



**Supira**  
MEDICAL

# Internship 2022

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Aug 18<sup>th</sup>, 2022

# Overview

Introduction

Projects

Things I  
learned

Takeaways

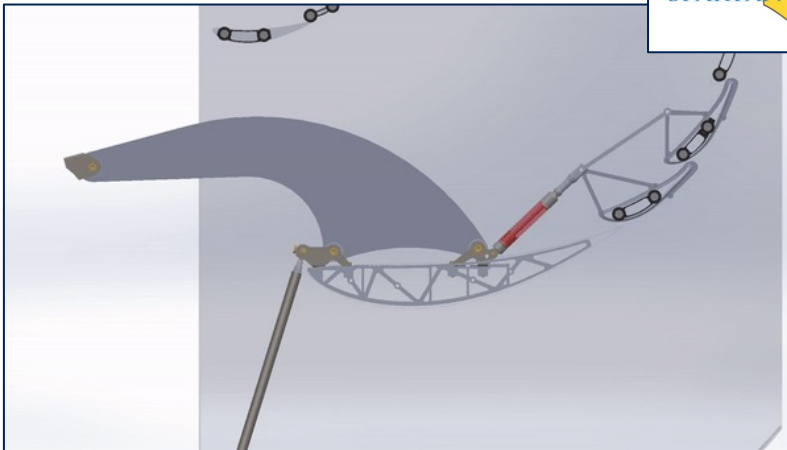
# *Introduction*

# About Me



Charles W. Davidson College of Engineering  
Department of Mechanical and Aerospace Engineering

- ▶ San Jose State University
  - ▶ Graduating in December 2022
  - ▶ B.S. in Mechanical Engineer
  - ▶ Why mechanical?
  - ▶ Spartan Racing Team



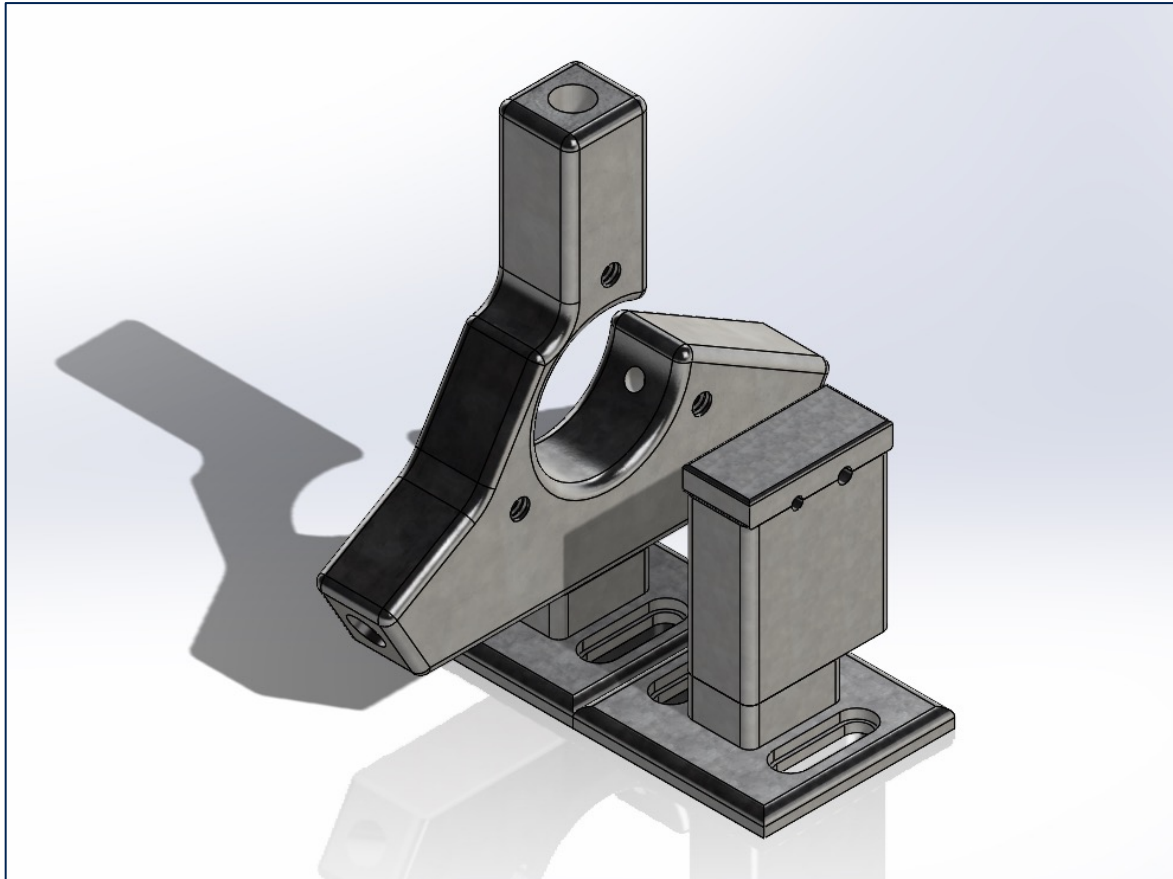
- ▶ Hobbies
  - ▶ Surfing
  - ▶ Hiking
  - ▶ Camping
  - ▶ Snowboarding



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# *Projects*

# UV curing station



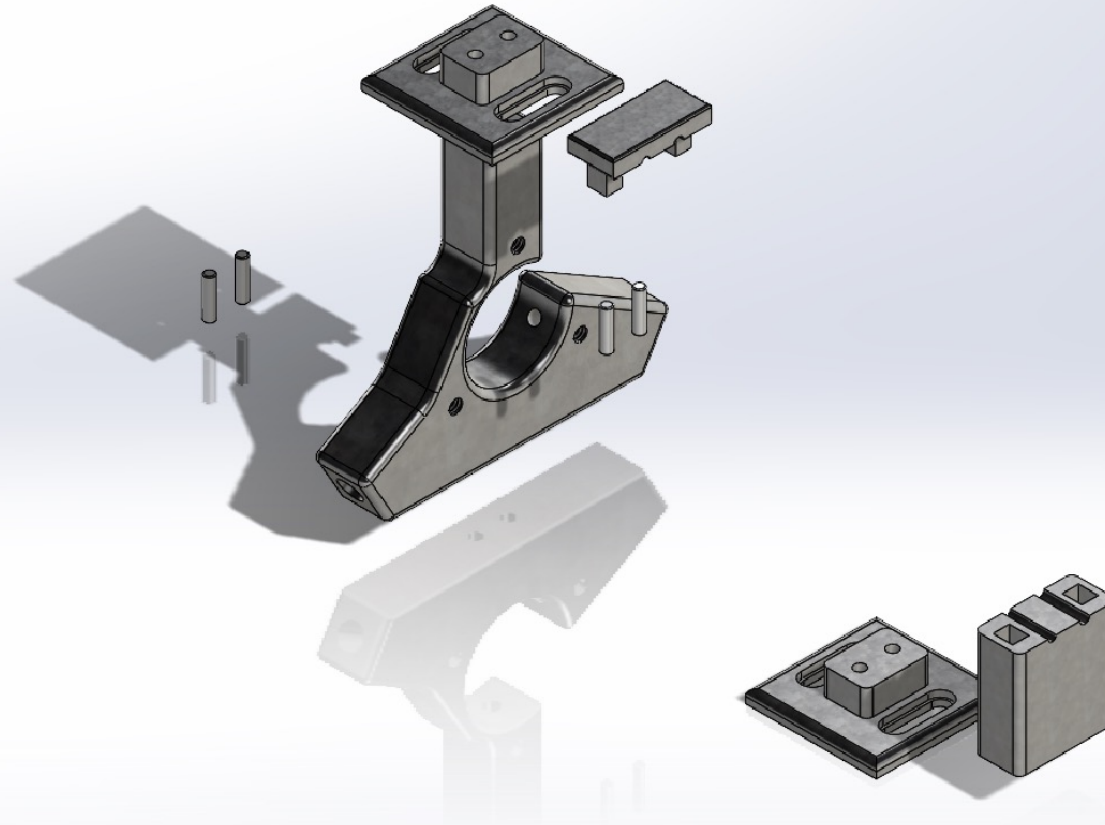
## ▶ Problem:

- ▶ Inconsistent results with curing throughout manufacturing
- ▶ Issues of Burning and the adhesive not fully curing

## ▶ Challenges:

- ▶ Operator useability
- ▶ Height / Space constraints
- ▶ Cables bending radius

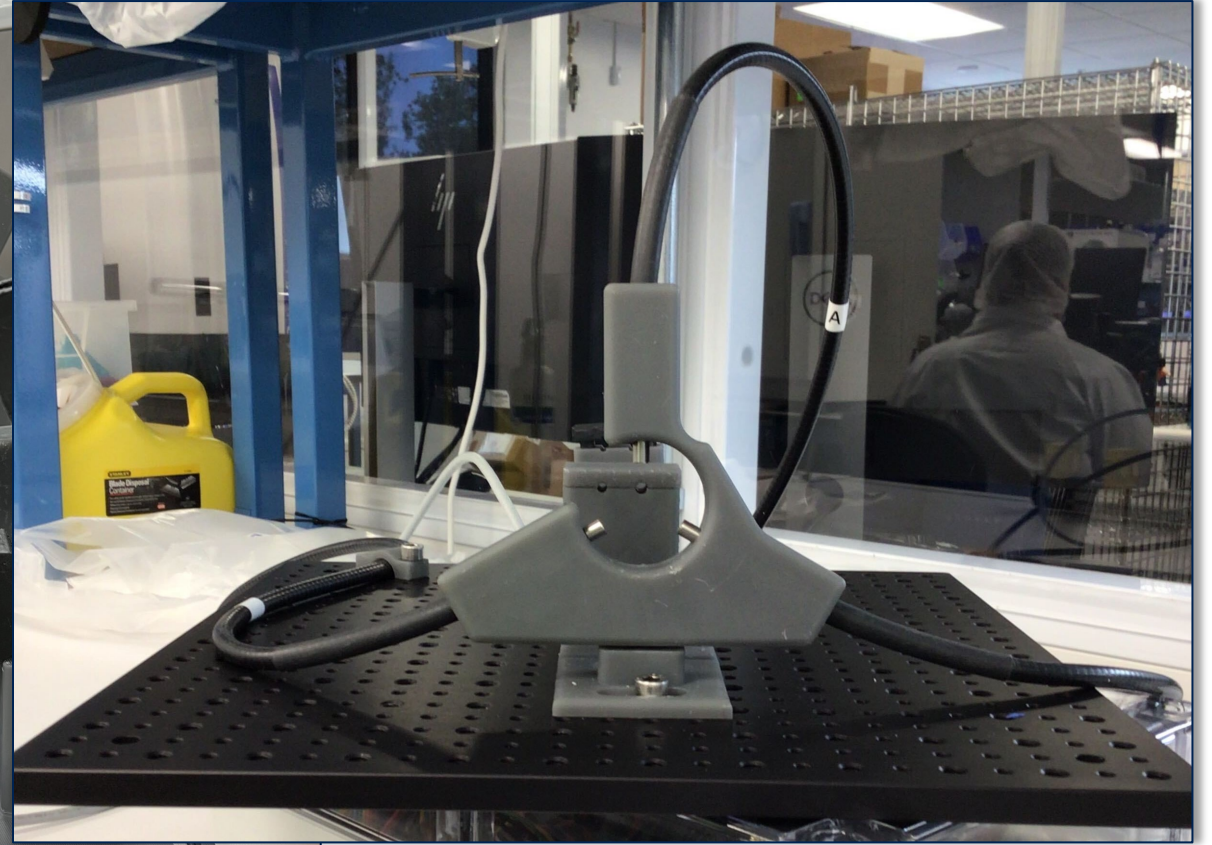
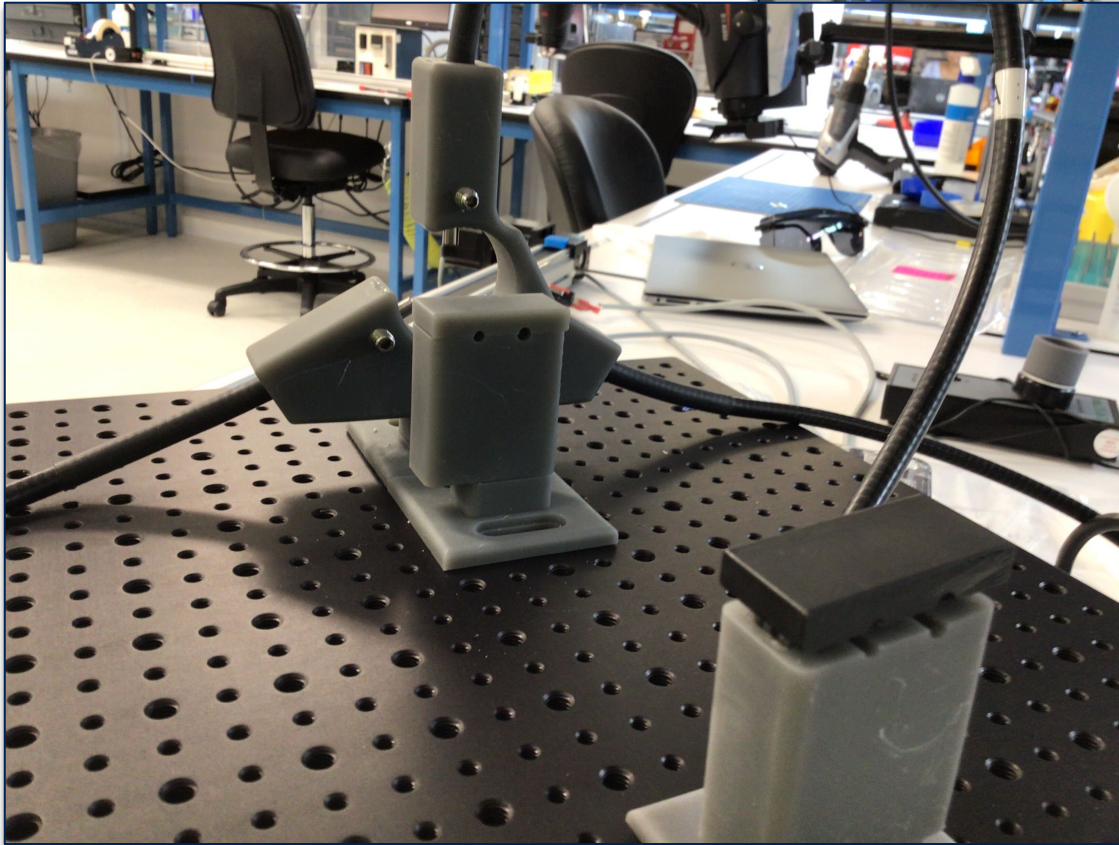
# UV curing station



Design



# Where it's made





# UV curing station

## ▶ Testing:

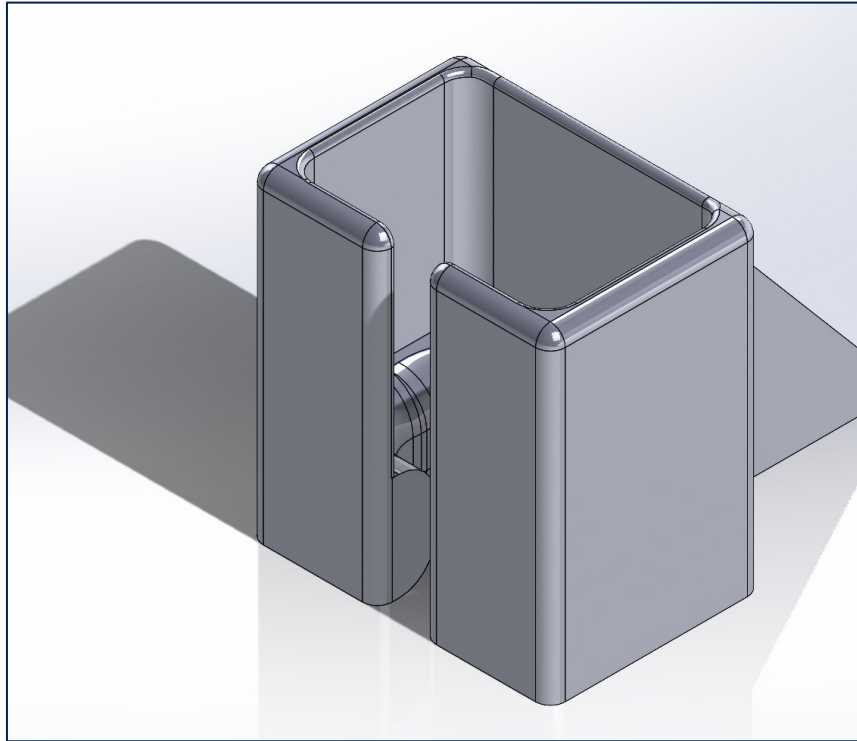
- ▶ DOE to explore process inputs
- ▶ Vary cure time and UV distance

## ▶ Other Findings:

- ▶ The storage temp of the Loctite 3311 matters
- ▶ The further the distance the less burn risk
- ▶ Volume of Loctite matters

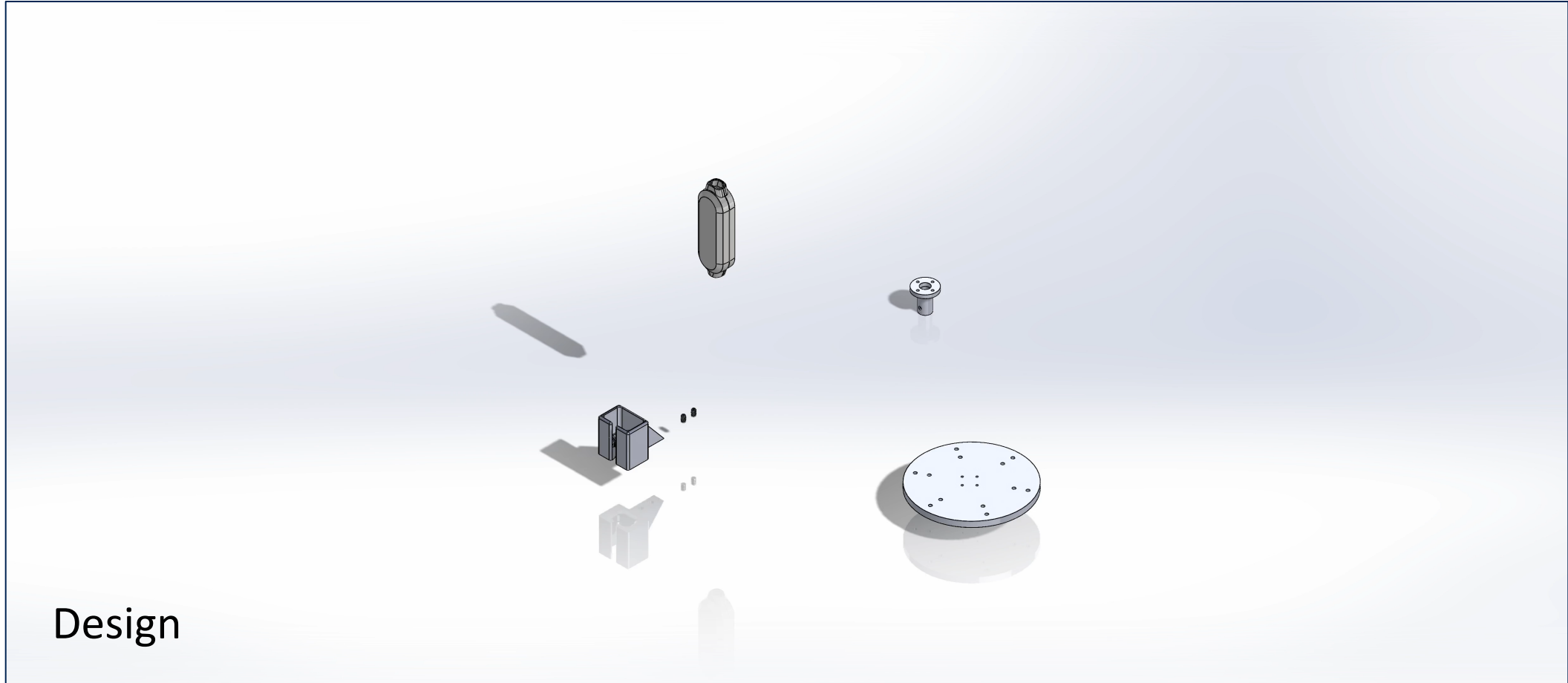
Distance of the wands being extruded (cm)	Time (seconds)						Tube OD (In)
	2	4	6	8	10	12	
0.5	Not cured	Not cured	Clear/sticky	Clear	Clear	Burnt/bubbly	0.11
0.75	Not cured	Not cured	Clear/sticky	Clear/sticky	Clear/fully cured	Burnt/bubbly	0.11
Distance of wands being extruded (cm)	Time (seconds)						Tube OD (In)
	2	4	6	8	10	12	
0.5	Not cured	Not cured	Clear/sticky	Clear/sticky	Clear/sticky	Clear/fully cured	0.14
0.75	Not cured	Not cured	Clear/sticky	Clear/fully cured	Burnt/bubbly	N/A	0.14
1	Not cured	Not cured	Clear/sticky	Clear/sticky	Clear/fully cured	Burnt/Bubbly	0.14

# Device Dryer

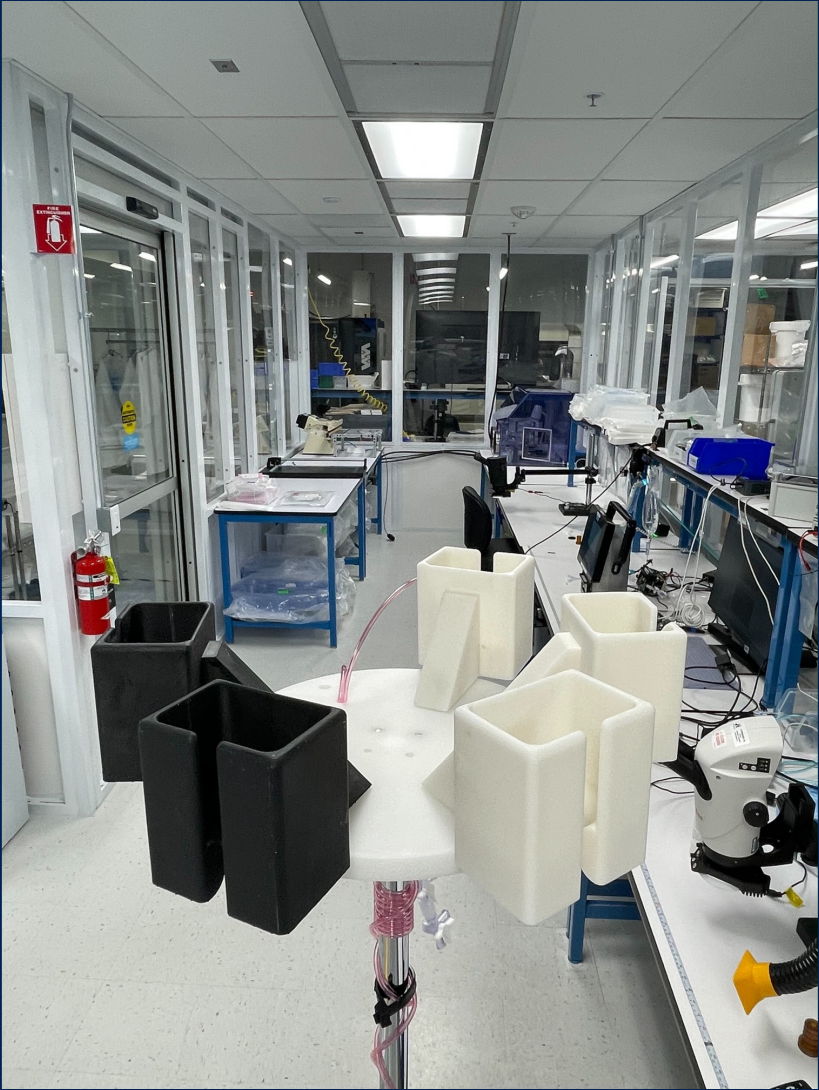


- ▶ **Problem**
  - ▶ No where to place Supira device after testing
  - ▶ Devices weren't drying completely
- ▶ **Challenges**
  - ▶ Mounting
  - ▶ Desk holes weren't centered
  - ▶ Enough room

# Device Dryer



# Where it's at now



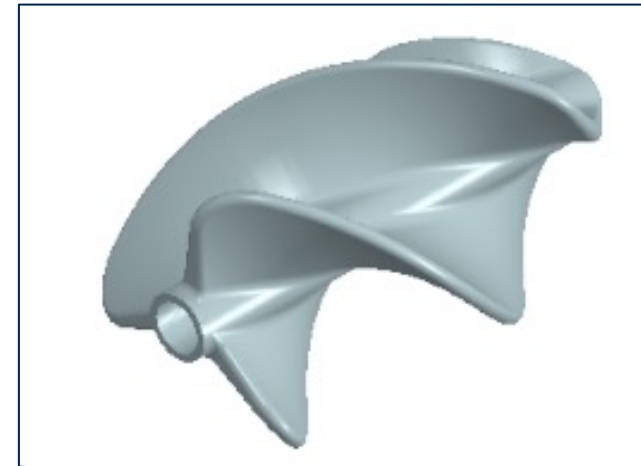
# *Impeller trimming fixture*

- ▶ Problem:

- ▶ Inconsistency of trimming the impellers to the appropriate location

- ▶ Challenges:

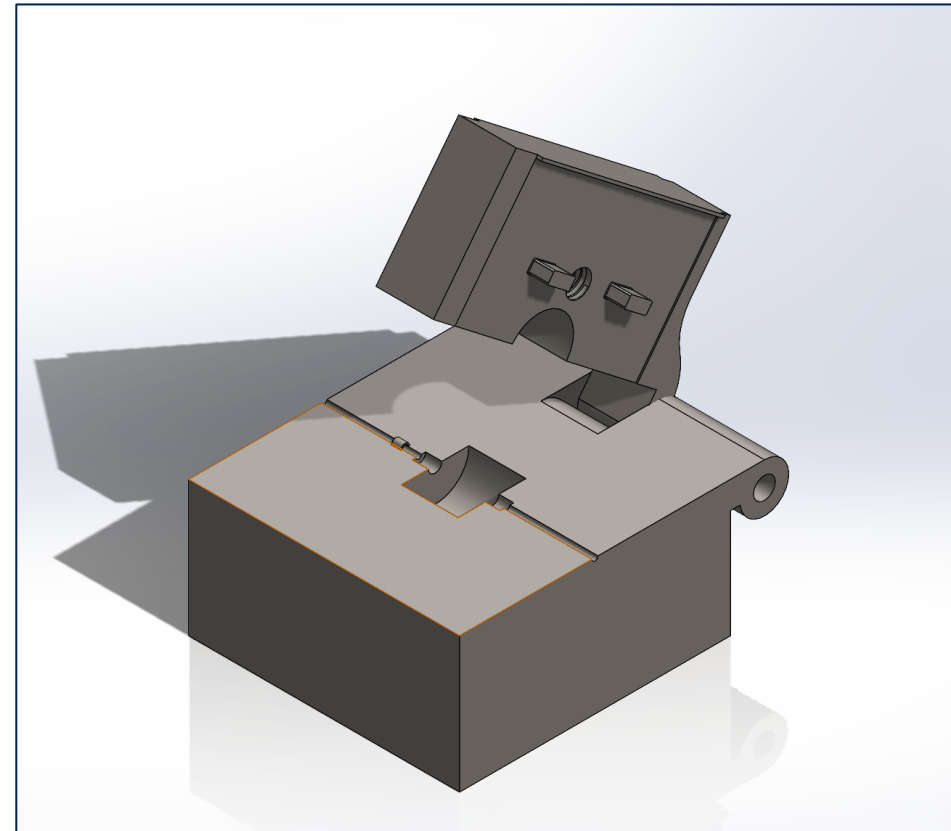
- ▶ Small part
- ▶ Very tight tolerances
- ▶ Part flexibility
- ▶ Small measurements



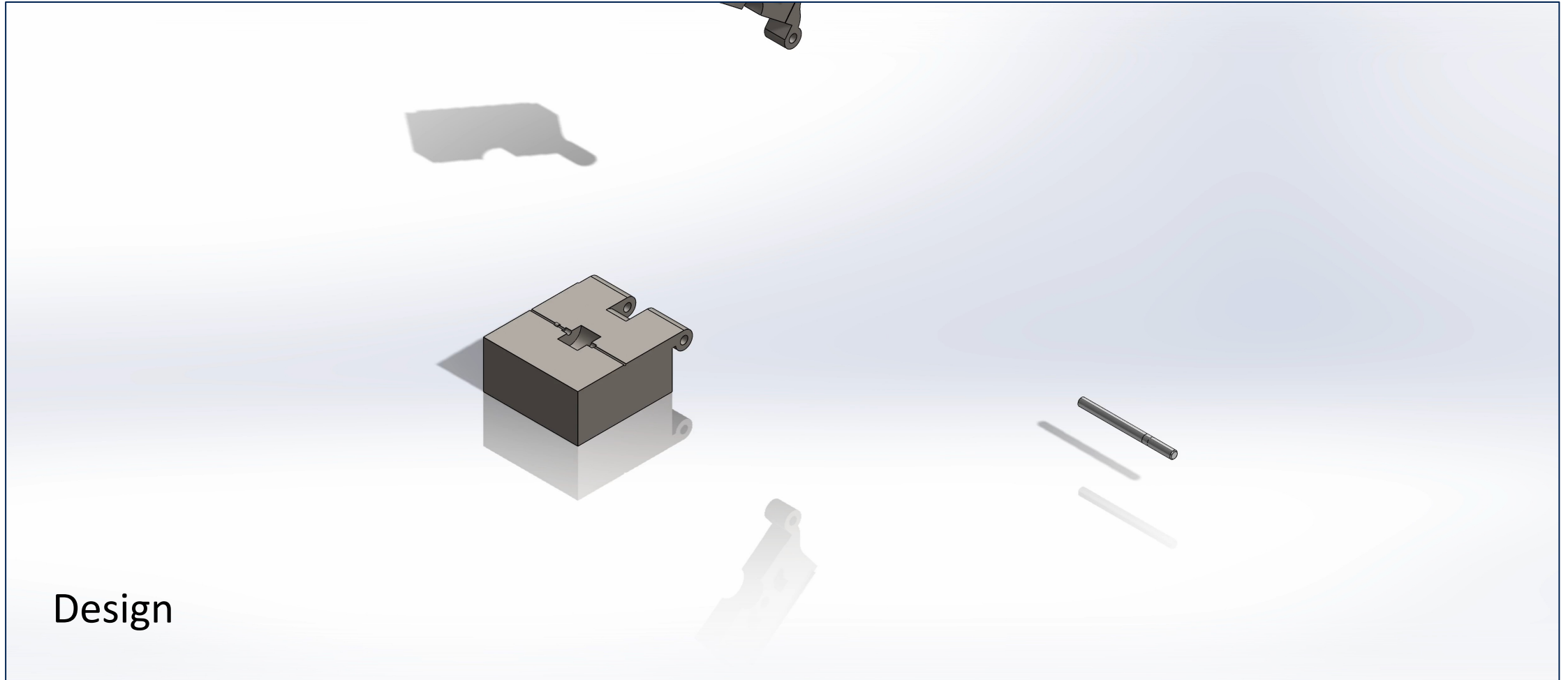


# Impeller trimming fixture

- ▶ Testing:
  - ▶ An accurate trim from both sides of the impeller
  - ▶ IQ after each trim
- ▶ Results:
  - ▶ TBD



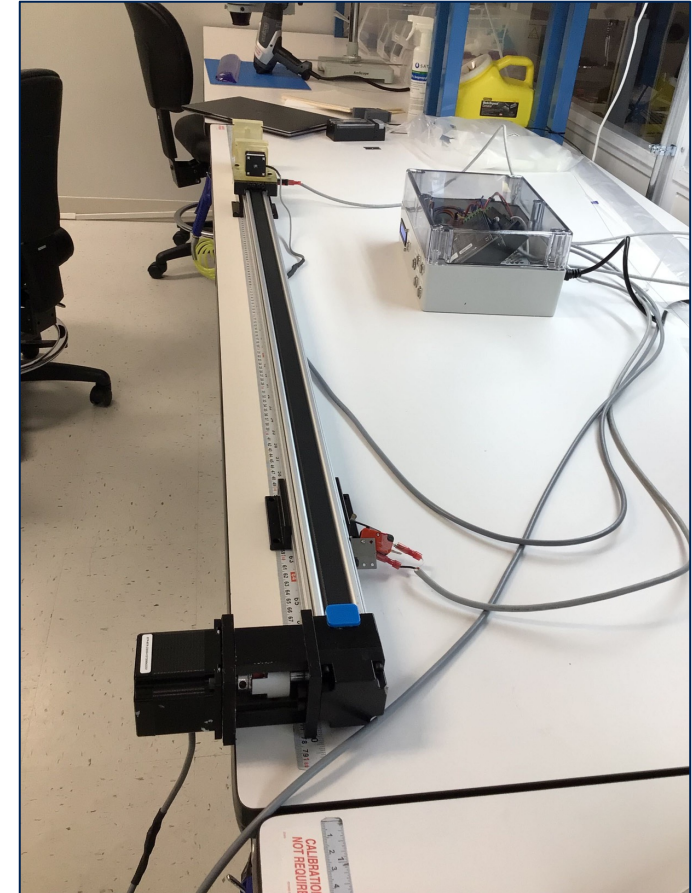
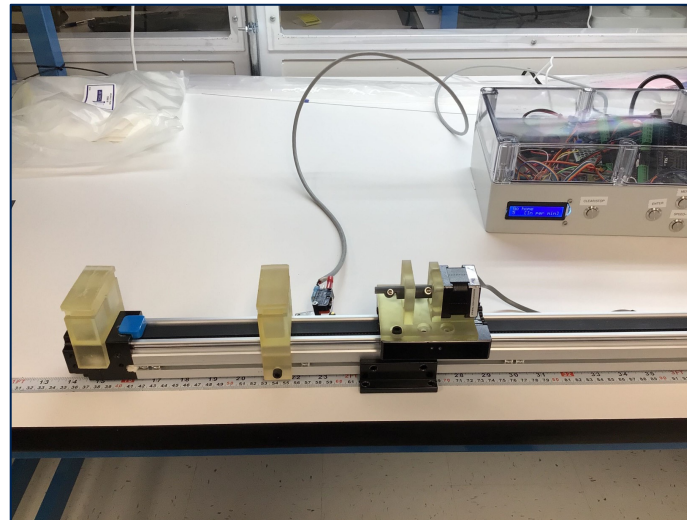
# *Impeller trimming fixture*



Design

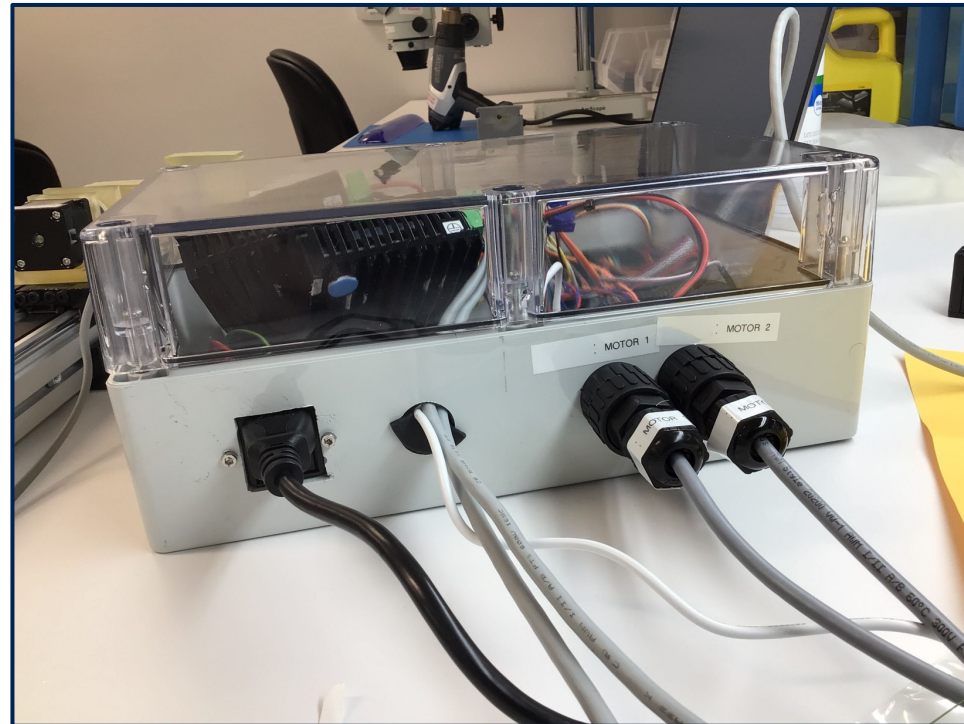
# Linear Coil Winder

- ▶ Need:
  - ▶ Multiple processes require it & takes a lot of time (bottle neck)
- ▶ Challenges:
  - ▶ Sourcing parts
  - ▶ Running two stepper motors at different speed at the same time
  - ▶ Cable management
  - ▶ Documentation
  - ▶ Validating against existing winder



# Linear Coil Winder

- ▶ Results:
  - ▶ Design improvement
  - ▶ Operators buy in was a success
  - ▶ Currently ready for use by the operators
  - ▶ Efficient coding



# What I've learned

Observed and learned the stage of a startup

From DV to first in human

A deeper understanding of R&D, Process development and operations work

Efficiency is important

Avoiding measurement mistakes

Tips and tricks on everyday task or long-term tasks