



## Dangers of laser levels in construction

A construction worker was struck in the eye by the beam from a laser level for a saw. Another worker was using the saw to cut a plank, with the laser beam as a guide. The injured worker was walking along the opposite side of the building when the incident occurred. Luckily, the power of the laser was low and the worker's "blink reflex" was fast enough to avoid permanent eye damage.

### 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 levellers has increased:

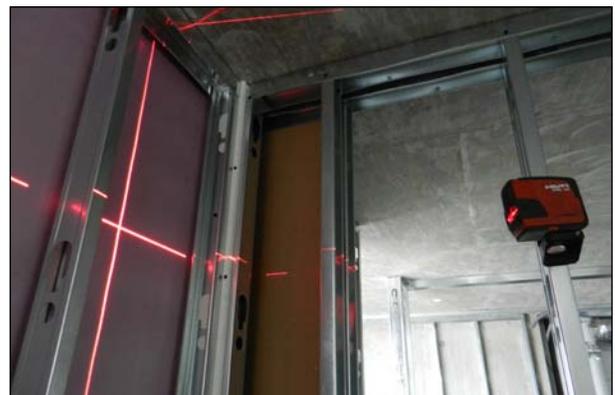
- *Plumb or dot lasers* produce a single or multiple dots of reference on a wall or work surface. They work to provide a reference point.
- *Line level lasers* emit a level line on the wall in either a single line, or a cross-hair fashion. These are most commonly used indoors and are usually small, hand-held 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.



*Dot laser level*



*Line laser level*



*Rotary laser level*

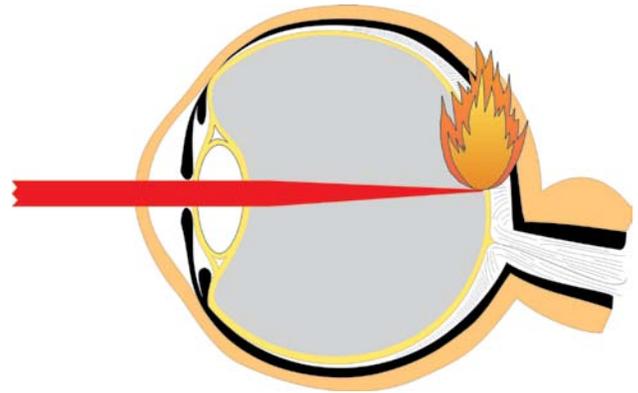
## How can a laser cause injuries?

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.

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*

## 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.



*Laser level label*



*Laser warning sign*



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