

**Department of Mechanical Engineering  
ME EN 7960 - Precision Machine Design**

**Design Project 1 - Micromachining XY Flexure Stage**

A small, extremely accurate XY stage is desired for a micromachining applications. The travel of this stage is 30 - 40 microns in the X- and Y- direction. The thrust force required for this application is on the order of 100 N. The stage is required to achieve the maximum travel at a frequency of at least 10 Hz.

The positional accuracy of this stage is 50 nanometers or better

Due to space constraints, the stage must not exceed an overall size of 125 x 125 mm. In fact, the smaller the outside dimensions the better. The height should be limited to less than 30 mm. The usable stage area is at least 25 x 25 mm. Furthermore, due to the environment the stage is used in, the stage must be absolutely waterproof (submersible).

