$2.55\ mW/cm^2$

$6.7\ \mu W/cm^2$

$\frac{5.2\ W/cm^2}{2.55\ mW/cm^2} = 2039$ $\quad \log_{10}(2039) = 3.3$

round up to OD = 4

Diffuse Reflections

$$H = \frac{P_\lambda \cos\Phi_v Q}{\pi r^2}$$

Q: Energy of incident beam
r: Distance from reflection

Worst case is $P_\lambda = 1$ and $P\cos\Phi = 1$

Katana's laser, $Q = 2W$

$$r = \sqrt{\frac{P_\lambda \cos\Phi_v Q}{\pi H}}$$

Solve for safe distance of MPE = $0.636\ mJ/cm^2$

$$r = \sqrt{\frac{1 \times 2\ J/s \times 0.25s}{\pi \times 0.636\ mJ/cm^2}} = \sqrt{\frac{0.5}{2 \times 10^{-3}}} = 15.8\ cm$$ ✓

Must be at least 16 cm, or 6.3 inches away

$$E_0 = \frac{4\Phi}{\pi [0.7cm]^2}, \quad \frac{4(2w)}{\pi\ 0.490cm^2} = 5.2\ W/cm^2 = \text{Maximum Irradiance}$$

Maximum MPE → $\frac{5.2\ W/cm^2}{2.55\ mW/cm^2} = 2039$ $\quad \log_{10}(2039) = 3.3$

round up to OD 4 @ 639 nm