

Sample Standard Operating Procedure Class 3B or 4 Laser Development Lab



I. Scope

- A. This document provides guidance for operators and spectators within the laser controlled area where there is potential access to a class 3b or 4 laser beam.
- B. Procedures reflected herein are in accordance with applicable regulation parameters impacting the operation of the laser laboratory.

II. Responsibilities

- A. _____ is responsible for the safety of this laboratory operation in conformance with this Standard Operating Procedure (SOP). In his/her absence, _____ shall assume these responsibilities.
- B. Only trained laboratory personnel and maintenance personnel from manufacturers may energize the laser or laser system

III. Laser Descriptions

- A. Diode Laser, Class 3B:
 - Wavelength: 850 nm
 - Maximum Average Power: 100 mW
- B. Argon Laser, Class 4:
 - Wavelength: 488 nm
 - Maximum Average Power: 5 W
- C. Additional laser sources at other wavelengths may be added and will be described in the appendices.

IV. Hazards

- A. The primary hazard associated with the lasers is an eye hazard from direct or reflected beams. Invisible, open beams may be present and must be controlled by the laser operator. High power devices and collimated beams produce greater hazard distances. Class 4 lasers produce diffuse reflection hazardous.

V. Control Measures

- A. Eyewear
 - 1. Approved laser safety eyewear with an optical density of at least 2.2 at 850 nm must be worn by all persons inside the lab when the diode laser is energized.
 - 2. Approved laser safety eyewear with an optical density of at least 4 must be worn during argon laser alignment and if the beam and reflections are not terminated by beam blocks and barriers.
 - 3. Laser operators are cautioned to avoid direct observation of the output of laser diodes or optical fibers without approved laser safety eyewear.
- B. Entryway Controls
 - 1. Entryway controls consist of an automatic light warning panel. All lasers will be powered from a separate laser circuit. If this circuit is not energized, the green light will be on. Energizing the Laser Circuit will automatically turn on the red light.
 - a. Green indicates no laser hazard is present. The area may be entered safely by authorized personnel without eyewear.

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- b. Red indicates that a laser is in operation and an open beam hazard may be present. All personnel entering the laboratory must wear approved laser safety eyewear.
2. Safety curtains or other approved barriers will prevent a laser hazard at the entryway. The laboratory must be light tight with covered windows.
- C. Authorized Users and Visitors
 1. Authorized Operators will have key access and may enter the laboratory at any time. Operators are responsible for following all provisions of this SOP at all times.
 2. Observers may enter the laboratory when accompanied by the laser operator after completing Laser Safety Awareness Training, reading and understanding this procedure, and signing a statement of understanding.
- D. Laser Operation
 1. Laser beams will be initiated in a controlled manner with the beam terminated on a specific target or a diffusely reflecting surface.
 2. The laser operator will notify all personnel in the laboratory before a laser beam is initiated.
 3. When practical beam paths at sitting or standing eye level will be avoided.
- E. Beam Alignments
 1. Only authorized personnel may align laser beams or move any lasers or optics while lasers are in operation.
 2. Secure all entrances into the laser area.
 3. Locate all equipment and materials needed prior starting alignment.
 4. Use laser protective eyewear with proper OD and wavelength for alignment. Use skin covers (lab coat, gloves, and UV face shield) to protect users from UV laser beam scatter.
 5. Intrabeam viewing must always be avoided. Whenever possible use a low power alignment laser (class 2 or 3A), if none is available, use the lowest beam power available.
 6. If there are others in the room make sure they are aware of the alignment in progress.
 7. Keep optical table(s) clear of objects which may cause unwanted reflections. Close laser shutter if entering the beam path is necessary.
 8. Insure all beam blocks, enclosures, and beam barriers are replaced when the alignment is complete.

VI. Training

- A. Individuals who use this equipment are required to take the UW EHS Laser Safety Class and shall be trained to recognize the intrinsic hazards, are aware of basic safety information that relates to their job duties, and know the safe operating requirement for this activity.
- B. All operating personnel shall read and understand this standard operating procedure (SOP) and all applicable references stated in this SOP. Signatures of all authorized operators are required at the end of this SOP.

VII. Emergency Procedures

1. In an event of a laser emergency, turn off all lasers and notify the Laser Safety Officer.
2. In an event of fire or other emergency, evacuate and notify the UW Police department by dialing 911.

