Laboratory Safety Bulletin

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Location: Essex Hall / B-37 • Hours: 8:30 am to 4:30 pm (M-F)

Guidelines to Laser Classification

The University of Windsor follows the American National Standard for Safe Use of Lasers (ANSI Z1361-2007) for managing lasers and/or laser systems on campus. This guide was developed to help provide Principle Investigators with a tool to determine if their laser and/or laser system requires registration with the University of Windsor Laser Safety Program.

Class 1: Lasers or laser systems that do not, under normal operating conditions, pose a hazard to personnel.

Examples: Laser printers, CD players, etc.

Class 1M: Safe for all condition of use except when passed through magnifying optics such as microscopes and telescopes. Produce large diameter beams but could be refocused.

No safety requirements are needed to use Class I laser devices - No registration required

Class 2: Low-power visible lasers or laser systems are incapable of causing eye injury the duration of the blink or human bright-light aversion response (0.25 sec). Only applies to visible-light lasers (400 – 700 nm) and limited to 1 mW continuous wave.

Examples: Helium-neon devices and most laser pointers

Class 2M: Safe for all condition of use except because of the blink reflex if not viewed through optical instruments.

Avoid viewing laser beam or pointing beam into person's eyes - No registration required

Class 3R (3A*): A Class 3R laser is considered safe if handled carefully, with restricted beam viewing. With a class 3R laser, the MPE can be exceeded, but with a low risk of injury. Visible continuous lasers in Class 3R are limited to 5 mW. For other wavelengths and for pulsed lasers, other limits apply.

Examples: Laser sights for firearms and some laser pointers

Avoid viewing laser beam or pointing beam into person's eyes - No registration required

Class 3B: A Class 3B laser is hazardous if the eye is exposed directly, but diffuse reflections such as from paper or other matter surfaces are not harmful. Continuous lasers in the wavelength range from 315 nm to far infrared are limited to 0.5W. For pulsed lasers between 400 and 700 nm, the limit is 30 mJ. Other limits apply to other wavelengths and to ultra-short pulsed lasers.

Examples: Visible HeNe lasers not exceeding 0.5W radiant power (CW) or 30 mJ (Pulsed)

Class 4: Lasers of laser systems present the eye and skin hazards from direct beam, specular reflections or diffuse reflections. In addition, class 4 laser can ignite flammable target, create hazardous airborne contaminants and usually a potentially lethal high voltage supply. Class 4 lasers and laser systems are those that emit radiation exceed the Class 3b.

Examples: Cutting, etching, and surgical lasers operating at greater than 500 mW (CW) or 0.03J (Pulsed)

Laser control program required for Class 3b and 4 Lasers

Refer to Laser Safety Program for more information

Registration required