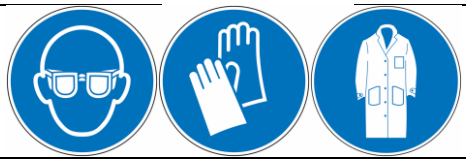
| | |
|---|---|
| **Potential Risks:** |   |
| **Personal protective equipment required:** |  |
| **Required training:** | WHMIS Training<br>Laboratory safety training<br>Biosafety training |
| **Reference:** | Canadian Biosafety Handbook, 2016, Government of Canada. |

⚠ **Caution: Never decontaminate biological waste that has been in contact with volatile or toxic chemicals, or radioactive materials in the autoclave. If this is the case, contact Hazardous Materials Management.**

## Step 1: Before loading the autoclave

1. Ensure the autoclave is in good condition.
2. Ensure that all materials used (bags, racks, containers and glassware) are suitable for autoclaving. Some bags prevent steam penetration, and others may melt during the cycle.
3. Ensure that the waste is suitable for autoclaving.

⚠ **Materials allowed: petri dishes, tubes, pipettes, pipette tips, gloves, paper towels, culture medium, stable non-volatile biological substances.**

Photo #1
Solid material allowed

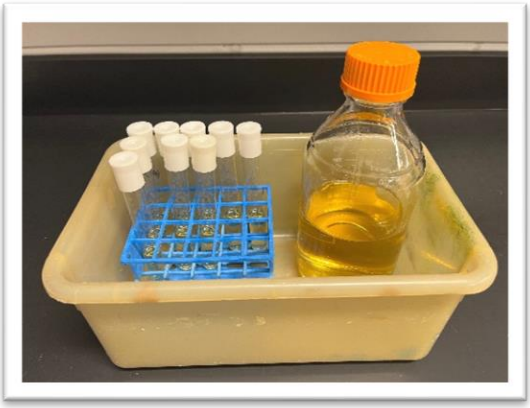


Photo #2
Liquid material allowed

## Step 2: Preparation of solid material

**Preparation of solid material**

1. Place material in an autoclavable biomedical waste bag.
2. Fill to ¾ of the bag.
3. Do not seal autoclave bags tightly to allow steam to pass.
4. Place the bag in a secondary container (autoclavable plastic tub) to prevent spills (photo #3).

Photo #3

## Step 3: Preparation of the liquid material

1. Place the small tubes containing liquid on a rack and then into the autoclavable plastic tray.
2. Place the glassware containing liquid directly into the autoclavable plastic tray (Photo #4).
3. Loosen the caps to prevent the container from bursting under pressure.

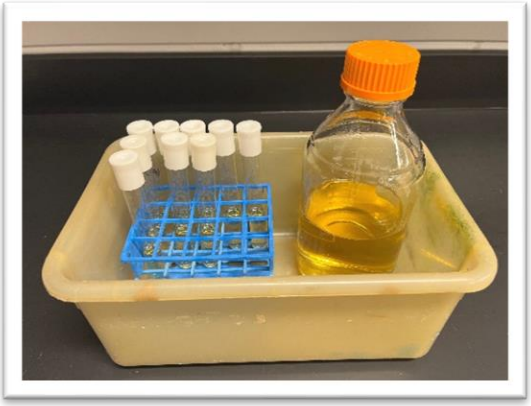


Photo #4

4. Make sure that the liquid never exceeds 2/3 of the container (photo #5).

Photo #5

## Step 4: Loading the autoclave

1. Load the materials into the autoclave according to the manufacturer's recommendations (photo #6).
2. Arrange the containers so that the steam can circulate freely around them.
3. Avoid letting the material touch the walls or top of the chamber.
4. Avoid overloading the autoclave to allow steam to circulate.
5. Close the autoclave door (photo #7).
6. Check that the autoclave door is closed and locked, and that the correct cycle has been selected.
7. Start the waste decontamination cycle.

⚠ **Caution: Do not forget to follow the manufacturer's recommendations specific to your autoclave (Examples: addition of distilled water, choice of a cycle according to solid waste vs. liquid waste).**

Photo #6

Photo #7

## Step 5: Unloading the autoclave

1. Put on personal protective equipment: safety glasses, long heat-resistant gloves and lab coat.
2. Always remember that the enclosure can be scorching.
3. Check that the pressure inside the autoclave has returned to zero by checking the pressure gauge (photo #8).
4. Open the door of the autoclave by standing on the side so as not to be exposed to its steam.


Photo #8

5. Unload the material from the autoclave (photo #9).
6. When the material is cool, remove or alter the biohazard symbol on the bag.
7. Weigh the bag and complete the decontamination log (Annex 1).

Photo #9

## Disposal of biological waste

Autoclaved bags must be placed in a regular black garbage bag.

⚠ **Caution: If the garbage bag is clear, a DECONTAMINATED MATERIAL label must be affixed to the bag.**

## Quality control

Verification of the effectiveness of the decontamination process should be performed periodically to ensure that the equipment is functioning properly and that the material is being decontaminated effectively before disposal. This verification should be done on a regular basis. The frequency of verification may vary depending on the use of the autoclave, ranging from weekly to monthly, and can be determined in collaboration with the Biosafety Advisor. Verification should be done using a biological indicator which is a standardized number of bacterial spores used to prove that the sterilization conditions of the load are adequate.

### Verification of the autoclave cycle

1. Place a biological indicator (photo #1) in the center of the material to be decontaminated (photo #2).
2. Leave another biological indicator outside the autoclave (photo #3).
3. Perform a decontamination cycle as usual, as described above.
4. At the end of the decontamination cycle, recover the biological indicator.
5. Incubate the two biological indicators according to the manufacturer's recommendations (photo #4).
6. After the incubation period, check the proliferation in the indicator and the expected results (see photo #5).
7. Complete the autoclave quality control log (Annex 2).

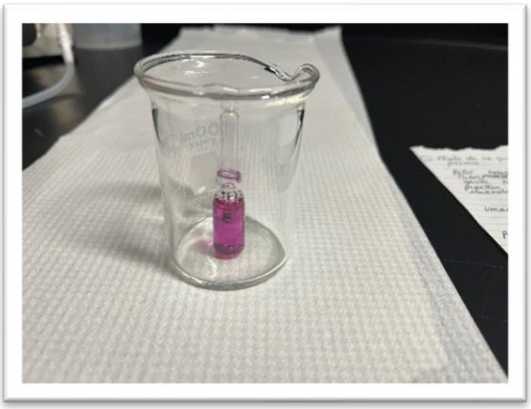


Photo #1

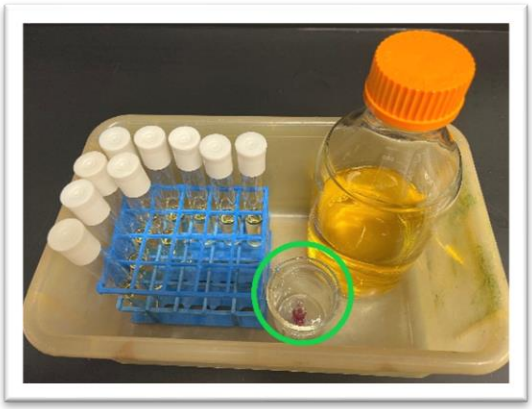


Photo #2


Photo #3


Photo #4

### Expected results

| Treatment of the indicator | Autoclaved | Non-autoclaved |
|---|---|---|
| Control | - | + |
| Proliferation | - | + |
| Color of the indicator | Pink | Yellow |

⚠ **CAUTION:** This is an example made with the MERCK kit. The exact colors and procedures may differ from company to company.

**If the results do not match:**

1. Check the expiration date of the indicators and the cycle used and repeat the test a second time.
2. If the results still do not correspond to the expected results, do not use the autoclave anymore, put a sign on the autoclave (do not use) and place a service call for repair.

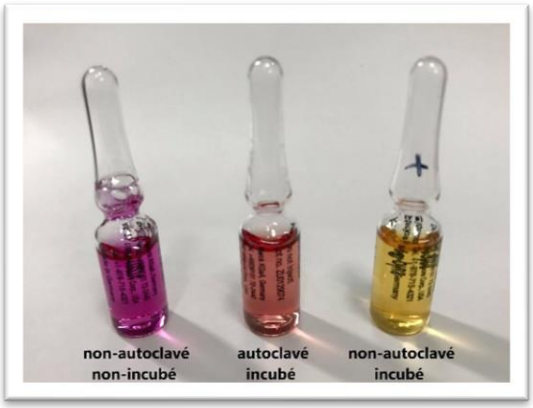



Photo #5

## History of changes and approvals

| Created by: | Marie-Eve Ducharme | Date | 2023/01/19 YYYY/MM/DD |
|---|---|---|---|
| Date of change | Description of the change | | |
| / / YYYY/MM/DD | | Prepared by: | |
| | | Validated by: | |
| | | Approved by: | |
| / / YYYY/MM/DD | | Prepared by: | |
| | | Validated by: | |
| | | Approved by: | |
| / / YYYY/MM/DD | | Prepared by: | |
| | | Validated by: | |
| | | Approved by: | |

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# ANNEX I

## REGISTER OF AUTOCLAVE DECONTAMINATION OF BIOMEDICAL WASTE

**AUTOCLAVE:**

CYCLE: _____ TEMPERATURE: _____ DURATION: _____

RESPONSIBLE FOR THE EQUIPMENT: _____ ROOM: _____

| DATE | USER | WEIGHT OF WASTE (KG) |
|---|---|---|
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Turn in records to the Biological Safety Officer at the end of each year.

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# ANNEX II

## QUALITY CONTROL OF THE AUTOCLAVE (BIOLOGICAL INDICATOR)

**BIOLOGICAL INDICATOR:**

MANUFACTURER: _____ LOT NO.: _____ EXPIRATION: _____

**AUTOCLAVE:**

CYCLE: _____ TEMPERATURE: _____ DURATION: _____

RESPONSIBLE FOR THE EQUIPMENT: _____ ROOM: _____

| DATE | INCUBATION TIME OF THE INDICATOR | RESULTS | | |
|---|---|---|---|---|
| | | POSITIVE CONTROL (NON-AUTOCLAVED) | NEGATIVE CONTROL (AUTOCLAVED) | USER |
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