

Title of Training	Laser Safety Training	
Equipment Info.	Make/Type/Size/Model	Sokkia DC 20 Laser
Material Needed	Operators Manual	Hard Hat-Safety Glasses (Goggles)-Work Shoes.
	Demarcated area with laser warning signs	

LASER SAFETY TRAINING

What is a laser?

The word "laser" is an acronym for Light Amplification by Stimulated Emission of Radiation. Laser light is generated when a power source (usually electric) is used to excite a "lasing material". Lasing materials can be solids (e.g., ruby or garnet), gases (e.g., helium or carbon dioxide), liquids (e.g., organic dyes), or semiconductors. The resultant light bounces back and forth between a pair of mirrors, is amplified, and is emitted as a beam—ready for use in hundreds of applications.

Depending on the power, lasers can permanently damage eyes and skin.

Use of lasers in construction

Use of different kinds of lasers in construction for line guides and levelers has increased:

Plumb or dot lasers produce a single or multiple dots of reference on a wall or work surface. They work to provide a reference point.



Dot laser level



Line laser level

Line level lasers emit a level line on the wall in either a single line, or a cross-hair fashion. These are commonly used indoors and are usually small, hand-held units either positioned on a ladder, saw horse, or table, or mounted to a light-weight jamb-pole or laser platform.

- *Rotary level lasers* can cast a laser beam in a complete 360-degree circle. Rotary lasers are commonly a bit larger and are typically mounted on sturdy surveying equipment such as tripods. The rotation of a single laser makes the human eye think its seeing a line around the room.



Rotary laser level

How can a laser cause injuries?

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Instructor Name		Date of Training	
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The most common injury from exposure to laser light is to the eye. When a bright light hits the eye, a person will blink or turn away from a light source—this typically takes a quarter of a second. Unfortunately, higher power lasers (see Class 3B and 4 below) can damage the eye in less time than that.

Symptoms of a laser burn to the eye include headaches and the sudden appearance of floaters (swirling distortions) in your vision. Minor burns to the cornea (transparent layer of tissue covering the eye) can cause a gritty feeling, like sand in the eye. Serious laser eye injuries can lead to permanent blindness.

Lasers can also harm the skin by causing thermal burns, ranging from "sunburn" (reddening and blistering) to third degree burns with charring.

How can you prevent harmful exposure to laser light?

Knowing what class of laser you are working with can minimize the hazard of exposure. Lasers are classified according to the power of the beam:

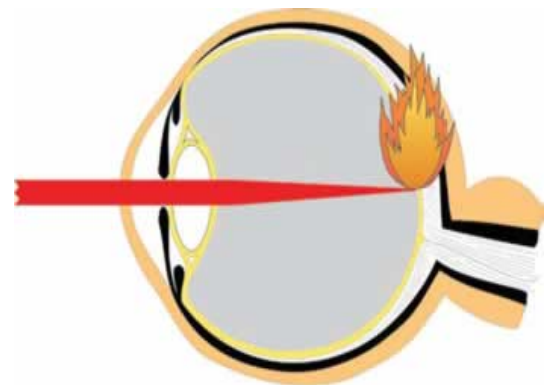
- *Class 1 and Class 2* lasers are low powered and won't damage the eye under normal operating conditions. The human "blink reflex" to bright light will protect you from exposure to these lasers, provided you don't stare into the beam.
- *Class 3R* lasers are intermediate in power and can cause eye damage if viewed directly.
- *Class 3B and Class 4* lasers are higher in power and can cause eye damage, skin damage, and fires. Some Class 4 lasers have enough power to cut off body parts.

Recommendations

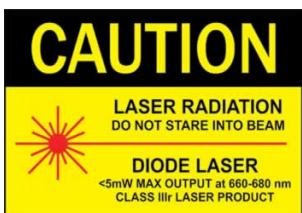
Make sure the laser you purchase is a low- or intermediate-power device, e.g., Class 2 or 3R. (The type and power of the laser will be indicated on a label on the device.)

When using a Class 2 or 3R laser device, you should post warning signs and barrier tape to warn other workers that a laser is in use.

The Occupational Health and Safety Regulation specifies that any use of a Class 3B or Class 4 laser requires the employer to have a trained Laser Safety Officer and to have a formal laser safety program.



Laser injury to the eye



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Eye and Face Protection



Safety Glasses

A wide range of safety glasses are available including scratch resistant, ultra-light weight, anti-fog and wrap around. Frames made of metal or plastic have impact-resistant lenses and side shields are available on some models. It is important to get a pair of safety glasses which are comfortable, do not visually impair the user but also provide optimum protection. If safety glasses become scratched, throw them out and replace. Glasses should be washed periodically with soap and water. Contact lenses and prescription glasses DO NOT provide adequate eye protection. Contact lenses have the potential to actually cause and/or increase injury. Prescription safety glasses or ‘over specs’ should be worn.

Safety Goggles

If there is risk from chemical splashes then safety goggles are recommended. Goggles are tight-fitting, completely covering the eyes and area immediately surrounding the eyes. They can provide protection from impact, dust and splashes. Some goggles will fit over prescription glasses.



Laser Safety Goggles

Laser radiation can be extremely dangerous to the unprotected eye. Direct, reflected or stray beams can cause permanent eye damage. Laser retinal burns can be painless, so it is essential that appropriate eye protection is worn. The type of laser safety goggles used depends upon the class of laser in use. Laser safety goggles should protect for the specific wavelength of the laser. Make **ABSOLUTELY SURE** the eyewear you're about to be put on is the correct protection for the wavelength(s) in use. Laser safety goggles should be labelled with the laser wave lengths, for which they are used, the optical density of those wavelengths and the visible light transmission. Note laser Safety training is required for class 3b and 4 laser users.

Important Notice

This Safety Training Topic (STT) does not necessarily cover all possible hazards associated with this equipment and should be used in conjunction with equipment manual. It is designed as a guide to be used to compliment training in the field at Brieser Construction and as a reminder to users prior to equipment use.

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EMPLOYEE NAME (Print or Type)	EMPLOYEE SIGNATURE	TRADE	JOB TITLE
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