**Class 4 Laser Standard Operating Procedure**

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| --- | --- |
| Principal Investigator:  | Room Number:  |
| Department:  | Revision#:  |
| Instrument(s):  | Date:  |

**This procedure shall be read and signed by all persons who use lasers listed in this SOP.**

**Yellow Highlights indicate areas that must be filled out or modified by the PI.**

1. **Laser Safety Contacts**

EHS Department 713-743-5858

ehs@uh.edu

1. **Medical Emergencies**

Call 911 (from campus phone line) or 713-743-3333 (from cell)

Notify the Laser Safety Officer of all laser-related injuries and near-misses as soon as possible.

1. **Laser Purpose – (brief description of intended research use(s) for laser)**

Equipment:

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Manufacturer | Model | Serial# | Type | Class | Max Output | Wavelength |
|  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |

1. **Scope**
2. This document provides safety guidance for laser operator(s) and spectator(s) within the laser controlled area.
3. Procedures documented herein are in accordance with applicable regulatory/guidance documents impacting the safe operation of the lasers in laboratories.
4. Class IV Lasers can cause severe and permanent injuries to the eyes of the operator and any bystanders. They are also capable of causing injury to the skin, burning, cutting, or etching certain materials, and igniting flammable materials. The byproducts of laser cutting, etching, or burning can be toxic or otherwise hazardous. Risks for all these hazards must be managed.
5. **Responsibilities**
6. The Principal Investigator (PI):
* Ensure that all laser users receive adequate and appropriate laser safety training prior to operating the laser(s). This training must include a review of the UH Laser Safety Manual, this laser safety training document, and hazard-specific, hands-on training with the device.
* Ensure that all safety procedures are followed.
* Determine the “Nominal Hazard Zone” of the laser. Safety devices such as beam stops, wall blocks, interlocks, etc. must be used whenever possible to reduce the size of this zone.
* Supervise or otherwise provide for adequate supervision of users, visitors, and service personnel as appropriate, and provide adequate security to prevent unauthorized use of the device
* Correct and control all laser equipment hazards as appropriate in a timely manner.
1. The Laser User(s) must:
* Be authorized and trained appropriately to operate potentially hazardous laser.
* Wear properly rated goggles if the person is exposed to and/or possibly exposed to a hazardous beam or its reflection.
* Adhere to all appropriate rules and procedures. Common sense and prudent practices must be considered all times when operating laser.
* Immediately report accidents or potentially dangerous situations to the supervisor and/or safety personnel.

1. The Laser Safety Officer (LSO) is responsible for implementing the UH laser safety policies. Specifically, the LSO will be responsible for periodic safety review of laser facilities, performing basic laser safety training, evaluating protecting equipment, and initiating corrective measures as necessary.
2. **Training**
3. The PI and Authorized Users must complete the UH Laser Safety training, and annual refresher training thereafter.
4. Authorized users shall also receive training from the PI or their designee in the safe operation of a particular laser.
5. **Protective Equipment**
	1. Protective eyewear which is appropriate for the power and wavelengths of the lasers in use must be worn by all operators while the laser is in operation if the laser is not completely enclosed. Eyewear must be worn during alignments.
	2. Eyewear wavelength(s) \_\_\_\_\_\_\_\_\_\_\_

Eyewear minimum OD \_\_\_\_\_\_\_\_\_\_\_ (ask LSO for help with minimum OD calculation)

* 1. A lab coat should be worn by personnel if laser operation involves the emission of UV radiation.
1. **Laser Entryway Controls**
2. All Class IV laser laboratories must have either LSO approved entryway controls or an installed LSO certified laser enclosure system.
3. Overriding any safety controls during normal operations is considered a serious violation of safety rules. Overriding actions include but are not limited to the following: defeating of interlocks, removal of external shutter from the laser beam path, removing laser interlock connectors.
4. Personnel requiring entry to a laser lab while laser operations are in progress shall knock and request permission to enter. They must enter with care, following any laser operator’s instructions that are given.
5. **Engineering/Safety Controls (list any safety measures such as enclosures, interlocks, etc. present in the laser setup)**
6. **Beam Alignment and Maintenance**
7. Beam alignment and/or laser machine preventative maintenance may only be performed by designated Authorized Users wearing protective eyewear appropriate to the wavelength in use.
8. Laser repairs and/or removal of a laser unit’s protective housing may only be performed by qualified personnel
9. Contract personnel should have the access to the laser lab only while escorted by a qualified laser operator. The contractor is required to understand all the hazards associated with lab and abide by the same safety procedures as laser operators while working on the beam alignments and maintenance.
10. **Operating Procedure**

**Start Up**:

**Shut-down:**

**Sample change/beam path modification/other common or potentially hazardous operations**

1. **Respiratory Protection (if applicable)**
2. **Filter Change Operating Procedure (if applicable)**

Additional information available at UH Laser Safety Manual at <https://uh.edu/ehs/manuals/files/laser-safety-manual.pdf>