



UNIVERSITY  
OF MANITOBA

Environmental Health and Safety

Updated October 25, 2019

# LASERS



## and Laser Systems

### Working Safely in Labs operating lasers

Lasers are used throughout the University community in research and teaching. Since the use of this technology constitutes a potential hazard to health, the possession and use of lasers is governed in the workplace by Manitoba Workplace Safety and Health. Effective February 1, 2007, the University of Manitoba has the duty to inform anyone that may be exposed to radiation from lasers at the University of the potential hazards (MB 217/2006 Workplace safety and Health Regulation Section 18.4). Additionally, section 16.28 of the regulation states, lasers must be installed, used and maintained in accordance with ANSI Z136.1 (latest version) American National Standard for Safe Use of Lasers.

"LASER" stands for Light Amplification by Stimulated Emission of Radiation

*High-powered lasers (Class 3B or Class 4) may be hazardous under direct or reflected viewing and may cause eye injury, skin damage or fire conditions. Careful attention to follow warning signs on doors and activated area warning devices, and asking questions of the laser operators will reduce the risk.*

### What kinds of lasers are used at the University?

#### Open Beam

Open beam lasers are used in research, for medical treatment and teaching purposes. Some other common open beam lasers are laser pointers and laser levels.

#### Embedded

Laser systems are enclosed in such a way that the laser radiation is not assessable during normal operation. Embedded lasers are found in laser printers and lab equipment. Hazardous laser radiation may be generated only during servicing. To be safe, do not enter a room when a Notice sign like this is posted.



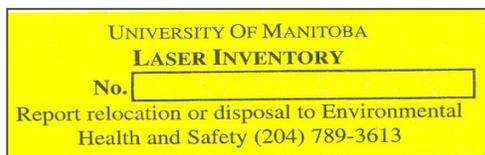
### How are Lasers controlled at the University?

A Laser Committee advises on the Laser Safety Program. The University has developed a web page to apprise owners of high powered lasers of the legal requirements and some resources to assist with this duty.

Environmental Health and Safety (EHS) provides staff and resources for the day to day operations of the Laser Safety Program including registering the high powered lasers (Class 3B or Class 4) used or stored at locations controlled by the University of Manitoba.

Details on the Laser Safety Program are found at <http://umanitoba.ca/radsafety>

Registered lasers have this label:



### Do I need more advanced Laser Training?

If you work in a room where:

**Enclosed/Embedded** lasers are used, no further laser training is required.

**Open beam** Class 3B or Class 4 lasers are used, you may need more information. Talk to your supervisor or the Departmental laser contacts.

If you plan to operate a laser or laser system containing a class 3B or 4 laser, then you require additional training.

Contact Radiation Safety at 789-3654 or 789-3359

Email: [radsafety@umanitoba.ca](mailto:radsafety@umanitoba.ca).

### Environmental Health and Safety

#### Bannatyne Office

5001 Medical Services Building  
750 Bannatyne Avenue  
Winnipeg, MB R3E 0W3

#### Fort Garry (main) Office

191 Extended Education Complex  
406 University Crescent  
Winnipeg, MB R3T 2N2

Phone: 204-474-6633

Fax: 204-789-3906

E-mail: [radsafety@umanitoba.ca](mailto:radsafety@umanitoba.ca)

Please do your part by following the instructions in this pamphlet.

## Laser Signage - who can help you if you need to enter a lab

OPEN BEAM Lasers may only be used by a trained operator that has control of the room. These laser controlled areas must have a sign at every entrance warning of the danger plus have contact information.

If a room or area has either the DANGER or WARNING laser sign posted at the entrance, do not enter without following the instructions on the sign. If the area warning device is illuminated or flashing, DO NOT ENTER.

When you may enter, perform duties that are covered by a safe work procedure (SWP) that includes the consideration of lab hazards. If a SWP does not include consideration of lab hazards, it is important to do a risk assessment with one of the contacts listed on the laser sign or WHIP+. (See Lab Hazard Clearance)

If you are a new student/tech, you should receive a lab orientation. (See Lab Safety Checklist for New Lab Personnel)

### The Departmental Contacts that are responsible for the laser in the lab space and Emergency Contacts

## Area Warning Device Posted at Entrance

Indicates when the laser is operating. The device may be a lighted or a flashing sign or a strobe light. DO NOT ENTER when the device is activated.



## Lasers are Labelled to Identify the Hazard



## How can I stay Safe?

When assessing the risk to work in the laser room, it is important to differentiate between open beam and embedded systems.

OPEN BEAM lasers release radiation that may reach the eye or skin.

Remember these rules to reduce your risk:

1. DIRECT VIEWING OF LASER BEAMS IS PROHIBITED.
2. Beware and heed warning signs at entrances.
3. Only trained operators should use Class 3B or 4 Lasers.
4. Only required personal should be in the laser controlled area. Do not be a spectator.
5. Class 3B and 4 lasers should be used in sole use laboratories or enclosures within the room and access controlled.
6. Be certain scattered laser radiation is not escaping through windows or openings to outside the laser controlled area. ASK!
7. If an eye exposure to a laser beam is suspected follow the posted **Laser Exposure/Injury Protocol** (medical emergency call 911)

## What are the hazards of Laser radiation?

Lasers are categorized by the level of hazard they create to people exposed to the beam. Lower class lasers are incapable of producing damaging radiation levels during normal operations plus eyes are protected as humans naturally look away or blink before the eye is damaged.

**High - powered lasers (Class 3B or Class 4)** produce damaging beams that may be hazardous. Direct or reflected exposure may cause eye injury, skin damage or fire conditions.

### EYE HAZARDS of LASERS

A split-second look at Class 3B or 4 laser can cause corneal and/or retinal burns, retinal injury, and corneal opacities. Permanent vision loss is possible. The injury can be extremely painful.

### SKIN HAZARDS of LASERS

- Thermal injury (BURN)
- Erythema (sun burn)
- Accelerated aging and pigmentation

Some people may be more at risk of photosensitive reactions from genetics or induced by medicines.

### FIRE OR EXPLOSION IN THE ROOM

Activate the Fire Alarm as you exit the building and follow your local procedures.

### LAB SECURITY Always close the door.

If you are the last person to leave, lock the lab door to maintain security.

### 'EVIDENCE OF FOOD CONSUMPTION'

Never consume food or drink in a lab and never place food or beverage related garbage in waste containers in the lab.