

Laser Pointer Safety Guidelines

Overview

Laser pointers have become ubiquitous in classrooms and lecture halls as they are a very valuable tool during presentations. When used correctly they pose very little risk. When proper laser pointers are used the eye's natural reflex to blind or turn away from a bright light is enough to protect someone from injury. However there could be some temporary side effects such as flash blindness (like a flash photo taken in a dark room), after images, or injuries due to being startled by a sudden bright light. Following safety guidelines will eliminate the chance of these effects

Only Class 2 and Class 3R (older lasers could be marked as 3a) laser pointers are approved for use as for classroom and lecture presentations. These laser pointers should be used in accordance with guidelines outlined in this document. Power level the laser light emitted from a laser pointer can not exceed 5 milliwatts (mW) which is the upper limit for a Class 3R laser. Any Class 3B laser must be reviewed and registered by Radiation Safety per Massachusetts regulations.

Classifications

Class 2 laser pointers output power is less than 1 mW. This is considered eye safe unless the laser is purposefully directed into the eye and the natural blink reflex is suppressed. Class 3R (formerly 3a) laser pointers output power is between 1 and 5 mW and can be hazardous if collecting optics are used.

Optical Hazards

The most common laser pointers are the red diode beam. Other colors are becoming more available which include green and blue colors. The green laser is of particular concern since the human eye is 50 times more sensitive to green light for the same power. Green lasers use a diode pumped doubled frequency Nd:YVO₄ (albeit some still use Nd:YAG) with a blocked infrared (IR) component to produce the green light. If the infrared filter becomes dislodged the IR emission can become a hazard.

When used properly laser pointers are a very safe and effective tool to use.



All laser pointers should have warning labels. Pointers that emit <5 mW have a Caution label. Lasers over 5 mW have a Danger label and must be registered with Radiation Safety. All laser pointers must have an on/off switch that requires constant pressure from your finger to operate.

Safety Guidelines

- Only red lasers (633-690 nm) should be used as laser pointers. Laser pointers over 5 mW are prohibited outside registered laser labs.
- Green laser pointers should not be used due to the eye's sensitivity to green light. Also, green lasers carry a risk of IR exposure.
- Only use laser pointers that have clear warning labels. Many pointers that do not have warning labels have not had a hazard analysis performed and may be more powerful than expected.
- Never stare into the beam of a laser. Always point the laser away from an audience and keep your finger away from the power button when facing people.
- Avoid shining laser at shiny objects.
- Do not use collecting optics such as lenses or binoculars when using a laser pointer.
- If you have concerns about a laser pointer contact Radiation Safety for a consultation.

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