the chamber wheel door counter clockwise.
- 5. Place biowaste and pan into autoclave.
- 6. Lock chamber door by turning chamber door wheel clockwise.

**Note:** DO NOT leave an operating autoclave unattended for longer than 45 minutes.

Cycle, Temperature and Time Selection

1. Select cycle 3 - at 250°F or 121°C.

# UNLOADING

- 1. Wear a lab coat, eye protection, heat resistant gloves and closed toe shoes.
- 2. Once the cycle is completed, the LED Indicator will indicate CYCLE COMPLETE.
- 3. Standing behind the door on the hinge side, open the door one inch.
- 4. After 10 minutes, the autoclave will beep indicating that it is safe to remove the container.
- 5. Securely close biowaste bag with twist tie that comes with autoclave bag or tie bag into a knot in order to reduce odors and prevent spills.
- 6. Place biowaste bag into Containers (barrels) marked "Autoclave Waste Only". Please be sure to replace the lid on the containers to minimize odor and prevent possible spillage.
- 7. Daily, WFUSM Environmental Services will empty these containers.
- **Note:** Autoclaved waste should not be brought back to your laboratory or stored in the hallways. Please use the waste containers (barrels) provided in each autoclave room. Environmental Services will not pick up waste from the hallways.

# MALFUNCTION, MECHANICAL PROBLEMS and EMERGENCY PROCEDURES

<u>MALFUNCTION</u> (Warning or Caution Indicator Lights)

"Warning and Caution Codes" information is posted near the autoclaves in the event the digital display (located on the front of the autoclave) indicates a malfunction.

MECHANICAL PROBLEMS and MAINTENANCE

Any mechanical problems/failures should notify EH&S (716-9375) of the problem. EH&S will notify the approved vendor for service. *EMERGENCY PROCEDURES* 

In the event of an employee injury during regular working hours, go to Employee Health on the Ground Floor of Meads Hall. After hours, you will Issued March 2002

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need to go to the NCBH Emergency Department located on the sub-basement of Ardmore Tower. Call 6-9111 for immediate emergency assistance.

#### SPILLS

If there is a spill inside the autoclave chamber, allow the unit to cool before attempting to clean up the spill. If glass breaks in the autoclave, use tongs, forceps or other mechanical means to recover fragments. Do not use bare or gloved hands to pick up broken glassware.

If a spill occurs in the autoclave room, please contact WFUSM Environmental Services at extension 6-4417.

#### REFERENCES

<u>Autoclave Use List</u> <u>BioWaste Management Program</u> <u>BioSafety Manual</u> <u>CDC Biosafety in Microbiological and Biomedical Laboratories</u>, 4<sup>th</sup> Edition

# APPENDIX 1 Environmental Health and Safety Internal Weekly Inspection Log

Check for the following:

- > Thermal paper supply
- Chemical indicators supply
- Biological indicators supply
- > Make sure the drain screen at the bottom of the chamber is clean

Date	Name and Signature of Inspector	Comments

# AUTOCLAVE USE LIST

DATE	TIME	CYCLE	PHONE EXTENSION	BIOWASTE (YES/NO)	NUMBER OF BAGS – IF BIOWASTE	CHEMICAL INDICATOR (If Biowaste – Accept or Reject)	PRINT YOUR NAME AND LABORATORY NAMES (NO INITIALS)

# AUTOCLAVE SAFETY BASICS

- Never autoclave nitrocellulose tubes they can explode!
- Carefully prepare items for autoclaving. Loosely cover or cap containers to avoid over-pressurization.
- Keeps loads small overloading hinders steam penetration.
- Bags should be open and should be contained within the stainless steel tray.
- Open door about one inch and allow ten minutes to let the load cool before removing tray.
- If you experience any problems or unusual occurrences, please report them to Environmental Health and Safety, 716-9375.