



Ultraviolet Lamps in Biosafety Cabinets

By Meagan Parrott

When determining how to decontaminate the workspace of your biosafety cabinet (BSC), it may seem like flipping a switch to turn on the ultraviolet (UV) lamp is the easiest and most effective method. But when it comes down to the details of effectiveness, upkeep, and hazards, the UV lamp is not the best choice.

In 2006, the American Biological Safety Association (ABSA) published a position paper on the "Use of Ultraviolet Lights in Biological Safety Cabinets" in the *Journal of Applied Biosafety*. They found that there are five factors that limit the effectiveness of the UV light as a germicide in BSCs:

1. In the BSC's dynamic air stream, UV light is non-penetrating. Thus, microorganisms beneath dust particles are not affected by the UV light.
2. Humidity adversely affects the effectiveness of UV, especially above 70% relative humidity.
3. Optimum temperature for output is 77-80°F and moving air tends to cool the lamp below its optimum operating temperature.
4. Dust and dirt present on the bulb can block the germicidal effectiveness of UV lights.
5. The amount of germicidal wavelength light emitted from UV bulbs decreases with age.



The CDC and NIH published *Biosafety in Microbiological and Biomedical Laboratories, 5th Edition* (BMBL) does not recommend the installation or use of UV lamps in BSCs. Their primary reason being that in order for the lamp to be used as an effective germicide, it must be cleaned weekly to remove any dust or dirt and checked weekly with a UV meter to ensure that the appropriate intensity of light is being emitted.

In ABSA's same position paper, they described the additional hazards that UV bulbs introduce into the laboratory environment. Exposure to UV light can lead to the development of skin cancer or burned corneas. For that reason, UV lamps must be turned off when the room is occupied and if the cabinet has a sliding sash, the sash should be closed when the lamp is on.

So, the next time your UV light burns out and you go to replace the bulb, consider not replacing it at all. Most BSC manufacturers are no longer placing UV lamps in their BSC's especially since the National Sanitation Foundation (NSF) Standard 49 no longer recommends them. Spraying and wiping disinfectant solutions on your work surfaces may be the safest and most effective choice.

References:

Burgener, J. (2006). *Position Paper on the Use of Ultraviolet Lights in Biological Safety Cabinets*. *Applied Biosafety*, 11 (4), 228-330. Available at www.absa.org/abj/abj/061104burgener.pdf.

NSF International Standard, American National Standard: NSF/ANSI 49-2010A: *Class II (Laminar Flow) Biohazard Cabinetry*. The NSF Joint Committee on Biohazard Cabinetry. U.S. Department of Health and Human Services, Public Health Services, CDC and NIH. (2009). *Biosafety in Microbiological and Biomedical Laboratories, 5th Edition*, Washington, DC: U.S. Government Printing Office. Available at <http://www.cdc.gov/biosafety/publications/bmbl5/>.

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Training

Most of EHSO's Trainings are available online in Blackboard.

www.ehso.emory.edu for registration information.

Radiation Safety Training

2nd Tuesdays at 9:00 am

Shipping Training

August 17th (12:00p.m-4:00pm)

Laboratory Safety Training

3rd Thursdays at 10:00 am

Eye Wash Testing

Someone in your lab should test the eyewash station once a month.

Bio-safety Cabinets/Chemical Fume Hoods Certification required annually.

Chemical/Radioactive Waste

Pick-up Schedule:

Monday Pick-up

RRC

Whitehead

1462 Clifton Road

School of Public Health

Tuesday Pick-up

Math & Science

Tuesday & Friday Pick-up

Atwood and Emerson

Wednesday Pick-up

Emory Children's Center

Clinic Building A & B

Winship Cancer Institute

Yerkes Main Station

Thursday Pick-up

Woodruff Memorial Research

Building

EUH (Clifton)

Friday Pick-up

All others on Atlanta campus

All **chemical** waste pick up should be requested by emailing

chemwaste@emory.edu

All **radioactive** waste pick up should be requested via EHS Assist pick-up.

Chemical waste disposal inventory form and/or **radioactive** waste inventory form should accompany all waste containers at the time of pick-up.

