

Johns Hopkins Safety Manual	<i>Guidance Document</i>	HSE G09
<i>Subject:</i> GUIDANCE FOR LASER POINTERS	<i>Review Date</i>	Dec-11
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The purpose of this guidance is to prevent startle hazard, temporary flash-blindness, after images, glare responses, and permanent eye damage caused by unsafe use of laser pointers. This guidance covers classification, selecting, labeling, and using laser pointers, both personal and Hopkins owned and applies to anyone using a laser pointer at Hopkins.

References:

<http://www.fda.gov/MedicalDevices/Safety/AlertsandNotices/ucm237129.htm>
<http://www.fda.gov/downloads/ForConsumers/ConsumerUpdates/UCM167564.pdf>

Responsibilities

Classification

Laser pointers have a maximum power output of 5 milliWatts (mW) and create a low-power visible laser beam with wavelengths between 400 to 700 nanometers (nm). These lasers are either Class 2 (<1 mW) or Class 3R or 3A (1 - 5 mW).

Selection

When choosing a laser pointer it is the best practice to pick a Class 2 laser. Most commercially available laser pointers, however, are class 3R or 3A. Choose red-orange lasers (633 to 650 nm wavelength, choose closer to 635 nm). Early diode laser pointers were dark red (670 nm wavelength) and difficult to see due to the eye's lower response to red. Newer red-orange lasers are significantly brighter than their dark predecessors using the same or even less power.

Green and blue laser pointers are available, however each as drawbacks. Initially, green will appear brighter than red. However, green may actually be too bright and has been found to leave a distracting after-image on the retina, making it difficult to concentrate on the presentation. Safety concerns have been raised about photo-biological effects from blue light laser pointers (400-500 nm) and they should be avoided.

Warning: Relatively inexpensive battery-operated hand-held laser "pointers" that are Class 3B (and some Class 4) are now commercially available, which are well in excess of the 5 mW legal limit for laser pointers. These devices can be very dangerous. Use of all Class 3B and Class 4 lasers at Hopkins must be approved by Health, Safety and Environment (955-3710); approval of a Class 3B or Class 4 laser "pointer" would not be given.

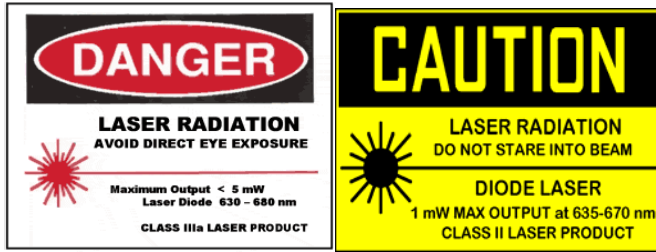
Warning: Some commercial green laser pointers have been observed to be missing the infrared (IR) filter, which results in dangerous emission of IR laser light that the user is unaware of. (The 532 nm laser pointer is not a simple single wavelength diode laser, but is a diode-pumped solid state laser. A doubling crystal is used to generate the 532 nm wavelength and then an IR filter must be used to block the 808 nm diode pump and the 1064 nm fundamental).

For a safety evaluation of a laser pointer or if you have questions on laser pointer safety, contact Health, Safety and Environment (955-3710).

Labeling

The manufacturer is required by the FDA to provide correct labeling. This includes the laser hazard symbol, laser classification, maximum power output and laser wavelength. Laser pointers must be labeled with either a CAUTION label for a Class 2, or a DANGER label for a Class 3A or Class 3R.

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Use

Laser pointers are effective tools when used properly. The following considerations should be observed when using laser pointers:

Never point a laser pointer at a person.

Permanent damage is possible if the beam is stared into, but there is also the possibility of startle hazard, temporary flash-blindness, after images, and glare response.

Class 3R and 3A laser pointer used is prohibited when optically aided viewing of the beam is probable.

Optical aids include telescopes, binoculars, viewing optics, and similar devices.

Only point at inanimate objects.

Finally, incidents associated with laser pointers involving aircraft are increasing and FDA is aware of incidents of pilots experiencing temporary flash blindness when lasers were aimed at their aircraft. Also reports of those exposed include bus drivers, sports figures, teachers, and police.