

Enclosed Laser Instrument Safety

Many enclosed laser instruments contain a class 3B or 4 laser. Both classes can potentially cause eye and skin injury under certain circumstances.

Instrument manufacturers include safeguards, barriers, interlocks, filters, cameras, monitors and covers to isolate machine operators from laser hazards.

By using safe work practices, and following the manufacturer's requirements, you should remain safe while using these instruments.

How To Work Safely with Enclosed Laser Systems

General Safety Guidelines:

- Do not work with any laser enclosed system until you have received hands-on training.
- Follow the user manual provided by the manufacturer. Review and follow the safety precautions.

- Do not remove or disable any barriers or open mechanical or electronic interlocking devices on any instrument. They are designed to protect you from laser and electrical exposures.
- Laser warning labels are found on each instrument posted by the manufacturer. Never deface labels.



Confocal Microscopes:

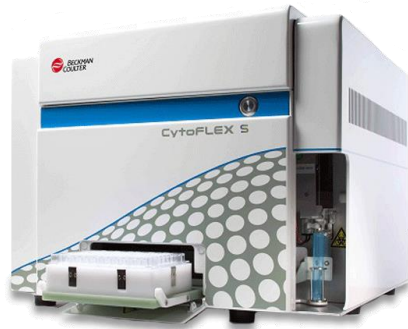
- Follow the user manual provided by the manufacturer. Review and follow all safety precautions.
- Laser protective eyewear must be worn, if the manufacturer requires it for an uncontrolled beam.
- Do not look directly into the beam or put reflective objects into the beam path.
- When changing the specimen ensure that no laser radiation exists in the specimen area. There is a risk of permanent eye damage from laser radiation.
- Never change specimens during a scanning operation because laser radiation can escape, uncontrolled, from the specimen area.
- Ensure laser filters are correct (usually ensured by computer)
- Do not open the microscope or defeat interlocks



- Microscope systems that are altered by the lab, including the addition of new lasers, must be reviewed by the Laser Safety Officer.
- Microscope systems with open beams must be registered with the Laser Safety Officer.

Laser Flow Cytometer and Cell Sorters:

- Follow the flow cytometer user manual provided for refilling sheath fluid and dispose of waste tank contents appropriately.
- Under normal operating conditions, the interlocks protect users from inadvertent exposure to laser radiation. Do not defeat laser safety interlocks and/or open other covers to access any components of the optical path. You risk personal eye and skin injury from the laser.



Flow cytometry



Cell Sorter

Laser Cutters:

- The top cover has interlocks to disable the laser when opened. Do not attempt to defeat the interlock. Serious eye and skin injuries are possible.
- Before operating a laser cutter, check that the material is on the list of approved materials. Unapproved materials can create fires and toxic gases, such as cyanide.
- Never look directly into the laser beam.

Report laser concerns, problems, incidents and accidents to the EHRS Laser Safety Officer, Valerie Perez vjperrez@ehrs.upenn.edu