

Overview of IEC laser classes:

Class	Type of lasers	Hazard posed	Relationship to MPE*	Typical AEL for CW lasers**
Class 1	Very low power or encapsulated lasers	Safe for skin and eyes	MPEs not exceeded, even for long exposure duration and with use of optical instruments	40µW for blue
Class 1M	Very low power lasers, either highly divergent or collimated with large beam diameter	Safe for skin and naked eye, but potentially hazardous to eyes when employing optical instruments	MPEs not exceeded for naked eye, even for long exposure duration, but may be exceeded with use of optical instruments	Same as Class 1, distinction with measurement requirements
Class 2	Visible low power lasers	Safe to skin, and safe to eyes with unintentional exposure. Avoid prolonged staring	Blink reflex limits exposure duration to 0.25 s; MPE for 0.25 s not exceeded, even with use of optical instruments	1mW
Class 2M	Visible low power lasers, either highly divergent or collimated with large beam diameter	Same as Class 2, but potentially hazardous when employing optical instruments	MPE for 0.25 s not exceeded for naked eye, but may be exceeded with use of optical instruments	Same as Class 2, distinction with measurement requirements
Class 3R	Low power lasers	Safe to skin and eyes when handled carefully; only small potential for accidental exposure	MPE with naked eye and optical instruments may be exceeded up to 5 times	5 times the limit of Class 1 in UV and IR, and 5 times the limit for Class 2 in visible, i.e., 5mW
Class 3B	Medium power lasers	Hazardous when eye is exposed; typically no hazard to skin; scattered light usually safe	Ocular MPE with naked eye and optical instruments may be exceeded more than 5 times; skin MPE usually not exceeded	500mW
Class 4	High power lasers	Hazardous to skin and eyes; scattered light also hazardous; potential fire hazard	Ocular and skin MPE exceeded; scattered light exceeds ocular MPE	No limit

*MPE (maximum permissible exposure) is the maximum level of exposure to laser radiation without hazardous effects or adverse biological changes to the eyes or skin.

**AEL (accessible emission limit) is the radiation level produced in regions that are accessible to the user. Users must not exceed the level established by a given laser class.