Custom Ingot Growth Oven Frame

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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
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

- OVEN
- CONTROL & POWER BOXES
- Step
- Motor
- COMPUTER
- HARD DRIVE
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