

LASER SAFETY

Lasers can be found in many areas of manufacturing. They have become a fundamental part of equipment design and have a wide array of uses. This increases our exposure and potential for safety incidents due to laser radiation. Laser or “Light Amplification by Stimulated Emission of Radiation” is a light that has low divergence and well defined wavelength. This differentiation from standard light sources (incandescent bulb) is one of the reasons that it can be dangerous to anyone working around it.

Lasers are classified by the level of danger they present. The end user should always understand the hazard potential for the specific laser in question.

Laser Classifications:

Class I: Inherently safe; no possibility of eye damage. This can be either because of a low output power (in which case eye damage is impossible even after hours of exposure), or due to an enclosure preventing user access to the laser beam during normal operation, such as in CD players or laser printers.

Class II: The blink reflex of the human eye (aversion response) will prevent eye damage, unless the person deliberately stares into the beam for an extended period. Output power may be up to 1 mW. This class includes only lasers that emit visible light. Some laser pointers are in this category.

Class IIa: A region in the low-power end of Class II where the laser requires in excess of 1000 seconds of continuous viewing to produce a burn to the retina. Supermarket laser scanners are in this subclass.

Class IIIa: Lasers in this class are mostly dangerous in combination with optical instruments which change the beam diameter or power density. Output power may not exceed 1–5 mW. Beam power density may not exceed 2.5 mW/square cm. Many laser sights for firearms and laser pointers are in this category.

Class IIIb: Lasers in this class may cause damage if the beam enters the eye directly. This generally applies to lasers powered from 5–500 mW. Lasers in this category can cause permanent eye damage with exposures of 1/100th of a second or less depending on the strength of the laser. A diffuse reflection is generally not hazardous but specular reflections can be just as dangerous as direct exposures. Protective eyewear is recommended when direct beam viewing of Class IIIb lasers may occur. Lasers at the high power end of this class may also present a fire hazard and can lightly burn skin.

Class IV: Lasers in this class have output powers of more than 500 mW in the beam and may cause severe, permanent damage to eye or skin without being magnified by optics of eye or instrumentation. Diffuse reflections of the laser beam can be hazardous to skin or eye within the Nominal Hazard Zone. Many industrial, scientific, and medical lasers are in this category.

Learn more about laser classifications... [Click Here!](#)

Safety when working around lasers

Although there are various safety standards for working around lasers, two of the most important are **protective eyewear** and **preventing exposure**.

Proper laser eyewear can protect the user if appropriately selected. One of the most important rules to remember is that laser safety glasses are wavelength specific. This means that your eyewear must match the task at hand and will require prior planning.

The second important step is simply to prevent the possibility of exposure. When equipment is designed, it will have several engineered safety systems built in. These systems may range from interlocks to shielding and to the direction of the laser. When working around systems with laser, it is important to know the class of the laser and how to properly protect yourself with the “built-in” safety systems.

Remember... Safety Matters.

