

University of Nebraska Medical Center  
 Biosafety Policies and Procedures

<b>TITLE:</b>	<b>IBC14- Paraformaldehyde Room and Biological Safety Cabinet Decontamination</b>
<b>OVERVIEW:</b>	Formaldehyde decontamination and neutralization/exhausting for a laboratory containment area or for a biological safety cabinet is periodically conducted on an “as necessary” basis to provide a sterile, germ-free environment for access purposes.
<b>APPLIES TO:</b>	Any decontamination process using paraformaldehyde.
<b>DEFINITIONS:</b>	Not applicable
<b>PROCEDURES:</b>	<p>Paraformaldehyde decontamination is performed by BalCon Air and Water Balancing, Omaha, NE through a contract with UNMC.</p> <p>Decontamination procedures are arranged by contacting the Coordinator of Special Projects at 559-4100.</p> <p>A room or large area decontamination also requires contacting the Safety Office and Biosafety Officer prior to initiation.</p> <p>BalCon uses a paraformaldehyde decontamination and ammonia neutralization procedure (BalCon procedures, “Formaldehyde and decontamination and neutralization or exhausting procedures for rooms and other large areas” and “Formaldehyde decontamination and neutralization or exhausting procedures of biological safety cabinets”).</p> <p><i>Decontamination procedure:</i></p> <ol style="list-style-type: none"> <li>1. Supervisor(s) of the area affected is notified that paraformaldehyde decontamination will be performed at least 2 weeks in advance if scheduled or as soon as possible if not anticipated.</li> <li>2. Decontamination is scheduled with the facility operator to allow time to notify facility and equipment users.</li> <li>3. MSDS for paraformaldehyde and ammonia are provided to the supervisor and a briefing of pending issues concerning this process will be given by safety personal to affected individuals.</li> <li>4. The facility supervisor will insure that personnel are aware of the decontamination and restrict all access to the area during the process.</li> <li>5. Prior to release of the paraformaldehyde the area and equipment are sealed.</li> <li>6. Warning signs of the decontamination process along with copies of the MSDS are placed on all doors leading to the affected area.</li> <li>7. The general process will involve boiling of water to reach the desired humidity, heating of a pre-measured volume of paraformaldehyde powder, and monitoring of the area to detect leaks</li> </ol>

# University of Nebraska Medical Center

## Biosafety Policies and Procedures

	<p>that may occur during release of the paraformaldehyde gas.</p> <p>8. The decontamination site is left sealed for at least a 4 hour exposure to the paraformaldehyde.</p> <p><i>Neutralization and exhausting procedure</i></p> <ol style="list-style-type: none"> <li>1. Ammonia powder is heated for the depolymerization process.</li> <li>2. Monitoring of the neutralization process is conducted to detect leaks.</li> <li>3. The neutralization process occurs for at least one hour exposure after which time a dosimeter reading is performed.</li> <li>4. Personnel may re-enter the area once the meter reading according to protocol indicates neutralization of the paraformaldehyde and levels are safe for reentry.</li> </ol>
<p><b>RECORD KEEPING:</b></p>	<p>BalCon and the office of the Coordinator of Special Projects will maintain a record of areas undergoing decontamination and the processing results.</p>
<p><b>OTHER INFORMATION:</b></p>	<p>The decontamination procedure provides a high-level of disinfection for rooms and biological safety cabinets while maintaining maximum protection for personnel.</p> <p>Rooms must be sealed to prevent exposure to personnel. Areas containing false ceilings require plastic lining before the decontamination process can occur.</p> <p>Any maintenance work occurring in areas where biological agent exposure may occur require decontamination prior to this maintenance or repair work being done (e.g., replacement of HEPA filter).</p> <p>Monitoring of the paraformaldehyde levels outside the decontamination area is the responsibility of BalCon personnel.</p> <p>Industry standards in the U.S. do not require biological monitoring of the decontamination process since the concentration of paraformaldehyde within the decontamination site is over 2x the kill rate when using standardized protocols, an exposure that is adequate to kill bacterial spores.</p> <p>If requested, biological monitoring within a room or a biosafety cabinet may be done by the placement of spore strips containing an ~10E6 concentration of <i>Bacillus atrophaeus</i> spores (catalogue #1-6100, Raven Biological Labs) within various areas of the decontamination site or by swab cultures. A 7-day incubation of the strips is required per manufacturer instructions before a site is determined to have</p>

# University of Nebraska Medical Center

## Biosafety Policies and Procedures

	undergone successful decontamination.
<b>REFERENCES:</b>	Refer to procedures as outlined in the BalCon protocols for more detailed information.

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Biosafety Policies and Procedures

**Risk Assessment for the Use of Paraformaldehyde  
During Decontamination**

**Process:**

Paraformaldehyde decontamination will be done only in areas that have been properly sealed and during off hours when other employees are not present.

**Risk to Personnel:**

The procedure as outlined provides minimal hazard to laboratory and testing personnel.