Laser Safety

Light Amplification Stimulated by Emission Radiation

Lasers are sources of non-ionizing radiation. They can emit light in the ultraviolet, visible light, and infrared region. Laser light is monochromatic, directional and coherent.

Hazard Classification

Class 1 and Class 1 M
- Laser is safe to use under normal conditions.
- The maximum permissible exposure (MPE) cannot be exceeded when viewing with the naked eye or aid of magnifying optics (e.g. telescope or microscope).
- Laser radiation can be in the visible or invisible spectrum.
- Class 1 M laser is safe under normal conditions except when passed through magnifying optics such as microscopes and telescopes.

Class 2 and Class 2M
- Laser is considered safe because the blink reflex (glare aversion response to bright lights) will limit the exposure to no more than 0.25 seconds.
- The maximum power output does not exceed 1 milliwatt (mW).
- Laser radiation is in the visible spectrum.
- Class 2M laser is safe except when passed through magnifying optics such as microscopes and telescopes.

Class 3R
- Medium powered laser is considered safe since protection of the eye can be accomplished by blink reflex.
- Direct viewing should be avoided since MPE can be exceeded which could result in eye damage.
- The maximum power output does not exceed 5 mW.
- Laser radiation can be in the visible or invisible spectrum.

Class 3B
- This laser is hazardous if the eye is exposed directly and with optics, but diffuse reflections such as those from matte surfaces are not harmful. Skin burns can also occur at higher wavelengths.
- The maximum power output is between 5 to 500 mW.
- Laser radiation can be in the visible or invisible spectrum.

Class 4
- This is the most powerful and hazardous laser because it can burn the skin, or cause permanent eye damage as a result of direct, diffuse or indirect beam viewing. Laser radiation can be in the visible or invisible spectrum.
- These lasers may ignite combustible materials, and thus may represent a fire risk.
- Lasers emit power greater than 500 mW.
- These lasers must be equipped with a key switch and a safety interlock.

When a Class 3B or Class 4 Laser is installed the following steps must be completed prior to operation:

1. **Registration** – All Class 3B and Class 4 lasers must be inventoried with the EHS Office.
3. **Laser Safety Training** – Mandatory online basic laser safety training course is offered by EHS and must be completed. Once the course is successfully passed, please print certificates for supervisor. Laser specific training must be provided by an experienced operator and documented.
4. **Eye Exam** – The baseline and termination eye exams are recommended for all Class 3B and Class 4 laser operators.
5. **Hazard Assessment** - Assess potential hazards and risk of exposure to hazardous levels of laser emission. Once hazard are identified, and the potential of exposure to those risks assessed, the user must develop and implement control measures (engineering controls, administrative controls, personal protective equipment).

Laser Safety Program
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