Ray Tracing

Snell's Law:

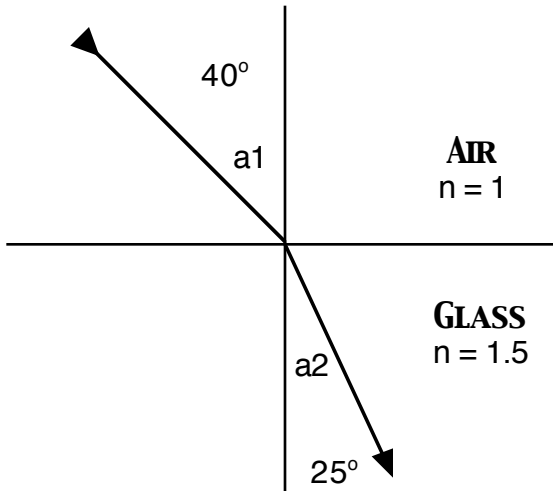
n1/ n2 = sin a2 / sin a1

1 / 1.5 = sin a2 / sin 40°

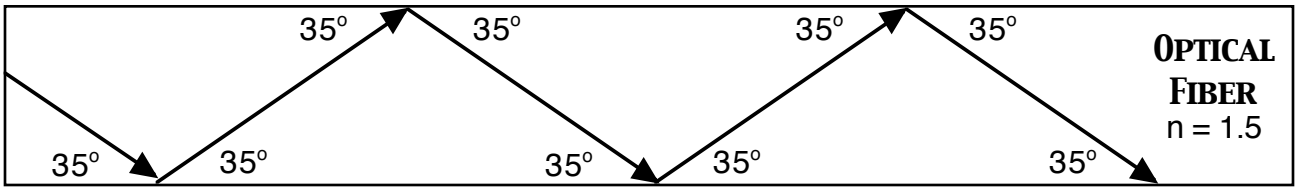
0.666 = sin a2 / 0.642787609

sin a2 = .428525066

a2 = 25.37°

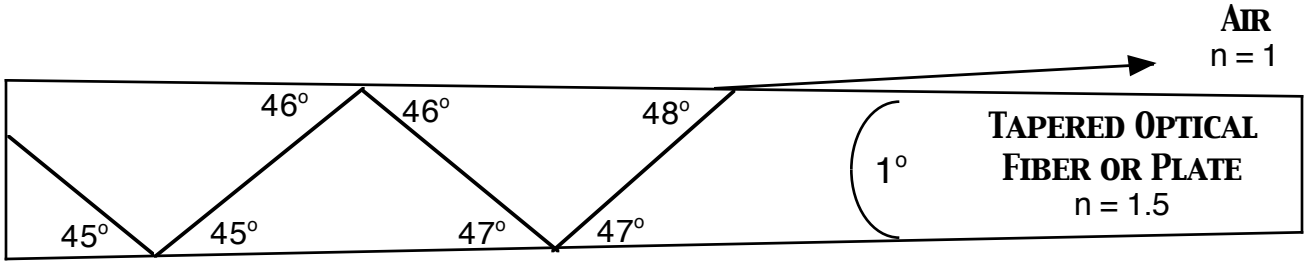


Total Internal Reflection



An optical fiber with perfectly parallel walls and without scratches, hairline fractures, cloudiness, imperfections or impurities within, will have total internal reflections of light travelling down it's core, virtually without any light excaping.

Critical Angle



Within an optical fiber, or an optical plate, with a one degree taper, with an index of refraction of 1.5, (n = 1.5) internally reflecting light rays will increase their angle of reflection by one degree at each subsequent reflection until it advances to > 41.8°. At this point, the ray excapes in a direction determined by Snell's Law.