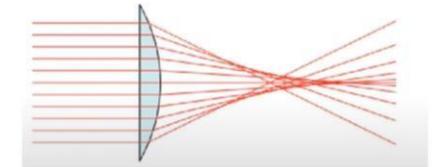
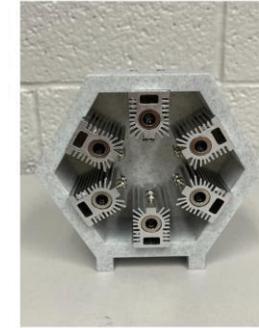
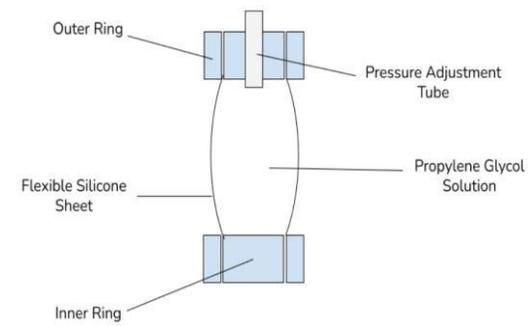


High Power Laser

High power industrial lasers are expensive, and are in short supply.

The main motivation for this project was to find a cheaper way to create industrial grade lasers.

The requirement for this project is to create a device to cheaply focus a large amount of energy to a small point varied over distance.



Directed Optical Laser Focusing Integrated Network

The engineered solution was to combine the power of several smaller and cheaper lasers into one focused point. This project uses six 1.6 W lasers for a combined output power of 9.6 W. The system driving power is 36W for an efficiency of 27%. The method of focusing the lasers was chosen to use the emerging technology of adjustable fluid filled lens. By changing the pressure inside a fluid filled container, a lens's focal length can be adjusted using an actuator. Combined with a distance sensor the lasers can be focused using a standard microcontroller.

Results

The laser system proved successful in focusing several lasers into one directed beam. The lasers are able to engrave wood at distances of 0.5 meters, and engrave metal at 0.1 meters or closer. The fluid filled lens was limited by how close it could move the focal length to the lens.

