

UCSC Laser Safety Frequently Asked Questions and Answers

1. *How do I become a Laser Safety Laboratory Safety Representative?*
2. *What type of training do I need to use a laser?*
3. *Do all lasers need to be registered? How do I register a laser?*
4. *I have one laser which contains multiple diode heads. Do I need to register each diode separately?*
5. *How do I dispose of a laser?*
6. *Is there a charge for laser safety services provided?*
7. *Do I need an eye exam if I work with lasers?*
8. *When am I required to wear protective eyewear?*
9. *Where can I purchase protective eyewear?*
10. *If I have a pair of laser eyewear, will it protect me from all types of laser radiation?*
11. *Are regular lab safety glasses acceptable for protection against lasers?*
12. *How do I perform safety checks of laser safety eyewear?*
13. *Are there specific symptoms of laser eye injuries?*
14. *How often do I need to check safety interlocks?*
15. *Do I need a Standard Operating Procedure for my laser? Who should write it?*
16. *What labels and signs do I need for my laser?*
17. *Does OSHA regulate lasers?*

1. How do I become a Laser Safety Laboratory Safety Representative?

The Principal Investigator (PI) who operates and/or maintains a Class 3B or 4 laser must act as, or designate, a Laser Safety Laboratory Safety Representative (Laser Safety LSR) who should be registered with the Laser Safety Officer (LSO). Contact EH&S 9-2553 to register with the LSO.

2. What type of training do I need to use a laser?

Laser safety training is divided into on-the-job training as well as formal classroom education. Persons wishing to use a laser should do so under the supervision of a knowledgeable operator. In addition, the laser Standard Operating Procedure (SOP) contains specific safety information for each Class 3B and 4 lasers. The Laser Safety LSR is responsible for maintaining the SOP, which should be readily available to all operators.

3. Do all lasers need to be registered? How do I register a laser?

Only Class 3B and 4 lasers are required to be registered with the Laser Safety Officer (LSO). To register a laser with the LSO, please complete and return the [UCSC Laser Inventory Survey Sheet](#) (RTF) .

4. I have one laser which contains multiple diode heads. Do I need to register each diode separately?

The LSO will determine registration requirements for this type of situation on a case-by-case basis. Generally speaking, if a laser system contains multiple diode heads, you may only need to register the system as a whole and not all individual diode heads.

5. How do I dispose of a laser?

Several considerations should be given when disposing of a laser – making the laser inoperative, removing it from inventory, and proper disposal of any hazardous waste that may be involved. Under no circumstances should Class 3B or 4 lasers be abandoned. Contact the Laser Safety Officer (LSO) to initiate proper disposal of a laser system.

6. Is there a charge for laser safety services provided?

No. The UCSC Environmental Health & Safety Department (UCSC EH&S) provides laser safety services such as training, inspections, inventory maintenance, registration, correspondence, supplies (such as warning signs and labels), Laser Safety Manual preparation, protective eyewear recommendations, and general consultations without chargeback.

7. Do I need an eye exam if I work with lasers?

Medical Surveillance is suggested for Class 3B and 4 lasers in accordance with section 6 of ANSI Z136.1-2007. Any employee with an actual or suspected laser-induced injury should be evaluated by a medical professional as soon as possible after the exposure.

8. When am I required to wear protective eyewear?

Protective eyewear is recommended when persons have access to Class 3B laser radiation and required for Class 4 laser radiation.

9. Where can I purchase protective eyewear?

For a listing of laser eyewear vendors see the "Laser Safety Links" section of the UCSC EH&S Laser Safety web page here. [http://ehs.ucsc.edu/lab_research_safety/lasers.php]

10. If I have a pair of laser eyewear, will it protect me from all types of laser radiation?

Laser eyewear is not designed for protection against all wavelengths. All laser eyewear is required to be clearly labeled with the wavelength(s) it provides protection against, and the optical density for each wavelength listed. Misusing eyewear (i.e., using eyewear which does not provide protection against the laser in use) may result in serious eye injury.

11. Are regular lab safety glasses acceptable for protection against lasers?

In some cases, such as for CO₂ and some ultraviolet wavelengths, certain lab safety glasses may provide adequate protection. You must first determine the wavelength of the laser as well as the required optical density for your situation; then you must ensure that regular lab safety glasses meet this requirement.

12. How do I perform safety checks of laser safety eyewear?

Eyewear should be inspected before every use. Eyewear should be checked for cracks, holes, deep scratches, discoloration or other damage (such as stems or straps which may not properly support the glasses in front of your eyes). Eyewear should be checked to see that it is clearly labeled with the wavelength(s) it provides protection against; and that the optical density for each wavelength listed is appropriate.

13. Are there specific symptoms of laser eye injuries?

Exposure to the invisible carbon dioxide laser beam (10,600 nm) can be detected by a burning pain at the site of exposure on the cornea or sclera. Exposure to a visible laser beam can be detected by a bright color flash of the emitted wavelength and an after-image of its complementary color (e.g., a green 532 nm laser light would produce a green flash followed by a red after-image).

14. How often do I need to check safety interlocks?

Safety interlocks on protective enclosures and entryways should be checked periodically for proper operation. It's important to perform this check in a way that does not endanger the person inspecting the interlock.

15. Do I need a Standard Operating Procedure for my laser? Who should write it?

A written standard operating, maintenance, and service procedure should be written for Class 3B lasers, and is required for Class 4 lasers. The Laser Safety LSR or their designee is responsible for generating the SOP.

16. What labels and signs do I need for my laser?

Warning labels are required to be affixed to all classes of lasers (except class 1) by the manufacturer. If they are unable to provide one, contact the Laser Safety Officer (LSO). Warning signs are required to be posted at the point where a person would have access to a Laser Controlled Area, in a way that would provide adequate notice to a person entering the area. Laser Warning signs should be properly worded according to the ANSI Standards. For guidance contact the Laser Safety Officer (LSO).

17. Does OSHA regulate lasers?

Although OSHA has not adopted any laser-specific standards (except for the construction industry), it often uses the ANSI Laser Standard as well as the General Duty Clause to enforce worker safety.