

Example of SOP for IR Laser

Standard Operating Procedures (SOP) for Class 4 HPD semiconductor Laser

Manufacturer	HPD	Building & Room Number	EH&S 101
Model Number	HPD-1/100/975	Laser Class	4
Serial Number	123456	Laser Type	Semiconductor
Frequency / Power	CW - 1W	Wavelength	905 nm
Normal O.D. Eyewear	>4	Alignment O.D. Eyewear	>4
Principal Investigator	Dr. John Doe	PI Emergency Phone Number	817-272-0000

ONLY STUDENTS OR PERSONS WHO HAVE COMPLETED UTA'S LASER SAFETY TRAINING AND ARE AUTHORIZED BY THE INSTRUCTOR SHALL OPERATE THIS LASER.

Operation steps are following:

1. Have emergency telephone numbers readily available (see emergency instructions).
2. Read operator manual, if necessary.
3. Ensure that all unauthorized people leave the room.
4. Secure the laboratory door. Turn the laser off if any unauthorized person or a person without laser safety eyewear enters the laboratory.
5. Activate the "Laser On" sign outside the laboratory door (Turn on the switch).
6. Ensure that all other lasers are turned off; only one laser at a time is operating.
7. Ensure all people remove wristwatches or other reflective jewelry from their bodies.
8. Set up the optical components necessary for the experiment.
9. Inspect all fire-resistant materials prior to use of the laser. If the material shows signs of degradation, it should be replaced before operations begin.
10. Check that all beam stops are in place and that there are no unnecessary reflective surfaces in the optical path.
11. Obtain key from your instructor or lockbox.
12. Put on appropriate laser safety eyewear. Ensure that appropriate laser safety eyewear is worn by everyone in the laboratory.
13. Set the laser power control to the lowest power possible.
14. Insert the interlock key into the switch and provide electrical power to the laser power supply.
15. Turn on the power supply of the laser.
16. Announce loudly, with a short countdown that you are turning the laser on.
17. Always use the lowest beam power necessary for the procedure.
18. Slowly turn current regulator CW until optical power necessary for your experiment is reached.
19. Record laser operating current, output power, and any necessary comments in the logbook.
20. Be aware during laser operation.

DO NOT REMOVE YOUR SAFETY EYEWEAR DURING THE ALIGNMENT PHASE. USE A PIECE OF FUSED SILICA TO DETERMINE THE POSITION OF THE BEAM THE BEAM WILL NOT BE VISIBLE. ENSURE THAT YOU HAVE THE CORRECT OPTICAL DENSITY EYEWEAR.

Optical alignment procedures:

1. Make sure that alignment eyewear is worn during the alignment procedures.
2. Do not remove your safety eyewear during the alignment step.
3. Align the optical components starting with the component nearest to the laser.

4. After the first optical component is aligned, move the first beam block behind the next optical component. Repeat this procedure until the entire optical system is aligned.
5. It is important that the laser beam is limited to one new component at a time until the system is aligned. This will minimize uncontrolled reflection during the alignment procedure.

Shutdown procedure:

1. To switch off the laser: Slowly turn current regulator CCW to zero current.
2. Turn off the power supply of the laser.
3. Remove the key from the laser interlock switch.
4. Turn off the "Laser On" light by switching it off.
5. Remove your laser safety eyewear and place them in their proper storage area.
6. Return key to your instructor or lockbox.
7. Write comments in the logbook.

Emergency Instructions:

1. If possible, shut the laser off and remove the interlock key. If not possible, alert everyone to get out of the laboratory and leave the laboratory yourself.
2. If there is a fire, get everyone out of the laboratory immediately. At the same time shout "FIRE" loudly and frequently. Turn on a fire alarm.
3. Contact your instructor and the University's Laser Safety Officer at Ext. 2-2185 immediately and describes the emergency.
4. If necessary, contact the University Police, emergency number at Ext. 2-3003.

Example of SOP for Visible Laser

Standard Operating Procedures (SOP) for Class IIIB Blue Diode Laser

Manufacturer:	JDS UNIPHASE	Building & Room #:	EH&S 101
Model Number:	1125P	Laser class:	3B
Serial Number:	123456	Laser type:	HeNe
Frequency	CW – 10mW	Wavelength	632.8nm
Normal O.D. Eyewear	3	Alignment O.D. Eyewear	2
Principal Investigator:	Dr. John Doe	Emergency phone #:	817-272-0000

ONLY STUDENTS WHO HAVE COMPLETED UTA'S LASER SAFETY TRAINING AND ARE AUTHORIZED BY THE INSTRUCTOR SHALL OPERATE THIS LASER.

Follow these steps anytime the laser is used.

1. Have emergency telephone numbers readily available.
2. Read operator manual if necessary.
3. Obtain the key from your instructor or lockbox.
4. Ensure that all unauthorized people leave the room.
5. Secure the laboratory door.
6. Activate the "Laser On" sign outside the laboratory door (Turn on the switch).
7. Turn the laser off if any unauthorized person or a person without laser safety eyewear enters the laboratory.
8. Ensure that all personnel remove wristwatches or other reflective jewelry from their bodies.
9. Ensure that appropriate laser safety eyewear is worn by everyone in the laboratory.
10. Ensure that the toggle switch on the back panel of the power supply are on 'TTL+' and 'Cur' settings while the main power supply and key switch, both, are in OFF position.
11. Attach the laser head to the connector of the power supply and fasten it with the screws provided. Ensure that the power cord is connected in the AC power jack at the back panel of the power supply.
12. Remove the label on the aperture and open the shutter. Make sure all the reflective objects are cleared from the beam path.
13. Switch on the main power supply. The red LED 'Power' is on.
14. Turn the key switch to the ON position. The laser starts to work after about 5 seconds delay. The green LED 'Laser' is on. The warm up time is about 15 minutes. The laser should be emitting light now.
15. The numbers on the display at front panel shows the current in diode in Amperes. To change the display to view thermal resistance of diode OR thermal resistance value of the crystal, change the toggle switch at the back panel of power supply. Make sure the key switch is in OFF position before changing the toggle switch.
16. Switch off the main power supply and reset the key switch after few minutes to restart the laser system.

DO NOT REMOVE YOUR SAFETY EYEWEAR DURING THE ALIGNMENT PHASE. IF YOU CANNOT SEE A FAINT IMAGE OF THE BEAM, YOU HAVE THE WRONG OPTICAL DENSITY EYEWEAR. TURN OFF THE LASER AND OBTAIN EYEWEAR WITH THE CORRECT OPTICAL DENSITY.

Optical alignment procedures:

1. All the optical alignments need to be carried out in presence of Dr. John Doe. All the other individuals besides Dr. Doe should leave the laboratory during the alignment procedures.
2. Make sure that alignment eyewear is worn during the alignment procedures. Do not remove your safety eyewear during the alignment step.
3. Set the laser to minimum current (~0.8A) by adjusting the circular knob.
4. The laser is coupled with a fiber, which is placed on a three axes adjustable mount.

5. It is important that the laser beam is limited to one new component at a time until the system is aligned. This will minimize uncontrolled reflection during alignment procedure.
6. When the fiber is coupled, remove the cover slip and the filter in front of CCD camera mounted on the microscope. Do not look into the microscope with your eye. Make sure that the setting knob is on CAMERA position
7. By looking at the computer screen, check for the beam spot for circularity and symmetry. You may go a bit out-of-focus by adjusting the microscope stage in Z-axis, to make the beam spot look bigger.
8. If not, make appropriate adjustments in the mirror angle or the three axes of the mount on which the fiber is mounted.
9. When alignment is completed, put back the filter in its position to avoid camera damage during actual experimentation.

Shutdown procedure:

1. Turn off the key switch first, and then switch off the main power of the power supply.
2. To keep the optic path free from dust, close the shutter.
3. Remove your laser safety eyewear and place them in their proper storage area.
4. Turn off the 'Laser in Use' lighted signs outside the laboratory.
5. Return the keys to your instructor or lockbox.

Emergency:

1. If possible, shut down the laser and remove the key. If not possible, alert everyone to get out of the laboratory and leave the laboratory yourself.
2. If there is a fire, get everyone out of the laboratory immediately. At the same time shout "FIRE" loudly and frequently. Turn on a fire alarm using a pull station if possible.
3. If necessary, contact the UTA Police Department, emergency number at Ext. 2-3003 or to reach off-campus fire/police/ambulance dial 9-911.
4. Contact your instructor and the University's Laser Safety Officer at Ext. 2-2185 immediately and describe the emergency.

Example of SOP for UV Laser

Standard Operating Procedures (SOP) Class 4 Argon Laser

Manufacturer:	COHERENT	Building & Room #:	EH&S 101
Model Number:	INNOVA 100-20	Laser class:	4
Serial Number:	123456	Laser type:	Argon
Frequency	CW 20 W	Wavelength	UV 364
Normal O.D. Eyewear	4	Alignment O.D. Eyewear	4
Principal Investigator:	Dr. John Doe	Emergency phone #:	817-272-0000

ONLY STUDENTS OR PERSONS WHO HAVE COMPLETED UTA'S LASER SAFETY TRAINING AND ARE AUTHORIZED BY THE INSTRUCTOR SHALL OPERATE THIS LASER.

Follow these steps anytime this laser is used.

1. Have emergency telephone numbers readily available.
2. Read operator manual if necessary.
3. Obtain the key from your instructor or lockbox.
4. Ensure that all unauthorized people leave the room.
5. Secure the laboratory door.
6. Activate the "Laser On" sign outside the laboratory door (Turn on the switch).
7. Turn the laser off if any unauthorized person or a person without laser safety eyewear enters the laboratory.
8. Ensure that all personnel remove wristwatches or other reflective jewelry from their bodies.
9. Ensure that appropriate laser safety eyewear is worn by everyone in the laboratory.
10. Ensure that everyone in the laboratory is wearing proper UV protective clothing. This could include long sleeve shirts, gloves etc.
11. Set up the optical components, check that all the beam stops are in place and there are no unnecessary reflective surfaces in the optical path (verify that beam path is clear, for an example: no plastic bags on optics).
12. Read operator manual, if necessary.
13. Write tube hours in the logbook – check for any notes in the logbook.
14. Verify that power connection for the laser is plugged into transformer.
15. Verify that the main power to the transformer is OFF.
 - a. Plug power connection for laser power supply into transformer.
 - b. Plug interlock "DONGLE" (J103) into laser power supply.
16. Verify that city cooling water is set to flow through power supply.
17. Turn on city water supply (red handle).
18. Verify that cooling water is flowing through power supply.
19. Plug in power for water pump.
20. Turn ON main power for the transformer.
21. Turn ON the key-switch for power supply.
22. Check for any fault error on remote control module.

23. Set the laser power to the lowest power possible at the start.
24. Press ON button – laser will start after ~ 30 to 40 second capacitor charge cycle.
25. Write laser operating current, output power, and any necessary comments in the logbook.
26. Be aware during laser operation.

DO NOT REMOVE YOUR SAFETY EYEWEAR DURING THE ALIGNMENT PHASE. USE A UV VIEWER OR ALIGNMENT PAPER TO DETERMINE THE POSITION OF THE BEAM THE BEAM WILL.

Optical alignment procedures:

1. Make sure that alignment eyewear is worn during the alignment procedures.
2. Do not remove your safety eyewear during the alignment step. Align the optical components starting with the component nearest to the laser.
3. When it is aligned, move the first beam block behind the next optical component. Repeat this procedure until the entire optical system is aligned.
4. It is important that the laser beam is limited to one new component at a time until the system is aligned. This will minimize uncontrolled reflection during the alignment procedure.

Shutdown procedure:

1. Press OFF button on remote control.
2. Turn OFF power supply key switch and remove key.
3. Turn OFF main power for transformer.
4. Allow cooling water to flow for 5 minutes.
5. Unplug cooling water pump.
6. Turn off city water supply.
7. Turn off the “Laser On” light by switching it off.
8. Remove your safety eyewear and return them to the lab manager for proper storage.
9. Return key to instructor or lockbox.
10. Write comments in the logbook.

Emergency:

1. If possible, shut the laser off and remove the interlock key. If not possible, alert everyone to get out of the laboratory and leave the laboratory yourself.
2. If there is a fire, get everyone out of the laboratory immediately. At the same time shout “FIRE” loudly and frequently. Turn on a fire alarm if possible.
3. Contact your instructor and the University’s Laser Safety Officer at Ext. 2-2185 immediately and describes the emergency.
4. If necessary, contact the University Police, emergency number at Ext. 2-3003.