



HEALTHIER WORKPLACES | A HEALTHIER WORLD

Occupational Exposure to Ultraviolet Radiation

White Paper

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Version 2 | November, 2019

Developed by the AIHA® Exposure Assessment Strategies Committee

Adopted by AIHA Board of Directors: March 2006

Updated November 2019

Ultraviolet (UV) radiation is a form of non-ionizing electromagnetic radiation that is divided into three regions based on biological effects: UV-A (315-400 nm), UV-B (280-315 nm), and UV-C (100-280 nm). UV radiation has been associated with human skin cancer and other adverse health effects (ICNIRP, 2010) as outlined below.

It is the position of the American Industrial Hygiene Association (AIHA) that the following information regarding occupational exposure to UV radiation is supported by scientific research and field studies:

1. Broad-spectrum UV radiation is classified as a known human carcinogen (International Association for Research on Cancer [IARC], 1992).
2. UV radiation can cause other harmful health effects from both chronic and acute exposures including erythema, accelerated skin aging, cataracts, retinal burns, photokeratitis, photosensitivity, genetic cellular mutation, and immune suppression (International Commission on Non-Ionizing Radiation Protection [ICNIRP], 2010; Gibbs & Norval, 2013).
3. Many occupational processes can expose workers to excessive amounts of UV radiation from natural sunlight or manmade sources such as germicidal lamps, “black lights,” UV light-emitting diodes (ULEDs), lasers, xenon lamps, quartz halogen lamps, welding and electrical discharges, and other very high temperature processes (>2000°C).
4. Occupational exposures to harmful UV radiation can be prevented or minimized through the use of engineering, administrative, and personnel protective equipment and controls.
5. Diseases caused by UV radiation exposure can be prevented or mitigated through the use of comprehensive medical surveillance, awareness, and treatment programs.
6. There is still great misunderstanding and lack of awareness by the public and industrial hygienists regarding the harmful effects of UV radiation and the benefits that could be achieved by reducing exposures through an aggressive training, prevention, and protection policy.

As a result of the above beliefs, good industrial hygiene practices encourage the following activities:

1. Continued research into occupational UV radiation exposure to include health effects, exposure assessment and employee exposure monitoring, training methods, prevention equipment and techniques, medical surveillance and treatment, and behavior modification.
2. Regulatory agency inspection and enforcement of existing standards and guidelines for environmental surveillance and worker protection. This may include the use of existing American Conference of Governmental Industrial Hygienists threshold limit values (TLVs) for UV radiation.
3. Development of programs and procedures for the improved control of exposures and protection of workers from harmful UV radiation in the workplace. This should also include employee training, exposure monitoring, medical surveillance programs, and education and awareness.



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In light of the number of workers exposed, the levels of exposure, and the subsequent possible health effects, industrial hygienists and other occupational and environmental health and safety specialists are encouraged to take the following actions:

1. Take a lead and proactive role in their institutions and organizations to increase management, worker, and public awareness about the hazards of exposure to UV radiation.
2. Learn more about UV radiation and effective control techniques regarding occupational exposures.
3. Develop new training opportunities inside their operations, and if needed, reach out to other safety professionals in similar operations to develop a unified approach to improve the safety culture.

References

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International Commission on Non-Ionizing Radiation Protection (ICNIRP): ICNIRP Statement-Protection of Workers Against Ultraviolet Radiation, *Health Physics* 99:66-87 (2010).



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