

Spotlight On Safety

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Effective Use of Autoclaves

Steam sterilization of materials is a dependable procedure for the destruction of all forms of microbial life. They are common lab tools that must be properly used to be effective. The following are guidelines for the effective use of steam sterilizers (autoclaves) for the decontamination of cultures and other potentially biohazardous materials.

Three Basic Autoclave Cycles

- Gravity or “Fast Exhaust” cycle - For dry goods, glassware, etc.
- Liquid or “Slow exhaust” cycle - Used to prevent sterilized liquids from boiling
- Pre-Vacuum cycle - For porous materials, animal bedding, etc. (not available on all machines)

Autoclave Training & Operation

- A logbook to record autoclave use must be maintained and available for inspection
- Materials should be carried to the autoclave in leak proof containers (**Primary** containers are red autoclave bags in a variety of sizes; **Secondary** containers are polypropylene plastic or stainless steel tubs commonly used to contain material during autoclaving)
- Always use secondary containers, polypropylene or stainless steel tubs to eliminate the damage to the machines
- Use chemical, tape, and/or biological indicators to validate the decontamination process (contact EHS for biological indicators)
- Processing time starts after the autoclave reaches normal operating conditions of 121°C (250°F) and 15 psi pressure
- Allow materials to cool for 10 minutes before removing them from the autoclave
- **Never** place sealed containers in an autoclave - large bottles with narrow necks can simulate sealed containers if filled with too much liquid
- **Don't** autoclave items containing solvents, volatile or corrosive chemicals (phenol, trichloroacetic acid, ether, chloroform, etc.) or any radioactive materials
- Always follow written procedures - dry materials usually need additional 20 minutes for drying (time can be increased for enclosed items such as pipette tips or bottles with lids)
- Average liquid sterilization times vary (add an additional 10-20 minutes for crowded items):
 - <500 ml = 30 min, 500 ml - 1 L = 40 min, 2 L - 4L = 55 minutes, 4L = 1 hour
- Polypropylene and polycarbonate can be autoclaved, but polyethylene and high density polyethylene cannot - look for initials imprinted on bottom of containers (PP=polypropylene, PC=polycarbonate, PE=polyethylene, HDPE=high density polyethylene); place container into an autoclave safe container the first time you autoclave if you are unsure about it
- To prevent bottle bottoms from breaking, place them in a tub with 1-2 inches of water

Visit www.ehs.ucr.edu for additional information or call EH&S at 827-5528 if you have any questions.