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Oregon OSHA

FACT SHEET Plus

Lasers: Safe work practices

Lasers are used in a wide variety of workplaces, including manufacturing, lumber, construction, and health care. While they can make certain tasks possible or easier, they do present some unique hazards and need to be treated with a certain amount of respect.

A LASER – which stands for *Light Amplification by Stimulated Emission of Radiation* – emits radiation in the infrared, visible light, or ultraviolet wavelengths. Humans can't see lasers in the infrared or ultraviolet wavelengths, but that doesn't mean that lasers aren't hazardous. Hazards can be from the beam itself (beam hazards), such as burns to the eyes or skin, or caused by the equipment that generates the beam (nonbeam hazards), such as electrical hazards.

Laser classifications and hazards

There are four classes of lasers (Class III lasers have two subclasses). Class III and Class IV lasers are the most hazardous.

Class	Hazards
Class I	Doesn't produce damaging radiation under normal operating conditions – when viewed under magnification, however, the beam can cause eye damage
Class II	Isn't dangerous unless the beam is viewed under magnification
Class IIIA	Can produce spot blindness and other eye injuries
Class IIIB	Can damage eyes and burn skin
Class IV	Can damage eyes, burn skin, and cause fires

The Laser Safety Officer

The recognized industry standard for the safe use of lasers, *American National Standard for Laser Safety* [ANSI Z136.1-2007], requires a *Laser Safety Officer* (LSO) when workers use Class IIIB or Class IV lasers – unless the lasers are enclosed in a Class I enclosure so they don't expose workers to damaging radiation. Although Oregon OSHA does not have rules that explicitly discuss laser safety, the Oregon Safe Employment Act requires that employers provide a safe and healthful work environment. When workers use or are exposed to Class IIIB or Class IV lasers, Oregon OSHA expects the employer to have an LSO.

The LSO's job is to:

- Classify or verify the classification of all lasers under the LSO's jurisdiction
- Conduct a hazard evaluation of all beam and nonbeam hazards
- Ensure that all control measures are implemented and followed
- Approve operating procedures related to the use of lasers
- Recommend or approve personal protective equipment (PPE) for laser exposures
- Ensure that employees who use lasers or are exposed to laser hazards have information and training on the safe use of the equipment
- Establish procedures for workers' medical surveillance, when necessary
- Establish procedures to investigate all incidents caused by employee exposure to laser radiation
- Establish a laser safety program that includes all of the above

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Questions and answers

Q: Where can I get LSO training?

A: There are several private vendors that offer classroom or Web-based training.

Q: What is a Class I enclosure?

A: It is a device that encloses the laser and prevents user access to the beam, and typically has safety interlocks that disables the laser if it is opened.

Q: Do these requirements apply to medical and dental lasers?

A: Yes.

Q: Are signs required when lasers are in use?

A: The LSO determines if signs are required.

Q: Are there any long-term effects from using lasers?

A: Regular exposure to laser radiation can lead to cataracts and skin cancer, particularly in the ultraviolet wavelengths. Addressing these hazards is part of the LSO's evaluation.

Q: What are some other nonbeam hazards?

A: Nonbeam hazards can include frostbite with cryogenic lasers, chemical exposures with dye-based lasers, and inhalation hazards from the fumes generated by cutting lasers.

Q: We have a Class IV laser in a Class I enclosure that is only opened by a service technician who is not my employee. Do I still have to have an LSO?

A: You need an LSO only if your employees are in the room while the Class I enclosure is opened and the laser is on.

Links:

- Oregon Safe Employment Act www.leg.state.or.us/ors/654.html
- Laser hazards: OSHA safety and health topics www.osha.gov/SLTC/laserhazards/
- Laser/Electrosurgery Plume: OSHA safety and health topics www.osha.gov/SLTC/laserelectrosurgeryplume/index.html
- Control of Smoke From Laser/Electric Surgical Procedures: NIOSH hazard controls www.cdc.gov/niosh/hc11.html
- Laser products and instruments: U.S. Food and Drug Administration www.fda.gov/Radiation-EmittingProducts/RadiationEmittingProductsandProcedures/HomeBusinessandEntertainment/LaserProductsandInstruments/default.htm

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