



Laser Glossary

Accessible Exposure Limit (AEL) - The maximum permissible power level for the appropriate class of laser as defined in ANSI Z136.1.

American National Standards Institute, ANSI Z136.1 "Safe Use of Lasers" – The standard that establishes occupational exposure limits and laser safety practices in the United States.

Aperture - An opening through which laser radiation can pass.

Aversion response - Closing the eye and moving the head away to avoid exposure to laser light.

Continuous Wave (CW) Laser - A laser with a continuous output of laser radiation for a duration greater than or equal to 0.25 seconds.

Diffuse Reflection - When a laser beam is reflected in many directions by a surface, reducing its intensity.

Infrared Radiation (IR) - Invisible radiation of wavelengths between 700nm - 1mm. This part of the electromagnetic spectrum is broken down into 3 bands: Near Infrared (IR-A) 700 nm to 1400 nm, Mid Infrared (IR-B) 1400 nm to 3000nm, and Far Infrared (IR-C) 3000 nm to 1 mm.

Intrabeam Viewing - Direct viewing of a point source laser beam on axis.

Irradiance - The power per unit area expressed in watts per square centimeter (W/cm²). It is also referred to as power density and applies to CW lasers.

Laser - An acronym for "Light Amplification by Stimulated Emission of Radiation". A laser is a monochromatic (same wavelength), coherent (waves in phase) beam of radiation.

Laser Safety Officer (LSO) - The LSO is responsible for monitoring the control of laser use and implementing the Laser Safety Program.

Maximum Permissible Exposure (MPE) - The maximum level of laser radiation to which a human can be exposed without harmful effects to the eye or skin. MPE values for eye exposure to direct beam viewing can be found in Table 5 of ANSI Z136.1 standard.

Nominal Hazard Zone (NHZ) - An area where the MPE is exceeded for the laser radiation emitted.

Optical Density (OD) - The base ten logarithm of the reciprocal of the transmittance. The OD is calculated for protective eyewear to reduce the transmission density to the safe MPE level.

Pulsed Laser - A laser that delivers energy in single or multiple pulses which are less than 0.25 seconds in duration.

Laboratory Safety

Radiant Exposure - Radiant energy per unit area expressed in joules per square centimeter (J/cm²). Radiant exposure applies to pulsed lasers.

Specular Reflection - A mirror-like reflection of the beam in which most of the power is retained in the reflected beam.

Ultraviolet Radiation (UV) - Invisible radiation that has wavelengths from 180nm to 400nm. UV radiation is broken down into three regions; Near Ultraviolet (UV-A) 315 nm to 400 nm, Mid Ultraviolet (UV-B) 280nm to 315nm, and Far Ultraviolet (UV-C) 100 nm to 280 nm.

Visible Radiation - Radiation that is visible to the human eye. The wavelengths are from 400 nm to 700 nm. At these wavelengths the eye can focus the light onto the retina increasing the radiant exposure by 100,000 times.

Wavelength - The distance between two successive points on a periodic wave which have the same phase.

Email radiation_safety@harvard.edu to send comments and suggestions to the Radiation Safety Office.