

UNIVERSITY OF TOLEDO

SUBJECT: DECONTAMINATION OF BSL3 EQUIPMENT AND FACILITIES Procedure No: HM-08-012

POLICY

The BSL3 equipment, facility, duct work, and filtration devices may require maintenance and certification and shall be properly decontaminated prior to work.

PURPOSE

To protect employees of the University of Toledo and contractors servicing this equipment, students, employees, and visitors benefiting from the proper operation of the BSL3 laboratory.

IMPORTANT

- Always obtain the approval of the Environmental Health and Radiation Safety Department (EHRS) prior to servicing or removing equipment in the BSL3 laboratory.
- Always inspect any HEPA filtered devices for label indicating that the piece of equipment has been certified within the last year before using.
- If an outside company is to be retained for the certification of UT HEPA's filtration devices then a record of this certification must be forwarded to EHRS.
- It is recommended that staff and students discontinue their activities in adjacent work areas until the decontamination is complete. Additionally, precautionary signage indicating the following should be posted while the decontamination is in process:

**DANGER
DECONTAMINATION IN PROCESS
AUTHORIZED PERSONNEL ONLY**

MATERIALS/EQUIPMENT FOR DECONTAMINATION OF BSL3 EQUIPMENT

1. An EHRS representative, or qualified outside vendor (Materials will be supplied by vendor if their services have been retained. Request for quote and Site Survey will be completed for project). The RO will approve all decontamination procedures prior to commencement.
2. Decontamination equipment (ie: Formaldehyde generating devices, hydrogen peroxide generating devices, or other approved methodologies).
3. Roll of 6 mil (polyethylene) plastic sheet and duct tape.
4. Smoke tubes or aerosol generating device.
5. Lock out/tag out device.
6. Personal protective equipment including but not limited to: tyvek suit or other suitable barrier gown, disposable gloves, respirator, head cover (bonnet), shoe covers, eye protection.
7. Paraformaldehyde (flake)/ammonium carbonate, hydrogen peroxide, or other decontamination chemicals.
8. Source of humidity to create >60% RH level
9. Hygrometer and thermometer

PROCEDURE

1. Obtain permission of EHRS/RO.
2. Don appropriate PPE for protection against the hazards present, and turn off electrically powered devices and de-energize.
3. Place appropriate spore testing indicator inside of containment
4. Seal (with plastic) and/or close all entry and exit openings to the room, exhaust system, and/or device.
5. Find or create three ½" access holes to device to be decontaminated.
6. Check humidity level and temperature within space to be decontaminated.
7. Determine total volume of space to be decontaminated.
8. Measure out appropriate amount of Paraformaldehyde/sodium carbonate, or hydrogen peroxide, and place in decontamination generator.
9. Determine appropriate contact time for the agent/material that is to be treated.

DECONTAMINATION GENERATOR OPERATION

1. Place rear of decontamination generator as close to the insertion point as possible.
2. Connect exhaust and supply hose from decontamination generator to access openings to the space. It is recommended that the exhaust from the generator be as short as possible and the return tube be long. Make sure hoses are replaced periodically and are not plugged.
3. Place decontamination chemicals in generator.
4. Set required "Contact Time" on the timer.
5. Plug the electrical cord of the decontamination generator into a power supply.
6. Turn "Power" switch to the "ON" position.
7. Push the "Start" button. This activates the blower, the heater, the solenoid, and the control timer.
8. After the desired decontamination cycle, the blower, heater, and solenoid valve will automatically be de-activated.
9. At the end of the "Contact Time", if necessary, a neutralization cycle will be initiated.
10. At the end of the neutralization cycle and contact time, turn the power switch to "OFF"
11. At the end of the cycle the following need to be noted, and for laboratory safety, recorded on a permanent record.
 - Date and Time.
 - Equipment (space)
 - Amount of decontamination chemical used
 - The contact time as recorded on the timer
 - The spore strip lot number

DECONTAMINATION OF BSL3 EQUIPMENT AND FACILITIES

After completion of the decontamination cycles it is now safe to check the spore strip/test for effectiveness of the decontamination cycle. If all indications are that the space has been decontaminated, work may resume to normal operation after notification by RO

INSPECTION OF HEPA FILTERS, PREFILTERS AND GASKETS

If determination is made by the RO that filters/housing require inspection, the following procedure will be utilized with the appropriate PPE and bag in/out procedures. HEPA filter housing, under normal circumstances, will be decontaminated prior to opening.

1. Open the HEPA filter housing. Remove filters to a safe location for inspection being careful not to damage the cubes.
2. All gaskets and seals are to be inspected for integrity and damage.
3. The past filter cavity should be inspected for dust and noticeable streaming of dust that would indicate by-passing of the HEPA filter.
4. If filter is in good condition and the pressure drop across it has not been significant (>25%) the filter can be reinstalled.
5. The HEPA filter cube or cubes should be carefully placed back into the housing to assure that the cubes and seals remain undamaged. Gaskets should be lubricated with appropriate lubricant prior to reinsertion.
6. The HEPA filter should be properly seated and tightly secured into its proper position.
7. Special attention should be paid to the air flow directional arrow to be sure the cube is not placed in backwards.
8. Prefilters should be removed and discarded to appropriate waste stream and new suitable pre-filters inserted into the housing.
9. The HEPA filter housing should now be inspected to ensure that the door seals and hinges are functioning properly.
10. The HEPA filter housing should now be securely closed and sealed completely.
11. A challenge (filter scan) to the HEPA filter efficiency should be performed to assure that the units exhaust cleaning system is functioning properly.

CERTIFICATION

Once the HEPA filter exhaust system has passed the necessary challenges a certification label with the date, and name of certifier shall be placed on the unit. The exhaust unit is now recertified and placed back into service.

DECONTAMINATION OF BLS3 EXHAUST SYSTEM

The decontamination of the BSL3 exhaust system will be completed by using a hydrogen peroxide solution supplied by an outside vendor. The scope of the project consists of all duct work from any sealed damper located in the mezzanine of the Health Education Building to the roof of the building including the HEPA filter housing to its final downstream isolation damper.

1. The animals will be euthanized and the housing units will be decontaminated, if required, within the space.
2. The "B" system supply will be shutdown followed by the shutdown of the BSL3 exhaust fan soon afterward.

DECONTAMINATION OF BSL3 EQUIPMENT AND FACILITIES

3. A neutral condition will be assured through the observation of the magnahelic outside of the BSL3 Lab and on the HEPA filter housing.
4. EHRS personnel will enter the mezzanine and close the isolation dampers leading to the large central exhaust stack.
5. EHRS will close down all of supply dampers leading into the BSL3 laboratory so that the "B" system supply can be restarted.
6. EHRS will also close the isolation damper on the downstream side of the HEPA filter housing.
7. (Optional) EHRS will remove the HEPA filters and prefilters into their respective Bag-in Bag-out systems and seal them tightly for later disposal.
10. The decontamination contractor will attached Hydrogen peroxide generator to the desired inlet port, to evenly distribute decontaminating agent throughout the system.
11. Suitable biological indicators will be placed with the duct work where possible for later retrieval.
12. The hydrogen peroxide will be generated and released into the duct work and allowed to remain per the contractors recommendation.
13. The biological indicators will be removed and incubated for 24 hours to confirm a kill.
14. (Optional) If the decontamination is successful the duct work will be released to any additional maintenance contractors for completion of scheduled work.
15. Once the work is completed, the exhaust fan will be turned back on followed by the supply air isolation dampers in the mezzanine.
14. The system will be rebalanced at this time.

Source: EHRS

Effective Date: 05/16/14

Review/Revision Date: