UCR Environmental Health & Safety

Spotlight On Safety

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Laser Classes and Signs

Class 1 and 1M Lasers

Class 1 lasers are considered to be incapable of producing damaging radiation levels during operation and are exempt from any control measures or other forms of surveillance.

Class 2 and 2M Lasers

Class 2 lasers emit accessible, visible (0.4 to 0.7µm) laser light with power levels less than 1 milliwatt (mW) radiant power and are capable of causing eye and skin damage through chronic exposure. The human eye blink reflex, which occurs within 0.25s, provides adequate protection. However, it is possible to overcome the blink response and stare into the Class 2 laser long enough to damage the eye.

Class 3R Lasers

Class 3R laser systems are potentially hazardous under some direct and specular reflection viewing conditions if the eye is appropriately focused and stable, but the probability of an actual injury is small. This laser will not pose either a fire hazard or diffuse-reflection hazard. Class 3R lasers have power levels of 1 to 5 mW and normally do not produce a hazard if viewed only momentarily by the unprotected eye. However, they pose severe eye hazards when viewed through optical instruments (e.g., microscopes, binoculars or other collecting optics). Therefore, Class 3R lasers shall bear a label warning against direct eye exposure or viewing directly with optical instruments. Laser pointers fall under this classification.

Class 3B Lasers

Class 3B laser systems may be hazardous under direct and specular reflection viewing conditions, but is normally not a diffuse reflection or fire hazard. Class3B continuous wave lasers are ultraviolet, infrared, or visible laser systems with power levels of 5 mW to 500 mW. Class 3B pulsed lasers are visible or near infrared systems with power levels of 5 mW to500mW, but cannot emit an average radiant power greater than 500 mW for longer than 0.25 s or cannot produce a radiant energy greater than 0.03 J per pulse.

Class 4 Lasers

Class 4 lasers are systems with power levels greater than 500 mW. These laser systems are a hazard to the eye or skin from the direct beam, and may pose a diffuse reflection or fire hazard. They may also produce laser generated air contaminants (LGACs) and hazardous plasma radiation.

Laser Signage

Laser signs can be created by accessing the “Laser Warning sign template” under Forms and Templates on the Laser Safety Website: https://ehs.ucr.edu/laboratory/laser

For more information visit www.ehs.ucr.edu or call 951-827-5528 if you have questions.