

Standard Operating Procedure Coherent Innova-200 Argon Laser

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**This SOP is intended only for the specific operation described below.
If required, refer to the I-200 Argon Laser manual for more specific details.**

The operator must confirm that the laser was left in running condition before using this SOP – see log book.

Report any omissions or changes in this SOP so corrections can be made.

Location:

This laser is currently located in V15 in the Class IV laser lab at Niagara College's Welland Campus. This laser's primary function is as a pump laser to run either the tunable dye or Ti:Sapph lasers.

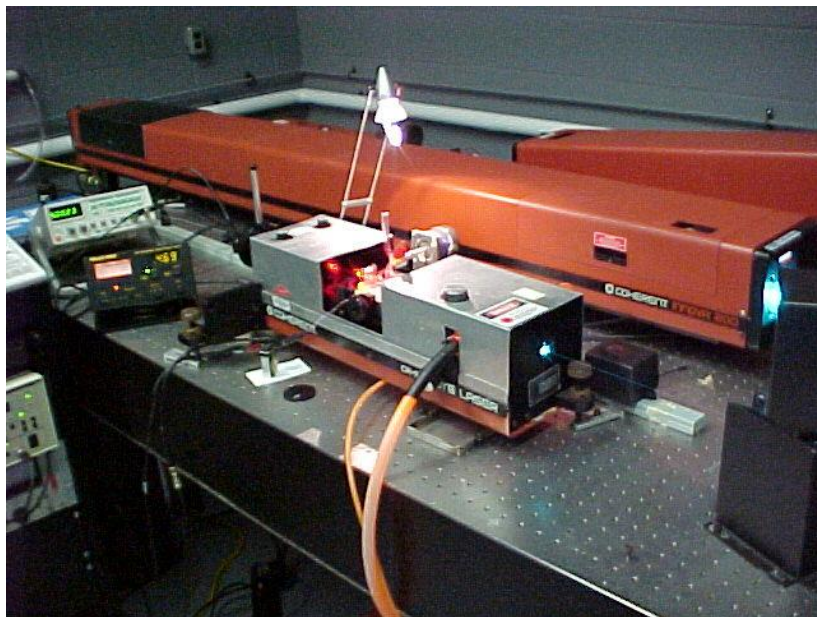


Figure 1. I-200 argon laser pumping a 599 dye laser that is running R6G laser dye.

Safety:

This laser is a Class IV laser and operators are expected to be familiar with proper safety precautions before operating this laser. The operator is directed to the Innova-200 laser manual for a complete description, the Standard, “ANSI Z136.1-2007 American National Standard for Safe Use of Lasers” and the laser safety officer (D. Turnbull)

Eyewear must be worn at all times that protects the operator and anyone else in the nominal hazard zone against radiation at 488-514 nm (argon laser radiation).

Summary from, “Laser Hazard Analysis Report for Innova-200-20 Argon Laser” 07/2/2009

At 20 Watts CW, 0.25 second exposure duration:

Small Source Ocular MPE = 2.55×10^{-3} W/cm²

Worse case optical density = 4.3

Intrabeam eye nominal hazard zone (NOHD) = 2570 meters

Small Source eye diffuse reflection nominal hazard zone = 2.27 meters

I-200 Laser Start-up

1. Make sure all people within the nominal hazard zone are wearing the correct laser goggles for the argon laser’s wavelengths. Remove any rings and jewelry.
2. Make sure the laser beam will be properly terminated.
3. Obtain key for the power supply (engraved “I-200”).
4. Turn the cooling water on full and check for leaks. If any water leaks are seen, immediately turn off water.
5. Turn key on the power supply to the “on” position.
6. **Make sure current is at 10 amps** (displayed on I-200 remote screen).
7. Press the system “on” button on power supply remote. Laser emission light will come on and tube will start after a brief delay.
8. After tube has started, current can be increased or decreased by pressing the $\uparrow\downarrow$ buttons, respectively. (ICL-PAS experiment with dye laser = 42 amps ~8 W)

Note 1: Do **not** use the light regulation feature.

Note 2: Laser emission should be observed at ~ 24A. Laser should be set to desired current, and then allowed a minimum of 10 minutes to warm-up. It will take ~ 30 minutes to become fully stable.

Note 3: The laser power display only reads to ~9W (<44 amps at aperture=9). Above this the display goes off scale and laser power must be determined with an appropriate external meter. If the current is inadvertently increased to where the display goes off scale, lower the

current back down to 10 A then increase current back to a level slightly below where power went off scale (<9W).

Note 4: At approximately 40A a tube overpressure fault will occur (fault light LED will light up – pressing the fault button will display the fault. Pressing the fault light again will acknowledge the fault). This is not a critical fault and can be ignored. The fault light will also light for a power track at limit error, which is also not a critical error (see below). Report any other faults at once (If you cannot get someone to check fault immediately, shutdown laser as described below until fault is checked out).

9. This laser is equipped with the power track system, piezoelectric actuators on the high reflector, to maintain laser stability. If the fault displayed reads, “power track at limit” acknowledge by repressing fault button and then press the tune button. This will recentre the actuators. At the same time, manually adjust the vertical and horizontal controls on the rear of the laser head to maximize power on the displayed bar graph (these should only require very minimal tweaking). Repress the tune button when complete.

Shut Down:

1. Using the ↓ button lower the power supply current to 10A.
2. Press the system power “off“ button.
3. Turn laser key off and return key to proper location.
4. **Wait 5 minutes before turning off the laser cooling water.**
5. Complete logbook – make sure to indicate if laser was left in running condition.