

BioSide Lines

October 2000

The Newsletter of the UW Office of Biological Safety

Ultraviolet Lights in Biosafety Cabinets

There are benefits and risks associated with the use of ultraviolet radiation for germicidal purposes in a biological safety cabinet (BSC). The following information is based on a recent evaluation prepared on behalf of the American Biological Safety Association.

The wavelengths of ultraviolet light below 280 nm cause chemical reactions and therefore have germicidal action. In addition to germicidal action, exposure to light in this region can cause erythema, harming skin and eyes. The permissible exposure threshold may be reached in less than a minute for hand level exposures at the cabinet face. **Personnel should not work in a BSC when UV lights are on.**

Additional chemical reactivity of UV light damages rubber materials and glues used in construction of the BSC, gradually compromising the function of the cabinet.

The efficacy of UV light for disinfection is influenced by a number of factors:

Poor penetration - Microorganisms not directly bathed in the light will not be affected.

Relative humidity - The germicidal effect drops off above 70% R.H.

Temperature - Optimum output of the germicidal wavelengths is at bulb temperature of 77-80°F.

Cleanliness - Dust and dirt can block the germicidal effectiveness of the lights.

Age - The intensity of the UV light emitted decreases with age of the bulb.

Ultraviolet lights require regular cleaning, maintenance, and monitoring to ensure germicidal activity. The efficacy of the UV bulb typically is tested during the cabinet certification process. It can cost more than \$100 to replace one of these bulbs. To extend the life of the bulb, and because there is no germicidal benefit gained from its extended use, it should be turned off after 15 minutes.

There is broad-based agreement that UV lights are not required nor recommended in BSCs. The risks simply outweigh the benefits.

Selection of Respiratory Protection

Fundamental to personal protective equipment for work with an aerosol transmitted pathogen is respiratory protection, often vaguely referred to as a "mask". Many different types of respiratory equipment are available. There is considerable variation in the type and degree of protection provided.

Different masks are designed to protect against exposure to microorganisms, human blood and tissues (bloodborne pathogens), chemical vapors, or dust. The common surgical mask is intended more to protect the patient than the person wearing it. Protection against microorganisms is afforded only by a "filtered facepiece," a mask that offers high efficiency particulate filtration. Carefully consider the manufacturer's recommended uses and match the use to your activity.

Equally important to the filtering ability is the degree of air leakage around the edges of the mask. Factors influencing fit include eyeglasses and facial hair. Movements of the head, such as breathing and talking, may create a "bellows effect," allowing particles to be sucked around the edges to the inside of the facepiece. Therefore, the protection provided by a particular respirator will vary greatly from person to person. Fit testing is a service provided by the Safety Department. For more information on respirator selection and fit testing, call Carla Alvarado ((3-2177) or Bill Deppen (2-9179).

Reference (available upon request by calling 3-9026): Kournikakis et al. 2000. Comparison of protection factors for selected medical, industrial and military masks. JABSA 5(1):12-18.

FAQ

When will my biosafety protocol be approved? Protocol registrations are processed monthly in conjunction with the Institutional Biosafety Committee meeting, which is tentatively scheduled for the first Wednesday of every month. Therefore, you can expect to receive the registration form by the second week of the month. They've been known to get lost in campus mail, so don't hesitate to call the Office (3-2037) if it fails to arrive in a timely fashion.

Training: Shipping Infectious Substances and Other Biological Materials

The Office of Biological safety will provide training and certification for shipping infectious substances and other biological materials, with a focus on safety and regulatory compliance for research laboratories. The U. S. Department of Transportation requires that persons involved in shipping hazardous materials in commerce be trained and certified in proper handling of these materials.

Tuesday October 17, 2000
Union South
1:00 to 3:00 p.m.
Refreshments will be served.

Registration is required. Contact Jan Klein at 3-9026 or jklein@fpm.wisc.edu.

Biosafety Cabinet Certification

Contributed by Rick Johnson (2-1809), Environmental Health Program – University Health Services

The service rates for certification testing and repair of biological safety cabinets (BSCs) and clean air devices (CADs) are based on the average costs of providing these services. Every two years the rates are reviewed and adjusted as necessary to reflect increases or decreases in labor, equipment and materials. The rates are also reviewed by UW-Madison Internal Audit to insure they accurately represent the costs of providing services. The following service rates will be effective through June 2002:

BSC Certification	\$170.00
CAD Certification	\$140.00
Formaldehyde Gas Decontamination	\$175.00
HEPA Filter Change (<u>not</u> including price of filter)	\$125.00
Repairs and Miscellaneous Services	\$ 40.00/hr