

**SUNY GENESEO  
ENVIRONMENTAL HEALTH & SAFETY**

<b>Ultraviolet Light Safety Plan</b>	<b>Reviewed by: Chuck Reyes, Environmental Health and Safety Director</b>
<b>Revision No.: 2</b>	<b>Prepared by: Frank Blasioli, EHS Specialist</b>
<b>Date: October 17, 2023</b>	<b>Page 1 of 4</b>

**I. BACKGROUND**

Ultraviolet (UV) light (or rays) is a type of electromagnetic non-ionizing radiation that is outside the visible spectrum of light and can only be detected by specialized instrumentation. UV light is used in tanning booths, welding arcs, black-lights, germicidal lamps and water and air purification equipment. The sun emits UV light and causing summer tans, however too much exposure causes burns or potentially more severe injuries. UV light can be harmful to people depending upon the duration of exposure and wavelength. Over-exposure to UV light may include erythema, corneal injuries, photokeratitis, cataracts, conjunctivitis, and skin cancer. UV light is broken down into three categories as shown below:

<b>Band</b>	<b>Wavelength</b>	<b>Hazard</b>
UV-A	315-400nm	Cataracts, skin cancer, retinal burns
UV-B	280-315nm	Lens cataracts, skin cancer, corneal injuries, erythema, photokeratitis
UV-C (the type SUNY Geneseo has)	100-280nm	Skin cancer, corneal injuries, erythema, photokeratitis

The Occupational Safety and Health Administration (OSHA) has no regulatory limits for UV light; however, the ACGIH (American Conference of Governmental Industrial Hygienists) has established threshold limit values (TLVs) for UV-C at 253.7 nm: 6,000 microwatts/centimeter squared in an 8 hr day.

Environmental Health and Safety has provided and will continue to provide assistance in measuring UV emissions and evaluating personal protective equipment for its UV protection.

**II. SCOPE**

This document defines the UV emitting devices on campus, the potential hazards to and protection from UV light sources and the outlines the responsibilities and practices to protect staff and contractors from the deleterious effects of UV light during routine maintenance activities.

**III. DEFINITIONS**

**Cataracts:** a condition that causes the lens of the eye to become cloudy.

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**Conjunctivitis** (pink eye): an inflammation of the transparent membrane that lines the eyelid and eyeball.

**Corneal injuries:** exposure-related injuries to the cornea include burns from chemical, thermal, and radiation sources.

**Electromagnetic Spectrum:** the range of all types of radiation including radio waves, microwaves, infrared, visible light, UV light, x-rays and gamma rays.

**Erythema:** reddening of the skin, similar to sunburn.

**Non-Ionizing Radiation:** is a series of energy waves composed of oscillating electric and magnetic fields travelling at the speed of light- considered low energy radiation.

**Photokeratitis:** Is a painful eye condition that is similar to sunburn except it affects the eyes and not skin. It has been described as having sand in the eyes. It may be caused by exposure to UV light from air cleaners, welding (“flash burn”) or sun glare from water, snow and ice or looking at the sun too long.

**Skin cancer:** the abnormal growth of skin cells.

**Upper Room:** the area of a room, near the ceiling, that contains a wall mounted air purifier located directly across from or above the air purifier which would receive direct waves of radiation. Wall mounted air purifiers are required to be mounted at least 7 feet off the floor.

#### **IV. RESPONSIBILITIES**

**Employees** have a responsibility to follow the UV Light Safety Plan and power down UV containing equipment prior to any activity which is in proximity to UV light (known as the “upper room”) or providing maintenance on equipment containing UV light.

**Supervisors** shall ensure that employees are aware of UV hazards in the area in which they work and that they follow the proper lock out tag out procedures prior to performing maintenance on UV containing equipment or equipment in proximity to the UV hazard.

**EHS** shall be responsible to update this plan, assist with Personal Protective Equipment (PPE) selection and perform periodic training to affected employees.

#### **V. UV PRODUCING DEVICES/PROCEDURES**

It is not expected that any personnel will be exposed to harmful UV rays because standard lockout/tagout (LOTO) procedures will be followed prior to maintenance. If for some reason LOTO is not possible, personnel could be exposed to harmful amounts and wavelengths of UV must take adequate steps to shield themselves and in some cases limit the duration of exposure.

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1. HVAC return air UV air purifiers by UVR Resources:

**Purpose:** The return air units are used to reduce the risk of airborne disease transmission by reducing the amount of air contaminants.

**General locations:** air handling units found in mechanical rooms in large lecture halls, dining halls, athletic buildings and the townhouses at Saratoga.

**Personal Protective Equipment:** Expected maintenance is annual bulb change out. Some units are interlocked whereby if a door is opened on the HVAC unit, the UV light will power down. Units that are not interlocked, maintenance personnel will need to de-energize units prior to maintenance. There may be an occasion where it may be necessary to override the interlock or enter a unit with UV powered up to see if they are working properly. In that case, UV resistant eye and face protection, long sleeves, pants, and gloves must be worn. No gap should exist between the shirt sleeves and the gloves.

2. Biosafety Cabinets (BSC), UV-C Germicidal Lamps

**Purpose:** Germicidal lamps are used for disinfecting the interior surfaces of a biosafety cabinet prior to and after use.

**General locations:** These lamps are found within the biosafety cabinets, above the work surface, at various locations within the Integrated Science Center.

**Personal Protective Equipment:** No PPE is needed if the door to the cabinet is closed which provides adequate protection to users. If users will be working in the BSC while the UV lamp is operating, personal protective equipment must be worn. The personal protective equipment must protect the eyes and skin. Appropriate PPE would consist of protective clothing, UV rated eye and face protection, and gloves:

**Protective clothing**

- Wear long sleeves, fully buttoned lab coat, long pants, and gloves.
- Tightly woven clothing that covers much of the body (especially neck), and gloves (with no gap between the cuff and the glove) should be worn at all times.

**Eye/Face protection**

- A polycarbonate face shield and /or eyeglasses (wrap around lens) with Z87 marking (ANSI Z87.1 UV certification) must be worn to protect the eyes and face.
- The *new* ANSI Z87.1 – 2015 UV certification for UV rated lenses must be marked with Z87U 5 and scale number (scale ranges from two to six, with

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the higher number providing the highest protection from far and near UV)  
Example: Z87U6.

- Ordinary prescription eyeglasses or contacts is inadequate for protection against the UV rays.

**Gloves**

- Wear nitrile gloves to protect exposed skin on the hands. Ensure exposed skin (wrist and forearms) are covered.

**VI. WASTE**

All intact UV lamps are Universal Waste and need to be boxed up and labeled per universal waste regulations. If lamps become broken, they must be treated as Hazardous Waste, by toxicity, and labeled per hazardous waste regulations.

**REFERENCES**

University of Rochester EHS webpage <https://www.safety.rochester.edu/ih/uvlight.html>

OSHA Interpretation letter, February 26, 2003, *Are there any OSHA regulations for workplace exposure to ultraviolet radiation?*

Environmental Health & Safety, University of Washington webpage  
<https://www.ehs.washington.edu/system/files/resources/uv-safety.pdf>