Our pupillometry wheel set-up requires five custom parts made from Aluminum 304 and Aluminum 6061-T6. These components fit securely to the optical posts we purchased from Thorlabs. We ordered them from eMachineShop, using the following files:

* Headring.step / Headring\_mod\_five\_eighths. step
* HeadPlateTop. step
* RotaryEncoderAdapter. step
* HeadPlateHolderThreaded. sldprt
* HeadPlateBottomThreaded.sldprt

|  |  |
| --- | --- |
|  | **Itemized Cost** |
| Rotary Encoder | $28.43 |
| Head Plate Holder (Set of 2) | $60.44 |
| Head Plate Holder Top | $39.14 |
| Head Plate Holder Bottom | $51.01 |
| Head Ring | $5.16 |

**Table 1.** The eMachineShop quotes for the five custom components, obtained in June 2023.

When submitting a quote through eMachineShop for custom CNC machining, you will be asked to “Specify threading and tolerances in a PDF, PNG or JPG”. The following screenshots from Fusion 360, with the accompanying description, will ensure that the two components are properly threaded.

|  |  |  |  |
| --- | --- | --- | --- |
|  | **Material** | **L x W x H (Inches)** | **Tolerance (Inches)** |
| Rotary  Encoder | Aluminum 304 | 0.590” x 0.157” x 2.559” | +/- 0.005" |
| Head Plate Holder | 1.184’’ x 0.595’’ x 0.667’’ |
| Head Plate Holder Top | 2.755” x 0.118” x 1.181” |
| Head Plate Holder Bottom | 4.330” x 0.118” x 1.181” |
| Head Ring | Aluminum 6061-T6 | 0.475" x 0.472" x 0.130" |

**Table 2.** The dimensions of each machined component in inches.

|  |  |  |  |
| --- | --- | --- | --- |
|  | **Material** | **L x W x H (Centimeters)** | **Tolerance (Centimeters)** |
| Rotary  Encoder | Aluminum 304 | 1.498 x 0.398 x 6.50 | +/- 0.0127 |
| Head Plate Holder | 3.007 x 1.511 x 1.694 |
| Head Plate Holder Top | 6.997 x 0.299 x 2.999 |
| Head Plate Holder Bottom | 10.998 x 0.299 x 2.999 |
| Head Ring | Aluminum 6061-T6 | 1.206 x 1.198 x 0.330 |

**Table 3.** The dimensions of each machined component in centimeters.

|  |  |  |  |
| --- | --- | --- | --- |
|  | **Material** | **L x W x H (Millimeters)** | **Tolerance (Millimeters)** |
| Rotary  Encoder | Aluminum 304 | 14.98 x 3.98 x 65 | +/- 0.0127 |
| Head Plate Holder | 30.07 x 15.11 x 16.94 |
| Head Plate Holder Top | 69.97 x 2.99 x 29.99 |
| Head Plate Holder Bottom | 109.98x 2.99 x 29.99 |
| Head Ring | Aluminum 6061-T6 | 12.06 x 11.98 x 3.30 |

**Table 4.** The dimensions of each machined component in millimeters.

A computer screen shot of a drawing

Description automatically generated

The two holes closest to the center of the plate of the “HeadPlateBottomThreaded.sldprt” file are each internally threaded with size 3 mm threads (ISO Metric profile, thread tolerance 6H, right hand direction).

A computer screen shot of a computer program

Description automatically generated

The two 0.396 cm diameter holes along the base of the “HeadPlateHolderThreaded.sldprt” file are each internally threaded with size 3 mm threads (ISO Metric profile, thread tolerance 6H, right hand direction).