

# Custom Ingot Growth Oven Frame



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**MicroPower**

# MicroPower Background

- MicroPower Global Inc. STAR  
Park 3055 Hunter Rd. San  
Marcos, TX
- Sponsor- Dr. Ruwan  
Dedigama, Senior Staff  
Engineer-Crystal Growth Lead
- Convert heat into electricity  
using thermoelectric  
properties
- Grow high quality  
semiconducting material



MicroPower Chips 2mm<sup>2</sup>  
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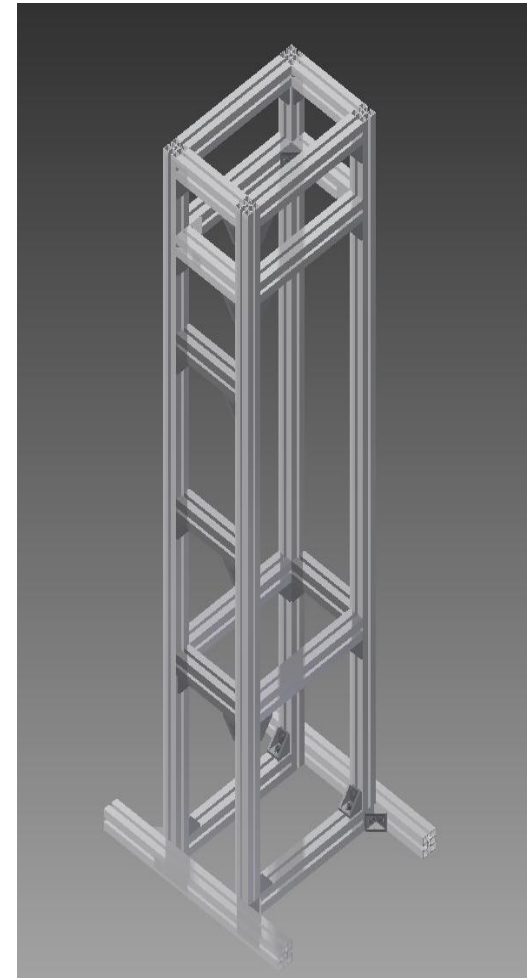
# Project Introduction

## PROBLEMS

- Design for improvement for an ingot growth oven frame
- Current design obsolete

## OPPORTUNITIES

- Create mobility
- Computer user friendly



# Customer Needs

## Constraints

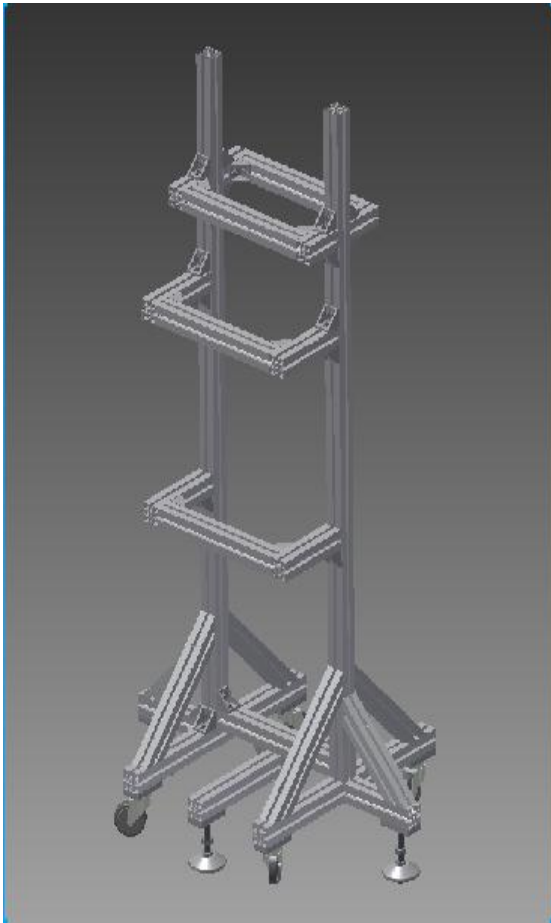
- The oven frame keeps the ingot stable
- The oven frame dimension is adjustable
- The structure of the oven allows easy access to reach ingot
- The oven frame is mobile



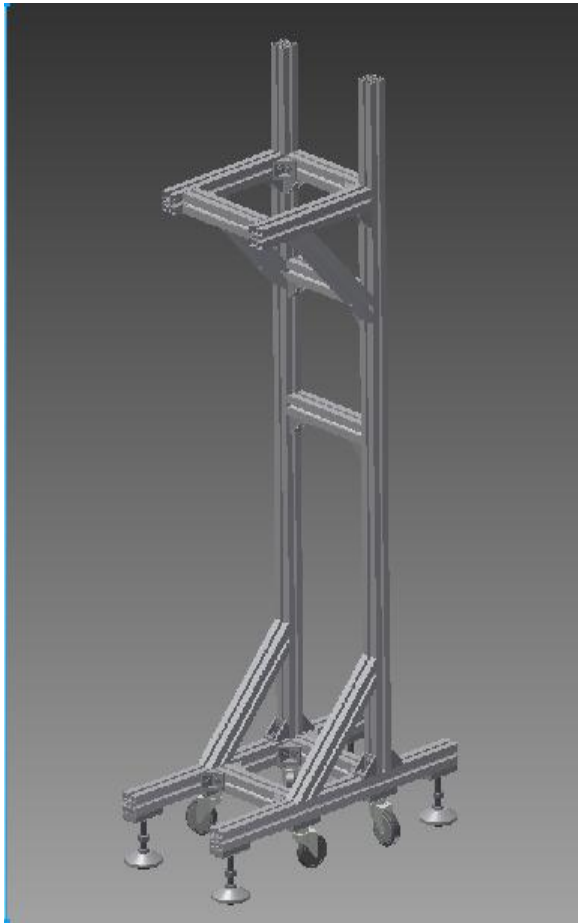
## Criteria

- The cost of material is minimized
- The frame is not taller than 6 feet

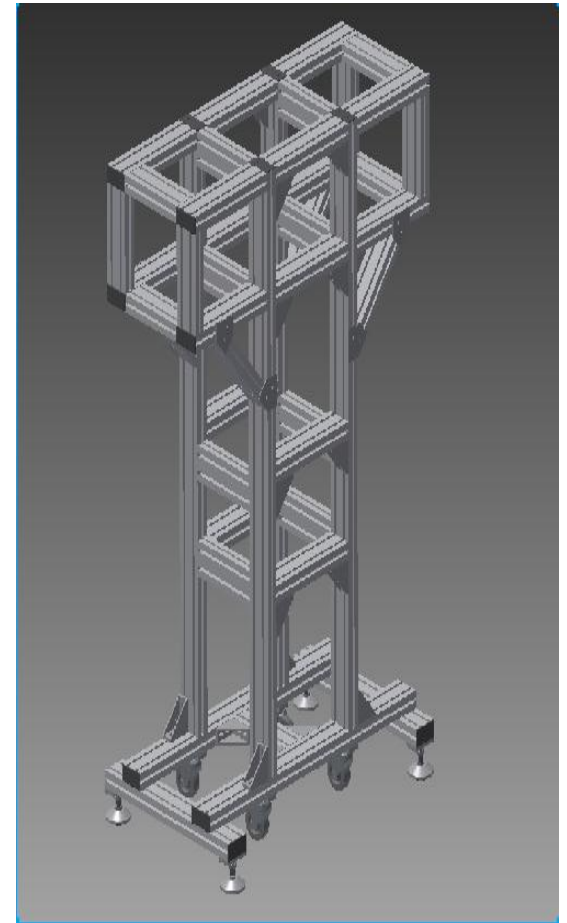
# Concept Generation



Single oven with  
unique storage  
potential

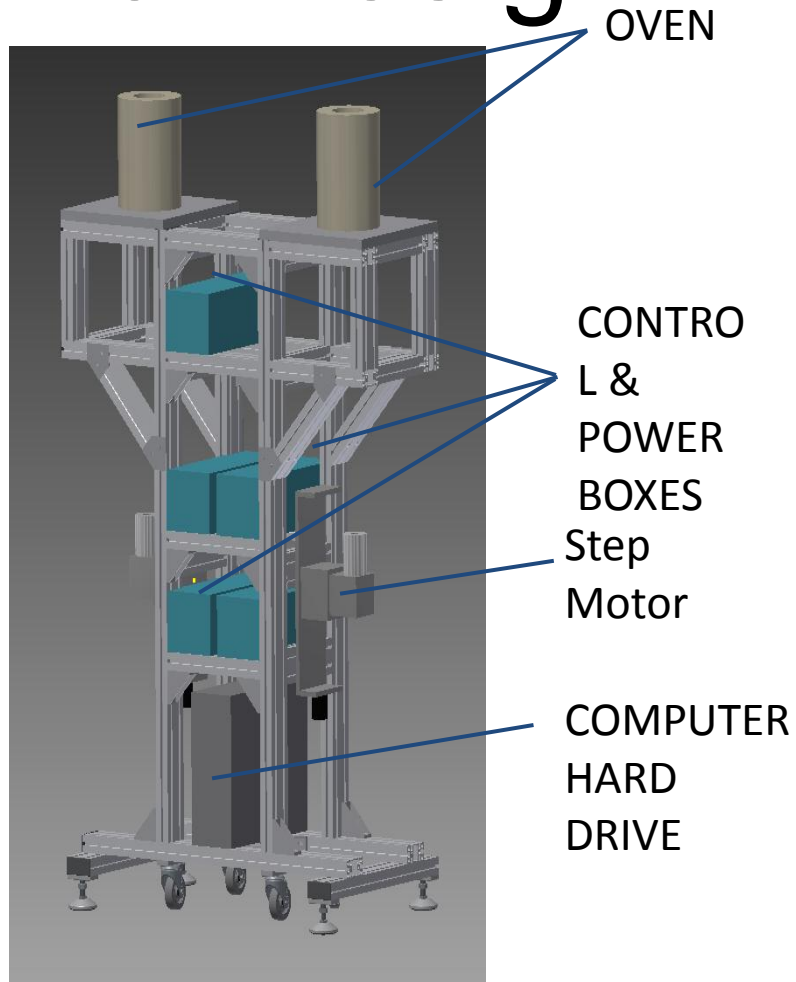


Single oven keeping  
material to a minimum

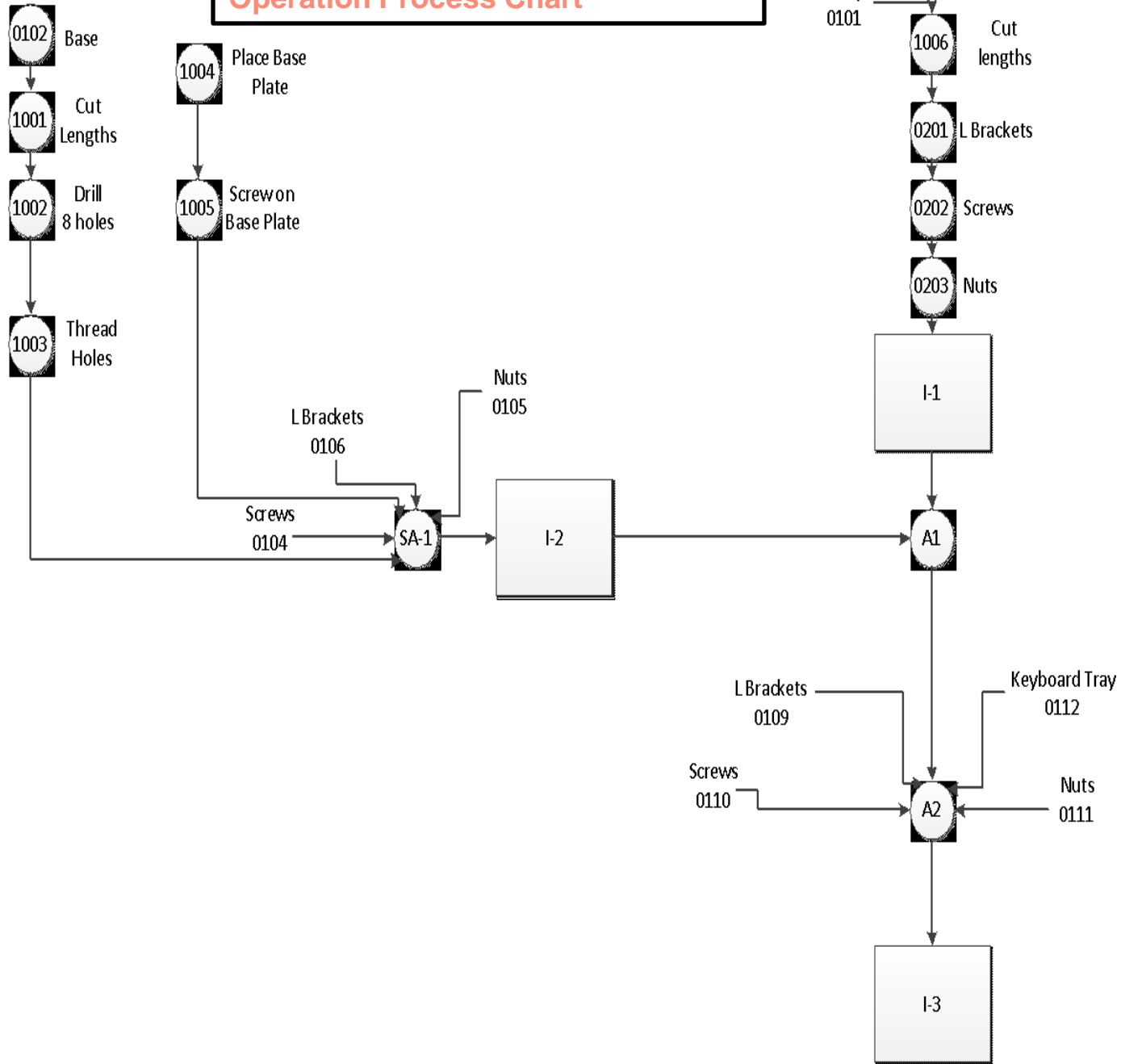


Dual ovens with  
one frame

# Final Design



# Operation Process Chart



# Manufacturing Processes



Drill press to create holes in the gusset plates



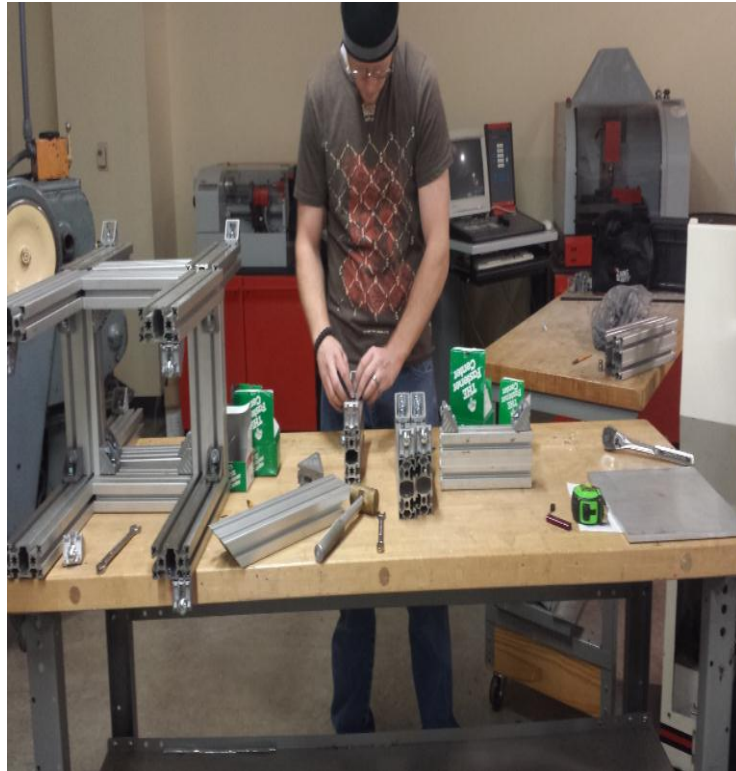
Water jet to cut gusset plates



Wet saw to cut extruded t-slots into desired length



# Assembly Processes



# Final product



The improved design (right picture) has many upgrades compared to the original design (left picture).

Improvements include:

1. Wheels for mobility
2. Glides for stability
3. The ability to hold two processes at once
4. Ability to hold all components
5. Better adjustability

