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Simplified Method for Selecting Laser Eye Protection for Intrabeam Viewing

Simplified Method for Selecting Laser Eye Protection for Intrabeam Viewing for Wavelengths between 400-1400 nm.**									
Q-Switched Lasers (10 ⁻⁹ - 10 ⁻² s)		Non-Q-Switched Lasers (0.4x10 ⁻³ - 10 ⁻² s)		Continuous-Wave Lasers Momentary (0.25 - 10 s)		Continuous-Wave Lasers Momentary (less than 1 h)		Attenuation	
Maximum Output Energy (J-cm ²)	Maximum Beam Radiant Exposure (J)	Maximum Output Energy (J-cm ²)	Maximum Beam Radiant Exposure (J)	Maximum Power Output (W)	Maximum Beam Irradiance (W-cm ²)	Maximum Power Output (W)	Maximum Beam Irradiance (W-cm ²)	Attenuation Factor	OD
10	20	100	200	10 ⁵ *	2 x 10 ⁵ *	100*	200*	1000000000	8
1	2	10	20	10 ⁴ *	2 x 10 ⁴ *	10*	20*	100000000	7
10 ⁻¹	2 x 10 ⁻¹	1	2	10 ³ *	2 x 10 ³ *	1	2	10000000	6
10 ⁻²	2 x 10 ⁻²	10 ⁻¹	2 x 10 ⁻¹	100*	200*	10 ⁻¹	2 x 10 ⁻¹	1000000	5
10 ⁻³	2 x 10 ⁻³	10 ⁻²	2 x 10 ⁻²	10	20	10 ⁻²	2 x 10 ⁻²	100000	4
10 ⁻⁴	2 x 10 ⁻⁴	10 ⁻³	2 x 10 ⁻³	1	2	10 ⁻³	2 x 10 ⁻³	10000	3
10 ⁻⁵	2 x 10 ⁻⁵	10 ⁻⁴	2 x 10 ⁻⁴	10 ⁻¹	2 x 10 ⁻¹	10 ⁻⁴	2 x 10 ⁻⁴	1000	2
10 ⁻⁶	2 x 10 ⁻⁶	10 ⁻⁵	2 x 10 ⁻⁵	10 ⁻²	2 x 10 ⁻²	10 ⁻⁵	2 x 10 ⁻⁵	100	1
*Not recommended as a control procedure at these levels. These levels of output power could damage or destroy the attenuating material used in eye protection. The skin also needs protection at these levels.									
**Use of this table may result in optical densities (OD) greater than necessary. See ANSI Z136.1-2000, section 4.6.2 for other wavelengths.									
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