Laser Eye Protection (wavelengths between 0.4 and 1.4 um)[a]

Q-Switched Lasers (10^{-9}-10^{-3} s)		Non-Q-Switched Lasers (0.4×10^{-3}-10^{-2} s)		Continuous-Wave Lasers Momentary (0.25-10 s)		Continuous-Wave Lasers Long-Term Staring (less than 1 hr)		Attenuation	
Max. Output Energy (J)	Max. Beam Radiant Exposure ($J\text{-}cm^{-2}$)	Max. Laser Output Energy (J)	Max. Beam Radiant Exposure ($J\text{-}cm^{-2}$)	Max. Power Output (W)	Max. Beam Irradiance ($W\text{-}cm^{-2}$)	Max. Power Output (W)	Max. Beam Irradiance ($W\text{-}cm^{-2}$)	Attenuation Factor	OD
10	20	100	200	$10^{(b)}$	$2 \times 10^{5(b)}$	$100^{(b)}$	$200^{(b)}$	10^8	8
1	2	10	20	$10^{(b)}$	$2 \times 10^{4(b)}$	$10^{(b)}$	$20^{(b)}$	10^7	7
10^{-1}	2×10^{-1}	1	2	$10^{3(b)}$	$2 \times 10^{3(b)}$	1	2	10^6	6
10^{-2}	2×10^{-2}	10^{-1}	2×10^{-1}	$100^{4(b)}$	$200^{(b)}$	10-1	2×10^{-1}	10^5	5
10^{-3}	2×10^{-3}	10^{-2}	2×10^{-2}	10	20	10^{-2}	2×10^{-2}	10^4	4
10^{-4}	2×10^{-4}	10^{-3}	2×10^{-3}	1	2	10^{-3}	2×10^{-3}	10^3	3
10^{-5}	2×10^{-5}	10^{-4}	2×10^{-4}	10^{-1}	2×10^{-1}	10^{-4}	2×10^{-4}	10^2	2
10^{-6}	2×10^{-6}	10^{-5}	2×10^{-5}	10^{-2}	2×10^{-2}	10^{-5}	2×10^{-5}	10	1

(a) From *Safe Use of Lasers*, American National Standard Z136.1-1993.

(b) Not recommended as a control procedure at these levels. These levels of output power could damage or destroy the attenuating material used in the eye protection. The skin also needs protection at these levels.