

APPENDIX A - Standard Operating Procedures

Class 3b or 4 Lasers

I. Scope

- a. This document provides safety guidance for laser operators and spectators within the laser controlled area.
- b. Procedures reflected herein are in accordance with applicable regulation parameters impacting the operation of the laser laboratory.
- c. This document must be paired with a completed Registration Form.

II. Responsibilities

- a. _____ (Laser Supervisor) is responsible for the safety of this laboratory operation in conformance with this Standard Operating Procedure (SOP). In the absence of _____, _____ shall assume these responsibilities.
- b. Only trained Laser Operators listed on the SOP, and maintenance personnel from manufacturers, may energize the laser or laser system

III. Personal Protective Equipment

- a. List all required PPE _____

IV. Beam Alignments

- a. List personnel permitted to perform alignment

 - A. Secure all entrances into the laser area.
 - B. Locate all equipment and materials needed prior starting alignment.
 - C. Use laser protective eyewear with proper OD and wavelength for alignment. Use skin covers (labcoat, gloves, and UV face shield) to protect users from UV laser beam scatter.
 - D. 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.
 - E. If there are others in the room make sure they are aware of the alignment in progress and are wearing all required PPE.
 - F. Keep optical table(s) clear of objects which may cause unwanted reflections. Close laser shutter if entering the beam path is necessary.
 - G. Insure all beam blocks, enclosures, and beam barriers are replaced when the alignment is complete.

V. Laser Controlled Areas

- a. The laser hazards associated with this laboratory have been analyzed, and the controls specified for these hazards will reduce the risk to employees and the environment to acceptable levels.
 - A. All entries into the laser controlled area must be posted with the proper warning sign.
 - 1. Do not rely on closed doors as adequate security. Use key locks or activated interlocks on doorways into the laser area.
 - 2. When the laser is energized, all entrances into the laser controlled area must be secured to prevent unauthorized access. If there is a “laser on” indicator it must be used.
 - B. This laser safety plan/standard operating procedures shall be stored near the laser or laser system. A copy shall also be uploaded into BioRAFT.
 - C. The laser beam shall be contained in the immediate area using non-reflective and non-flammable beam blocks and/or partitions.
 - D. It is the discretion of the laser operator to allow or deny entry into the laser area while the laser is energized.
 - E. If there are windows in the laser area, they must be blocked with opaque material that is non-reflective and non-flammable.
 - F. If possible position the laser so it is not at standing or sitting eye level.
 - G. If the laser/laser system is key operated; do not leave the key in the laser when the experiment is finished.

VI. Non-beam Hazards

- a. Laser dyes should be handled with care and proper protective equipment must be used (labcoat, safety glasses and gloves). If dyes are to be mixed, it must be done in a well ventilated fume hood. Dye pumps and storage must be in secondary containers.
- b. When working with high voltage, the “buddy” system should always be used. Trained CPR laboratory personnel are highly recommended.
- c. Compressed gas cylinders must be secured properly and staff should be trained with the proper hazards and handling of the various gases.
- d. Attention should be given to protect against fire, especially with a class 4 laser/laser system. Flammable solvents may be used in laser dyes or to clean components. Fire extinguishers (charged properly) should be kept in the laser area and staff should know how to use them.
- e. Good general housekeeping can greatly improve safety from physical hazards. Cables should be secured to keep trip hazards to a minimum.

VII. Laser Maintenance

- a. Only properly trained PI’s and approved personnel may service laser systems. List these people: _____

- b. All enclosures, interlocks, and safety devices must be replaced and verified operational prior to returning the laser to regular use.

VIII. Training

- a. Individuals who use these equipment are required to take the Rowan University Environmental Health and Safety (EHS) Laser Safety Training 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.

IX. Emergency Procedures

- a. In an event of a laser emergency, refer to this manual which should be posted in the laser controlled area.
- b. In an event of fire or other emergency, evacuate and dial 9-1-1.

XI. Additional Safety Measures
