HIGH TEMPERATURE VACUUM SYSTEM

FIU | Motorola Nanofabrication Research Facility
FLORIDA INTERNATIONAL UNIVERSITY

Motivation

- Contribute in the development of high vacuum high temperature furnace used for manufacturing of retinal implants
- Fundamental Heat Transfer, materials, and programming knowledge

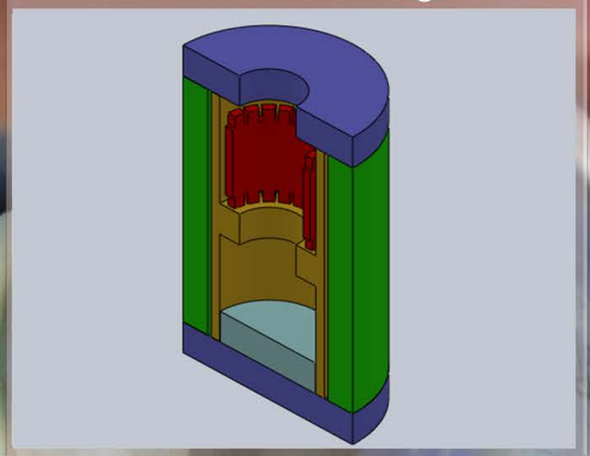
Problem Statement

- Braze Titanium metal with 96% alumina ceramic using gold as a filler material
- Archive brazing in vacuum system in less than 20 seconds

Objective

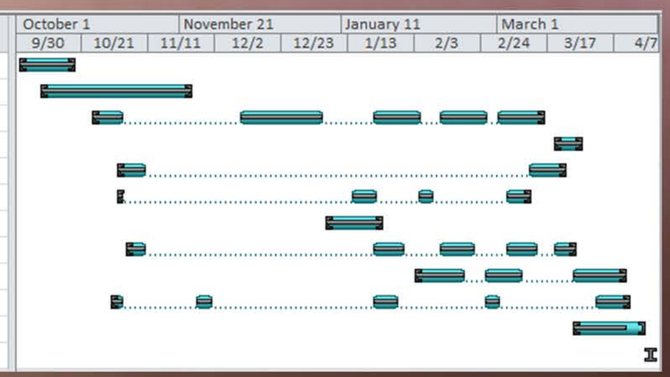
- Design and manufacturing of mini furnace to work in vacuum
- Design and assembly of system inside vacuum
- Programming of control
- Heat transfer simulation analysis

Final Furnace Design



Assembly of Feedthrough

Task Name	Duration
Project Discussion	14 days
Research	36 days
Alternative Designs	61 days
Final Design	7 days
Cost Anaylsis	17 days
Model & Simulations	19 days
Prototype and Testing	14 days
Product Manufacturering	36 days
Testing	35 days
Final Report	29 days
Prepare for Presentation	17 days
Final Presentation	1 day



Final Design

- Single hot zone alumina furnace with tungsten wire, and zirconia insolation
- Linear mechanism for vertical motion

Analysis

- Radiation heat transfer analysis in SolidWorks
  - Furnace
  - Linear mechanism

Dariesky Linares

Christopher Sequera

Project Advisor
- Dr. W. Kinzy Jones